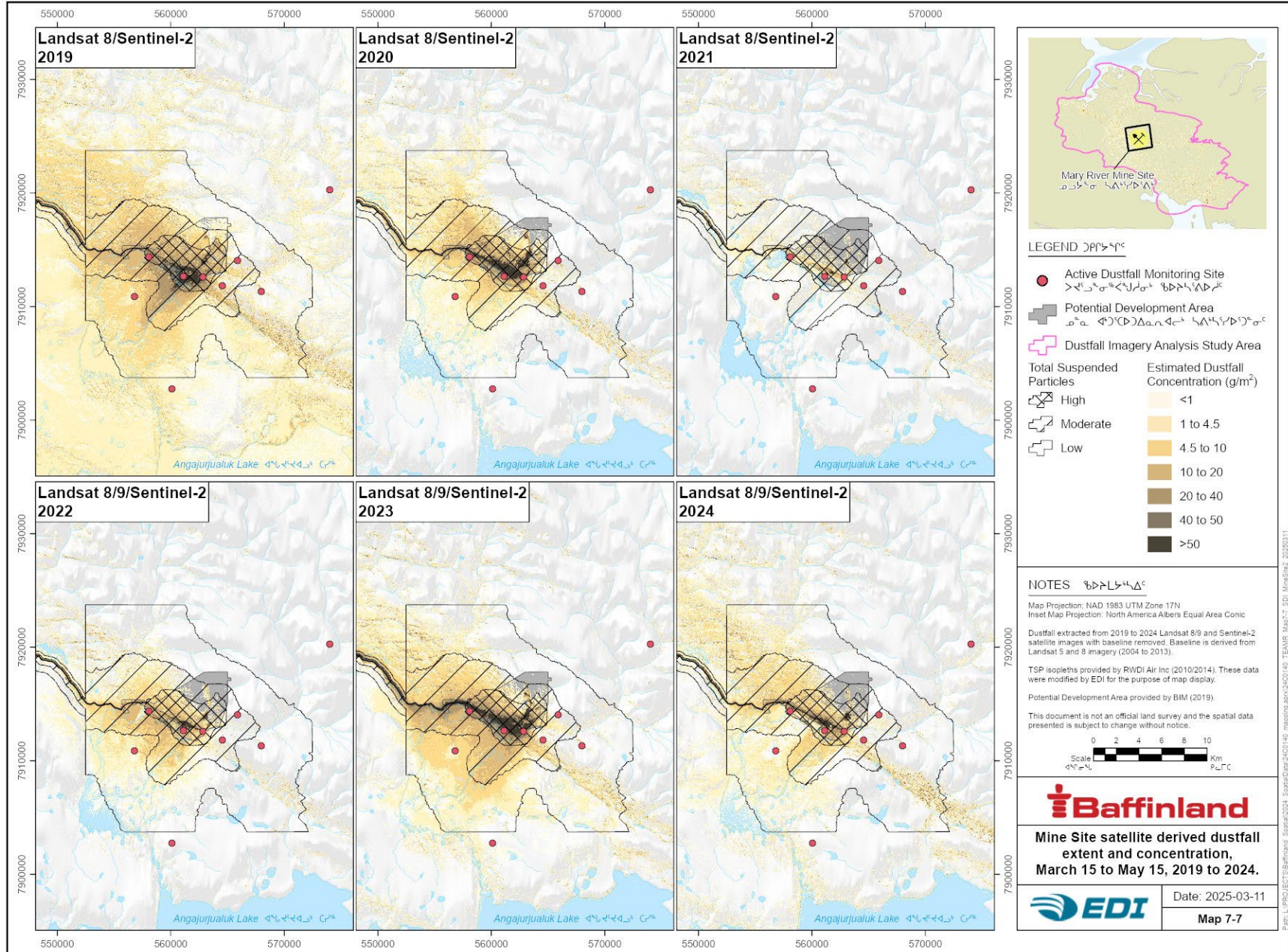


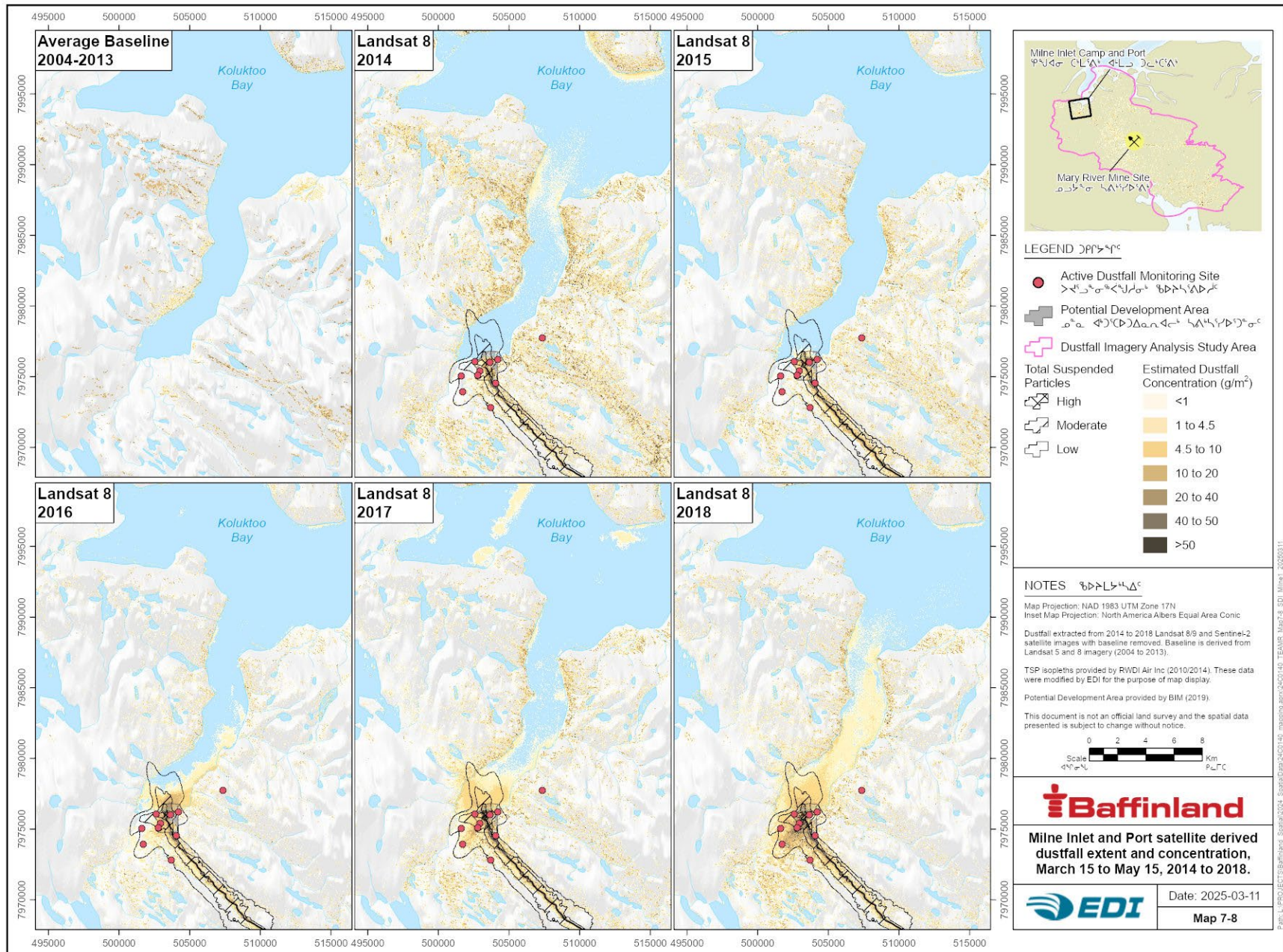
Figure 7-19. Satellite-derived dustfall extents from 2014 to 2024 with baseline years 2004 and 2013.  
*The mean baseline has been removed from the data.*



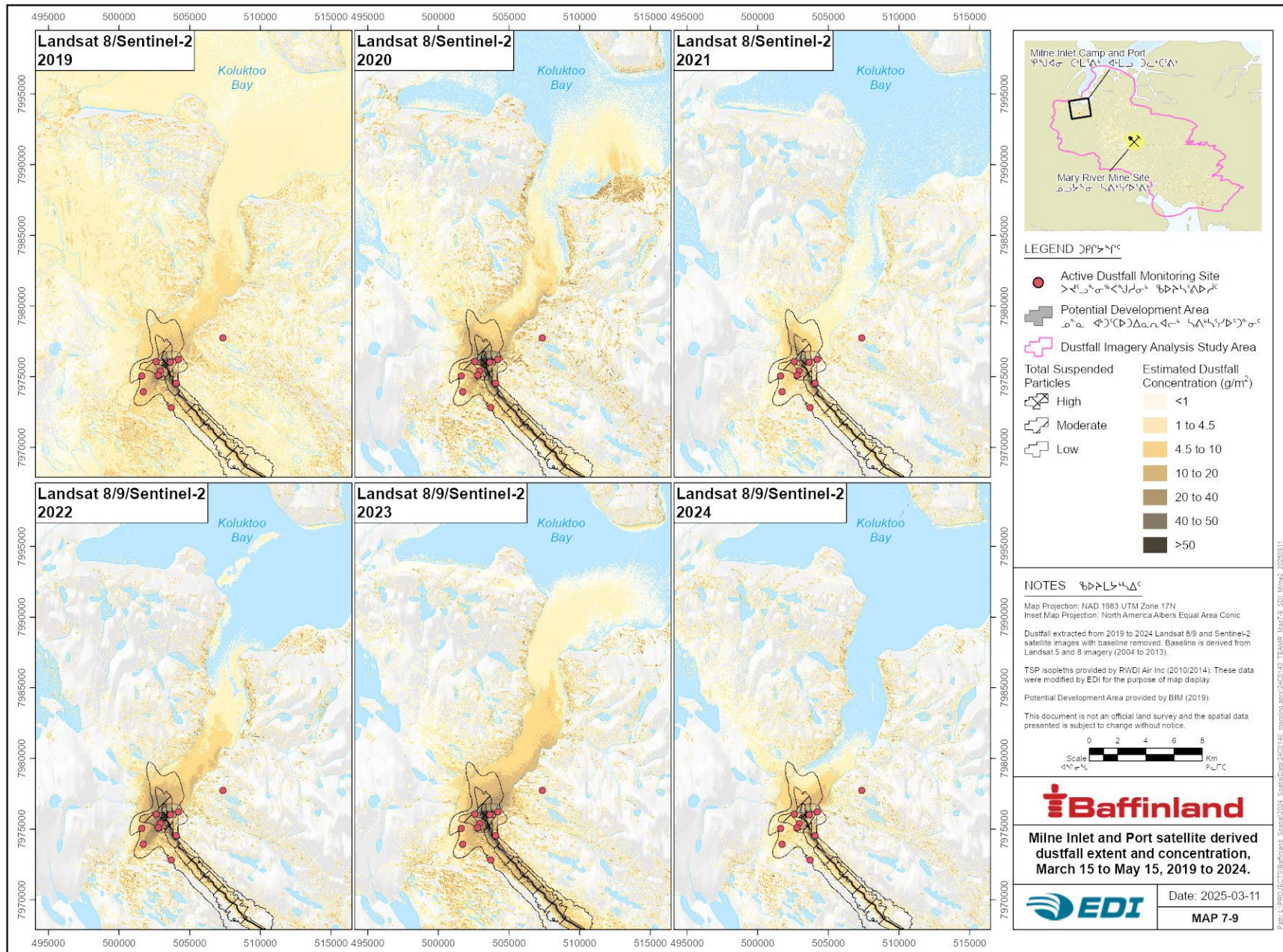




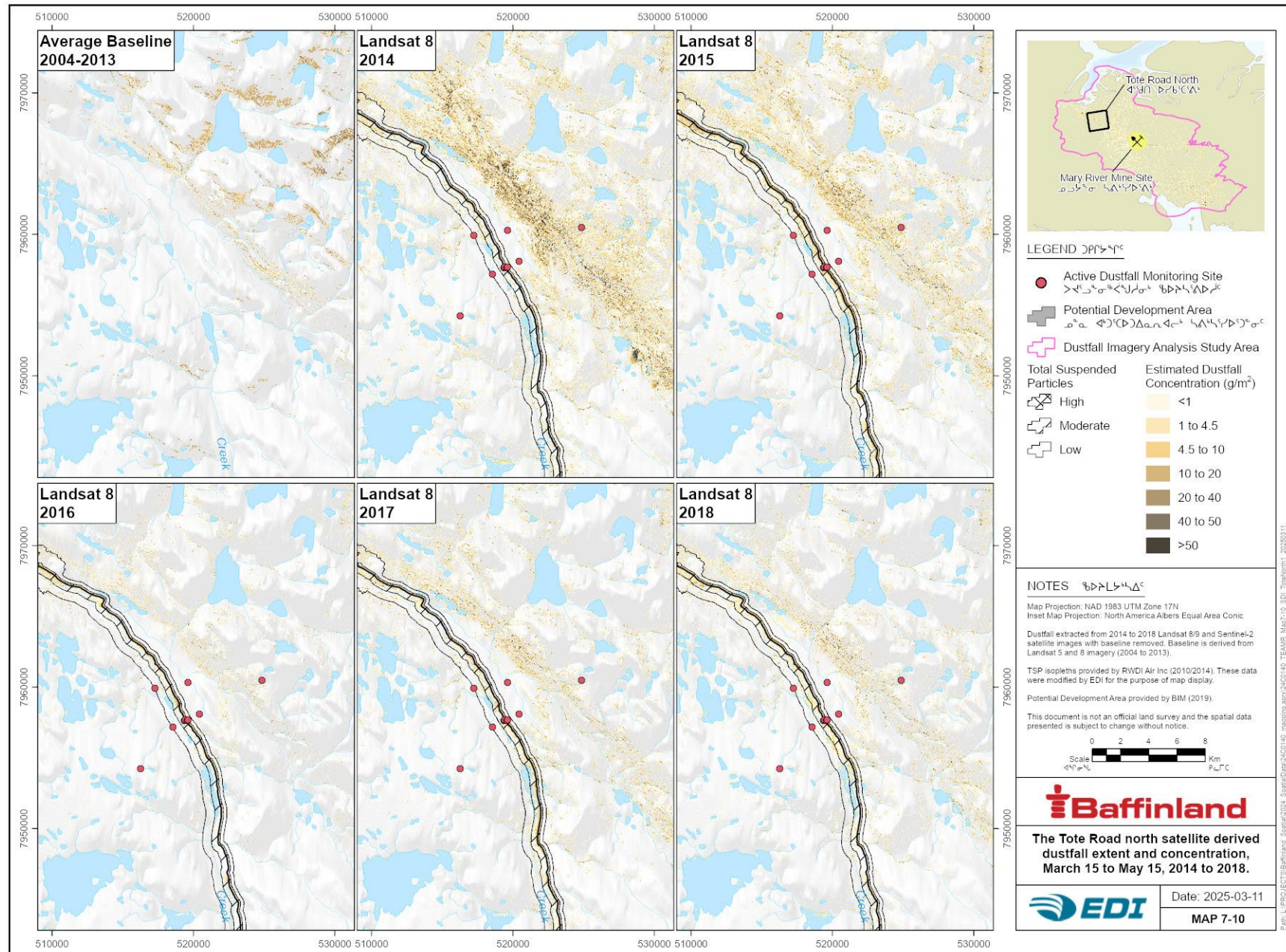












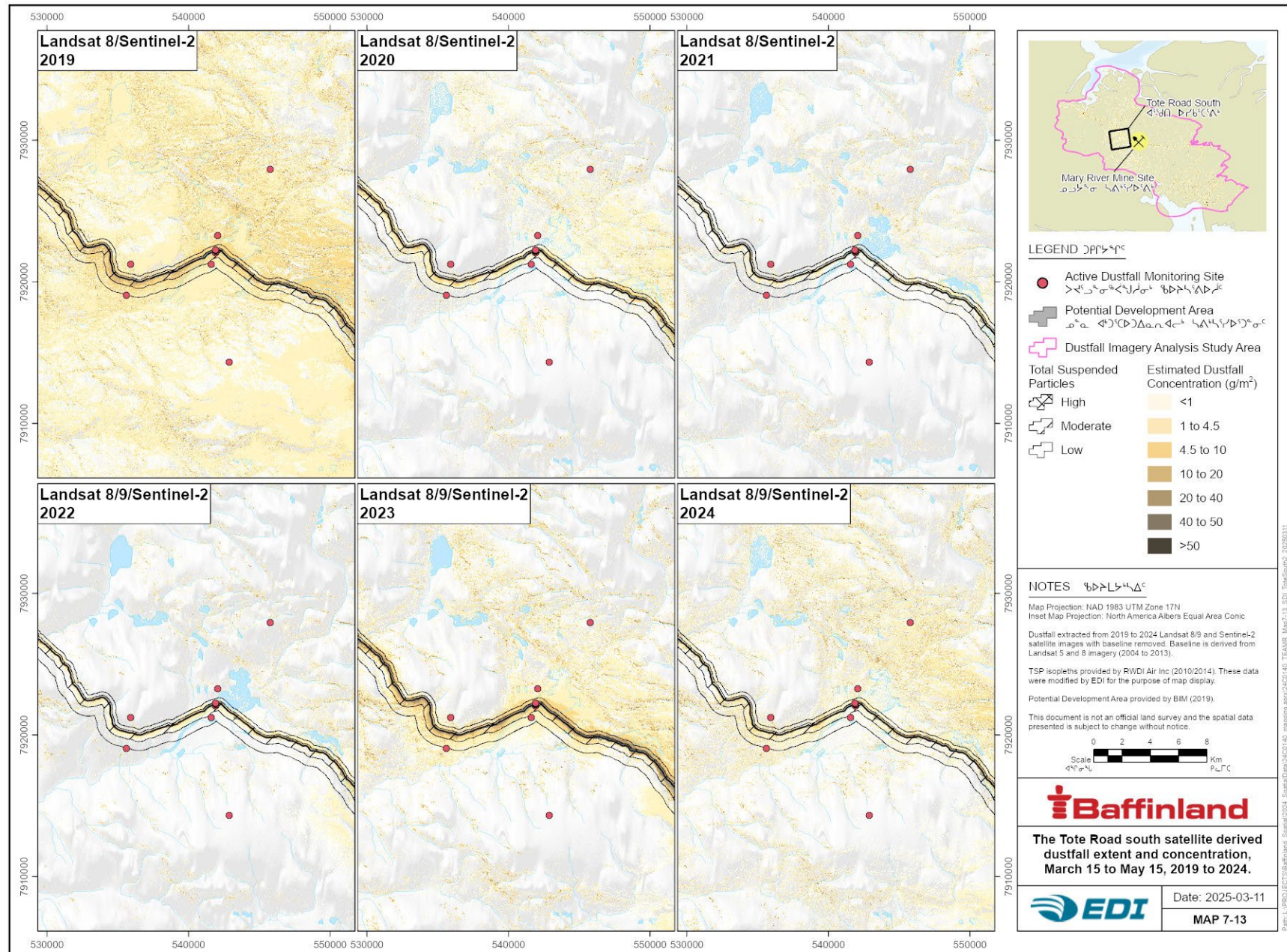














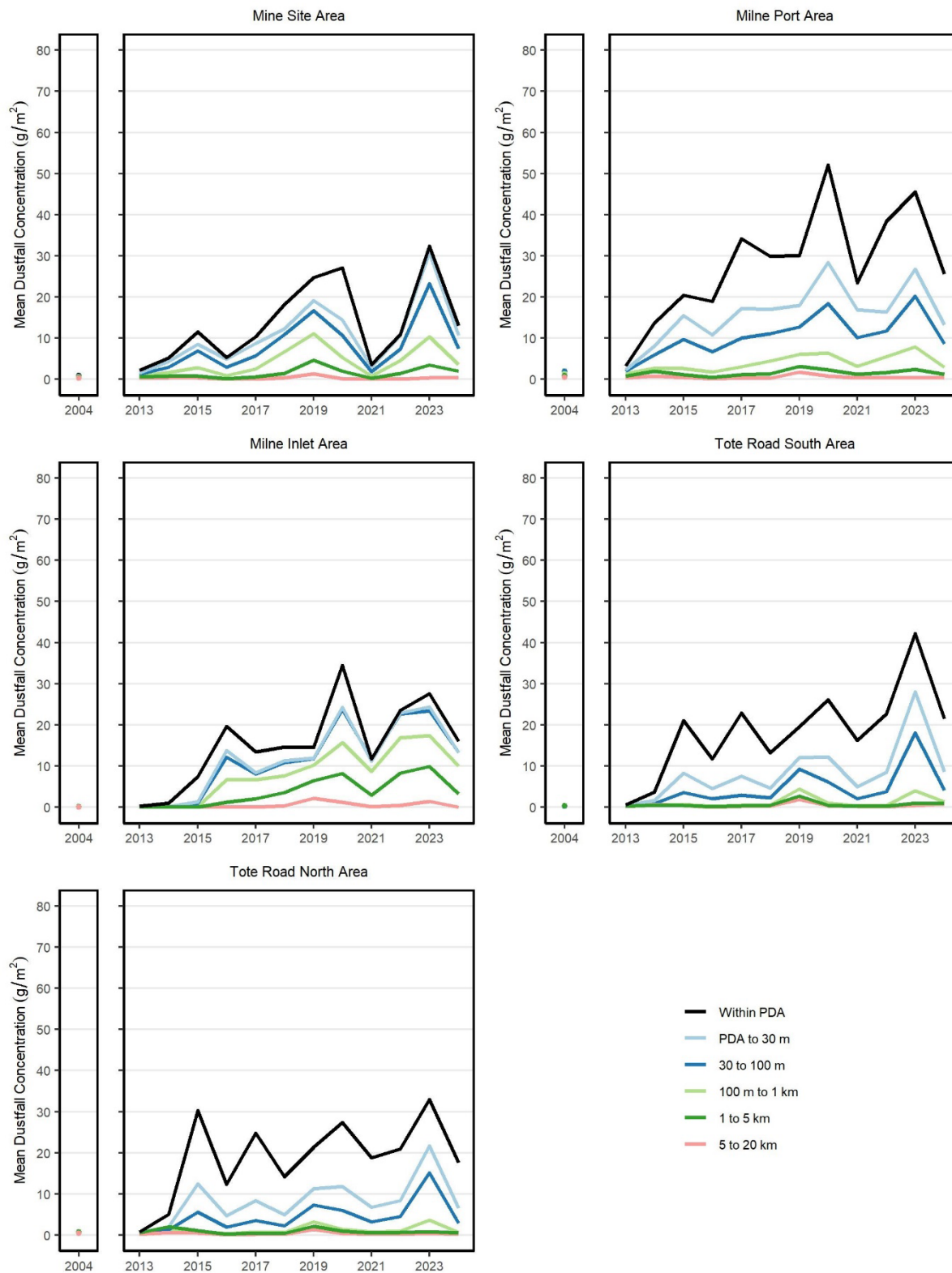


Figure 7-20. Satellite-derived mean dustfall concentrations from 2014 to 2024 with baseline years 2004 and 2013. The mean baseline has been removed from the data.





**Table 7-10. Estimated mean dustfall concentrations (and standard deviations) in Areas of Community Concern around Milne Inlet, 2004 and 2013 to 2024.**

Year	Reference (g/m <sup>2</sup> )	Pamiujaq (g/m <sup>2</sup> )	Eastern Channel (g/m <sup>2</sup> )	Mouth of Tugaat (g/m <sup>2</sup> )	Quarnak (g/m <sup>2</sup> )	Qullutu Lake (g/m <sup>2</sup> )
2004	0.00 (0.00)	0.00 (0.00)	0.95 (1.34)	0.05 (0.17)	0.38 (0.82)	0.01 (0.21)
2013	0.08 (0.36)	0.00 (0.00)	0.70 (1.04)	0.00 (0.00)	0.00 (0.00)	0.01 (0.30)
2014	0.00 (0.00)	0.00 (0.00)	5.21 (5.87)	0.12 (0.57)	1.15 (0.59)	0.03 (0.59)
2015	0.00 (0.00)	0.00 (0.00)	0.65 (1.20)	0.08 (0.39)	0.00 (0.00)	0.01 (0.34)
2016	0.07 (0.34)	0.00 (0.00)	0.89 (1.62)	0.06 (0.30)	0.00 (0.00)	0.00 (0.16)
2017	0.60 (2.14)	0.00 (0.00)	0.68 (1.22)	0.00 (0.00)	0.04 (0.16)	0.01 (0.26)
2018	0.80 (2.54)	0.00 (0.00)	1.14 (1.46)	0.00 (0.00)	4.00 (0.81)	0.04 (0.63)
2019	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	1.63 (0.67)	4.11 (0.71)	1.38 (0.80)
2020	0.13 (0.32)	0.00 (0.00)	0.24 (0.76)	0.18 (0.35)	0.44 (0.76)	0.09 (0.41)
2021	0.00 (0.00)	0.00 (0.00)	0.05 (0.16)	0.02 (0.09)	0.31 (0.41)	0.02 (0.15)
2022	0.72 (1.81)	0.00 (0.00)	0.43 (0.81)	0.00 (0.00)	3.74 (0.71)	0.16 (1.18)
2023	0.12 (0.54)	0.00 (0.00)	1.46 (1.36)	0.00 (0.00)	3.09 (0.72)	0.02 (0.44)
2024	0.00 (0.00)	0.00 (0.00)	3.50 (3.05)	0.00 (0.00)	0.13 (0.47)	0.04 (0.45)

**Table 7-11. Estimated mean dustfall concentrations (and standard deviations) in Areas of Community Concern south/southwest of the Mine Site, 2004 and 2013 to 2024.**

Year	Reference (g/m <sup>2</sup> )	Mine Site 40 WNW (g/m <sup>2</sup> )	Kanajjuk (g/m <sup>2</sup> )	Ridge West (g/m <sup>2</sup> )	Inuktorfik Lake (g/m <sup>2</sup> )	Angajurjualuk Lake (g/m <sup>2</sup> )
2004	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	5.11 (12.98)	0.03 (0.46)	0.04 (0.45)
2013	0.08 (0.36)	0.09 (0.41)	0.00 (0.00)	0.04 (0.15)	0.07 (0.72)	0.02 (0.39)
2014	0.00 (0.00)	0.24 (1.11)	0.00 (0.00)	0.98 (3.14)	0.11 (0.98)	0.05 (0.62)
2015	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.59 (1.54)	0.08 (0.73)	0.06 (0.64)
2016	0.07 (0.34)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.06)	0.01 (0.28)
2017	0.60 (2.14)	0.00 (0.01)	0.00 (0.00)	0.04 (0.19)	0.05 (0.62)	0.03 (0.45)
2018	0.80 (2.54)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.01 (0.21)	0.04 (0.73)
2019	0.00 (0.00)	0.57 (1.79)	1.52 (0.74)	1.02 (1.71)	1.02 (1.18)	1.58 (1.96)
2020	0.13 (0.32)	0.08 (0.39)	0.00 (0.00)	1.12 (2.71)	0.04 (0.47)	0.02 (0.31)
2021	0.00 (0.00)	0.07 (0.32)	0.00 (0.00)	0.23 (0.85)	0.05 (0.56)	0.03 (0.36)
2022	0.72 (1.81)	0.00 (0.00)	0.00 (0.00)	0.41 (1.88)	0.03 (0.41)	0.01 (0.28)
2023	0.12 (0.54)	0.04 (0.17)	0.00 (0.00)	0.64 (2.03)	0.10 (0.83)	0.07 (0.69)
2024	0.00 (0.00)	0.50 (1.72)	0.00 (0.00)	6.00 (4.73)	0.16 (1.04)	0.08 (0.74)





#### 7.4.4 SNOW SAMPLING PILOT STUDY

Improved alignment of 2024 snow sampling with satellite acquisition and an extended sampling period (into late May) resulted in all 10 surface snow sample sites corresponding to Landsat and Sentinel-2 images taken on the same day (Table 7-12 and Table 7-13). The samples also spanned a wide range of concentrations (<212, 700 mg/L). The SDI values of the corresponding images were extracted at the sample sites and combined with the surface snow samples from previous years, for a total sample size of 33 for Landsat and 11 for Sentinel-2 (Map 7-14).

Using the rational equation presented in Mauro et al. (2015) for mineral dust versus SDI measured from hyperspectral data, a non-linear regression model was fit to the Landsat data with significant coefficients ( $P > 0.1$ , residual standard error = 0.0151; Figure 7-21).

$$SDI_L = \frac{0.0445 \times Conc - 2.5803}{Conc + 234.9602}$$

A non-linear regression model did not fit to the Sentinel-2 data. Additional samples may be required to increase the sample size. Models are needed for Landsat and Sentinel-2 data to have full coverage of the study area for each year of analysis. The continuation of the pilot study is being evaluated in relation to the need for and viability of improvements to experimental design and comparison with the current method using the passive dustfall monitoring data.

**Table 7-12. Surface snow samples and corresponding Sentinel-2 Snow Darkening Index values from satellite imagery used in the analysis, 2022 to 2024.**

Sample ID	Date	Easting	Northing	Total Suspended Solids (mg/L)	Snow Darkening Index	Satellite
TR-SS-07-S	2022-05-01	535893	7921188	5.4	0.010	Sentinel-2
TR-SS-03-S	2024-05-20	541919	7922046	4670	0.032	Sentinel-2
TR-SS-02-S	2024-05-20	541587	7921214	749	0.017	Sentinel-2
TR-SS-07-S	2024-05-20	541959	7922215	407	0.036	Sentinel-2
TR-SS-06-S	2024-05-20	541889	7922262	7910	0.043	Sentinel-2
TR-SS-05-S	2024-05-20	541960	7922219	12700	0.038	Sentinel-2
TR-SS-04-S	2024-05-20	541904	7922127	6760	0.029	Sentinel-2
MS-SS-02-S	2024-05-21	558069	7914394	1580	0.040	Sentinel-2
MS-SS-04-S	2024-05-22	561443	7913005	8560	0.012	Sentinel-2
MS-SS-05-S	2024-05-22	563312	7916808	88.6	-0.011	Sentinel-2
MS-SS-09-S	2024-05-29	574861	7853164	4.4	-0.008	Sentinel-2





**Table 7-13. Surface snow samples and corresponding Landsat Snow Darkening Index values from satellite imagery used in the analysis, 2022 to 2024.**

Sample ID	Date	Easting	Northing	Total Suspended Solids (mg/L)	Snow Darkening Index	Satellite
TR-SS-07-S	2022-05-01	535893	7921188	5.4	-0.002	Landsat 9
TR-SS-08-S	2022-05-01	542052	7923280	5.1	-0.006	Landsat 9
MP-SS-05-S	2022-05-09	503339	7979591	151	0.004	Landsat 8
MP-SS-05-S	2022-05-09	503339	7979591	151	0.001	Landsat 8
MP-SS-02-S	2022-05-09	505212	7976892	17.6	-0.003	Landsat 8
MP-SS-02-S	2022-05-09	505212	7976892	17.6	-0.006	Landsat 8
MP-SS-01-S	2022-05-09	506661	7975666	<2 <sup>1</sup>	-0.018	Landsat 8
MP-SS-01-S	2022-05-09	506661	7975666	<2 <sup>1</sup>	-0.015	Landsat 8
MS-SS-06-S	2022-05-01	552214	7904596	4.5	-0.002	Landsat 9
MS-SS-01-S	2022-05-01	555807	7913700	157	0.017	Landsat 9
MS-SS-04-S	2022-05-02	561454	7913021	746	0.065	Landsat 8
MS-SS-02-S	2022-05-02	558081	7914370	170	0.029	Landsat 8
MS-SS-05-S	2022-05-02	563308	7916817	14.5	-0.006	Landsat 8
MP-SS-01-S	2023-05-11	506675	7975667	105	-0.001	Landsat 9
MP-SS-02-S	2023-05-11	505210	7976908	124	0.006	Landsat 9
MP-SS-05-S	2023-05-11	503370	7979583	667	-0.001	Landsat 9
MP-SS-06-S	2023-05-11	508569	7986481	10.4	-0.005	Landsat 9
MP-SS-08-S	2023-05-11	531889	7984932	3.5	-0.007	Landsat 9
MP-SS-11-S	2023-05-11	480269	7991947	2.3	-0.012	Landsat 9
MS-SS-08-S	2023-05-12	536359	7896650	11.2	-0.009	Landsat 8
MS-SS-09-S	2023-05-12	574911	7853193	4	-0.013	Landsat 8
TR-SS-02-S	2023-05-12	542055	7923282	89.4	-0.001	Landsat 8
TR-SS-03-S	2024-05-20	541919	7922046	4670	0.038	Landsat 9
TR-SS-02-S	2024-05-20	541587	7921214	749	0.004	Landsat 9
TR-SS-07-S	2024-05-20	541959	7922215	407	0.056	Landsat 9
TR-SS-06-S	2024-05-20	541889	7922262	7910	0.051	Landsat 9
TR-SS-05-S	2024-05-20	541960	7922219	12700	0.056	Landsat 9
TR-SS-04-S	2024-05-20	541904	7922127	6760	0.062	Landsat 9
MS-SS-02-S	2024-05-21	558069	7914394	1580	0.037	Landsat 8
MS-SS-02-S	2024-05-21	558069	7914394	1580	0.040	Landsat 8
MS-SS-04-S	2024-05-22	561443	7913005	8560	0.006	Landsat 9
MS-SS-05-S	2024-05-22	563312	7916808	88.6	0.000	Landsat 9
MS-SS-09-S	2024-05-29	574861	7853164	4.4	-0.016	Landsat 9

<sup>1</sup> < denotes below the detection limit.







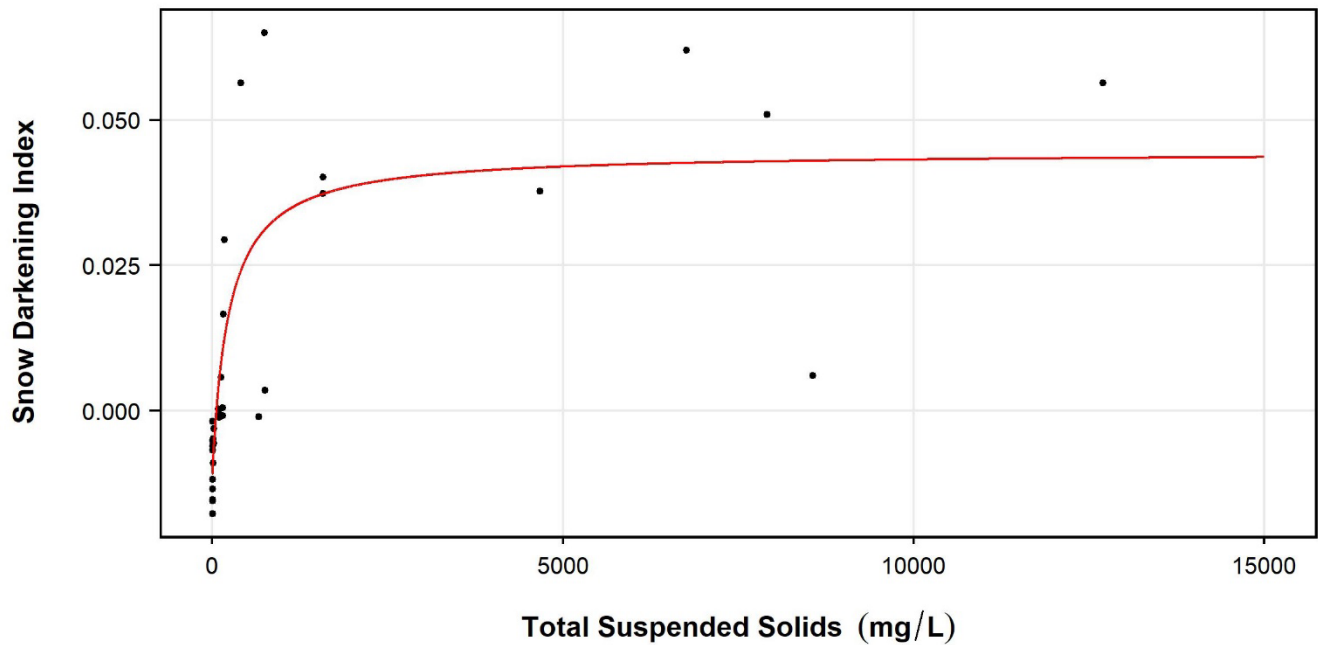


Figure 7-21. Non-linear regression (rational fit) between Total Suspended Solids and Landsat 8/9 Snow Darkening Index.





## 8 VEGETATION

Baffinland Iron Mines Corporation (Baffinland) is committed to monitoring the potential effects of the Mary River Project (the Project) on vegetation abundance, diversity, and health. Based on the committed monitoring frequency of three to five years delineated in the Terrestrial Environment Mitigation and Monitoring Plan (Baffinland Iron Mines Corporation 2016a), the 2024 monitoring program focused on exotic invasive vegetation.

### Vegetation Summary

No exotic invasive vegetation species were recorded during the 2024 surveys. Monitoring for exotic invasive vegetation is expected to occur again between 2027 and 2029 (or as informed by ongoing incidental monitoring).

### 8.1 EXOTIC INVASIVE VEGETATION MONITORING

Conditions under the Nunavut Impact Review Board Project Certificate (Nunavut Impact Review Board 2012) were developed to address concerns about the potential introduction and spread of exotic invasive vegetation from Project-related activities. In 2014, Baffinland established a long-term program to monitor the possible introduction of exotic invasive vegetation species. This commitment directly relates to the following Project Conditions (PCs):

- **PC #32** *The Proponent shall ensure that equipment and supplies brought to the Project sites are clean and free of soils that could contain plant seeds not naturally occurring in the area. [...]*
- **PC #37** *The Proponent shall incorporate protocols for monitoring for the potential introduction of invasive vegetation species (e.g. surveys of plant populations in previously disturbed areas) into its Terrestrial Environment and Monitoring Plan. [...]*

The Terrestrial Environment and Mitigation and Monitoring Plan outlines the measures at the Project for mitigating and monitoring exotic invasive vegetation. The primary objective is to prevent the establishment and proliferation of potential exotic invasive plant species within the Project footprint and adjacent areas. Targeted surveys of exotic invasive plant species are completed every three to five years, or as triggered by incidental observations, to verify the status of exotic invasive plants at the Project and evaluate the effectiveness of these mitigations (Baffinland Iron Mines Corporation 2016a).

#### 8.1.1 METHODS

##### 8.1.1.1 History of Exotic Invasive Vegetation Monitoring at the Project

Exotic invasive vegetation monitoring was initiated in 2014 and repeated every three to five years, along with ongoing incidental monitoring during the growing season. The following bullet points summarize the findings of exotic invasive vegetation monitoring at the Project.



- **2014** — Comprehensive survey of disturbed areas and Project boundaries at the Mine Site, Milne Inlet, and along the Tote Road. No exotic or invasive plant species were observed.
- **2019** — Comprehensive survey of disturbed areas and Project boundaries at the Mine Site, Milne Inlet, and along the Tote Road. One exotic plant species (garden tomato) was observed growing at the Mine Site below the sewage/effluent discharge pipe.
- **2020** — Follow-up monitoring of previously identified exotic plant species at the sewage/effluent discharge pipe. No exotic or invasive plant species were observed.
- **2024** — Comprehensive survey of disturbed areas and Project boundaries at the Mine Site, Milne Inlet, and along the Tote Road. No exotic or invasive plant species were observed (findings described hereafter).

#### 8.1.1.2 Survey Methods and Search Areas

Standardized survey procedures were used to determine the presence/absence and abundance (where applicable) of potential exotic invasive species following methods described in *Guidelines for Rare Plant Surveys in Alberta* (Alberta Native Plant Council 2012) and *2016 Survey of Exotic Plants Along NWT Highways* (Oldham and Delisle-Oldham 2016). Surveys focused on previously disturbed areas within and adjacent to the Project footprint and along Project boundaries where exotic invasive plants are most likely to occur (e.g., along Project infrastructure, road margins, and laydown areas). Site surveys considered the level of ground disturbance (i.e., exposed soil can be more prone to the establishment of invasive vegetation) and proximity to Project activities and vehicle traffic (i.e., vehicle traffic is a vector for the proliferation of invasive vegetation). Surveys focused on listed invasive species per *Non-Native and Invasive Species in Nunavut* (Government of Nunavut 2020).

Exotic invasive vegetation surveys were completed by two qualified botanists and two Inuit assistants, occasionally under the supervision of Baffinland Environmental Staff to support access and safety. Surveys differentiated between three focal areas at the Project: the Mine Site, Milne Inlet, and along the Tote Road. The Mine Site, Milne Inlet, and laydowns along the Tote Road were primarily surveyed on foot to the extent safely accessible. Project margins along the Tote Road were surveyed by vehicle travelling at slow speeds. Areas of active construction, heavy equipment use, and blasting were not accessible.

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### 8.1.2 RESULTS AND DISCUSSION

Exotic invasive vegetation surveys were completed in July 2024. The timing of the surveys was intended to coincide with vegetation ‘green-up’ and early/mid-summer flowering to optimize plant species observation and identification. Survey locations and search efforts are summarized in Table 8-1 and presented in Map 8-1. Surveys targeted disturbance areas within and adjacent to the Project footprint where exotic invasive plants could potentially occur (i.e., through incidental introduction), such as areas with frequent human and/or vehicle activity (Photo 8-1 to Photo 8-3). The total survey effort was 163 hours and 29 minutes, completed by two to five personnel, depending on the survey location.

No exotic invasive vegetation species were recorded during the 2024 surveys. The Terrestrial Environment and Mitigation and Monitoring Plan prescribes the survey frequency for monitoring exotic invasive vegetation





(three to five years, pending findings from ongoing incidental monitoring). Monitoring for exotic invasive vegetation is expected to occur again between 2027 and 2029.

**Table 8-1. Summary of the 2024 exotic invasive vegetation monitoring program.**

Survey Area		Date	Start to Stop Time	No. Pers.	Person Hrs. (hh:mm)	Exotic Invasives
Mine Site	Effluent Discharge	5 Jul 2024	09:45 to 11:30	5	08:45	—
	Landfill	5 Jul 2024	12:25 to 14:05	4	06:40	—
	104 Laydown	5 Jul 2024	14:50 to 15:30	4	02:40	—
	Mobile Maintenance	5 Jul 2024	15:33 to 15:40	2	00:14	—
	Mine Site Complex, Fuel Farm	5 Jul 2024	15:44 to 16:45	5	05:05	—
	Sailiivik Camp, Wastewater Treatment Plant	6 Jul 2024	08:45 to 11:05	4	09:20	—
	Warehouse Laydown	6 Jul 2024	12:08 to 13:10	4	04:08	—
	OHT Laydown	6 Jul 2024	13:20 to 13:40	5	01:40	—
	Quarry	6 Jul 2024	13:56 to 14:48	5	04:20	—
	Fueling Area, Mine Site Complex Water	6 Jul 2024	15:25 to 16:23	4	03:52	—
	Airstrip Perimeter	7 Jul 2024	09:07 to 10:55	4	07:12	—
	Aerodrome Laydown	7 Jul 2024	11:30 to 11:45	4	01:00	—
	Weatherhaven	7 Jul 2024	13:20 to 14:34	5	06:10	—
	Helipad, Hangar	7 Jul 2024	15:00 to 15:12	4	00:48	—
	Water Treatment Ponds	7 Jul 2024	15:17 to 15:42	4	01:40	—
	Incinerator	7 Jul 2024	16:13 to 16:37	4	01:36	—
	Site Services	8 Jul 2024	09:40 to 10:27	5	03:55	—
	Warehouse	8 Jul 2024	10:40 to 11:15	5	02:55	—
	MS08 Water Treatment Plant, Weather Station	8 Jul 2024	14:00 to 15:48	5	09:00	—
	Haul Road, Magazine Laydown	8 Jul 2024	15:49 to 16:41	5	04:20	—
Tote Road	km 100 to km 60, Laydowns, Pullouts	9 Jul 2024	08:33 to 13:10	4	18:28	—
	km 60 to Milne Port, Laydowns, Pullouts	13 Jul 2024	09:45 to 14:45	4	20:00	—
Milne Inlet	LP3 Pad, Helipad	14 Jul 2024	07:56 to 08:44	4	03:12	—
	LP5, LP6, W10a and W10b Laydowns	14 Jul 2024	09:13 to 10:16	4	04:12	—
	380 Camp, Wastewater Treatment Plant	14 Jul 2024	11:18 to 12:04	4	03:04	—
	OHT, W14 and W3 Laydowns	14 Jul 2024	12:22 to 12:57	5	02:55	—
	Port Site Camp, Environment Buildings, Site Services, Incinerator, ERT Building	14 Jul 2024	14:50 to 15:12	5	01:50	—
	B1 Pad, East Beach	14 Jul 2024	15:23 to 16:35	4	04:48	—
	R3 Laydown	16 Jul 2024	08:09 to 08:40	5	02:35	—
	Ore Pad	16 Jul 2024	08:42 to 09:05	5	01:55	—
	Quarry, MP04a Pond, Snow Dump	16 Jul 2024	10:14 to 10:57	5	03:35	—
	D2 Laydown	16 Jul 2024	11:08 to 11:29	5	01:45	—
	Warehouse, Warehouse Laydown	16 Jul 2024	11:42 to 12:24	5	03:30	—
	East Beach Effluent Discharge	16 Jul 2024	14:00 to 14:34	5	02:50	—



Table 8-1. Summary of the 2024 exotic invasive vegetation monitoring program.

Survey Area	Date	Start to Stop Time	No. Pers.	Person Hrs. (hh:mm)	Exotic Invasives
Ship Loader, Ore Docks	16 Jul 2024	14:43 to 15:00	5	01:25	—
West Beach	16 Jul 2024	15:09 to 15:34	5	02:05	—
Total Survey Hours				163:29	



Photo 8-1. Representative survey areas at the Mine Site.

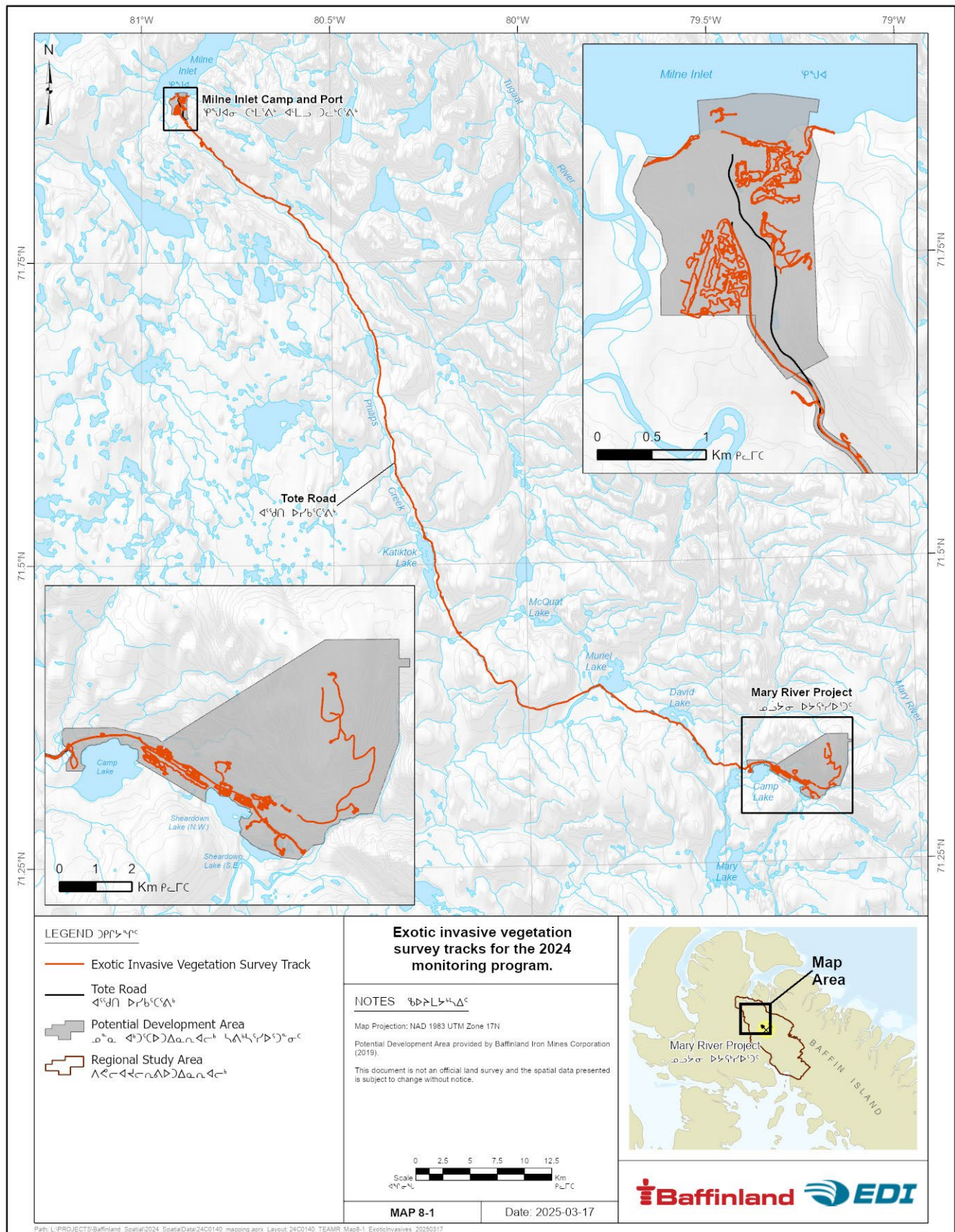


Photo 8-2. Representative survey areas along the Tote Road and within roadside pullouts/laydowns.





Photo 8-3. Representative survey areas at Milne Inlet.







### 8.1.2.1 Ancillary Observations

Native vegetation can be mistakenly recorded as potential exotic invasive species. During the field survey, two native species of dandelion—horned dandelion (*Taraxacum ceratophorum*) and northern dandelion (*Taraxacum phymatocarpum*)—were observed occurring sporadically along the Tote Road and along the perimeter of disturbed areas at the Mine Site (Photo 8-4). Arctic chamomile (*Tripleurospermum maritima* ssp. *Phaeocephala*) was found at Milne Inlet on a sandy bluff along the western side of East Beach (Photo 8-5). Voucher specimens for these species were collected for further characterization and species confirmation.



Photo 8-4. Northern dandelion observed along the perimeter of Sailiivik Camp at the Mine Site; July 6, 2024.



Photo 8-5. Arctic chamomile observed along East Beach at Milne Inlet; July 16, 2024.



## 9 MAMMALS

Using multiple indicators and approaches, surveillance monitoring of mammals at the Mary River Project (the Project) is intended to understand better, predict, and mitigate potential mammal interactions within and/or near the Potential Development Area (PDA).

Caribou (*Rangifer tarandus*)—a keystone species in the North Baffin Island ecosystem—is recognized as a key wildlife indicator because of its ecological and social significance. However, in 2019, North Baffin Island caribou were at a low point in their 60 to 80- year population cycle (Government of Nunavut 2019). Caribou observations from site personnel are recorded infrequently, incidentally, or during surveys.

### Mammal Summary

Ground-based surveys continue to monitor potential wildlife interactions with the Project. These include snow track surveys, snowbank height surveys, Height of Land (HOL) surveys, remote camera monitoring, and incidental sighting reports from on-site personnel. The following are key findings from 2024 monitoring activities on mammals at the Project.

**Snow Track Surveys** — Twelve snow track surveys were completed in 2024. No caribou, Arctic wolf, or other large mammal tracks were observed. Arctic fox, red fox, lemming, Arctic hare, and ptarmigan tracks were noted during the various surveys. Ptarmigan had the highest percentage of tracks that crossed or were noted on the Tote Road, while foxes most frequently travelled parallel to the Tote Road. Lemmings had the highest deflection response and Arctic hare meandered the most.

**Snowbank Height Monitoring** — Snowbank height monitoring was completed between January and December 2024. An average of 86% compliance with the 100 cm snowbank height threshold was recorded in 2024. Since 2020, survey locations have been randomized (instead of repeated kilometre locations) to improve representativeness and reduce bias.

**Height of Land Surveys** — Height of Land surveys were completed during the caribou calving season (early June 2024). All HOL stations were visited (minus one) at least twice between May 29 and June 10, 2024. The total observation time was 32 hours and 25 minutes, with an average observation time of 40 minutes per station. Fifteen individual caribou were observed during the HOL surveys in 2024 on June 3, 4, 5, and 8. Before the 2024 HOL surveys, the last time a caribou was observed on a HOL survey was in 2013.

**Remote Cameras** — Remote cameras documented a combination of birds (e.g., ptarmigan, raptors, and songbirds), Arctic hare, and Arctic fox between January 1 and December 28, 2024. Fifteen detections of caribou were noted on a single camera (i.e., Baffin-11). No wolves or bears were observed in any reviewed images. This supports the current observation of low caribou numbers and movement in the PDA, despite increased observation during the monitoring period.





**Aerial Caribou Survey**<sup>12</sup> — An aerial caribou survey occurred in March 2023 before caribou calving. During the survey, 112 caribou across 36 groups were observed. All observed caribou occurred in the southern subregion of the wildlife Regional Study Area (RSA), and only two groups (nine individuals total) occurred in an overlapping portion of the northern subregion. No aerial surveys occurred in 2024.

**Caribou Tote Road Observations** — Twenty two observation events of caribou occurred along the Tote Road in 2024. No adverse behaviour from caribou was observed in response to the Tote Road or its traffic.

**Incidental Observations** — Two incidental observations of three caribou occurred near the Mine Site, and 97 observations (possibly repeated observations) occurred along the Tote Road. Forty-three caribou were noted outside the PDA.

**Hunter and Visitor Logs** — Baffinland Security monitors land use and the presence of land users in the PDA via hunter and visitor logs that document travel or hunting within the PDA. Overall log numbers slightly decreased from 2022 but were similar to 2018 and above pre-COVID counts.

## 9.1 SNOW TRACK SURVEYS

The following Project Conditions (PCs) address concerns regarding potential caribou crossings of linear features (i.e., train or vehicle traffic) and constraining of wildlife movement across roadways (Nunavut Impact Review Board 2020):

- **PC #54dii** *“The Proponent shall provide an updated Terrestrial Environmental Management and Monitoring Plan which shall include...Snow track surveys during construction and the use of video-surveillance to improve the predictability of caribou exposure to the railway and Tote Road. Using the result of this information, an early warning system for caribou on the railway and Tote Road shall be developed for operation.”*
- **PC #58f** *“Within its annual report to the NIRB, the Proponent shall incorporate a review section which includes... Any updates to information regarding caribou migration trails. Maps of caribou migration trails, primarily obtained through any new collar and snow tracking data, shall be updated (at least annually) in consultation with the Qikiqtani Inuit Association and affected communities, and shall be circulated as new information becomes available.”*

Snow track surveys were completed from March to November 2023 to address these PCs. Surveys focused on the surveillance of potential wildlife movement (including caribou and other species) near roadways and documentation of behavioural responses to human activities near the Project.

<sup>12</sup> This section was first reported in the 2023 Terrestrial Environment Annual Monitoring Report (EDI Environmental Dynamics Inc. 2024). The Result and Discussion section has been updated and reissued for completeness.



### 9.1.1 METHODS

The purpose of snow track surveys is to monitor patterns of movement and response of caribou and other wildlife to Project-related activities based on observable tracks in proximity to roadways. Snow track surveys were completed within 24 to 48 hours following a fresh snowfall. Surveys were led by two or three Baffinland Iron Mines Corporation (Baffinland) personnel along the Tote Road from a light truck at a speed of ~30 km/hr. If/when wildlife tracks were suspected, personnel further investigated on foot to confirm species identification and follow the tracks (to or from the roadway) to document movement patterns, behaviour, and habitat use (if/where possible). The following information was recorded:

- georeferencing (latitude and longitude) at the location of the tracks/wildlife crossing;
- species identity;
- number of distinct sets of tracks (i.e., group size);
- description of track behaviour in response to the road (e.g., crossed, on road, parallel to road, deflection, meander; Figure 9-1);
- height of snowbank measured at either the crossing point or likely point of deflection (i.e., the point where the animal redirected its path away from the road); and,
- site photo documentation and other miscellaneous survey observations (if/where applicable).

Potential factors influencing data capture and species identification included deterioration of snow conditions (i.e., from sun or wind) and visibility for initial detection. These factors were recorded during each survey and allocated a 'condition score' ranging from poor (limited visibility) to good (visibility adequate, some limitations) to excellent (no limitations on visibility).

Based on discussions during Terrestrial Environment Working Group (TEWG) meetings regarding snow track frequency, Baffinland agreed to implement snow track surveys and will make best efforts to conduct these surveys at a frequency of once per week along the Tote Road. Surveys will occur during snow cover seasons when environmental conditions permit the surveys to be completed effectively and safely<sup>13</sup>. The criteria for conditions include fresh snowfall (within the last 48 hours) and suitable light conditions. Table 9-1 outlines when snow track surveys were completed based on suitable survey conditions and safety.

<sup>13</sup> Survey condition criteria will be the ultimate driver of the number of surveys completed each month and may be less than a frequency of once per week. Surveys will not generally be possible in December, January, or February due to darkness.



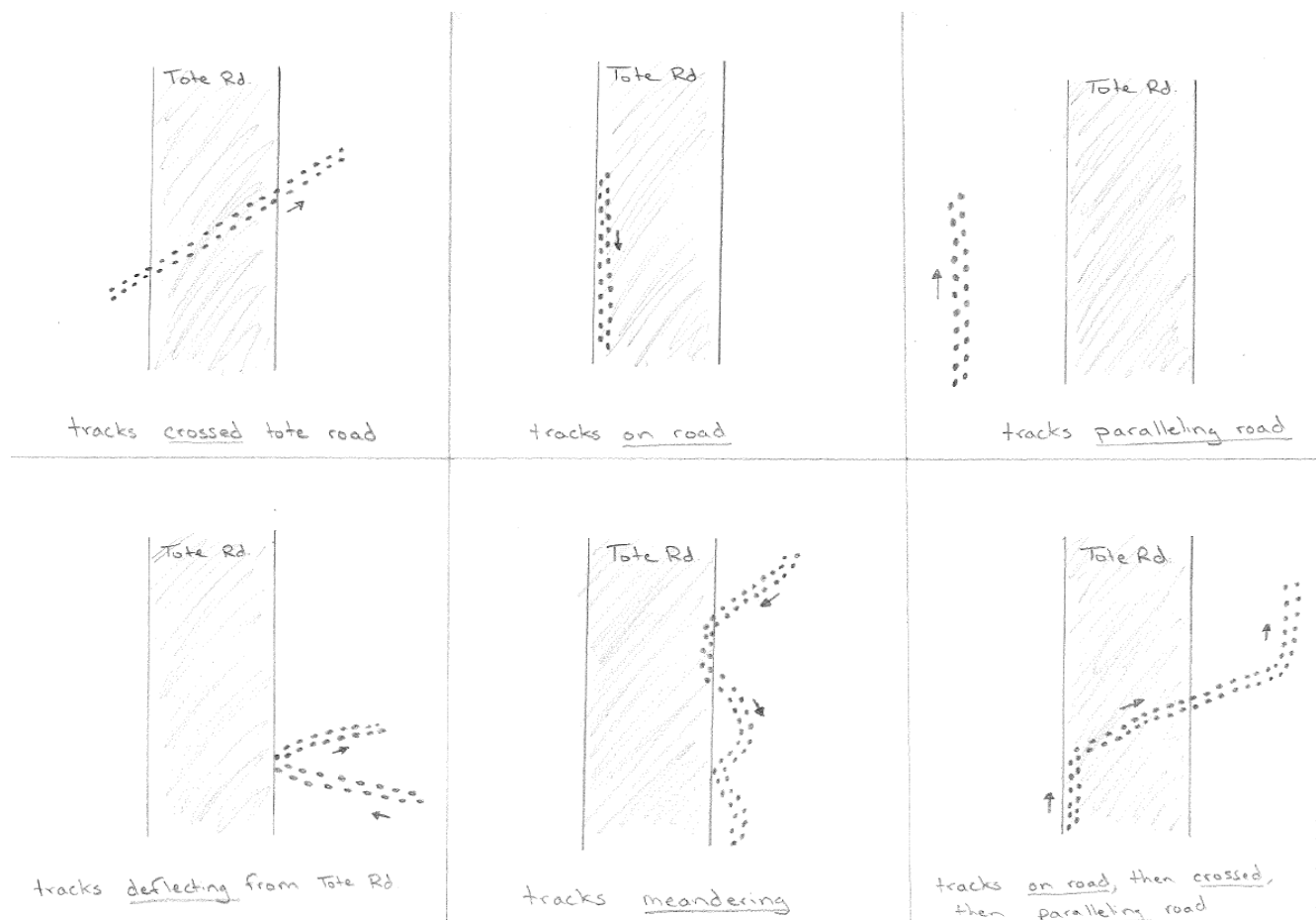


Figure 9-1. Various behaviours observed along the Tote Road based on tracks.

## 9.1.2 RESULTS AND DISCUSSIONS

Two hundred and seventy-three tracks were observed during 12 surveys completed after recent snowfall between February and November 2024<sup>14</sup> (Table 9-1). Of the 273 tracks recorded, 131 were noted as ‘fresh tracks’ (<24 hours old). Fox tracks (either Arctic fox [*Vulpes lagopus*] or red fox [*Vulpes vulpes*] as it is difficult to distinguish between their tracks) accounted for 86% of fresh tracks. Arctic hare (*Lepus arcticus*) accounted for 2% of fresh tracks. ‘Other tracks’ (i.e., lemming, Common Raven, unknown, and ptarmigan combined) accounted for 12% of fresh tracks. Based on the 2024 snow track survey results (Figure 9-2, Table 9-2), ptarmigan crossed the Tote Road or were noted on the Tote Road the most frequently, while foxes travelled parallel to the Tote Road the most frequently. Lemmings had the highest deflection response of all species, and Arctic hare meandered the most.

<sup>14</sup> On February 8, February 24, March 7, March 19, March 29, April 11, April 17, April 24, April 30, May 25, October 28, October 29, and November 12, 2024.



Table 9-1. Weekly snow track compliance tracker, rationale log, and observations.

Week Start Date	Week End Date	Day Completed	Justification if Incomplete	Snow Age (hrs)	Snow Cover (%)	24 hr Wind History	Track Observations
31-Dec-23	06-Jan-24	Not completed	Insufficient light	n/a	n/a	n/a	n/a
07-Jan-24	13-Jan-24	Not completed	Insufficient light	n/a	n/a	n/a	n/a
14-Jan-24	20-Jan-24	Not completed	Insufficient light	n/a	n/a	n/a	n/a
21-Jan-24	27-Jan-24	Not completed	Insufficient light	n/a	n/a	n/a	n/a
28-Jan-24	03-Feb-24	Not completed	Insufficient light	n/a	n/a	n/a	n/a
04-Feb-24	10-Feb-24	<b>08-Feb-23</b>	n/a	36	85	2–15 km/hr	No tracks observed
11-Feb-24	17-Feb-24	<b>15-Feb-23</b>	n/a	36	90	2–15 km/hr	Fox tracks (4 total)
18-Feb-24	24-Feb-24	Not completed	No fresh snowfall	n/a	n/a	n/a	n/a
25-Feb-24	02-Mar-24	Not completed	No fresh snowfall	n/a	n/a	n/a	n/a
03-Mar-24	09-Mar-24	<b>07-Mar-24</b>	n/a	36	80	15–30 km/hr	Fox tracks (8 total)
10-Mar-24	16-Mar-24	Not completed	No fresh snowfall	n/a	n/a	n/a	n/a
17-Mar-24	23-Mar-24	<b>19-Mar-24</b>	n/a	24	100	None	Fox, lemming, ptarmigan, and unknown tracks (40 total)
24-Mar-24	30-Mar-24	<b>29-Mar-24</b>	n/a	24	100	None	Fox, lemming, Common Raven, and unknown tracks (27 total)
31-Mar-24	06-Apr-24	Not completed	Daily snow, no 24 hr period for prints to accumulate	n/a	n/a	n/a	n/a
07-Apr-24	13-Apr-24	<b>11-Apr-24</b>	n/a	36	100	2–15 km/hr	Fox and lemming tracks (30 total)
14-Apr-24	20-Apr-24	<b>17-Apr-24</b>	n/a	24	100	2–15 km/hr	Fox, Arctic hare, and Common Raven tracks (39 total)
21-Apr-24	27-Apr-24	<b>24-Apr-24</b>	n/a	24	100	2–15 km/hr	Fox and Arctic hare tracks (20 total)
28-Apr-24	04-May-24	<b>30-Apr-24</b>	n/a	24	100	2–15 km/hr	Fox, Arctic hare, and unknown tracks (25 total)
05-May-24	11-May-24	Not completed	No fresh snowfall	n/a	n/a	n/a	n/a
12-May-24	18-May-24	Not completed	No fresh snowfall	n/a	n/a	n/a	n/a
19-May-24	25-May-24	<b>25-May-24</b>	n/a	36	75	2–15 km/hr	Fox and Arctic hare tracks (11 total)
26-May-24	01-Jun-24	Not completed	No fresh snowfall	n/a	n/a	n/a	n/a





Table 9-1. Weekly snow track compliance tracker, rationale log, and observations.

Week Start Date	Week End Date	Day Completed	Justification if Incomplete	Snow Age (hrs)	Snow Cover (%)	24 hr Wind History	Track Observations
02-Jun-24	08-Jun-24	Not completed	No fresh snowfall	n/a	n/a	n/a	n/a
09-Jun-24	15-Jun-24	Not completed	No fresh snowfall	n/a	n/a	n/a	n/a
16-Jun-24	22-Jun-24	Not completed	No fresh snowfall	n/a	n/a	n/a	n/a
23-Jun-24	29-Jun-24	Not completed	No fresh snowfall	n/a	n/a	n/a	n/a
30-Jun-24	06-Jul-24	Not completed	No fresh snowfall	n/a	n/a	n/a	n/a
07-Jul-24	13-Jul-24	Not completed	No fresh snowfall	n/a	n/a	n/a	n/a
14-Jul-24	20-Jul-24	Not completed	No fresh snowfall	n/a	n/a	n/a	n/a
21-Jul-24	27-Jul-24	Not completed	No fresh snowfall	n/a	n/a	n/a	n/a
28-Jul-24	03-Aug-24	Not completed	No fresh snowfall	n/a	n/a	n/a	n/a
04-Aug-24	10-Aug-24	Not completed	No fresh snowfall	n/a	n/a	n/a	n/a
11-Aug-24	17-Aug-24	Not completed	No fresh snowfall	n/a	n/a	n/a	n/a
18-Aug-24	24-Aug-24	Not completed	No fresh snowfall	n/a	n/a	n/a	n/a
25-Aug-24	31-Aug-24	Not completed	No fresh snowfall	n/a	n/a	n/a	n/a
01-Sep-24	07-Sep-24	Not completed	No fresh snowfall	n/a	n/a	n/a	n/a
08-Sep-24	14-Sep-24	Not completed	No fresh snowfall	n/a	n/a	n/a	n/a
15-Sep-24	21-Sep-24	Not completed	No fresh snowfall	n/a	n/a	n/a	n/a
22-Sep-24	28-Sep-24	Not completed	No fresh snowfall	n/a	n/a	n/a	n/a
29-Sep-24	05-Oct-24	Not completed	No fresh snowfall	n/a	n/a	n/a	n/a
06-Oct-24	12-Oct-24	Not completed	No fresh snowfall	n/a	n/a	n/a	n/a
13-Oct-24	19-Oct-24	Not completed	No fresh snowfall	n/a	n/a	n/a	n/a
20-Oct-24	26-Oct-24	Not completed	No fresh snowfall	n/a	n/a	n/a	n/a
27-Oct-24	02-Nov-24	<b>28-Oct-24</b>	n/a	24	100	2–15 km/hr	Fox, Arctic hare, lemming, ptarmigan, and Common Raven tracks (43 total)
03-Nov-24	09-Nov-24	Not completed	Daily snow, no 24 hr period for prints to accumulate	n/a	n/a	n/a	n/a
10-Nov-24	16-Nov-24	<b>12-Nov-24</b>	n/a	35	90	15–30 km/hr	Fox, Arctic hare, and lemming tracks (26 total)



Table 9-1. Weekly snow track compliance tracker, rationale log, and observations.

Week Start Date	Week End Date	Day Completed	Justification if Incomplete	Snow Age (hrs)	Snow Cover (%)	24 hr Wind History	Track Observations
17-Nov-24	23-Nov-24	Not completed	Insufficient light	n/a	n/a	n/a	n/a
24-Nov-24	30-Nov-24	Not completed	Insufficient light	n/a	n/a	n/a	n/a
01-Dec-24	07-Dec-24	Not completed	Insufficient light	n/a	n/a	n/a	n/a
08-Dec-24	14-Dec-24	Not completed	Insufficient light	n/a	n/a	n/a	n/a
15-Dec-24	21-Dec-24	Not completed	Insufficient light	n/a	n/a	n/a	n/a
22-Dec-24	28-Dec-24	Not completed	Insufficient light	n/a	n/a	n/a	n/a
29-Dec-24	04-Jan-25	Not completed	Insufficient light	n/a	n/a	n/a	n/a





**Table 9-2. Species track response to the Tote Road from February to November 2024.**

Species	% Crossed	% On Road	% Parallel to Road	% Deflection	% Meander
Arctic Hare	45	9	27	0	18
Fox	40	11	35	11	3
Lemming	25	5	25	30	15
Ptarmigan	67	33	0	0	0
Common Raven	50	25	25	0	0
Unknown	67	0	33	0	0

Representative site survey conditions and observed tracks are shown in Photo 9-1 to Photo 9-4. Observed track locations and direction of travel in relation to the Tote Road are presented in Map 9-1. Snow track surveys will continue regularly after snowfalls and will be completed more frequently if/when caribou are observed near the Project—to be informed by other monitoring inputs, including HOL monitoring data, incidental monitoring data, and/or observations during aerial surveys.

**Inter-annual Trend** — No caribou, Arctic wolf (*Canis lupus*), or large mammal tracks were observed during snow track surveys completed between 2014 and 2024. Species track composition was similar to previous years, but there was a significant increase in the overall numbers of fox tracks. The increase in fox tracks may be a result of their mobile nature combined with increased tracking frequency in 2024 (Figure 9-3).

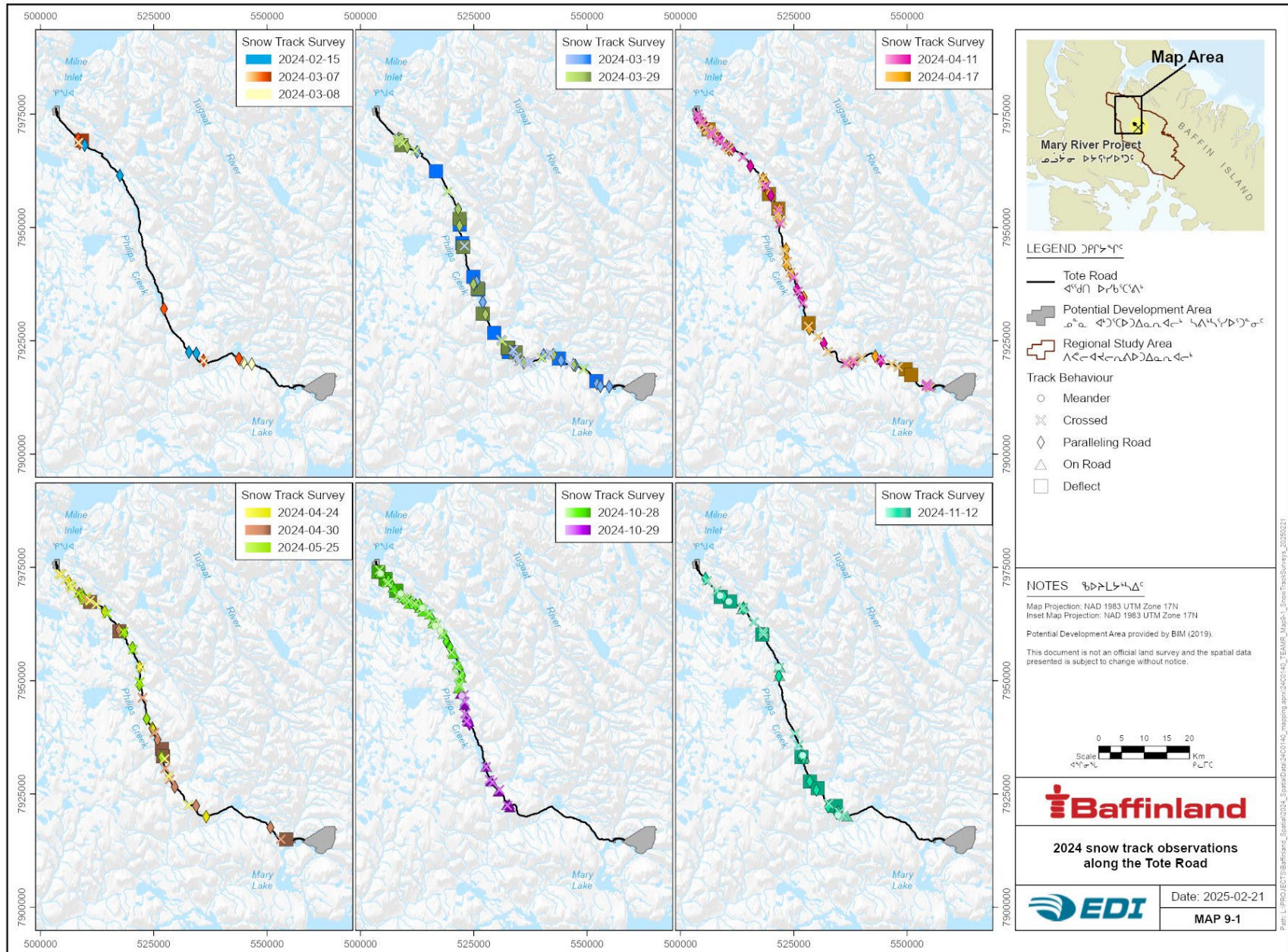






Photo 9-1. Fox tracks parallel to the Tote Road.



Photo 9-2. Baffinland staff completing track survey and recording old hare tracks.



Photo 9-3. Fresh Arctic hare tracks alongside the Tote Road.



Photo 9-4. Small mammal track deflecting from the Tote Road.

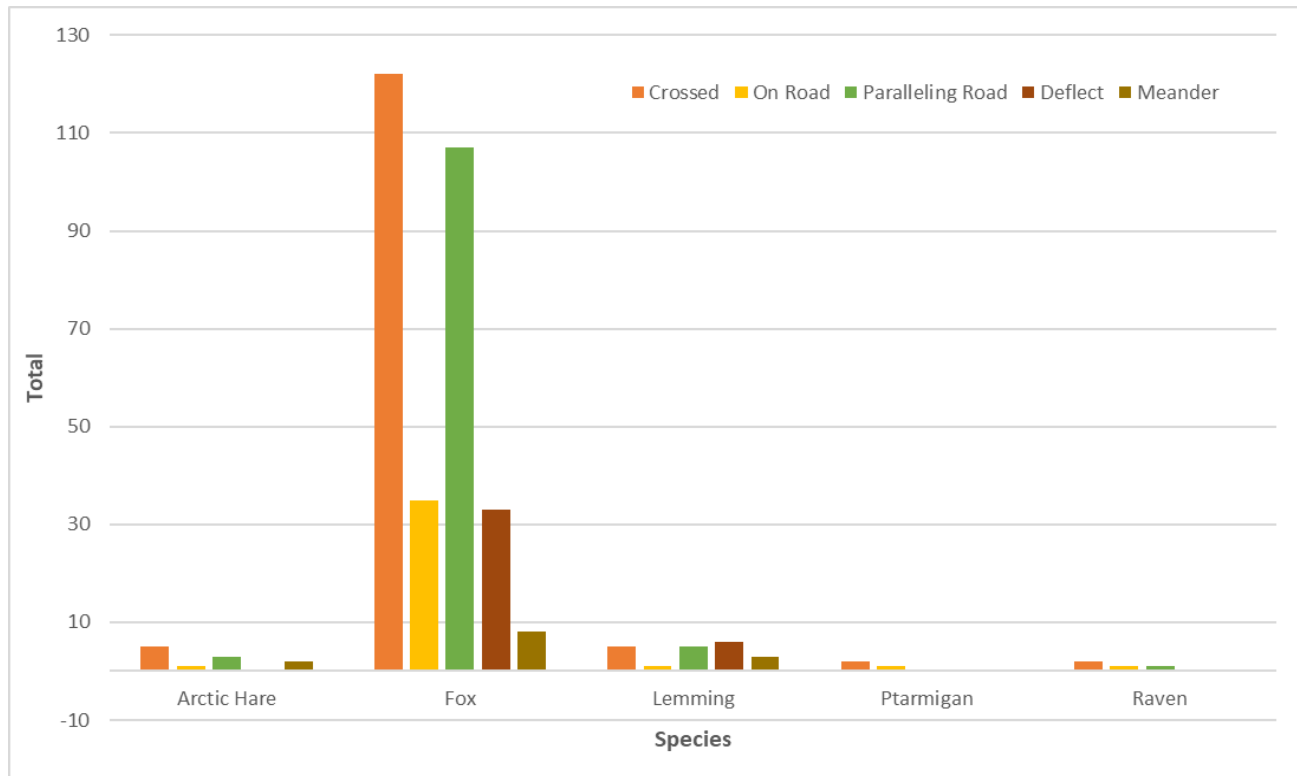


Figure 9-2. 2024 Tote Road snow track response based on species.

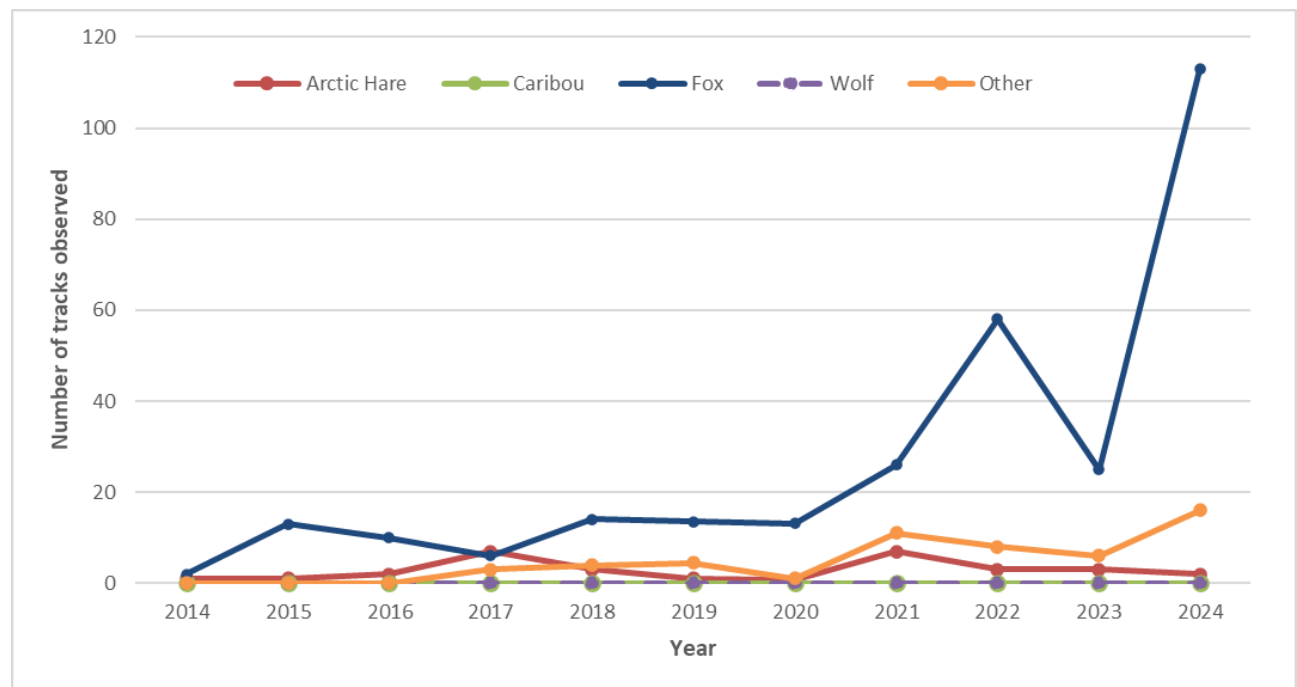


Figure 9-3. 2024 inter-annual trends — snow track survey (2014 to 2024).  
*“Fox” includes both red and Arctic foxes as it is difficult to distinguish based only on tracks. ‘Other’ refers to ptarmigan and small mammals such as lemmings and ermines.*





## 9.2 SNOWBANK HEIGHT MONITORING

The following PCs address uncertainty in the Final Environmental Impact Statement (Baffinland Iron Mines Corporation 2012) and Early Revenue Program Final Environmental Impact Statement (Baffinland Iron Mines Corporation 2013a) concerning caribou movement (Nunavut Impact Review Board 2020):

- **PC #53ai** *“Specific measures intended to address the reduced effectiveness of visual protocols for the Milne Inlet Tote Road and access roads/trails during times of darkness and low visibility must be included.”*
- **PC #53c** *“The Proponent shall demonstrate consideration for...Evaluation of the effectiveness of proposed caribou crossing over the railway, Milne Inlet Tote Road and access roads as well as the appropriate number.”*

To address these PCs, Baffinland committed to various mitigation measures to facilitate effective caribou crossings of the Tote Road and reduce potential barriers to caribou movement. Mitigation measures include snowbank management by (1) maintaining snowbank heights at <100 cm along roadways and (2) smoothing/contouring snowbanks along the edges of roadways to reduce the probability of drifting snow. These mitigations were designed to minimize barriers to caribou crossing the Tote Road, improve driver visibility, and reduce potential wildlife-vehicle collisions. In conjunction with the snow track surveys (Section 9.1), snowbank height monitoring was implemented to verify that these mitigation measures are effective.

### 9.2.1 METHODS

Snowbank height monitoring was completed monthly on one day in January, February, March, April, November, and December 2024. During each survey, Baffinland personnel measured snowbank heights at up to 50 randomized kilometre marker locations along the Tote Road (e.g., KM5.8, KM16, and KM42), being mindful of safety and access<sup>15</sup>. In response to input from the TEWG, survey locations were randomly chosen to eliminate potential survey biases and to better capture/verify snowbank conditions along the Tote Road. At each survey location, Baffinland personnel took two snowbank height measurements (east- and west-side snowbanks), photographed site conditions, and recorded any other relevant information (Photo 9-5 to Photo 9-7). Due to vehicle traffic and safety considerations, anywhere from 65 to 98 measurements were captured during each monitoring survey and deemed either ‘compliant’ (≤100 cm) or ‘non-compliant’ (>100 cm).

<sup>15</sup> Occasionally, measurements could not be taken due to low visibility by ore haul truck drivers and/or high traffic at a given location. Safety concerns were the primary reason for not stopping at a survey location to take measurements (e.g., the Tote Road was too narrow to pull over and park while still allowing ore haul trucks to safely pass).



### 9.2.2 RESULTS AND DISCUSSIONS

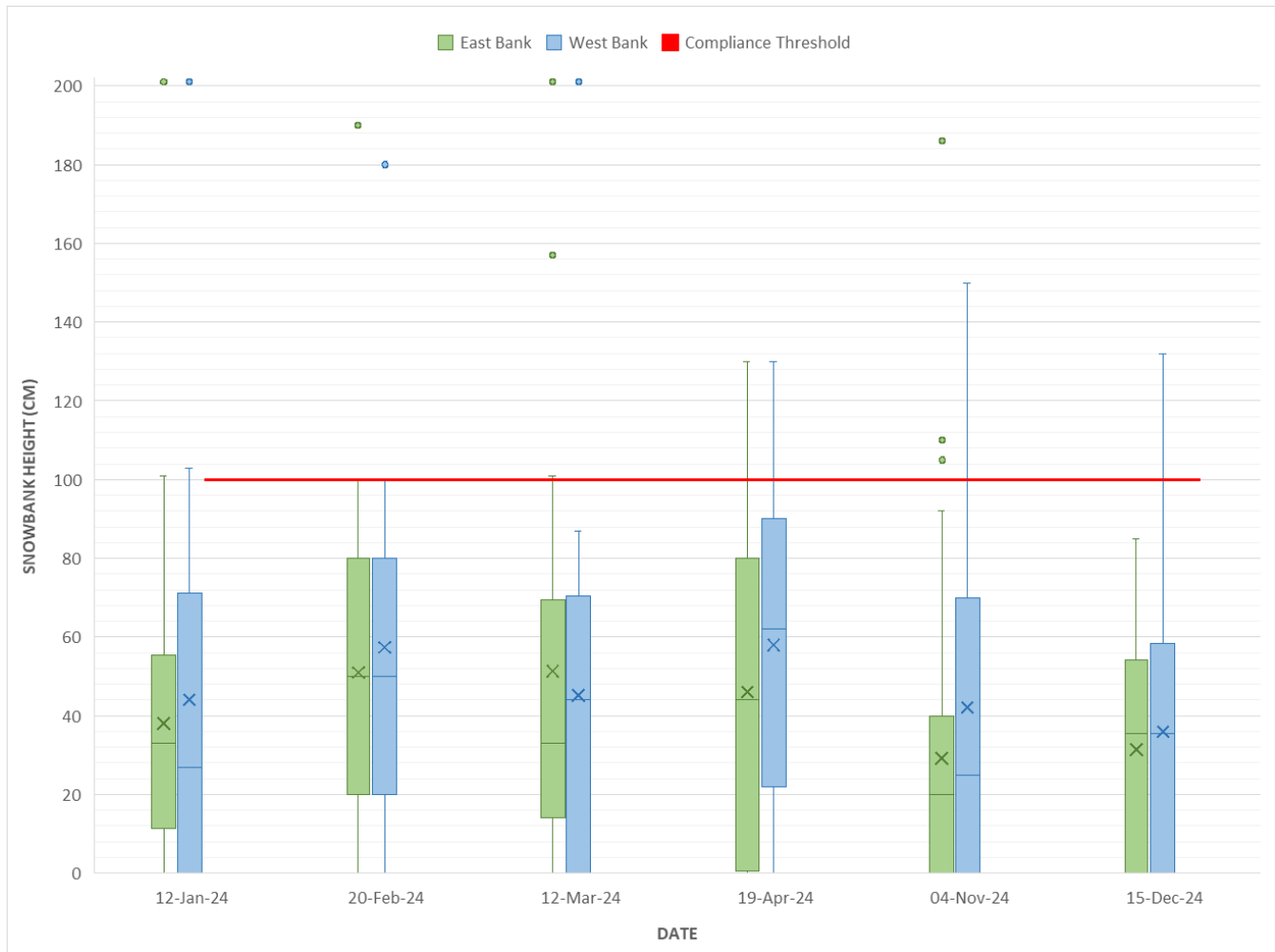
Snowbank measurements across all surveys ranged from 0 to 200+ cm in height. Compliance of snowbank height ranged from 76 to 97% (per survey) and averaged 86% for all surveys combined (Table 9-3). Mean snowbank height per survey typically ranged between 34 to 59 cm. Snowbank height typically increased throughout winter because of cumulative snowfall. To reduce snowbank height and drifting, efforts were made to ‘feather’ (i.e., push back and redistribute) large snow piles after substantial snowfalls (Photo 9-7). Snowbanks that exceeded the 100 cm height threshold (Figure 9-4) typically occurred where snow could not be adequately redistributed for safety and/or operational reasons (e.g., steep or uneven topography, narrow or winding road segments).

**Inter-annual Trend** — Most snowbank height measurements collected between 2014 and 2024 complied with the 100 cm height limit. Snowbank height compliance was similar during the 2014 to 2016 and 2018 to 2024 monitoring periods, ranging between 80 to 97%. Snowbank heights in 2017 had the lowest overall compliance rate at 66% (Figure 9-5).

**Table 9-3. 2024 Tote Road snowbank height monitoring.**

Survey Date	Number of Measurements	Compliances	Exceedances	Percent Compliance
January 12, 2024	70	56	7	80%
February 20, 2024	76	69	10	91%
March 12, 2024	83	65	8	78%
April 19, 2024	78	76	9	97%
November 4, 2024	88	83	11	94%
December 15, 2024	94	71	2	76%
<b>2024 Total</b>	<b>489</b>	<b>420</b>	<b>47</b>	<b>86%</b>





**Figure 9-4. 2024 snowbank height monitoring time series and distribution for snowbank heights.**  
*'X' represents the mean snowbank height for each survey. The horizontal line represents the median. The box represents the first and third quartiles. The whiskers represent the minimum and maximum values within 1.5 times the interquartile range.*