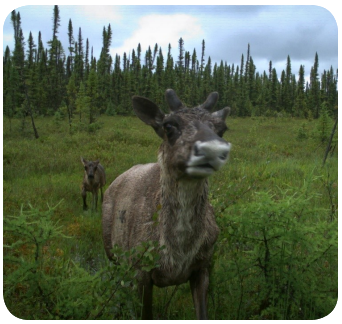
Keeyask Generation Project

Terrestrial Effects Monitoring Plan

Caribou Sensory Disturbance Monitoring Report

TEMP-2024-12



KEEYASK

Manitoba Environment and Climate ChangeClient File 5550.00
Manitoba Environment Act Licence No. 3107

2023 -2024

KEEYASK GENERATION PROJECT

TERRESTRIAL EFFECTS MONITORING PLAN

REPORT #TEMP-2024-12

CARIBOU SENSORY DISTURBANCE MONITORING

YEAR 2 OPERATION

2023

Prepared for

Manitoba Hydro

By

Wildlife Resource Consulting Services MB Inc.

June 2024

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SUMMARY

Background

Construction of the Keeyask Generation Project (the Project) at the former Gull Rapids began in July 2014 and all generating units were in service by March 2022. The Keeyask Hydropower Limited Partnership (KHLP) was required to prepare a plan to monitor the effects of construction and operation of the generating station on the terrestrial environment. Monitoring results will help the KHLP, government regulators, members of local First Nation communities, and the general public understand how construction and operation of the generating station will affect the environment, and whether more needs to be done to reduce harmful effects.

In addition to migratory caribou that occasionally reach the Keeyask region in winter, a small group of caribou occupies the Keeyask region in spring and summer, referred to as summer resident caribou. These caribou are known to calve on the islands in Gull and Stephens lakes and in mainland habitat (raised treed patches surrounded by low, wet areas, which essentially act as islands).

Predicted Project effects on summer resident caribou in the Keeyask region included a loss of physical habitat from clearing and development. Caribou were also expected to temporarily avoid or less frequently use otherwise suitable habitat near construction sites due to sensory disturbance (e.g., noise and light from construction activities), resulting in a loss of effective habitat. It was thought that caribou would return to Project-affected calving habitat during operation, but that there may be ongoing avoidance of areas near the generating station and the North and South access roads.

Why is the study being done?

Caribou calving on islands in lakes and in mainland habitat near the Project was expected to be affected by the loss of effective habitat due to noise and light disturbance during construction. The goals of caribou sensory disturbance monitoring during Project operation are to determine the extent to which caribou increase their use of the calving and calf-rearing habitat formerly disturbed by construction activity and to estimate the ongoing loss of effective habitat. At the same time, monitoring other large mammals may provide an indication of the effects of potential changes in the distribution of alternative prey (moose) and predators (black bear and gray wolf) on the caribou population.

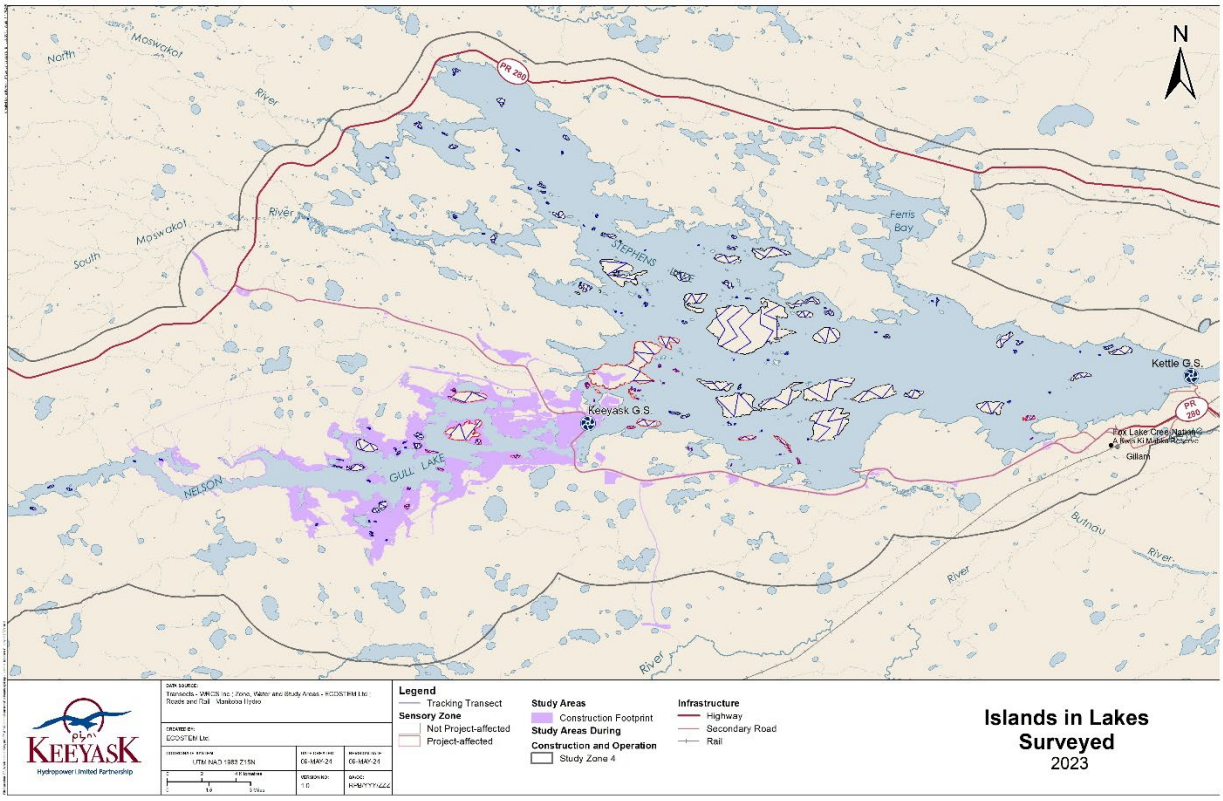
What was done?

Ground tracking transect and trail camera surveys were used to gather information on the use of islands in lakes, mainland habitat, and habitat near the North and South access roads by caribou and other large mammals. Islands in lakes and mainland areas were surveyed because these habitats are known to be used by caribou during the calving and calf-rearing period, when caribou

are sensitive to disturbance. Habitat along the North and South access roads was surveyed to determine the effects of Project operation traffic disturbance on caribou and other large mammals.

Ground tracking transects were visited three times in 2023, timed to coincide with periods in the caribou calving and calf-rearing season. During each visit, signs (e.g., tracks and droppings) of caribou and other large mammals were recorded.

In April 2023, a trail camera was placed on most ground tracking transects on islands in lakes and within each mainland habitat surveyed. Trail cameras were placed where caribou activity was most likely to be detected (i.e., heavily used game trails, large openings). Photographs were reviewed following camera removal in September 2023, and the species, number, and sex (where possible) of photographed animals were noted. The timing of ice breakup on Gull and Stephens lakes was monitored using trail cameras deployed along the shorelines, to see how it corresponds with the use of the islands in the lakes by caribou.



What was found?

Caribou occupied 59% of the islands in lakes surveyed in 2023 and 15% were also occupied by calves. These values were marginally higher than the percentages observed in 2021. As predicted, many Project-affected islands (those within 4 km of the Project site) continued to be unoccupied by caribou in 2023. Although there was less caribou activity on unaffected islands in

2023 than during the pre-construction survey years, caribou occupied 48% of the newly formed islands in the reservoir, and calves occupied 12%, an increase from 2021. More caribou and caribou calves were photographed on affected and unaffected islands in 2023 compared to all other survey years between 2015-2022.

In 2023, the percentage of ice cover on Stephens Lake remained consistent from mid-April until mid-May and then decreased rapidly. Ice breakup was on May 25 and Stephens Lake was free of ice by May 26. Ice breakup on Gull Lake was May 19, with no ice remaining on May 25.

Caribou occupied 72% of all surveyed mainland habitat areas and 13% were also occupied by calves. Caribou activity was found in over half of Project-affected mainland habitats (those within 4 km of the Project site). Caribou occupied more unburned than burned habitats, though did not differ in reference areas of burned and unburned habitat. Signs of calves were only found in mainland habitats that were not affected by the Project.

On access road transects the density of caribou signs was marginally greater more than 2 km from the access roads than within 2 km. Very few calf signs were found along these transects in 2023.

Moose signs were abundant and widely distributed on islands in lakes and in peatland complexes. Signs of black bear and gray wolf presence were sparse in caribou calving habitat in the Keeyask region, and caribou and predators occupied relatively few of the same islands in lakes and peatland complexes in 2023.

What does it mean?

While the location of caribou in Gull and Stephens lakes during spring and summer can vary from year to year, the potentially unoccupied islands near the Project site may show avoidance of habitat by some caribou due to operation-related sensory disturbances. However, some Project-affected islands continued to be occupied by caribou. As caribou can eventually get used to human disturbance, some animals may have been less affected by ongoing operations activity than others. In 2023 overall, caribou numbers in the broader region have not returned to the numbers observed during pre-construction.

Some of the new islands formed in the reservoir following impoundment in late 2020 were predicted to become suitable for calving caribou in the future. It was not anticipated that caribou would occupy new islands in the reservoir and use them for calving in the years immediately after impoundment. Caribou used them for calving in 2021 and 2023, suggesting that they are already suitable habitat. Moose calving on the newly formed islands was also prevalent. Earlier than expected occupancy of primary and secondary calving habitat for caribou and moose in the reservoir could enhance the recovery of caribou and moose in the region more quickly than expected during operations.

Caribou activity was found in fewer Project-affected mainland habitats than in unaffected habitats and in more unburned than burned habitats. Caribou tend to avoid forest that is less than 50 years old but may pass through regenerating forest to get from one patch of more suitable habitat to

another. The absence of calf activity in burned mainland habitat suggests that cows avoid recently burned areas when calving.

Caribou activity near the access roads during 2023 operations was similar to previous construction surveys. Caribou were generally expected to avoid areas within 2 km of the access roads. As caribou can tolerate some human disturbance, some individual animals may be less affected by traffic noise than others. Potential differences in habitat quality closer to and farther from the road, possibly related to fire or other factors, could also have influenced caribou distribution.

The abundance and distribution of moose signs in the Keeyask region suggest that enough habitat is available to sustain a moose population, which is likely an adequate source of primary prey for gray wolves. Because caribou and predators occupied relatively little of the same calving habitat in 2023, these areas appeared to provide calving caribou with protection from predators, as expected.

What will be done next?

Caribou sensory disturbance monitoring will continue in 2025, when additional studies and further analyses will be conducted to identify potential increases in caribou calving and calf-rearing activity in habitat affected during Project construction, to assess the loss of effective habitat during Project operation, and to identify ongoing avoidance of the access roads or other Project components.

STUDY TEAM

We would like to thank Sherrie Mason and Rachel Boone of Manitoba Hydro and Ron Bretecher of North/South Consultants Inc. for logistical assistance in the field. We would also like to thank James Ehnes of ECOSTEM Ltd. for GIS support and mapping. Biologists and other personnel who designed, participated in, and drafted the survey results included:

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1.0 INTRODUCTION

The Keeyask Generation Project (the Project) is a 695-megawatt hydroelectric generating station (GS) located at the former Gull Rapids on the lower Nelson River in northern Manitoba where Gull Lake flows into Stephens Lake. Project construction began in July 2014 and all generating units were in service by March 2022.

The *Keeyask Generation Project Response to EIS Guidelines* (the EIS), completed in June 2012, provides a summary of predicted effects and planned mitigation for the Project. Technical supporting information for the terrestrial environment, including a description of the environmental setting, effects and mitigation, and a summary of proposed monitoring and follow-up programs is provided in the *Keeyask Generation Project Environmental Impact Statement Terrestrial Supporting Volume* (TE SV). *The Terrestrial Effects Monitoring Plan* (TEMP) was developed as part of the licensing process for the Project. Monitoring activities for various components of the terrestrial environment were described, including the focus of this report, the use of calving and calf-rearing habitat in the Keeyask region by caribou (*Rangifer tarandus*) during Project construction and operation.

In addition to the migratory caribou that occasionally reach the Keeyask region in winter, a small number of caribou occupy the area in spring and summer (herein referred to as caribou or summer resident caribou). These summer resident caribou are known to calve on the islands in Gull and Stephens lakes and in peatland complexes composed of treed islands (raised areas of mainland habitat) surrounded by expansive, treeless wetlands. These islands in lakes and in peatland complexes (collectively referred to as calving habitat hereafter) are provided a physical barrier by the surrounding habitat and offer some protection from predators such as black bear (*Ursus americanus*) and gray wolf (*Canis lupus*).

The Project may affect the distribution of caribou and their use of calving habitat due to habitat loss and alteration, sensory disturbance, and changes in the predator community. Predicted Project effects on caribou included the loss or alteration of winter and calving habitat and a reduction in habitat intactness (i.e., the degree to which habitat remains unaltered by fire and human disturbances) in the Keeyask region. In addition to the loss of physical habitat, a loss of effective habitat due to sensory disturbance was anticipated during Project construction. Noise generated by construction activity, blasting, and vehicle traffic was expected to result in caribou temporarily avoiding otherwise suitable habitat near these disturbances. This loss of effective habitat for summer resident caribou was predicted to occur within 4 km of the Project construction site and within 2 km of the North and South access roads (Keeyask Hydropower Limited Partnership [KHLP] 2012). Because caribou in the Keeyask region tend to calve solitarily and in low densities on the landscape, the presence of undisturbed calving habitat is critical for successful reproduction (Leclerc et al. 2014).

Habitat alteration may also affect the vulnerability of caribou cows and calves to black bears and gray wolves. Habitat alteration, including land clearing for trails and roads, may change or facilitate predator movements and can increase predation risk (James and Stuart-Smith 2000).

Habitat alteration may also result in increased populations of alternative prey such as moose (*Alces alces*), which could increase the predator population, potentially affecting caribou mortality and reproduction (James et al. 2004; Peters et al. 2012).

As part of the TEMP, ground tracking transects and trail camera surveys were conducted during Project construction to monitor changes in the distribution and relative abundance of caribou due to sensory disturbance or to changes in the alternative prey and predator communities. Beginning in 2022, and continuing in 2023, monitoring during operation was conducted to determine if caribou calving and calf-rearing activity increased in habitat affected during Project construction, to estimate the loss of effective habitat, and to identify residual avoidance of the access roads or other Project components during operation. The distribution and relative abundance of moose, black bear, and gray wolf were also documented to estimate the amount of alternative prey and predator activity in the region. The timing of ice breakup on Gull and Stephens lakes was monitored using trail cameras because of its potential to affect the use of islands in lakes by calving caribou.

2.0 METHODS

2.1 SURVEY METHODS

2.1.1 GROUND TRACKING TRANSECTS AND TRAIL CAMERAS

Ground tracking transect and trail camera surveys were conducted to gather information on the use of islands in lakes, peatland complexes, and habitat near the North and South access roads by caribou and three other large mammal species. Ground tracking surveys began 2015 and continued in 2017, 2018, 2020, and 2021, during Project construction, and were continued in 2023, during the second year of operation. Trail camera surveys were conducted annually from 2015 to 2021 during Project construction, and continued in 2022 and 2023, during the first two years of Project operation.

Moose were included in the surveys as they are a potential attractant for wolves, which could opportunistically prey on caribou. Black bears and gray wolves were included as they are common predators of adult caribou and calves and can influence their use of habitat. Islands in lakes and peatland complexes were surveyed as these habitats are known to support caribou during the sensitive calving and calf-rearing period. Habitat along the North and South access roads was also surveyed to determine the effects of traffic disturbance on caribou and other large mammals.

Transects on islands in lakes, in peatland complexes, and near the access roads were visited three times in 2023, from April 5 to 23, July 16 to July 31, and from September 6 to 22 (Table 1). The initial visit was prior to cow arrival, to ensure that animals were not disturbed during calving. The second visit coincided with the late calving and early calf-rearing period and the third visit was during the mid to late calf-rearing period.

Table 1: Start and End Dates of Survey Visits to Tracking Transects, 2023

Transect Type	Visit 1			Visit 2			Visit 3		
	Start Date	End Date	No. Days	Start Date	End Date	No. Days	Start Date	End Date	No. Days
Island in lakes	April 7	April 23	16	July 16	July 31	15	Sept. 6	Sept. 21	15
Peatland complex	April 5	April 21	16	July 16	July 28	12	Sept. 6	Sept. 22	16
Access road	April 16	April 23	7	July 19	July 31	12	Sept. 7	Sept. 22	15

During the initial 2023 visit, biodegradable thread was strung approximately 75 cm above ground level and anchored to trees or shrubs roughly every 20 m (Searing 1981; Demarchi and Searing 1997). Thread was used to ensure that surveying consistently occurred along the same line and to increase sign detectability. Breaks in the thread helped identify animal movements. All signs visible up to 1 m on either side of the transect were recorded, including tracks, trails, droppings, beds, browse or feeding sites, and visual observations. The specific locations of signs were recorded using hand-held Global Positioning System (GPS) units.

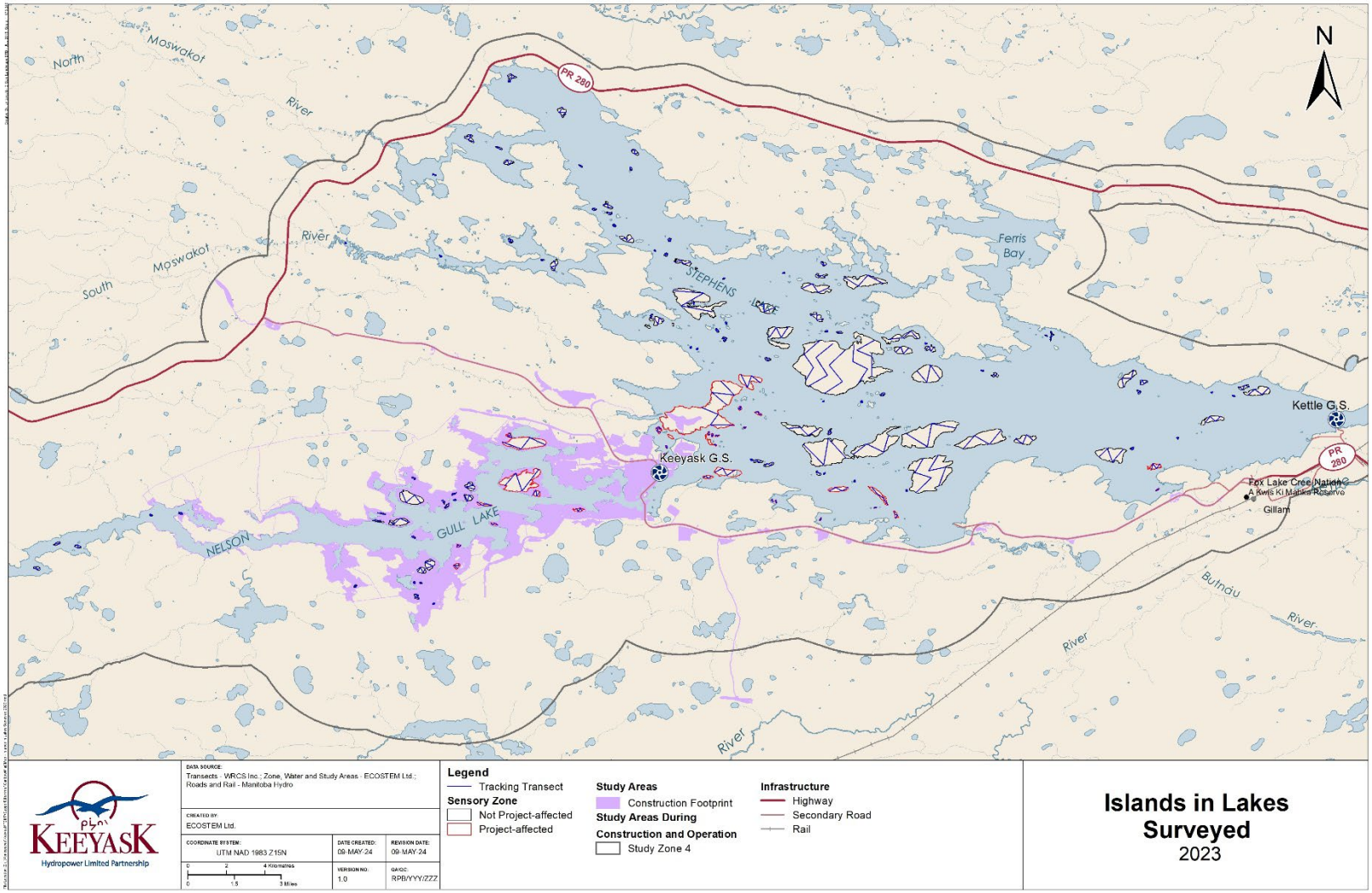
During the second and third visits, large mammal activity was identified at breaks in the thread along each transect, where possible. The locations of all thread breaks were recorded with a GPS unit. Signs such as tracks and scat were used to identify the species responsible for each thread break, where possible.

2.1.1.1 ISLANDS IN LAKES

For the tracking transect study, islands greater than 0.5 ha in size in Stephens and Gull lakes and upstream in the Nelson River with more than 5% tree cover were selected ("islands in lakes"). These islands were classified by their distance to Project-related disturbance, where those within 2 km of borrow areas or Project infrastructure or within 4 km of the generating station were designated as "Project-affected" and those beyond were designated as "unaffected" (KHLP 2015). Islands formed in the reservoir after impoundment in late 2020 were designated as "new," including a small island formed from a larger pre-existing one.

A total of 148 transects were surveyed on 140 islands in Stephens and Gull lakes in 2023 (Appendix 1, Table A-1). Thirty-four transects totalling 33 km in length were surveyed on 33 Project-affected islands, while 113 transects totalling 117.2 km in length were surveyed on 106 unaffected islands. Transect length was proportional to island size. One transect was typically established on each island. However, five of the largest islands (>300 ha) were divided into 150-ha units, with one transect surveyed in each (Map 1). In general, "Z"-shaped transects were established across islands to maximize the detection of mammal signs (e.g., tracks and droppings).

One hundred and fifty-two Reconyx™ PM35C31 trail cameras were placed on 142 islands during the first visit to tracking transects in April 2023. Most were on the same islands as in 2015, 2016, 2017, 2018, 2019, 2021 and/or 2022, the previous trail camera monitoring years for caribou (Appendix 1, Table A-2). Cameras were placed where caribou activity would likely be detected (i.e., heavily used game trails, large openings). Batteries and memory cards were exchanged during the second visit to tracking transects in July, and the cameras were removed during the third visit in September. Photographs were reviewed following removal of memory cards, and the species, number, and sex of photographed animals was determined, where possible.



Map 1: Islands in Lakes Surveyed in 2023

2.1.1.2 PEATLAND COMPLEXES

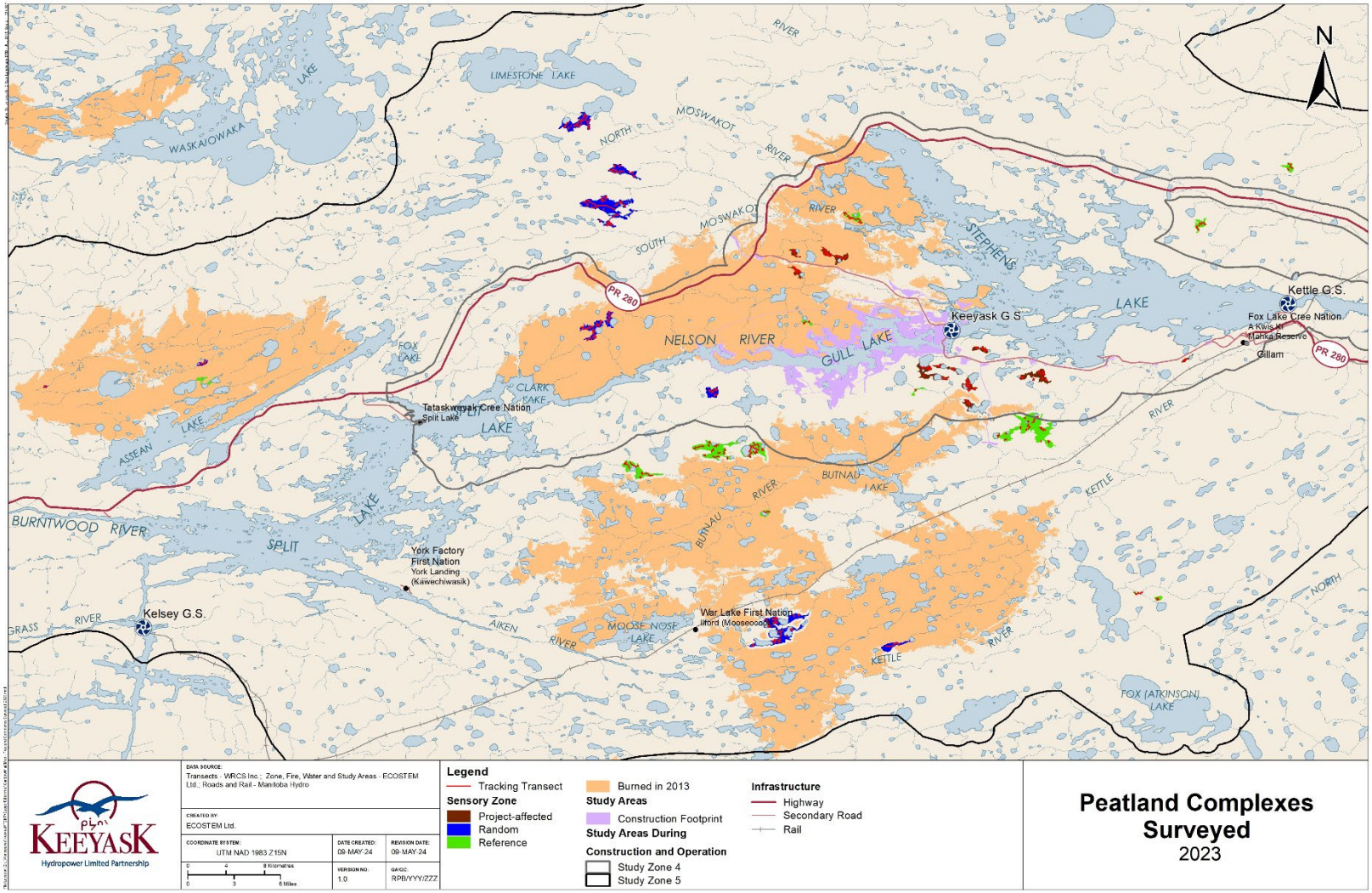
Peatland complex tracking transects were established on raised mainland habitat "islands" within a wet bog matrix. Peatland complexes were selected and categorized based on their distance to a disturbance source. Project-affected peatland complexes were within 4 km of the generating station or within 2 km of the North or South access roads, and where disturbance was generated only from these features. For each Project-affected peatland complex, a reference peatland complex similar in size and with comparable habitat characteristics but not affected by sensory disturbance (i.e., more than 4 km from the generating station and more than 2 km from the access roads) was selected. Random peatland complexes were selected randomly from undisturbed areas to act as a reference for natural variability. The state of Project-affected, reference, and random peatland complexes relative to the forest fires in 2013 (burned or unburned) was also identified.

Like the islands in lakes, tracking transects in peatland complexes were "Z" shaped and varied in length depending on habitat island size. One hundred and eighty-eight transects totalling 112.2 km in length were surveyed in 35 peatland complexes (Table 2, Map 2). The number of transects in each peatland complex ranged from 1 to 20, and the length of transects in complexes ranged from 176 m to 3.0 km. All transects had been surveyed in 2015, 2017, 2018, 2020, and 2021 (Appendix 1, Table A-3).

A Reconyx™ PM35C31 or HP2X trail camera was placed on one transect within each of 30 peatland complexes in April 2023, all at locations surveyed in previous years (Appendix 1, Table A-4). A trail camera was placed in one complex that was not surveyed by tracking transect (Map 2). In all, 32 trail cameras were deployed where caribou activity would likely be detected (i.e., heavily used game trails, large openings). Batteries and memory cards were exchanged during the second visit to tracking transects in July, and the cameras were removed during the third visit in September. Photographs were reviewed following removal of memory cards, and the species, number, and sex of photographed animals was determined, where possible.

Table 2: Peatland Complex Transects Surveyed in 2023

Complex Type	Number of Complexes	Number of Transects	Length of Transects (km)
Project-affected, burned in 2013	3	15	8.9
Project-affected, not burned in 2013	8	27	17.1
Reference, burned in 2013	3	9	5.5
Reference, not burned in 2013	8	53	30.9
Random, burned in 2013	4	20	12.4
Random, not burned in 2013	5	64	37.4
Total	31	188	112.2



Map 2: Peatland Complexes Surveyed in 2023

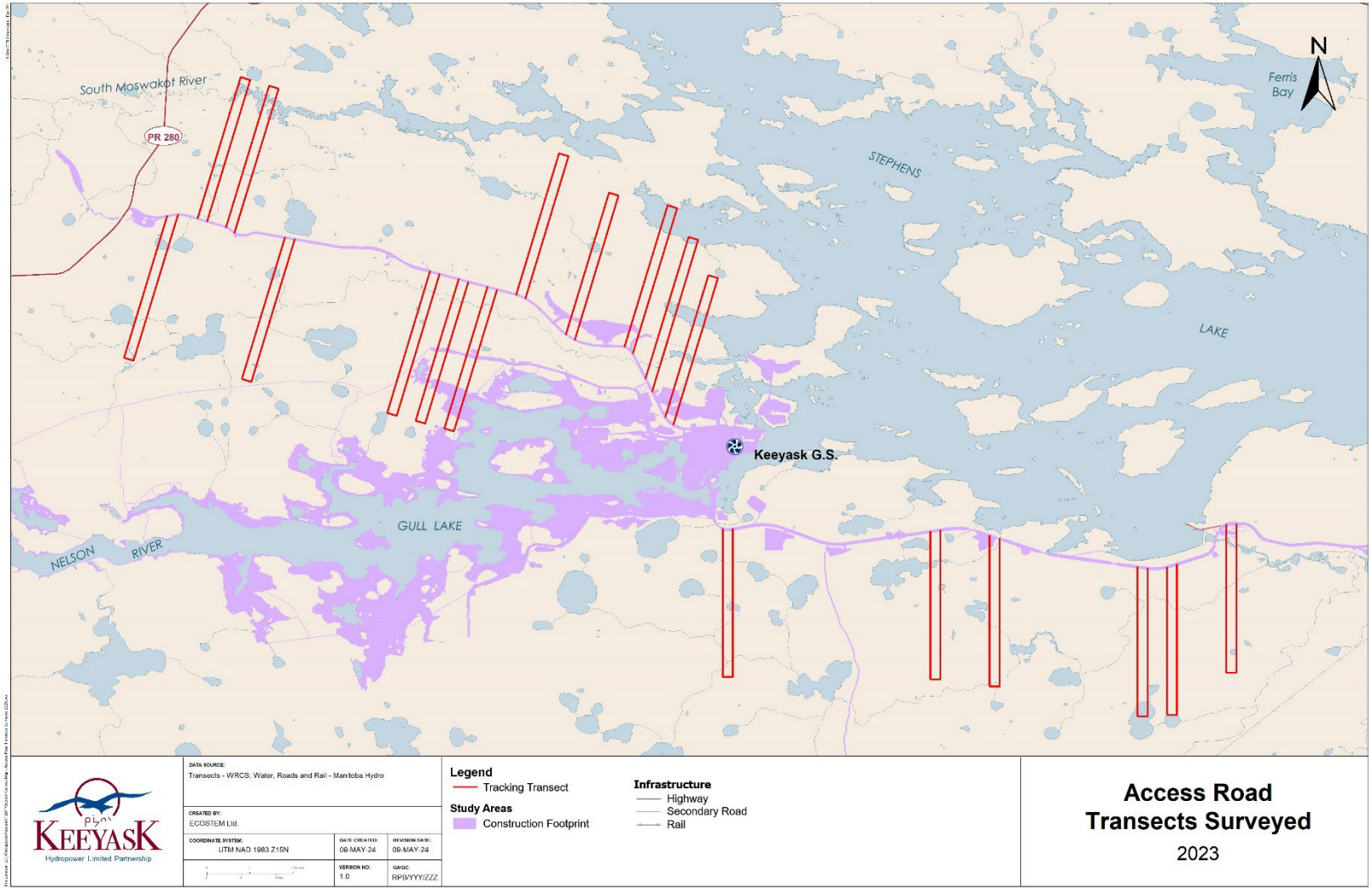
2.1.1.3 ACCESS ROAD TRANSECTS

Access road tracking transects were placed at random locations along and perpendicular to the North and South access roads. Transects were developed to be 10.3 km long, consisting of two 5-km long portions separated by 333 m. Actual transect lengths varied due to terrain and obstacles such as water bodies (Table 3).

Eighteen access road transects were surveyed in 2023, all of which were also surveyed in 2015, 2017, 2018, 2020, and 2021. Seven transects totalling 76.4 km in length were north of the North Access Road, five totalling 54.7 km were south of the North Access Road, and six totalling 63.8 km were south of the South Access Road (Map 3). Of the 194.8 km surveyed, approximately 72.0 km were within 2 km of an access road, where effects of sensory disturbance on caribou were anticipated, and approximately 122.8 km were beyond 2 km, where no sensory disturbance effects were expected.

Table 3: Access Road Transects Surveyed in 2023

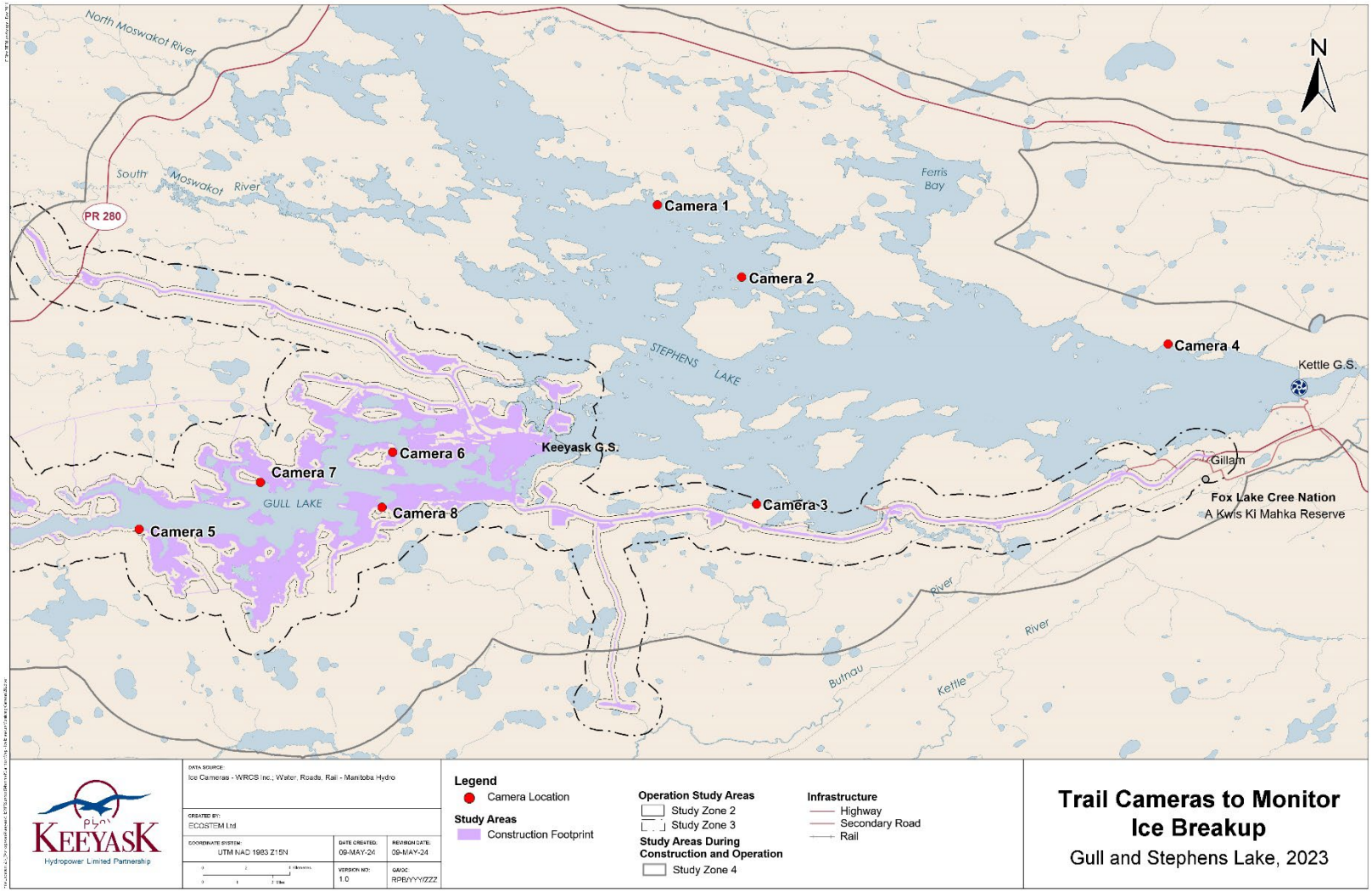
North Access Road		South Access Road	
Transect	**Length (km)**	**Transect**	**Length (km)**
N23	10.6	S1	11.8
N24	10.2	S10	10.7
N34	11.8	S15	9.4
N36	13.4	S16	11.0
N38	9.5	S18	10.3
N39	10.5	S8	10.6
N40	10.3		
S42	12.1		
S46	12.5		
S51	11.2		
S52	10.3		
S53	8.7		



Map 3: Access Road Tracking Transects Surveyed in 2023

2.1.2 TIMING OF ICE BREAKUP

Four trail cameras were placed on the shores of Stephens Lake and four were placed on the shores of Gull Lake between April 8 and 16, 2023 to monitor the timing of ice breakup (Map 4). The trail cameras, which were set to take a picture of the lake every four hours during daylight hours, were removed in July 2023. Ice coverage was estimated at 25% increments in each photograph from each camera. Ice breakup was defined as the date when all cameras on a lake indicated 25% or less ice coverage in view.



Map 4: Trail Camera Locations to Monitor Ice Breakup on Gull and Stephens Lakes, 2023

2.2 DATA ANALYSIS

Trail camera data for 116 islands in lakes and 32 peatland complexes that were surveyed each year from 2015 to 2023 were analyzed by averaging the percentage of camera days (total number of days each camera was deployed and functional) during which caribou were photographed each year for an indication of the relative amount of caribou activity. A Mann-Whitney test was used to compare the percentage of camera days caribou were photographed on Project-affected and unaffected islands in lakes each year and a Kruskall-Wallis test was performed to compare the percentage of camera days caribou were photographed in Project-affected, reference, and random peatland complexes each year (McDonald 2014), with significance determined at the $\alpha = 0.05$ level. Where a significant difference was found among peatland complexes, a Dwass-Steel-Critchlow-Fligner test for pairwise comparisons (Systat Software Inc. 2009) was performed, also with significance determined at the $\alpha = 0.05$ level. Statistical tests were performed with SYSTAT 13.2.

Ground tracking transect and trail camera data were summarized separately and then combined for a broader indication of large mammal distribution on islands in lakes and in peatland complexes in the region. Only tracking data from July and September were included in the combined data because signs observed in April were of varying ages (dependent on time since last snowfall) and because the first visit was prior to the caribou calving season.

Using the combined tracking transect and trail camera data, the presence and general distribution of caribou, caribou calves, moose, and moose calves was examined for islands and peatland complexes and compared with previous survey years. A total of 145 Project-affected and unaffected islands in lakes and 32 peatland complexes were surveyed in 2023. Combined tracking transect and trail camera data were also used to identify islands in lakes and peatland complexes occupied by caribou and by moose and/or predators during the survey period, as the presence of moose, black bears, or gray wolves on islands or in peatland complexes occupied by caribou can provide an indication of the influence of predators and alternative prey (moose) on the selection of calving and calf-rearing habitat by caribou. Large mammals were considered present on an island or in a peatland complex when their sign was observed on one or more tracking transects and/or when they were photographed by at least one trail camera. A Fisher's exact test (McDonald 2014) was performed to compare the occupancy rates of caribou (percentage of islands where caribou were observed) on Project-affected and unaffected islands in lakes before (2010–2014) and during (2015, 2017, 2018, 2020, and 2021) Project construction. Significance was determined at the $\alpha = 0.05$ level. A two-proportion z test (Statology 2019; Glen 2021) was performed in Excel to compare the occupancy rates of caribou on Project-affected and unaffected islands in lakes each year, with significance determined at the $\alpha = 0.05$ level. The same test was performed to compare the occupancy rates of caribou on Project-affected, reference, and random peatland complexes during Project construction (2015, 2017, 2018, 2020, and 2021), with significance determined at the $\alpha = 0.05$ level.

Primary calving habitat was described in the EIS as islands greater than 10 hectares (ha) in size in lakes or peatland complexes greater than 200 ha in area. Secondary calving habitat was considered islands between 0.5 and 10 ha in size in lakes and peatland complexes between 30 and 200 ha in area. Using the combined tracking and trail camera data, the mean percentage of survey years in which caribou and caribou calves occupied islands in lakes and peatland complexes identified as primary, secondary, or unsuitable during Project construction was calculated. In Gull Lake, only islands in existence before the reservoir was impounded were included. Islands that were not surveyed all five years over the construction period (n = 11) were excluded. Overall, 34 primary and 74 secondary calving islands were included in the analysis. Twenty-six peatland complexes that were surveyed all five years over the construction period were categorized by size; 5 primary, 13 secondary, and 8 small “non-habitat” complexes were included in the analysis.

For access road tracking transects, sign density (signs/km) was calculated using the distance surveyed during the initial visit in April to describe large mammal activity. The activity of caribou and other large mammals within 2 km of the North and South access roads and subject to sensory disturbance was compared with activity in areas further away and not subject to sensory disturbance (KHLP 2015). A Mann-Whitney test (McDonald 2014) was performed in SYSTAT 13.2 to compare the density of caribou signs within 2 km of and more than 2 km from the access roads during the combined second and third visits. Significance was determined at the $\alpha = 0.05$ level.

3.0 RESULTS

3.1 GROUND TRACKING TRANSECTS AND TRAIL CAMERAS

3.1.1 ISLANDS IN LAKES

Caribou signs were observed on 73 of the 140 islands on which ground tracking transects were surveyed, with 12 islands also having caribou calf signs (Table 4; Appendix 1, Table A-5). Moose signs were observed on 69 of the islands, with nine of the islands also having moose calf signs. Signs of black bear were observed on seven islands, and gray wolf signs were observed on eleven islands.

Table 4: Number of Islands in Lakes on Which Large Mammal Signs Were Observed, 2023

Species	Visit 1 (April 5-23)	Visit 2 (July 16-31)	Visit 3 (Sept. 6-22)	Visits 2 & 3	All Visits
Caribou	0	55	43	73	73
Caribou calf	0	8	4	12	12
Moose	8	38	24	62	69
Moose calf	0	7	2	9	9
Black bear	0	4	3	7	7
Gray wolf	11	0	1	1	11

Caribou were photographed on 42 islands, and caribou calves were photographed on 15 islands. Caribou were first photographed on the islands on April 22, 2023, with the first female photographed the same day. In previous years, the first adult was photographed between April 9 and June 28 and the first female was photographed between May 14 and June 7. The first caribou calf was photographed on May 15, 2023. In previous years caribou calves were first photographed between May 21 and June 20.

Moose were photographed on 41 islands, and moose calves were photographed on 23 islands. The first moose calf was photographed on May 15, 2023. In previous survey years, moose calves were first photographed between May 29 and June 13.

The number of islands occupied by caribou remained relatively high from June until August and declined in September. The number of islands occupied by moose peaked in June and gradually declined into September (Table 5). Few predators (black bear and gray wolf) were captured on

trail cameras. Low numbers of black bear were photographed on islands throughout the survey period. Gray wolves were only photographed on islands in April and May.

Caribou were photographed on the same island as black bears twice in 2023. Moose were photographed on three of the same islands as black bears or gray wolves (Table 6). The shortest observation between caribou and black bear on an island was six days. The shortest observation between black bear and moose on an island was eight days, and the shortest observation between gray wolf and moose was 18 days. Caribou and gray wolves were not photographed on the same island in 2023.

Table 5: Number of Islands in Lakes Occupied by Large Mammals Monthly from Trail Camera Data, 2023

Species	April	May	June	July	August	September	All
Caribou	2	6	18	16	18	8	42
Caribou calf	0	3	6	6	7	1	15
Moose	0	6	21	17	14	4	41
Moose calf	0	5	14	4	5	1	23
Black bear	0	1	1	1	3	1	6
Gray wolf	2	1	0	0	0	0	3

Table 6: Nearest Dates on Which Caribou or Moose and Predators Were Photographed on the Same Islands in Lakes, 2023

Island	Caribou	Moose	Black Bear	Gray Wolf
KI122003	–	August 3	August 11	–
KI122005	–	July 24	August 5	–
KI124026	–	July 8	–	May 4
KI124193	June 8, July 7	–	June 2, July 17	–

Trail cameras were set up on 25 to 28 Project-affected islands in lakes and on 88 or 89 unaffected islands from 2015 to 2020. After reservoir impoundment, trail cameras were placed on 31 to 34 Project-affected islands and 107 to 109 unaffected islands from 2021 to 2023. No caribou were photographed on Project-affected islands in 2018 (Table 7). Caribou were photographed on 4 to 24% of Project-affected islands in other survey years, with 2023 having the highest percentage of islands where caribou were photographed (Table 7).

Calves were photographed on the same large Project-affected island in 2015, 2019, and 2022, and on a smaller island formed from it in 2021 and 2023. No caribou calves were photographed on Project-affected islands from 2016 to 2018 or in 2020. Caribou and calves were photographed on unaffected islands in lakes each year, on 16 to 33% and six to 12% respectively, over the survey period. Caribou calves were photographed on 12% of unaffected islands in 2023, the

highest percentage observed over the survey period (Table 7). Of the newly formed unaffected islands, caribou were photographed on two in 2023, none in 2022, and two in 2021.

Table 7: Number and Percentage of Project-affected and Unaffected Islands in Lakes on Which Caribou and Calves Were Photographed, 2015–2023

Year	Project-affected				Unaffected			
	No. with Caribou	Percent with Caribou	No. with Calves	Percent with Calves	No. with Caribou	Percent with Caribou	No. with Calves	Percent with Calves
2015	1	4	1	4	15	17	5	6
2016	3	11	0	0	14	16	6	7
2017	2	8	0	0	17	19	9	10
2018	0	0	0	0	23	26	7	8
2019	5	19	1	4	21	24	5	6
2020	4	16	0	0	29	33	5	6
2021	5	16	1	3	30	28	7	7
2022	7	21	1	3	32	30	7	6
2023	8	24	2	6	35	32	13	12

Photo 1: Caribou Cow and Suckling Calf on an Island in Stephens Lake on July 8, 2023

Photo 2: Moose Cow and Two Calves on an Island in Stephens Lake on June 5, 2023

Photo 3: Gray Wolf on an Island in Stephens Lake on April 21, 2023

Photo 4: Black Bear on an Island in Gull Lake on May 28, 2023

Trail cameras were placed on 26 Project-affected islands from 2015 to 2020 and on 34 Project-affected islands from 2021 to 2023. Trail cameras were also placed on 90 unaffected islands from 2015 to 2020 and on 110 Project-affected islands from 2021 to 2023 (Appendix 1, Table A-6). There was no significant difference in the percentage of camera days caribou were photographed on Project-affected versus unaffected islands every year except for 2018, when no caribou were photographed on Project-affected islands (Table 8). Caribou were photographed every year on five of the islands, all of which were unaffected by the Project (Appendix 1,Table A-7).

Table 8: Mean Percentage of Camera Days Caribou Were Photographed on Project-affected and Unaffected Islands in Lakes, 2015–2023

	Project-affected			Unaffected				
Year	Mean	SD	Rank Sum	Mean	SD	Rank Sum	*U*	*p*
2015	0.05	0.23	1,329.50	0.31	0.94	5,111.50	978.50	0.09
2016	0.10	0.30	1,392.00	0.35	0.98	4,824.00	1,041.00	0.48
2017	0.09	0.38	1,354.50	0.47	1.30	5,200.50	1,003.50	0.14
2018	0	0	1,209.00	0.49	1.17	5,461.00	858.00	0.00
2019	0.13	0.30	1,430.50	0.42	0.99	5,239.50	1,079.50	0.48

2020	0.15	0.42	1,283.00	0.56	1.14	5,272.00	932.00	0.07
2021	0.15	0.40	1,938.50	0.53	1.20	7,652.50	1,442.50	0.15
2022	0.30	0.82	2,249.50	0.45	0.86	7,903.50	1,654.50	0.27
2023	0.77[1]	2.41	2,317.50	0.49	1.00	8,122.50	1,722.50	0.39

[1] – Island KI123253 had an usually high number of photos that increased the overall mean and SD

When results from tracking transect and trail camera surveys were combined, large mammal activity was detected on 115 of the 145 islands surveyed in 2023. Caribou and moose occupied 55 of the same islands, eight of which were also occupied by black bear or gray wolf (Map 5). Ten islands were occupied by caribou and black bear, nine islands were occupied by moose and black bear, and one island was occupied by moose and gray wolf. Twenty-eight islands were occupied by only caribou and 25 islands were occupied only by moose.

Caribou occupied 59% of the islands surveyed in 2023, including 48% of newly formed islands surveyed in the reservoir (Table 9). Caribou occupied a smaller percentage of Project-affected than unaffected islands and calves were detected on eight percent of Project-affected islands. Caribou calves were observed on three of the new islands in the reservoir. Moose were also observed on a greater percentage of unaffected islands than Project-affected islands. Moose calves were observed on a greater percentage of unaffected than Project-affected islands and were detected on 24% of the new islands surveyed in the reservoir (Map 7). Black bear and gray wolf activity was observed on few islands relative to caribou and moose (Table 9; Map 8).

Table 9: Project-affected and Unaffected Islands Occupied by Large Mammals from Combined Tracking Transect and Trail Camera Data, 2023

Species	Project-affected		Unaffected		All	
	Number	Percentage	Number	Percentage	Number	Percentage
Caribou	15	42	70	64	85	59
Caribou calf	3	8	19	17	22	15
Moose	12	33	69	63	81	56
Moose calf	2	6	19	17	21	15
Black bear	3	8	10	9	13	9
Gray wolf	0	0	3	3	3	2

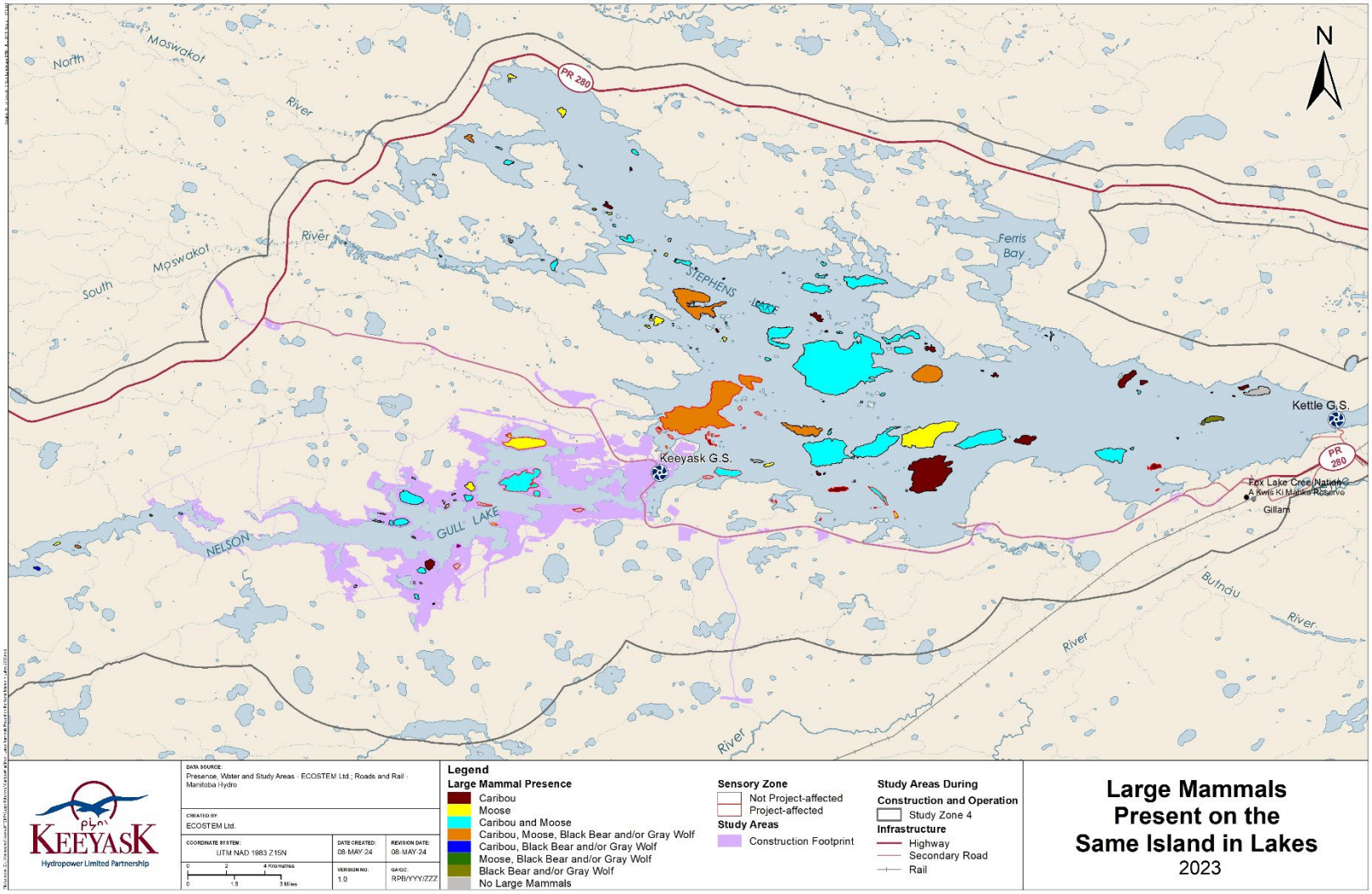
Both tracking transect and trail camera surveys were conducted in 2015, 2017, 2018, 2020, 2021 and 2023. When tracking transect data from July and September and all trail camera data were combined each year, the percentage of Project-affected islands on which caribou were detected ranged from 28% in 2015 to 65% in 2017. The percentage of Project-affected islands on which caribou were detected in 2023 fell between these values at 42% (Table 10). The percentage of unaffected islands on which caribou were detected ranged from 58% in 2018 to 70% in 2017 and

decreased 11% from 2022 in 2023 at 59% (Table 10). Caribou calves were detected on a smaller percentage of Project-affected than unaffected islands in all six survey years; no calves were detected on Project-affected islands between 2017 and 2021 in years when tracking transect and trail camera surveys were both conducted. Caribou calves occupied eight percent of Project-affected islands in 2023, an increase from the zero islands in recent survey years.

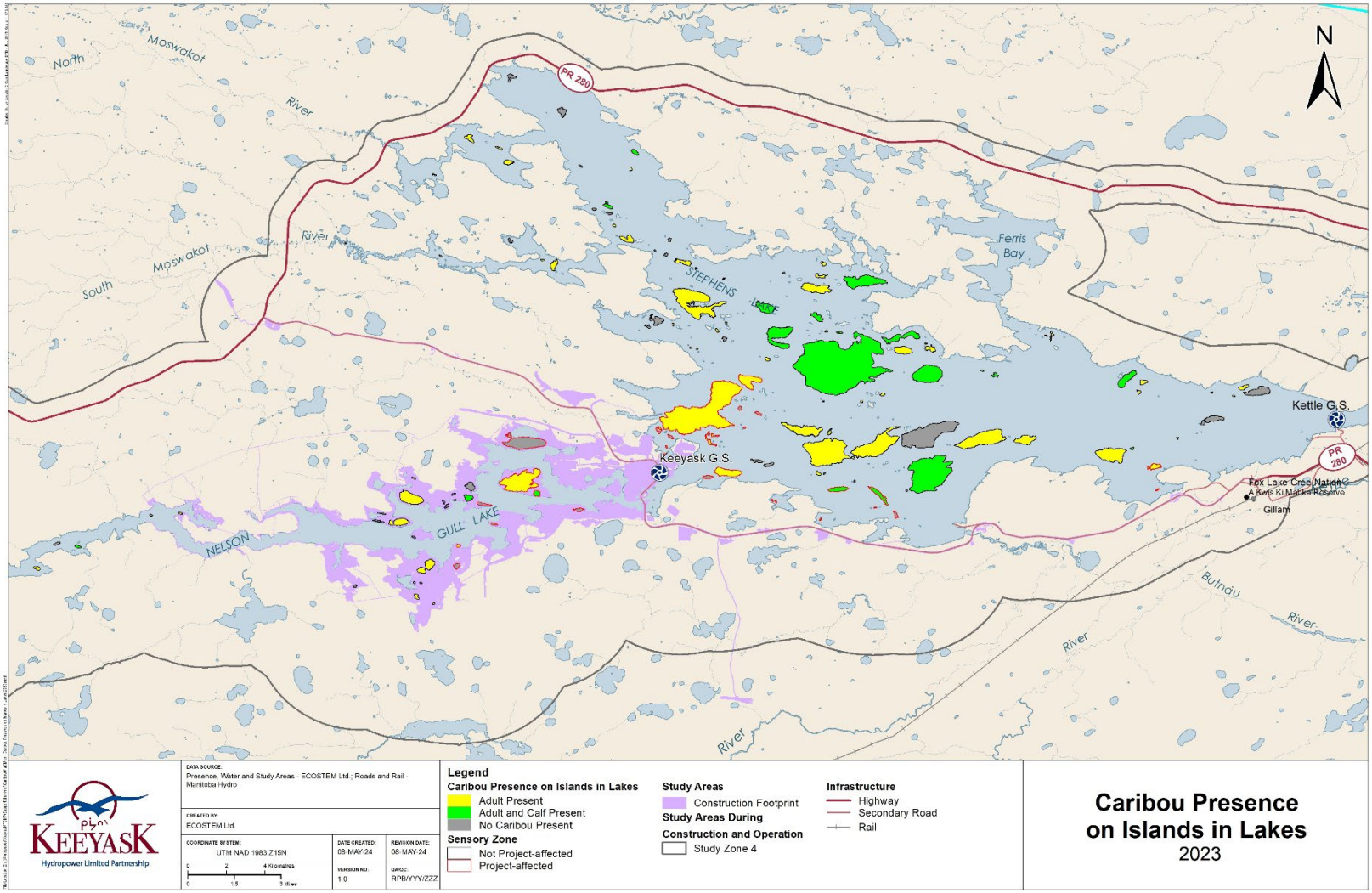
The percentage of Project-affected islands on which moose were observed was similar but declining in 2015, 2017, and 2018 and then declined sharply in 2020 to 46%. In 2021 and 2023 the percentage of Projected-affected islands on which moose were observed continued to decline reaching 33% in 2023 (Table 10). The percentage of unaffected islands on which moose were observed declined from 2015 to 2020 and then increased 16% in 2021 but declined to 56% in 2023. The percentage of Project-affected islands on which moose calves were detected also decreased during the survey period, from a high of 39% in 2017, to a low of four percent in 2021, showing a small increase in 2023 to six percent (Table 10). On unaffected islands moose calves declined from 2015 to 2017, remained relatively stable until 2021, and declined further in 2023 (Table 10).

Table 10: Percentage of Project-affected and Unaffected Islands in Lakes on Which Caribou and Moose Presence Was Detected during Ground Tracking and/or Trail Camera Surveys, 2015, 2017, 2018, 2020, 2021, and 2023

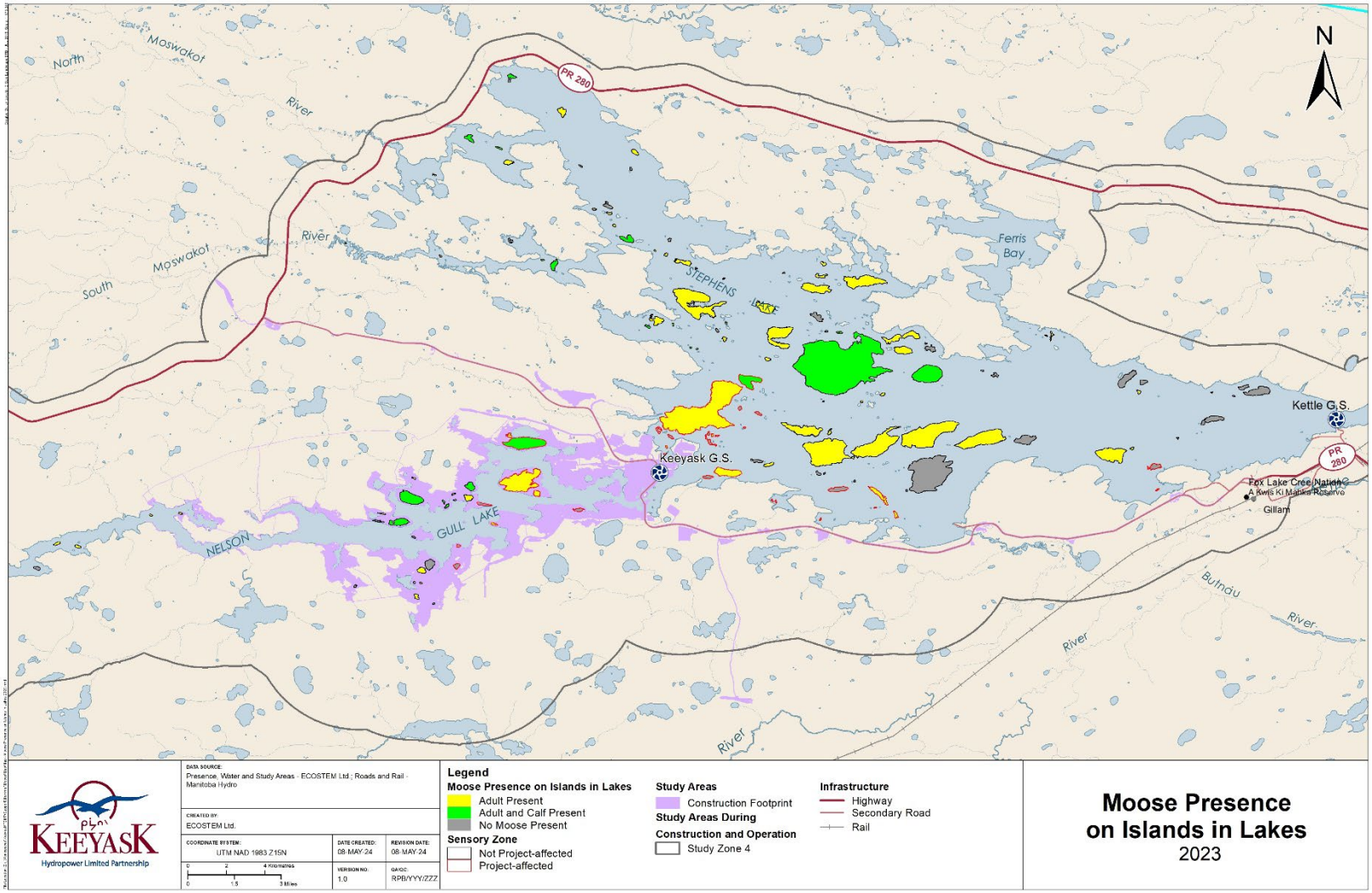
Species	Project-affected							Unaffected						
	2015	2017	2018	2020	2021	2023	% Change 2021-2023	2015	2017	2018	2020	2021	2023	% Change 2021-2023
Caribou	28	65	40	38	38	42	11	67	70	58	61	66	59	-11
Caribou calf	7	8	0	0	0	8	NA	19	25	11	10	16	15	-6
Moose	79	77	76	46	38	33	-13	91	72	66	61	71	56	-21
Moose calf	31	39	20	21	4	6	50	41	22	26	24	26	15	-42



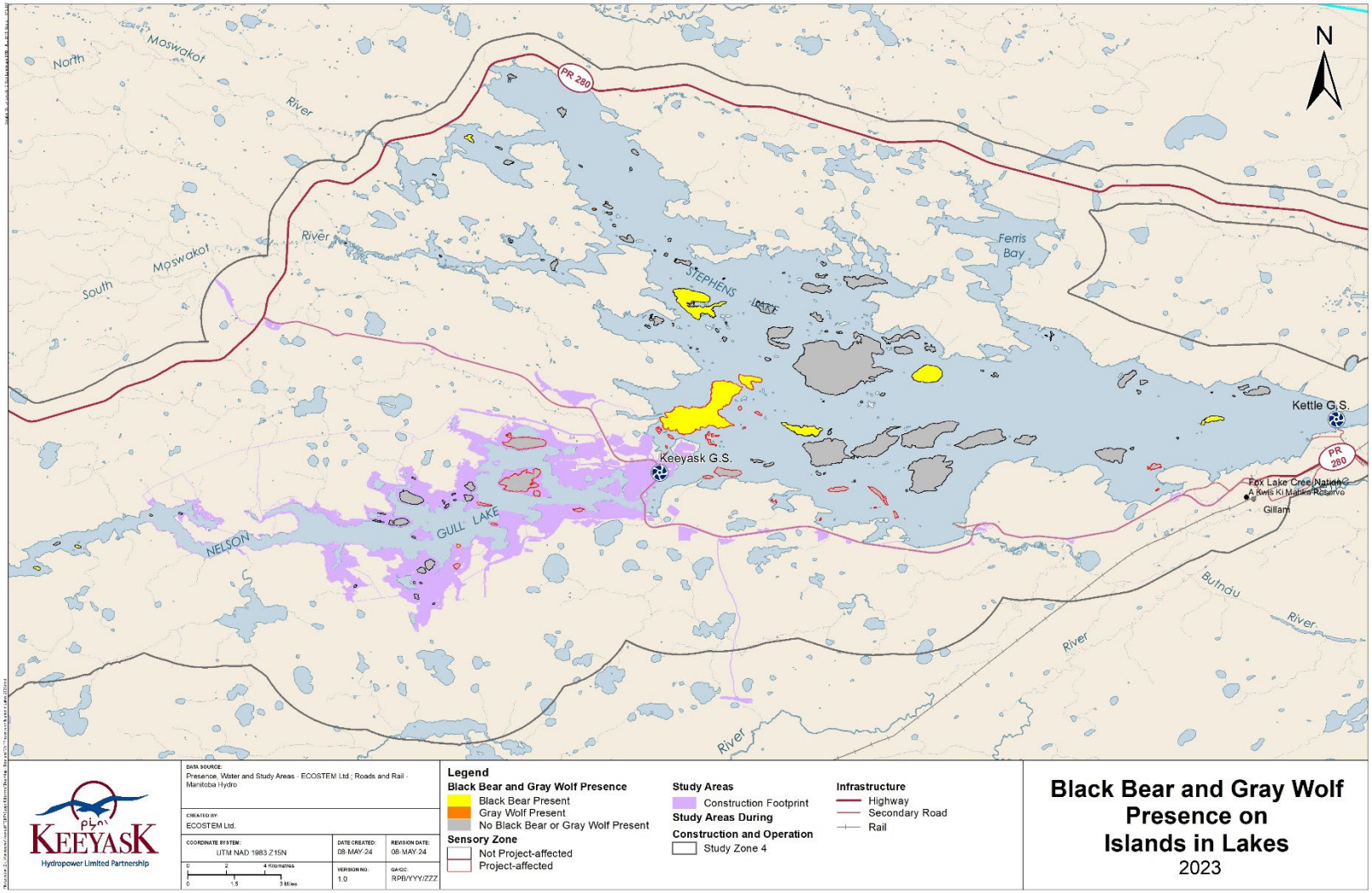
Map 5: Large Mammals Present on the Same Island in Lakes, 2023



Map 6: Caribou Presence on Islands in Lakes, 2023

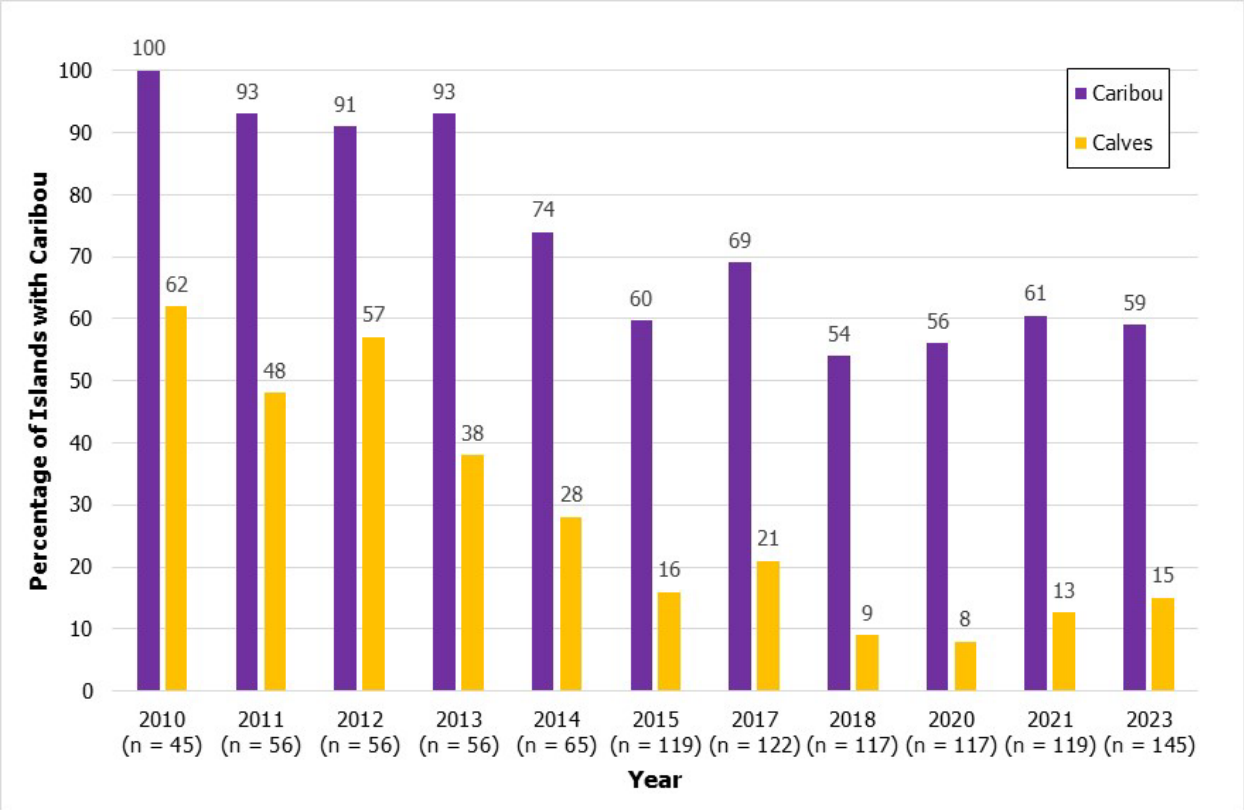


Map 7: Moose Presence on Islands in Lakes, 2023



Map 8: Black Bear and Gray Wolf Presence on Islands in Lakes, 2023

The percentage of islands in lakes on which caribou and calves were observed from combined trail camera and ground tracking data in July and September declined from the pre-construction (2010–2014) to construction (2015–2021) periods, and remained steady during operation (2023) (Figure 1). Before construction, the percentage of surveyed islands in lakes on which they were detected decreased from 100% in 2010 to 74% in 2014 for caribou and from 62% in 2010 to 28% in 2014 for calves (KHLP 2012; WRCS unpubl. data). The declining trend continued during construction in 2015, when caribou were detected on 60% of islands and calves on 16% (WRCS 2016). The percentage of islands on which caribou and calf activity was observed increased to 69% for caribou and 21% for calves in 2017 (WRCS 2018b), then declined again in 2018 and 2019, to just over 50% for caribou and just under 10% for calves. In 2023, caribou and calf activity (59% and 15%, respectively) was similar to 2015.

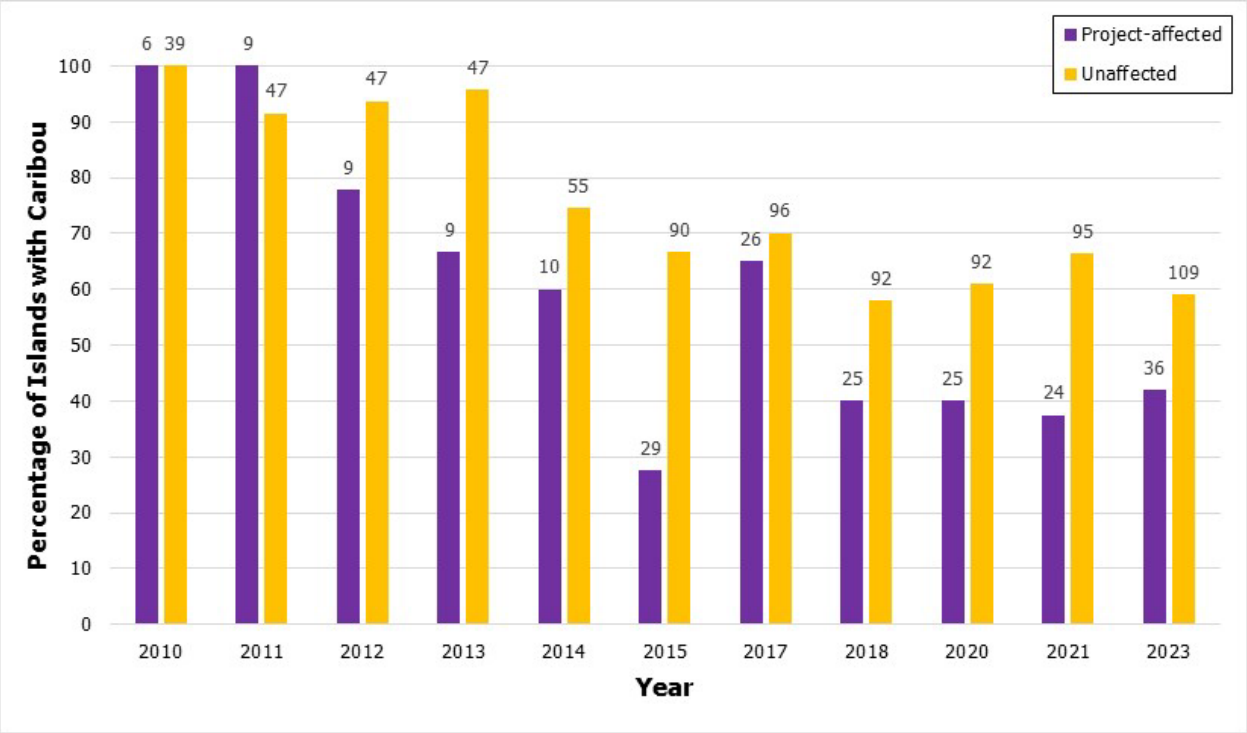


NOTE: "n" indicates the number of islands surveyed each study year.

Figure 1: Percentage of Islands in Lakes on Which Caribou Activity Was Observed from Combined Trail Camera and Tracking Transect Data, before (2010–2014) and during (2015–2021) Project Construction, and during Operation (2023)

During the 2010 to 2014 pre-construction period, six to 10 Project-affected and 39 to 55 unaffected islands were surveyed, most of which were also surveyed from 2015 to 2023. The percentage of Project-affected islands on which caribou activity was detected declined steadily before construction began, from 100% in 2010 and 2011 to 60% in 2014 (Figure 2). During construction,

caribou activity continued to decline on Project-affected islands in 2015, increased in 2017, declined in 2018, and then was similar during 2020, 2021, and 2023. On unaffected islands, caribou activity was similar to or greater than activity on Project-affected islands during the pre-construction and construction periods and remained steady during operation. A decline in caribou activity from the pre-construction to construction periods, which remained steady during operation was also observed on unaffected islands but was less pronounced than the decline on Project-affected islands. Before construction, caribou activity was detected on 91 to 100% of unaffected islands from 2010 to 2013, and on a smaller percentage (75%) in 2014. During construction, caribou activity was observed on 58 to 70% of unaffected islands, and on 59% of unaffected islands during construction.



NOTE: Data labels indicate the number of Project-affected and unaffected islands surveyed each study year.

Figure 2: Percentage of Project-affected and Unaffected Islands on Which Caribou Activity Was Observed from Combined Trail Camera and Tracking Transect Data, before (2010–2014), during (2015–2021) Project Construction, and during Operation (2023)

Caribou occupied an average of 79% of Project-affected islands before Project construction, 41% during construction, and 42% during operation. Caribou occupied an average of 90% of unaffected islands before Project construction, 65% during construction, and 59% during operation. A Fisher's exact test indicated that there was no significant difference in occupancy rates on Project-affected and unaffected islands before or during Project construction ($p = 0.26$), before construction or operation ($p = 0.64$), or between construction and operation ($p = 1.0$). When

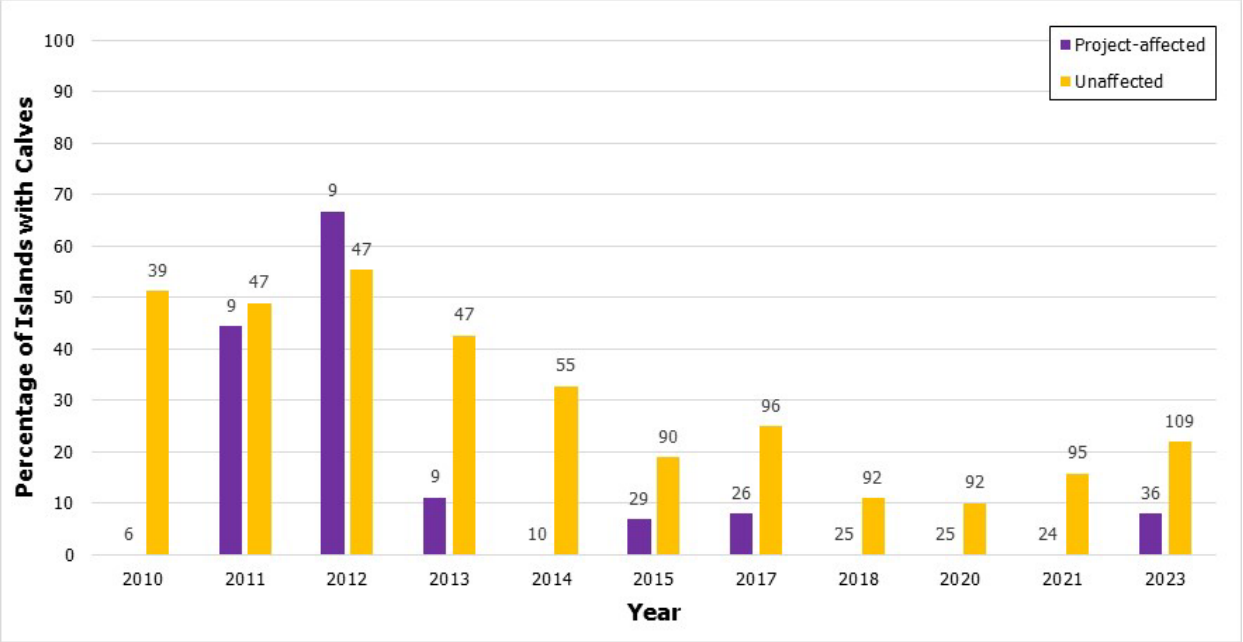
occupancy was compared between Project-affected and unaffected islands each survey year, caribou occupied a significantly greater proportion of unaffected islands before Project construction in 2013, during Project construction in 2015, 2020, and 2021, and during operation in 2023. There were no significant differences for other survey years (Table 11).

Table 11: Statistical Comparison of Caribou Occupancy on Project-affected and Unaffected Islands in Lakes before (2010–2014), during (2015–2021) Project Construction and during Operation (2023)

Year	Project-affected		Unaffected		Pooled Sample Proportion	*z*	*p*
	Proportion of Islands Occupied	No. of Islands Surveyed	Proportion of Islands Occupied	No. of Islands Surveyed			
2010	1.00	6	1.00	36	1.00	–	–
2011	1.00	9	0.91	47	0.93	0.91	0.36
2012	0.78	9	0.94	47	0.91	1.53	0.13
2013	0.67	9	0.96	47	0.91	2.80	0.01
2014	0.60	10	0.75	55	0.72	0.95	0.34
2015	0.28	29	0.67	90	0.57	3.70	<0.01
2017	0.65	26	0.70	96	0.69	0.43	0.67
2018	0.40	25	0.58	92	0.54	1.57	0.12
2020	0.36	25	0.62	92	0.56	2.32	0.02
2021	0.38	24	0.66	95	0.61	2.58	0.01
2023	0.42	36	0.64	109	0.58	2.32	0.02

Caribou calves were detected on a greater percentage of unaffected than Project-affected islands in all years before and during construction except for 2012 (Figure 3). No calves were observed on Project-affected islands in 2010, 2014, 2018, 2020, or 2021. The percentage of Project-affected and unaffected islands on which calves were detected declined from the pre-construction to construction periods and increased slightly during operation.

Caribou calves occupied an average of 26% of Project-affected islands before Project construction, 3% during construction, and 8% during operation. Caribou calves occupied an average of 46% of unaffected islands before Project construction, 16% during construction, and 22% during operation. A Fisher's exact test indicated that there was no significant difference in occupancy rates on Project-affected and unaffected islands before or during Project construction ($p = 0.16$), before Project construction and operation ($p = 0.81$), or during construction and operation ($p = 0.30$). When occupancy was compared between Project-affected and unaffected islands each survey year, calves occupied a significantly greater proportion of unaffected islands in 2010 and 2014, before Project construction and in 2021, during Project construction. There were no significant differences for other survey years (Table 12).



NOTE: Data labels indicate the number of Project-affected and unaffected islands surveyed each study year.

Figure 3: Percentage of Project-affected and Unaffected Islands on Which Caribou Calf Activity Was Observed from Combined Trail Camera and Tracking Transect Data, before (2010–2014), during Project Construction (2015–2021), and during Operation (2023)

Table 12: Statistical Comparison of Caribou Calf Occupancy on Project-affected and Unaffected Islands in Lakes before (2010–2014), during (2015–2021) Project Construction, and during Operation (2023)

Year	Project-affected		Unaffected		Pooled Sample Proportion	*z*	*p*
	Proportion of Islands Occupied	No. of Islands Surveyed	Proportion of Islands Occupied	No. of Islands Surveyed			
2010	0	6	0.51	39	0.44	2.35	0.02
2011	0.44	9	0.49	47	0.48	0.25	0.80
2012	0.67	9	0.55	47	0.57	0.63	0.53
2013	0.11	9	0.43	47	0.38	1.78	0.07
2014	0	10	0.33	55	0.28	2.13	0.03
2015	0.07	29	0.19	90	0.16	1.53	0.13
2017	0.08	26	0.25	96	0.21	1.91	0.06
2018	0	25	0.11	92	0.09	1.72	0.08
2020	0	25	0.10	92	0.08	1.63	0.10
2021	0	24	0.16	95	0.13	2.08	0.04
2023	0.08	36	0.22	109	0.19	1.87	0.06

All 34 primary calving islands were occupied by caribou during at least one year over the six survey years (Table 13). Twelve percent of the 74 secondary islands were unoccupied by caribou and 28% were occupied only one year. Forty-seven percent of primary calving islands and 70% of secondary islands were unoccupied by caribou calves over the survey years. Three percent of primary islands were occupied by calves for four and five years, and none were occupied for all six. No secondary islands were occupied by calves for more than three years.

Table 13: Percentage of Primary and Secondary Calving Islands in Lakes Occupied by Caribou and Calves between Zero and Six Years during Ground Tracking and/or Trail Camera Surveys, 2015, 2017, 2018, 2020, 2021, and 2023

No. of Years Occupied	Caribou		Caribou Calves	
	Primary Islands	Secondary Islands	Primary Islands	Secondary Islands
0	0	12	47	70
1	3	28	26	23
2	24	30	12	3
3	35	12	9	4
4	18	11	3	0
5	12	5	3	0
6	9	1	0	0

3.1.2 PEATLAND COMPLEXES

Large mammal signs were found on all 30 of the peatland complexes in which ground tracking transects were surveyed (Appendix 1, Table A-8). Caribou signs were observed in 23 complexes (Table 14). Moose were somewhat more widely distributed. Gray wolf and black bear signs were observed in fewer complexes than either caribou or moose.

Table 14: Number of Peatland Complexes Occupied by Large Mammals from Tracking Transect Data, 2023

Species	Visit 1 (April 5–23)	Visit 2 (July 16-31)	Visit 3 (Sept. 6–22)	Visits 2 & 3	All Visits
Caribou	7	21	12	23	23
Caribou calf	0	6	0	4	4
Moose	16	26	20	28	28
Moose calf	1	8	1	8	8
Black bear	2	4	2	5	7
Gray wolf	5	2	2	4	3

Large mammals were photographed in 22 of the 32 peatland complexes in which trail cameras were placed. Moose were the most commonly photographed large mammal, observed in 12 complexes. Caribou were photographed in seven complexes, and black bear and gray wolf were photographed in 5 and one complex, respectively (Table 15). Two caribou and two moose calves were photographed. No caribou were photographed in the same complex as predators. A moose was photographed in one complex (KV1260000) with a gray wolf, 18 days apart.

Table 15: Number of Peatland Complexes Occupied Monthly by Large Mammals from Trail Camera Data, 2023

Species	April	May	June	July	August	September	All
Caribou	0	2	4	3	1	0	7
Caribou calf	0	0	1	1	0	0	2
Moose	0	3	1	4	5	2	12
Moose calf	0	0	0	1	1	0	2
Black bear	0	2	2	0	1	1	5
Gray wolf	1	0	0	0	0	0	1

Trail cameras were placed in 30 to 34 peatland complexes from 2015 to 2023. Caribou were photographed in few Project-affected peatland complexes over the survey period (Table 16). They

were photographed in 9 to 36% of reference complexes and 0 to 50% of random complexes from 2015 to 2023.

Table 16: Number and Percentage of Peatland Complexes in Which Caribou Were Photographed, 2015–2023

	Project-affected		Reference		Random	
Year	Number	Percentage	Number	Percentage	Number	Percentage
2015	1	9	1	8	2	22
2016	2	18	1	8	1	11
2017	2	18	1	8	0	0
2018	0	0	4	33	2	22
2019	0	0	1	8	3	33
2020	2	18	3	25	2	22
2021	0	0	2	17	3	33
2022	0	0	3	25	3	33
2023	1	9	4	33	2	22

No caribou calves were photographed in Project-affected peatland complexes from 2015 to 2023 (Table 17). Caribou calves were photographed in a single reference complex in each of 2017 and 2018 and in two in 2022. Calves were photographed in at least one random peatland complex except in 2017, 2019, and 2021. No calves were photographed in any complex in 2019 and 2021.

Table 17: Number and Percentage of Peatland Complexes in Which Caribou Calves Were Photographed, 2015–2023

	Project-affected		Reference		Random	
Year	Number	Percentage	Number	Percentage	Number	Percentage
2015	0	0	0	0	1	11
2016	0	0	0	0	1	11
2017	0	0	1	8	0	0
2018	0	0	1	8	2	22
2019	0	0	0	0	0	0
2020	0	0	0	0	1	11
2021	0	0	0	0	0	0
2022	0	0	2	17	1	11
2023	0	0	0	0	1	11

Photo 5: Caribou Cow and Calf in a Peatland Complex on July 6, 2023

Photo 6: Moose calf in a Peatland Complex on August 2, 2023

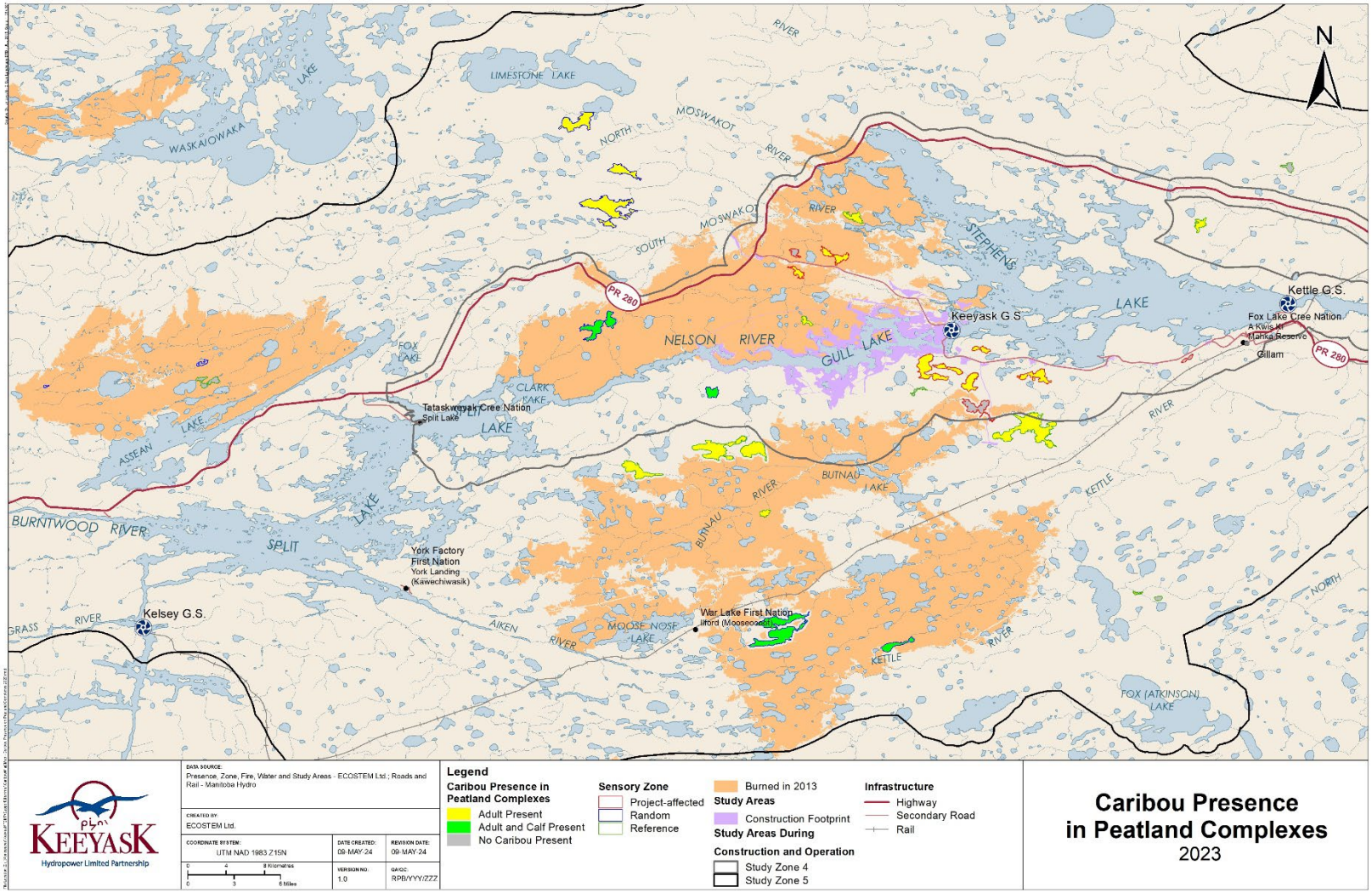
Photo 7: Black Bear in a Peatland Complex on June 14, 2023

Trail cameras were placed in 11 Project-affected, 12 reference, and nine random peatland complexes most years from 2015 to 2023 (Appendix 1, Table A-9). Caribou were photographed in five (45%) Project-affected, seven (64%) reference, and six (67%) random complexes at least one year over the survey period. No caribou were ever photographed in 14 complexes, five of which were Project-affected, five of which were reference, and three of which were random. There was no significant difference in the number of camera days caribou were photographed among Project-affected, reference, and random peatland complexes in any year (Table 18). Caribou were not photographed consistently in any peatland complex from 2015 to 2023. There was no significant difference in the percentage of camera days caribou were photographed in Project-affected complexes among the eight survey years (Kruskal-Wallis H = 8.23, p = 0.41).

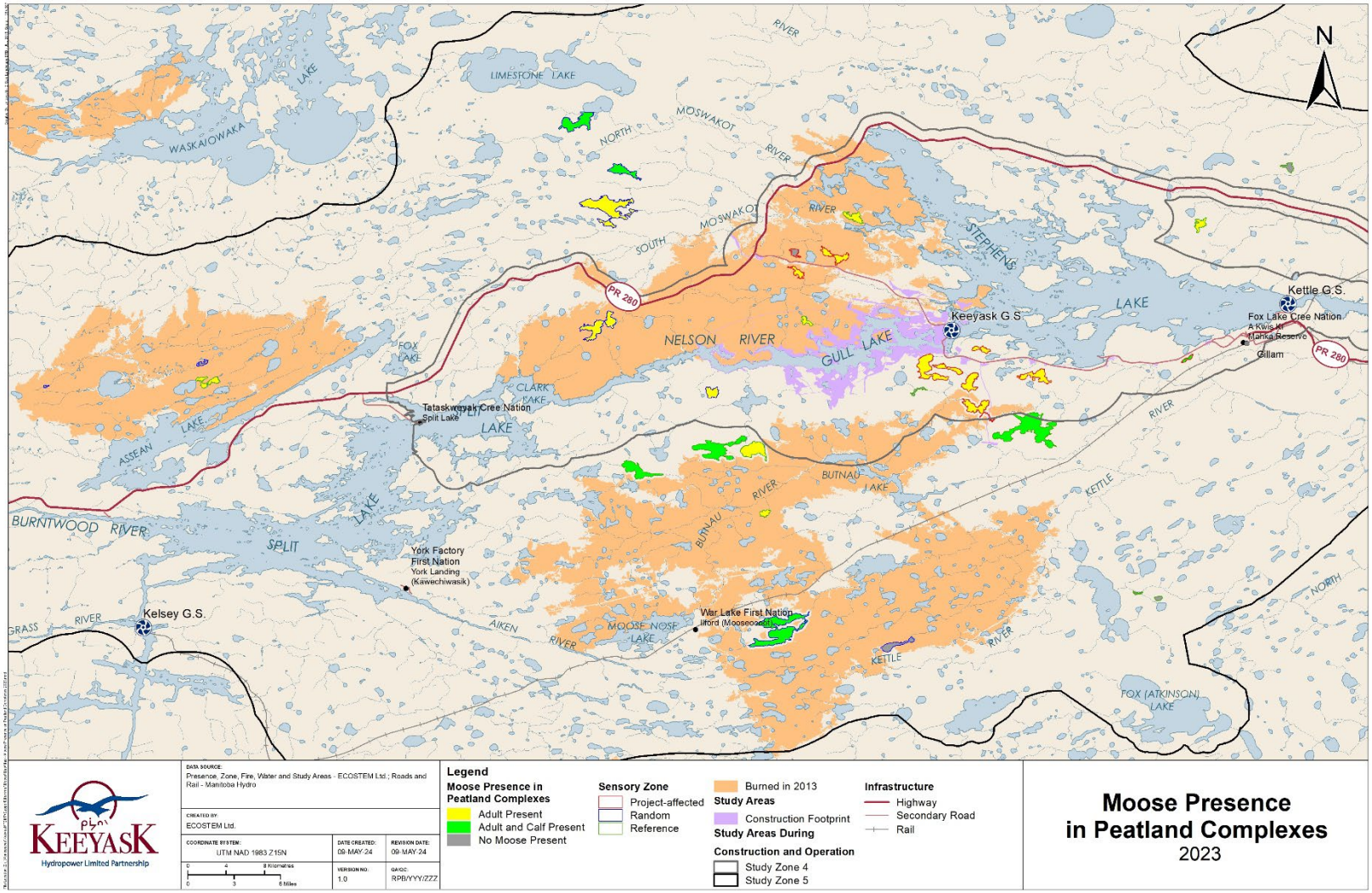
Table 18: Mean Percentage of Camera Days Caribou Were Photographed in Project-affected, Reference, and Random Peatland Complexes, 2015–2023

	Project-affected			Reference			Random				
Year	Mean	SD	Rank Sum	Mean	SD	Rank Sum	Mean	SD	Rank Sum	*H*	*p*
2015	0.19	0.63	175.00	0.27	0.94	190.50	0.50	1.29	162.50	1.04	0.59
2016	0.49	1.43	192.50	0.05	0.19	188.50	0.22	0.65	147.00	0.65	0.72
2017	0.48	1.21	198.00	0.05	0.18	195.00	0	0	135.00	2.03	0.36
2018	0	0	148.50	0.34	0.60	226.00	0.22	0.47	153.50	4.09	0.13
2019	0	0	159.50	0.25	0.86	191.00	0.80	1.23	177.50	4.87	0.09
2020	0.16	0.37	173.00	0.43	1.16	204.50	0.26	0.59	150.50	0.23	0.89
2021	0	0	135.00	0.22	0.51	192.00	0.50	0.84	169.00	3.89	0.14
2022	0	0	148.50	0.48	1.03	210.50	0.86	1.90	169.00	3.89	0.14
2023	0.37	0.88	157.00	0.33	0.59	219.00	0.06	0.19	152.00	2.012	0.37

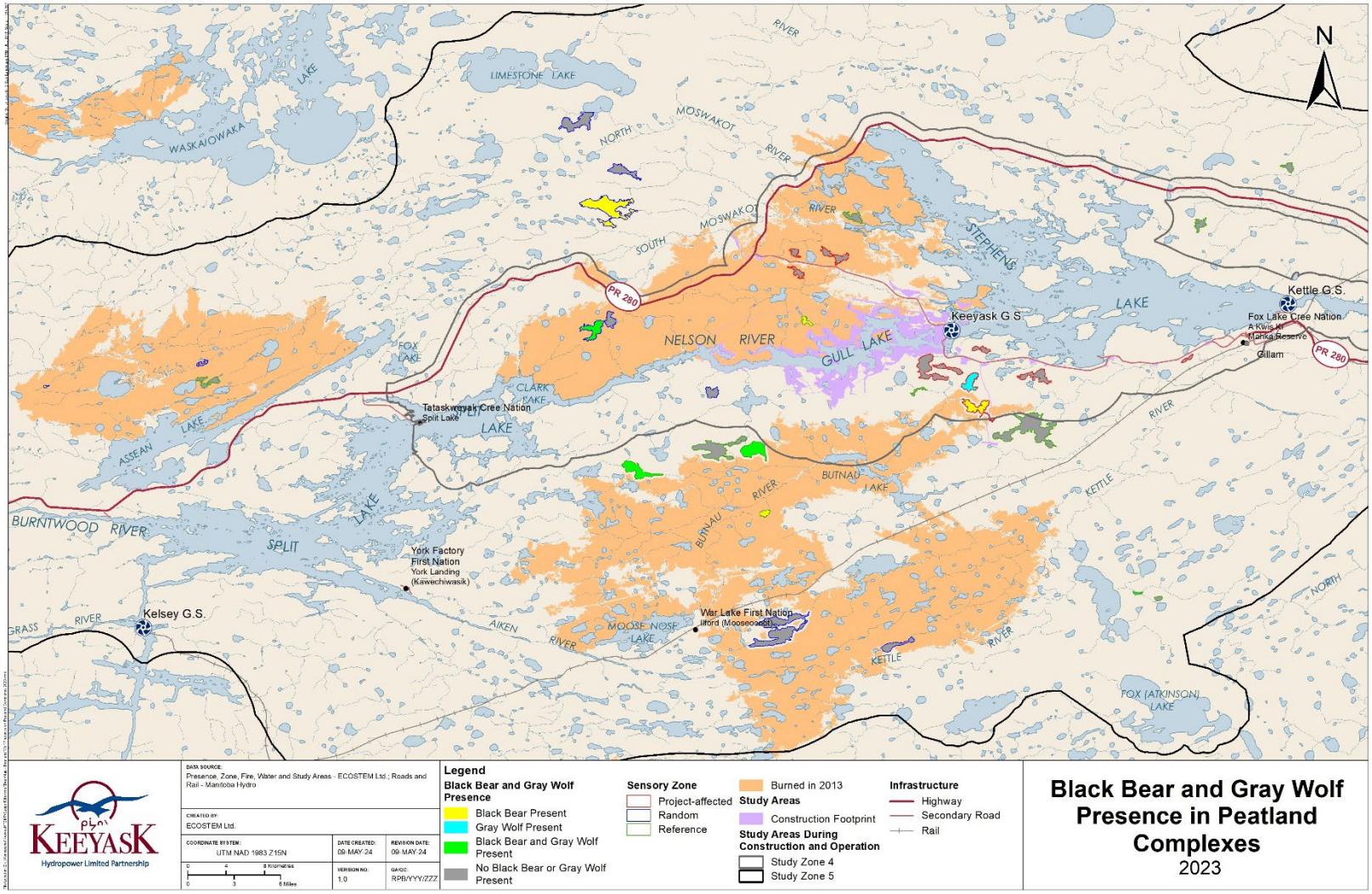
When results from tracking transect and trail camera surveys were combined, large mammal activity was detected in 27 of the 32 peatland complexes surveyed in 2023. Caribou activity was widely distributed in peatland complexes and were detected in 23 complexes (Map 9). Moose were also widely distributed and detected in 24 complexes (Map 10). Gray wolves and/or black bears (Map 11) were detected in four of the complexes occupied by both caribou and moose (Map 12).



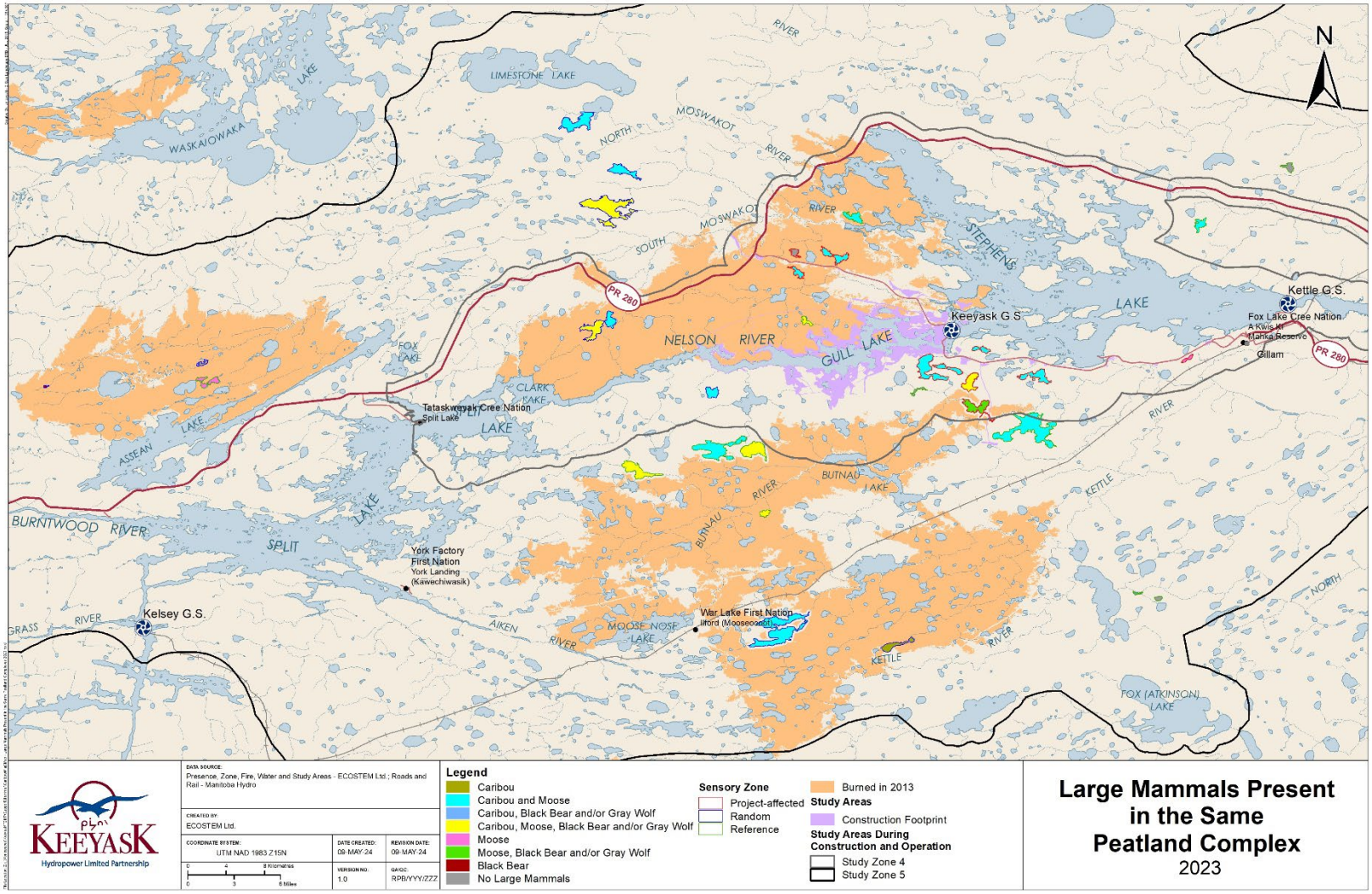
Map 9: Caribou Presence in Peatland Complexes, 2023



Map 10: Moose Presence in Peatland Complexes, 2023



Map 11: Black Bear and Gray Wolf Presence in Peatland Complexes, 2023



Map 12: Large Mammals Present in the Same Peatland Complexes, 2023

When tracking transect and trail camera data were combined, caribou were detected in the greatest percentage of reference peatland complexes and the smallest percentage of Project-affected complexes in 2023 (Table 19). Caribou were detected in a greater percentage of burned Project-affected and reference complexes. Caribou calves were only detected in random complexes and were not found in Project-affected or reference complexes (Table 19).

Table 19: Peatland Complexes Occupied by Caribou by Disturbance Source and Forest Fire Influence from Combined Tracking Transect and Trail Camera Data, 2023

Complex Type	Burned in 2013	Caribou		Caribou Calf	
		Number Occupied	Percentage Occupied	Number Occupied	Percentage Occupied
Project-affected	Yes	2	67	0	0
	No	5	63	0	0
	Total	7	64	0	0
Reference	Yes	3	75	0	0
	No	6	75	0	0
	Total	9	75	0	0
Random	Yes	2	50	2	50
	No	5	100	2	40
	Total	7	78	4	44
All		23	72	4	13

Moose were detected in the greatest percentages of Project-affected peatland complexes and in equal percentages in reference and random complexes (Table 20). Moose were detected in 100% of burned reference peatland complexes and in 100% of unburned, random complexes (Table 20). Moose calves were observed in the greatest percentage of random complexes and in the smallest percentage of Project-affected complexes (Table 20).

Table 20: Peatland Complexes Occupied by Moose by Disturbance Source and Forest Fire Influence from Combined Tracking Transect and Trail Camera Data, 2023

Complex Type	Burned in 2013	Moose		Moose Calf	
		Number Occupied	Percentage Occupied	Number Occupied	Percentage Occupied
Project-affected	Yes	2	67	0	0
	No	7	88	1	13
	Total	9	82	1	9
Reference	Yes	4	100	0	0
	No	5	63	3	38
	Total	8	67	3	25
Random	Yes	1	25	0	0
	No	5	100	3	75
	Total	6	67	3	33
All		23	72	9	28

Black bears were detected in the greatest percentage of reference peatland complexes and in the smallest percentage of Project-affected complexes (Table 21). Gray wolves were observed in the greatest percentage of reference complexes and the lowest percentage of Project-affected peatland complexes (Table 21).

Table 21: Peatland Complexes Occupied by Black Bear and Gray Wolf by Disturbance Source and Forest Fire Influence from Combined Tracking Transect and Trail Camera Data, 2023

Complex Type	Burned in 2013	Black Bear		Gray Wolf	
		Number Occupied	Percentage Occupied	Number Occupied	Percentage Occupied
Project-affected	Yes	0	0	0	0
	No	1	13	1	13
	Total	1	9	1	9
Reference	Yes	2	50	0	0
	No	2	25	3	38
	Total	4	33	3	25
Random	Yes	2	50	1	25
	No	1	20	0	0
	Total	3	33	1	11
All		8	25	5	16

Both tracking transect and trail camera surveys were conducted in 2015, 2017, 2018, 2020, 2021, and 2023. When tracking transect data from July and September and all trail camera data were

combined each year, the percentage of burned Project-affected peatland complexes in which caribou were detected fluctuated over the survey period, ranging from 0% in 2018 to 100% in 2017 (Table 22). There was a general decline in the percentage of unburned, Project-affected complexes in which caribou were detected from 2015 to 2020, followed by an increase in 2021, which remained steady in 2023. There was no change in caribou calf detection in burned Project-affected complexes from 2015 to 2023 because none were observed in any survey year. Caribou calves were detected in 13% (n = 1) of unburned complexes in 2015, 2017, and 2020 and in none in 2018, 2021, or 2023. Moose were detected in all (100%) burned Project-affected complexes from 2015 to 2021 and declined to 67% in 2023. Moose detections in unburned complexes fluctuated between 75% and 100% over the survey period, and there was no change from 2021 to 2023. The percentage of burned Project-affected complexes in which moose calves were observed ranged from 0 in 2021 to 100% in 2015 and 2020. The percentage of unburned complexes in which moose calves were detected increased from 2018 and 2020 to 2021 and declined in 2023.

When tracking transect and trail camera data were combined, caribou were detected in 25% to 75% of burned reference peatland complexes over the survey period, with an increase of 50% from 2021 to 2023 (Table 23). The percentage of unburned, reference complexes in which caribou were detected declined after 2017. No caribou calves were detected in burned complexes over the six-year survey period. There was no change in the percentage of unburned reference complexes in which caribou calves were detected from 2015 to 2020 and then a 66% decline was observed in 2021, with a further decline to zero in 2023. The percentage of burned reference complexes in which moose were detected was between 75% and 100% over the survey period. Moose were observed in all unburned complexes each year except 2020 and 2023. The percentage of burned reference complexes in which moose calves were observed declined over the survey period, from 75% in 2015 to zero in 2021 and 2023. In unburned complexes, moose calf detection was variable and ranged from a low of 25% in 2020 to a high of 75% in 2021.

Table 22: Percentage of Project-affected Peatland Complexes in Which Caribou and Moose Presence Was Detected during Ground Tracking and/or Trail Camera Surveys, 2015, 2017, 2018, 2020, 2021, and 2023

	Burned							Unburned						
Species	**2015**	**2017**	**2018**	**2020**	**2021**	**2023**	**% Change 2021–2023**	**2015**	**2017**	**2018**	**2020**	**2021**	**2023**	**% Change 2021–2023**
Caribou	33	100	0	33	67	67	0	75	63	50	50	63	63	0
Caribou calf	0	0	0	0	0	0	0	13	13	0	13	0	0	0
Moose	100	100	100	100	100	67	-23	100	88	75	100	88	88	0
Moose calf	100	67	67	100	0	9	+9	38	63	13	13	25	13	-12

Table 23: Percentage of Reference Peatland Complexes in Which Caribou and Moose Presence Was Detected during Ground Tracking and/or Trail Camera Surveys, 2015, 2017, 2018, 2020, 2021, and 2023

	Burned							Unburned						
Species	**2015**	**2017**	**2018**	**2020**	**2021**	**2023**	**% Change 2021–2023**	**2015**	**2017**	**2018**	**2020**	**2021**	**2023**	**% Change 2021–2023**
Caribou	50	50	67	50	25	75	+50	100	100	88	75	88	75	-13
Caribou calf	0	0	0	0	0	0	0	38	38	38	38	13	0	-13
Moose	100	75	100	75	75	100	+25	100	100	100	88	100	63	-37
Moose calf	75	50	33	25	0	0	0	50	75	38	25	75	38	-37

When tracking transect and trail camera data were combined, the percentage of burned, random peatland complexes in which caribou were detected fluctuated between 25% and 75% over the survey period (Table 24). Caribou were detected in all unburned random complexes each year but 2020. Caribou calves were only detected in burned random complexes in 2018 and 2023. Moose were detected in all burned, random complexes in 2015, 2017, and 2020, and in 75% in 2018 and 2021, but only 25% in 2023. The percentage of burned, random peatland complexes in which moose calves were detected declined from 2017 to 2020, when none were observed. Moose calves were found in 25% of burned complexes in 2021, and zero in 2023. The percentage of unburned random complexes in which moose calves were detected fluctuated over the survey period and was greatest in 2015.

Table 24: Percentage of Random Peatland Complexes in Which Caribou and Moose Presence Was Detected during Ground Tracking and/or Trail Camera Surveys, 2015, 2017, 2018, 2020, 2021, and 2023

	Burned							Unburned						
Species	**2015**	**2017**	**2018**	**2020**	**2021**	**2023**	**% Change 2021–2023**	**2015**	**2017**	**2018**	**2020**	**2021**	**2023**	**% Change 2021–2023**
Caribou	75	25	75	25	50	50	0	100	100	100	80	100	100	0
Caribou calf	0	0	25	0	0	50	+50	60	40	40	60	20	40	+20
Moose	100	100	75	100	75	25	-50	100	100	40	100	100	100	0
Moose calf	75	75	40	0	25	0	-25	80	40	50	20	60	75	+15

There was no significant difference between caribou occupancy rates in Project-affected and reference peatland complexes during any of the survey years (Table 25). There was no significant difference between caribou occupancy rates in Project-affected and random complexes in 2015, 2017, 2020, 2021, or 2023 (Table 26). In 2018, caribou occupied a significantly greater proportion of random complexes than Project-affected complexes ($z = 2.41$, $p = 0.02$).

Table 25: Statistical Comparison of Caribou Occupancy in Project-affected and Reference Peatland Complexes during Ground Tracking and/or Trail Camera Surveys, 2015, 2017, 2018, 2020, 2021, and 2023

Year	Project-affected		Reference		Pooled Sample Proportion	*z*	*p*
	Proportion of Complexes Occupied	Number of Complexes Surveyed	Proportion of Complexes Occupied	Number of Complexes Surveyed			
2015	0.64	11	0.83	12	0.74	1.04	0.30
2017	0.73	11	0.83	12	0.78	0.58	0.56
2018	0.36	11	0.75	12	0.56	1.88	0.06
2020	0.45	11	0.67	12	0.56	1.06	0.29
2021	0.64	11	0.67	12	0.66	0.15	0.88
2023	0.64	11	0.82	12	0.73	0.98	0.33

Table 26: Statistical Comparison of Caribou Occupancy in Project-affected and Random Peatland Complexes during Ground Tracking and/or Trail Camera Surveys, 2015, 2017, 2018, 2020, 2021, and 2023

Year	Project-affected		Random		Pooled Sample Proportion	*z*	*p*
	Proportion of Complexes Occupied	Number of Complexes Surveyed	Proportion of Complexes Occupied	Number of Complexes Surveyed			
2015	0.64	11	0.89	9	0.75	1.29	0.20
2017	0.73	11	0.67	9	0.70	0.29	0.77
2018	0.36	11	0.89	9	0.60	2.41	0.02
2020	0.45	11	0.56	9	0.50	0.49	0.62
2021	0.64	11	0.78	9	0.70	0.68	0.50
2023	0.64	11	0.78	9	0.70	0.68	0.50

There was no significant difference in caribou calf occupancy rates in Project-affected and reference peatland complexes in 2015, 2017, 2018, 2020, or 2021 (Table 27). In 2023 there were no caribou calves in either the Project-affected or reference complexes and no comparisons were made. There was no significant difference in calf occupancy rates in Project-affected and random

complexes in 2015, 2017, 2020, or 2021 (Table 28). In 2018 and 2023, caribou calves occupied a significantly greater proportion of random complexes than Project-affected complexes.

Table 27: Statistical Comparison of Caribou Calf Occupancy in Project-affected and Reference Peatland Complexes during Ground Tracking and/or Trail Camera Surveys, 2015, 2017, 2018, 2020, 2021, and 2023

Year	Project-affected		Reference		Pooled Sample Proportion	*z*	*p*
	Proportion of Complexes Occupied	Number of Complexes Surveyed	Proportion of Complexes Occupied	Number of Complexes Surveyed			
2015	0.09	11	0.25	12	0.17	1.01	0.31
2017	0.09	11	0.25	12	0.17	1.01	0.31
2018	0	11	0.25	12	0.13	1.78	0.08
2020	0.09	11	0.25	12	0.17	1.01	0.31
2021	0	11	0.08	12	0.04	0.96	0.34
2023	0	11	0	12	NA	NA	NA

Table 28: Statistical Comparison of Caribou Calf Occupancy in Project-affected and Random Peatland Complexes during Ground Tracking and/or Trail Camera Surveys, 2015, 2017, 2018, 2020, 2021, and 2023

Year	Project-affected		Random		Pooled Sample Proportion	*z*	*p*
	Proportion of Complexes Occupied	Number of Complexes Surveyed	Proportion of Complexes Occupied	Number of Complexes Surveyed			
2015	0.09	11	0.33	9	0.20	1.34	0.18
2017	0.09	11	0.22	9	0.16	0.79	0.43
2018	0	11	0.33	9	0.15	2.06	0.04
2020	0.09	11	0.33	9	0.20	1.34	0.18
2021	0	11	0.11	9	0.05	1.13	0.26
2023	0	11	0.44	9	0.20	2.46	0.01

All five of the primary caribou calving complexes were occupied by caribou for between two and four years over the six survey years (Table 29). The 13 secondary complexes were occupied for between two and five years. The eight non-habitat complexes were occupied by caribou for between one and three years, with half being occupied for one year. Sixty percent of primary complexes were occupied by caribou calves for one year and 40% were occupied for two years. Most secondary complexes (62%) and non-habitat complexes (75%) were unoccupied by calves.

Table 29: Percentage of Primary, Secondary, and Non-Habitat Peatland Complexes Occupied by Caribou and Calves between Zero and Six Years during Ground Tracking and/or Trail Camera Surveys, 2015, 2017, 2018, 2020, 2021, 2022, and 2023

Number of Years Occupied	Caribou			Caribou Calves		
	Primary Complexes	Secondary Complexes	Non-habitat	Primary Complexes	Secondary Complexes	Non-Habitat
0	0	0	0	0	62	75
1	0	0	50	60	31	25
2	40	23	25	40	8	0
3	20	46	25	0	0	0
4	40	23	0	0	0	0
5	0	8	0	0	0	0
6	0	0	0	0	0	0

3.1.3 ACCESS ROAD TRANSECTS

Caribou signs were observed on all 18 access road transects surveyed in 2023 (Table 30; Appendix 1, Table A-11). Caribou calf signs were observed on two transects. Moose signs were detected on all access road transects and moose calf signs were observed on 10 transects. Predator signs were observed on fewer transects than caribou and moose signs.

Table 30: Number of Access Road Tracking Transects on Which Large Mammals Were Detected, 2023

Species	Visit 1 (April 16–23)	Visit 2 (July 19–31)	Visit 3 (Sep. 7–22)	Visits 2 & 3	All Visits
Caribou	4	14	13	14	18
Caribou calf	0	2	0	2	2
Moose	18	18	18	18	18
Moose calf	3	8	5	10	10
Black bear	3	6	6	9	11
Gray wolf	11	3	1	4	12

The density of caribou signs was greatest during the second visit to access road transects in 2023 (Table 31). Moose sign density was considerably greater than that of all other large mammal species over all visits and was greater during the second and third visits than during the first. Caribou calf, moose calf, black bear, and gray wolf signs were sparse during all visits.

Table 31: Mammal Sign Density along Access Road Transects, 2023

Species	Visit 1		Visit 2		Visit 3		Visit 2 & 3	
	No. of Signs	Signs/km	No. of Signs	Signs/km	No. of Signs	Signs/km	No. of Signs	Signs/km
Caribou	13	0.07	151	0.78	97	0.50	248	0.64
Caribou Calf	0	0.00	21	0.11	0	0.00	21	0.05
Moose	341	1.75	696	3.57	317	1.63	1013	2.60
Moose Calf	5	0.03	17	0.09	7	0.04	24	0.06
Black Bear	3	0.02	10	0.05	9	0.05	19	0.05
Gray Wolf	45	0.23	3	0.02	1	0.01	4	0.01

During the combined second and third visits, the density of caribou signs was slightly greater further than 2 km from the access roads than within 2 km in 2023 (Table 32). The density of caribou calf signs was low during most visits, but was relatively high during visit 2, greater than 2 km from the road. The density of moose signs was greater within 2 km of the access roads than further away, and the density of moose calves was greater further than 2 km of the access roads.

Table 32: Mammal Sign Density Within 2 km of and More Than 2 km from the North and South Access Roads, 2023

Species	Visit 1 (Signs/km)		Visit 2 (Signs/km)		Visit 3 (Signs/km)		Visit 2 & 3 (Signs/km)	
	≤2 km	>2 km	≤2 km	>2 km	≤2 km	>2 km	≤2 km	>2 km
Caribou	0.06	0.21	0.76	0.81	0.47	0.51	0.62	0.66
Caribou Calf	0.00	0.00	0.04	0.15	0.00	0.00	0.02	0.08
Moose	3.07	1.40	4.22	3.27	1.71	1.60	2.97	2.43
Moose Calf	0.01	0.03	0.06	0.11	0.04	0.03	0.05	0.07
Black Bear	0.01	0.02	0.07	0.04	0.11	0.01	0.09	0.02
Gray Wolf	0.31	0.20	0.03	0.01	0.01	0.00	0.02	0.00

Tracking transect surveys were conducted in 2015, 2017, 2018, 2020, and 2021 during Project construction and in 2023 during Project operation. The density of caribou signs during the combined second and third visits to tracking transects were slightly lower within 2 km of the access roads than farther away in 2023, but the difference was not significant (Table 33). Sign density

was greater farther from the access roads in 2018, 2020, and 2021 as well, but the differences were not significant.

Table 33: Density of Caribou Signs Within 2 km of and More Than 2 km from the North and South Access Roads, 2015, 2017, 2018, 2020, 2021, and 2023

	≤ 2 km from Access Road			> 2 km from Access Road				
Year	**Mean**	**SD**	**Rank Sum**	**Mean**	**SD**	**Rank Sum**	***U***	***p***
2015	1.67	1.97	342.0	1.13	1.20	324.0	171.00	0.78
2017	2.38	3.47	302.0	1.83	1.73	364.0	131.00	0.33
2018	0.17	0.28	289.5	0.36	0.45	376.5	118.50	0.14
2020	0.29	0.76	302.5	0.42	0.60	363.5	131.50	0.29
2021	0.38	0.52	347.0	0.49	1.03	319.0	176.00	0.64
2023	1.24	1.31	326.0	1.37	1.25	340.0	155.0	0.82

3.1.4 INCIDENTAL OBSERVATIONS

In 2023, mammal and bird species incidentally detected on islands, in peatland complexes, and along access road transects during ground tracking and trail camera surveys included: American beaver, American crow, American marten, American robin, bald eagle, black-backed woodpecker, Canada goose, Canada jay, Canada lynx, common raven, mallard, northern flicker, North American river otter, red fox, red squirrel, sandhill crane, snowshoe hare, spruce grouse, and sharp-tailed grouse.

3.2 TIMING OF ICE BREAKUP

Four cameras were placed at Stephens Lake and four cameras were placed at Gull Lake to monitor the timing of ice breakup in 2023. On Stephens Lake, the percentage of ice cover remained consistent from installation in mid-April until May, began to break up in early May, and then decreased rapidly in mid May (Table 34). Ice breakup was on May 25 and Stephens Lake was free of ice by May 26.

In previous survey years ice breakup on Stephens Lake was observed by June 2, 2015; May 20, 2016; June 2, 2017; May 27, 2018; May 23, 2019; and May 26, 2020; June 6, 2022. Stephens Lake was free of ice by June 3, 2015; May 22, 2016; June 3, 2017; June 4, 2018; May 25, 2019; and June 1, 2020; June 12, 2022 (Table 35).

Table 34: Timing of Ice Breakup on Stephens and Gull Lakes, 2023

Percent Ice Cover	Stephens Lake Cameras				Gull Lake Cameras			
	1	2	3	4	5	6	7	8
100	April 30	May 5	May 4	May 1	May 7	May 7	May 2	May 5
75	May 19	May 12	May 12	May 11	May 10	May 23	May 13	May 11
50	May 21	May 17	May 16	May 16	May 13	May 18	May 18	May 16
25	May 25	May 19	May 18	May 19	May 15	May 19	May 19	May 17
0	May 26	May 24	May 20	May 23	May 25	May 22	May 20	May 20

Table 35: Timing of Ice Breakup on Stephens Lake, 2015–2022

Percent Ice Cover	2015	2016	2017	2018	2019	2020	2021	2022
100	May 9–12	April 27–29	April 11–16	April 7–11	April 6–7	March 25–28	April 12–20	April 19–22
75	May 20–27	May 8–17	May 20–31	May 20–24	April 20–28	April 29–30	May 10–30	May 7–9
50	May 23–June 1	May 10–19	May 27–June 1	May 22–24	May 18–20	May 20–26	May 14–June 3	May 16–29
25	May 25–June 2	May 14–20	May 27–June 2	May 23–27	May 19–23	May 25–26	May 22–June 6	May 20–June 2
0	May 26–June 3	May 18–22	May 28–June 3	May 28–June 4	May 21–25	May 28–June 1	May 29–June 12	May 24–June 7

Photo 8: Ice Cover at 100% on Stephens Lake on May 4, 2023

Photo 9: Ice Cover at 75% on Stephens Lake on May 12, 2023

Photo 10: Ice Cover at 50% on Stephens Lake on May 16, 2023

Photo 11: Ice Cover at 25% on Stephens Lake on May 18, 2023

Photo 12: Ice Cover at 0% on Stephens Lake on May 20, 2023

3.3 MORTALITY

In 2023 there were no caribou mortalities reported on the Project access roads. In April 2024, both the North and South Access Roads were officially transferred to Manitoba Transportation and Infrastructure to become part of Provincial Trunk Highway 280. This is the last year wildlife mortality along the Project access roads will be reported as part of the Caribou Sensory Disturbance study.

4.0 DISCUSSION

As predicted in the EIS, the majority of Project-affected islands were unoccupied by caribou in 2023. Of the 85 islands in lakes occupied by caribou, only 15 (18%) were Project-affected. Signs of caribou calves were observed on three (8%) Project-affected islands during ground tracking transect or trail camera surveys, which is similar to the numbers observed in 2015 and 2017 but an increase from 2018, 2019, and 2021 where no caribou calves were detected on Project-affected islands. Increased use of Project-affected islands during operation monitoring could be due to less noise disturbance during Project operation compared to Project construction. However, the continued avoidance of the area by caribou generally suggests that the Project remains a source of disturbance for caribou, as predicted by the EIS. The apparent absence of caribou activity on most Project-affected islands could indicate that caribou are generally avoiding Project-related sensory disturbance. However, there was adult caribou activity on several Project-affected islands, and a cow and calf were observed on Caribou Island during pre-impoundment monitoring surveys (WRCS 2021). Three adults and one calf caribou were photographed on Caribou Island in 2023. As caribou can habituate to human disturbance, some individuals may be less affected by Project operation than others (Haskell et al. 2006). It should be noted that these field studies can document animals' presence in an area but cannot confirm their absence; as such, it cannot be known for certain that there were no caribou on some of the surveyed islands.

The specific timing of caribou calving in the area is uncertain, but likely occurs from May 1 to June 30 based on data collected on calving caribou in Stephens Lake from 2010 to 2014 and from studies on boreal woodland caribou at roughly the same latitude (Rettie and Messier 2001; Ferguson and Elkie 2004). Caribou cows may avoid islands if there is ice on the lakes during the early calving period. In 2023, ice breakup on Gull and Stephens lakes was in mid/late May, in the first half of the general calving period. One calf was photographed on an island in Stephens Lake on May 15, when ice cover of the lake was around 50%.

Moose were slightly more widely distributed than caribou on islands in lakes in 2023. Most (65%) of the islands occupied by caribou were also occupied by moose. Black bears largely were detected on islands with both caribou and moose. Grey wolves were detected on three islands in 2023, on one of which moose were also detected.

Overall, islands in lakes appear to be more valuable as calving habitat for caribou and moose than islands in peatland complexes. The EIS anticipated a 65% increase in the area of islands in lakes between 0.5 and 10 ha after reservoir impoundment, some of which was expected to be suitable for calving caribou and moose. It was not expected that caribou and moose would occupy the new islands in the reservoir so quickly and use them to calve only one year after impoundment. In 2023, caribou were detected on 12 monitored newly formed islands, with calves detected on at least two. Earlier than expected occupancy of primary and secondary calving habitat for caribou and moose in the reservoir could enhance the increase of caribou and moose numbers in the region more quickly than expected during Project operation.

Caribou occupied a small percentage of Project-affected peatland complexes in 2023. There was no calf activity in Project-affected complexes, possibly indicating avoidance of Project-related sensory disturbances by calving females. Caribou occupied 12% more unburned than burned complexes. Caribou tend to avoid forest that is less than 50 years old (Schaefer and Pruitt 1991) but may pass through regenerating forest to get from one patch of more suitable habitat to another. The percentage of Project-affected and random peatland complexes in which caribou activity was observed was the same between 2021 and 2023. An increase in caribou activity was observed in reference complexes over the same period, returning to a percentage near what was observed in 2015 and 2017. The percentage of each type of complex occupied by caribou in 2021 was within the range of previous survey years, suggesting that there was relatively little change during the beginning of Project operation from Project construction. The occupancy rate of caribou in Project-affected peatland complexes was lower than in reference complexes each survey year, but the differences were not statistically significant. Caribou generally occupied a smaller percentage of Project-affected than random complexes over the survey period, except for 2017. In 2018, the occupancy rate was significantly lower in Project-affected than random complexes, but there were no significant differences in every other year. Because there were no large, consistent differences in caribou occupancy in Project-affected versus reference or random peatland complexes, construction-related Project effects on caribou appeared to be small.

Moose and caribou occupied similar numbers of peatland complexes in 2023, but moose calves occupied 15% more peatland complexes than caribou calves. Moose calves were not detected in any burned complexes in 2023.

In 2023 there was a slightly lower density of caribou signs within 2 km of the access roads than beyond 2 km from the access roads, but the difference was not significant. As no significant difference was detected in caribou signs within compared to beyond 2 km of the access road during Project construction, it is not surprising that continues to be the case during Project operation. The density of moose signs was higher within 2 km of the road than beyond, consistent with what was observed during Project construction and supporting that moose may be more tolerant of, or habituate faster to, anthropogenic sensory disturbances than caribou. Density of moose calves was greater beyond 2 km from the access roads, suggesting that the higher tolerance is only present in moose without calves.

The abundance and distribution of moose signs in 2023 in the Keeyask region suggests that it continues to provide enough habitat during Project operation to sustain a moose population, which is likely an adequate source of primary prey for gray wolves. Signs of black bear and gray wolf presence were sparse in caribou calving habitat in the Keeyask region, and caribou and predators occupied relatively few of the same islands in lakes and peatland complexes in 2023. These areas appeared to provide calving caribou with protection from predators, as expected.

5.0 SUMMARY AND CONCLUSIONS

In 2023, caribou were present on over half of the islands in lakes and peatland complexes surveyed in the Keeyask region. Caribou did not avoid all islands or peatland complexes within 4 km of the Project, or all areas within 2 km of the access roads. As predicted in the EIS, sensory disturbance from Project operation and limited traffic may have caused some individual caribou to avoid areas closer to the Project or access roads, but some areas within the predicted disturbance zones were occupied by caribou and calves. These caribou may have habituated to the anthropogenic disturbance.

Monitoring will continue in 2025 during operation to examine if potential increases in caribou calving and calf-rearing activity in habitat affected during Project construction continues, to assess the loss of effective habitat during Project operation, and to identify ongoing avoidance of the access roads or other Project components.

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APPENDIX 1:
TABLES

Table A-1: Number of Times Transects Were Surveyed on Islands in Lakes, 2015, 2017, 2018, 2020, 2021, and 2023

Island	Transect	2023	2021	2020	2018	2017	2015
KI122001	KI122001	3	3	2	3	3	3
KI122003	KI122003	3	3	2	3	3	3
KI122005	KI122005	3	3	2	3	3	3
KI122006	KI122006	3	3	2	3	3	3
KI122200	KI122200	3	3	–	–	–	–
KI122202	KI122202	0	3	–	–	–	–
KI123005	KI123005	3	3	0	0	2	3
KI123008	KI123008	0	0	0	0	2	3
KI123010	KI123010	0	3	2	3	3	3
KI123012	KI123012	3	3	2	3	3	3
	KI123012_001	–	–	2	3	3	3
KI123012_2	KI123012_2	3	3	–	–	–	–
KI123203	KI123203	3	–	–	–	–	–
KI123205	KI123205	3	3	–	–	–	–
KI123206	KI123206	3	3	–	–	–	–
KI123207	KI123207	3	3	–	–	–	–
KI123208	KI123208	3	–	–	–	–	–
KI123209	KI123209	3	3	–	–	–	–
KI123210	KI123210	3	3	–	–	–	–
KI123212	KI123212	3	–	–	–	–	–
KI123214	KI123214	3	3	–	–	–	–
KI123215	KI123215	3	3	–	–	–	–
KI123216	KI123216	2	3	–	–	–	–
KI123217	KI123217	3	3	–	–	–	–
KI123218	KI123218	3	3	–	–	–	–
KI123219	KI123219	3	3	–	–	–	–
KI123220	KI123220	3	3	–	–	–	–
KI123221	KI123221	3	3	–	–	–	–
KI123225	KI123225	3	–	–	–	–	–
KI123226	KI123226	3	3	–	–	–	–
KI123229	KI123229	3	3	–	–	–	–
KI123230	KI123230	3	3	–	–	–	–
KI123231	KI123231	3	3	–	–	–	–
KI123233	KI123233	3	3	–	–	–	–
KI123237	KI123237	3	3	–	–	–	–
KI123238	KI123238	3	3	–	–	–	–
KI123240	KI123240	3	–	–	–	–	–
KI123253	KI123253	3	–	–	–	–	–

Island	Transect	2023	2021	2020	2018	2017	2015
KI123252	KI123252	0	3	–	–	–	–
KI124003	KI124003	3	3	2	3	3	3
KI124004	KI124004	3	3	2	2	2	3
KI124005	KI124005	3	3	2	3	3	3
KI124007	KI124007	3	3	2	3	3	3
KI124009	KI124009	3	3	2	3	3	3
KI124010	KI124010	3	3	2	3	3	3
KI124013	KI124013	2	3	2	2	3	3
KI124015	KI124015	3	3	2	3	3	3
KI124016	KI124016	3	3	2	3	3	3
KI124017	KI124017	3	3	2	3	3	3
KI124018	KI124018	3	3	2	3	3	3
KI124019	KI124019	3	3	2	3	3	3
KI124020	KI124020	3	3	2	3	3	3
KI124022	KI124022	3	3	2	3	3	3
KI124024	KI124024	3	3	2	3	3	3
KI124026	KI124026	3	3	2	3	3	3
KI124029	KI124029	3	3	2	3	3	3
KI124030	KI124030	3	3	2	3	3	3
KI124035	KI124035	3	3	2	3	3	3
KI124037	KI124037	3	3	2	3	3	3
KI124038	KI124038	3	3	2	3	3	3
KI124040	KI124040	3	3	2	3	3	3
KI124041	KI124041	3	3	2	3	3	3
KI124042	KI124042	3	3	2	3	3	3
KI124043	KI124043	3	3	2	3	3	3
KI124044	KI124044	3	3	2	3	3	3
KI124045	KI124045	3	3	2	3	3	3
KI124046	KI124046	3	3	2	3	3	3
KI124047	KI124047	3	3	2	3	3	3
KI124050	KI124050	3	3	2	3	3	3
KI124052	KI124052	3	3	2	3	3	3
KI124053	KI124053	3	3	2	3	3	3
KI124055	KI124055	3	3	2	3	3	3
KI124056	KI124056	3	3	2	3	3	3
KI124057	KI124057	3	3	2	3	3	3
KI124058	KI124058	3	3	2	3	3	3
KI124060	KI124060	3	3	2	3	3	3
KI124063	KI124063	3	3	2	3	3	3
KI124065	KI124065	3	3	2	3	3	3
KI124066	KI124066	3	3	2	3	3	3

Island	Transect	2023	2021	2020	2018	2017	2015
	KI124066_001	3	3	2	3	3	3
KI124069	KI124069	3	3	2	3	3	3
KI124070	KI124070	3	3	2	3	3	3
KI124072	KI124072	3	3	2	3	3	3
KI124075	KI124075	3	3	2	3	3	3
KI124079	KI124079	3	3	2	3	3	3
KI124080	KI124080	3	3	2	3	3	3
KI124082	KI124082	3	3	2	3	3	3
KI124083	KI124083	3	3	2	2	3	3
KI124086	KI124086	3	3	2	3	3	3
KI124088	KI124088	3	3	2	3	3	3
KI124089	KI124089	3	3	2	3	3	3
KI124090	KI124090	3	3	2	3	3	3
KI124091	KI124091	3	3	2	3	3	3
KI124092	KI124092	3	3	2	3	3	3
	KI124092_001	3	3	2	3	3	3
KI124094	KI124094	3	3	2	2	3	3
KI124096	KI124096	3	3	2	3	3	3
KI124097	KI124097	3	3	2	3	3	3
KI124100	KI124100	3	3	2	3	2	0
KI124102	KI124102	3	3	2	3	3	3
KI124103	KI124103	0	0	0	0	0	3
KI124105	KI124105	3	3	2	3	3	3
KI124111	KI124111	0	0	0	0	0	3
KI124115	KI124115	3	3	2	3	3	3
KI124117	KI124117	3	3	2	3	3	3
KI124120	KI124120	3	3	2	3	3	3
KI124124	KI124124	3	2	2	3	3	3
KI124125	KI124125	3	3	2	3	3	3
KI124128	KI124128	3	3	2	3	3	3
KI124129	KI124129	3	3	2	3	3	3
KI124133	KI124133	3	3	2	3	3	3
KI124136	KI124136	3	3	2	3	3	3
KI124141	KI124141	3	3	2	3	3	3
KI124145	KI124145	3	3	2	3	3	3
KI124146	KI124146	0	0	0	0	0	3
KI124147	KI124147	3	3	2	3	3	3
KI124150	KI124150	3	3	2	3	3	0
KI124151	KI124151	3	3	2	3	3	3
KI124152	KI124152	0	0	0	0	0	3
KI124153	KI124153	3	3	2	3	3	3

Island	Transect	2023	2021	2020	2018	2017	2015
KI124155	KI124155	3	3	2	3	3	3
KI124156	KI124156	3	3	2	3	3	3
KI124158	KI124158	3	3	2	3	3	3
KI124162	KI124162	3	3	2	3	3	3
KI124163	KI124163	3	3	2	3	3	0
KI124164	KI124164	3	3	2	3	3	3
KI124165	KI124165	3	3	2	3	3	3
KI124166	KI124166	3	3	2	3	3	3
KI124167	KI124167	3	3	2	3	3	3
KI124170	KI124170	3	3	2	3	3	3
KI124173	KI124173	3	3	2	3	3	3
KI124176	KI124176	3	3	2	3	3	3
KI124178	KI124178	3	3	2	3	3	3
KI124180	KI124180	3	3	2	3	3	3
	KI124180_001	3	3	2	3	3	3
KI124181	KI124181	3	3	2	2	3	3
KI124182	KI124182	3	3	2	3	3	3
KI124186	KI124186	3	3	2	3	3	3
	KI124186_001	3	3	2	3	3	3
	KI124186_002	3	3	2	3	3	3
	KI124186_003	3	3	2	3	3	3
	KI124186_004	3	3	2	3	3	3
KI124192	KI124192	3	3	2	3	3	3
KI124193	KI124193	3	3	2	3	3	3
KI124194	KI124194	3	3	2	3	3	3
KI124196	KI124196	3	3	2	3	3	3
KI124197	KI124197	3	3	2	3	3	3
KI124202	KI124202	3	3	0	3	3	3
KI124205	KI124205	3	3	2	3	3	3
	KI124205_001	3	3	2	3	3	3
KI124206	KI124206	3	3	2	3	3	3
KI124209	KI124209	3	3	2	3	3	3
KI124210	KI124210	3	3	2	3	3	3
KI124212	KI124212	3	3	2	3	3	3
KI124214	KI124214	3	3	2	3	3	3
KI124217	KI124217	3	3	2	3	3	3
KI124227	KI124227	3	2	2	3	3	3
KI126011	KI126011	0	0	0	0	0	3
KI126016	KI126016	0	0	0	0	1	3
KI126017	KI126017	0	0	0	0	0	3
KI126020	KI126020	0	0	0	3	1	3

Table A-2: Number of Trail Cameras on Islands in Lakes, 2015 to 2023

Island	2023	2022	2021	2020	2019	2018	2017	2016	2015
KI122001	1	1	1	1	1	1	1	1	1
KI122003	1	1	1	1	1	1	1	1	1
KI122005	1	1	1	1	1	1	1	1	1
KI122006	1	1	1	1	1	1	1	1	1
KI122200	1	1	1	–	–	–	–	–	–
KI122202	0	0	1	–	–	–	–	–	–
KI123005	1	1	1	0	0	0	0	1	1
KI123008	0	0	0	0	0	0	0	0	1
KI123010	0	1	1	1	1	1	1	1	1
KI123012	1	1	1	1	2	2	2	2	2
KI123201	0	1	0	–	–	–	–	–	–
KI123203	1	0	0	–	–	–	–	–	–
KI123205	1	1	1	–	–	–	–	–	–
KI123206	1	1	1	–	–	–	–	–	–
KI123207	1	1	1	–	–	–	–	–	–
KI123208	1	0	0	–	–	–	–	–	–
KI123209	1	1	1	–	–	–	–	–	–
KI123210	1	1	1	–	–	–	–	–	–
KI123212	1	1	0	–	–	–	–	–	–
KI123214	1	1	1	–	–	–	–	–	–
KI123215	1	1	1	–	–	–	–	–	–
KI123216	1	1	1	–	–	–	–	–	–
KI123217	1	1	1	–	–	–	–	–	–
KI123218	1	1	1	–	–	–	–	–	–
KI123219	1	1	1	–	–	–	–	–	–
KI123220	1	1	1	–	–	–	–	–	–
KI123221	1	1	1	–	–	–	–	–	–
KI123225	1	1	0						
KI123226	1	1	1	–	–	–	–	–	–
KI123229	1	1	1	–	–	–	–	–	–
KI123230	1	1	1	–	–	–	–	–	–
KI123231	1	1	1	–	–	–	–	–	–
KI123233	1	1	1	–	–	–	–	–	–
KI123237	1	1	1	–	–	–	–	–	–
KI123238	1	1	1	–	–	–	–	–	–
KI123240	1	1	0	–	–	–	–	–	–
KI123252	0	0	1	–	–	–	–	–	–

Island	2023	2022	2021	2020	2019	2018	2017	2016	2015
KI123253	1	1	1	–	–	–	–	–	–
KI124003	1	1	1	1	1	1	1	1	1
KI124004	1	1	1	1	1	1	1	1	1
KI124005	1	1	1	1	1	1	1	1	1
KI124007	1	1	1	1	1	1	1	1	1
KI124009	1	1	1	1	1	1	1	1	1
KI124010	1	1	1	1	1	1	1	1	1
KI124013	1	1	0	0	1	1	1	1	1
KI124015	1	1	1	1	1	1	1	1	1
KI124016	1	1	1	1	1	1	1	1	1
KI124017	1	1	1	1	1	1	1	1	1
KI124018	1	1	1	1	1	1	1	1	1
KI124019	1	1	1	1	1	1	1	1	1
KI124020	1	1	1	1	1	1	1	1	1
KI124022	1	1	1	1	1	1	1	1	1
KI124024	1	1	1	1	1	1	1	1	1
KI124026	1	1	1	1	1	1	1	1	1
KI124029	1	1	1	1	1	1	1	1	1
KI124030	1	1	1	1	1	1	1	1	1
KI124035	1	1	1	1	1	1	1	1	1
KI124037	1	1	1	1	1	1	1	1	1
KI124038	1	1	1	1	1	1	1	1	1
KI124040	1	1	1	1	1	1	1	1	1
KI124041	1	1	1	1	1	1	1	1	1
KI124042	1	1	1	1	1	1	1	1	1
KI124043	1	1	1	1	1	1	1	1	1
KI124044	1	1	1	1	1	1	1	1	1
KI124045	1	1	1	1	1	1	1	1	1
KI124046	1	1	1	1	1	1	1	1	1
KI124047	1	1	1	1	1	1	1	1	1
KI124050	1	1	1	1	1	1	1	1	1
KI124051	0	0	0	0	0	0	0	1	0
KI124052	1	1	1	1	1	1	1	1	1
KI124053	1	1	1	1	1	1	1	1	1
KI124055	1	1	1	1	1	1	1	1	1
KI124056	1	1	1	1	1	1	1	1	1
KI124057	1	1	1	1	1	1	1	1	1
KI124058	1	1	1	1	1	1	1	1	1
KI124060	1	1	1	1	1	1	1	1	1

Island	2023	2022	2021	2020	2019	2018	2017	2016	2015
KI124063	1	1	1	1	1	1	1	1	1
KI124065	1	1	1	1	1	1	1	1	1
KI124066	2	2	2	1	2	2	2	2	2
KI124069	1	1	1	1	1	1	1	1	1
KI124070	1	1	1	1	1	1	1	1	1
KI124072	1	1	1	1	1	1	1	1	1
KI124075	1	1	1	1	1	1	1	1	1
KI124077	1	1	1	1	1	1	1	1	0
KI124079	1	1	1	1	1	1	1	1	1
KI124080	1	1	1	1	1	1	1	1	0
KI124082	1	1	1	1	1	1	1	1	1
KI124083	1	1	1	1	1	1	1	0	1
KI124086	1	1	1	1	1	1	1	1	1
KI124088	1	1	1	0	1	1	1	1	1
KI124089	1	1	1	1	1	1	1	1	1
KI124090	1	1	1	1	1	1	1	1	1
KI124091	1	1	1	1	1	1	1	1	1
KI124092	2	2	2	1	2	2	2	2	2
KI124094	1	1	1	1	1	1	1	1	1
KI124096	1	1	1	1	1	1	1	1	1
KI124097	1	1	0	1	1	1	1	1	1
KI124102	1	1	1	1	1	1	1	1	1
KI124103	1	1	1	1	1	1	1	1	1
KI124105	1	1	1	1	1	1	1	1	1
KI124111	0	0	0	0	0	0	0	1	1
KI124113	1	1	1	1	1	1	1	1	0
KI124115	1	1	1	1	1	1	1	2	1
KI124117	1	1	1	1	1	1	1	1	1
KI124120	1	1	1	1	1	1	1	1	1
KI124124	1	1	1	1	1	1	1	1	1
KI124125	1	1	1	1	1	1	1	1	1
KI124128	1	1	1	1	1	1	1	1	1
KI124129	1	1	1	1	1	1	1	1	1
KI124131	1	1	1	1	1	1	1	1	0
KI124133	1	1	1	1	1	1	1	1	1
KI124136	1	1	1	1	1	1	1	1	1
KI124141	1	1	1	1	1	1	1	1	1
KI124145	1	1	1	1	1	1	1	1	1
KI124146	1	1	1	1	1	1	1	1	1

Island	2023	2022	2021	2020	2019	2018	2017	2016	2015
KI124147	1	1	1	1	1	1	1	1	1
KI124151	1	1	1	1	1	1	1	1	1
KI124152	1	1	1	0	1	1	1	1	1
KI124153	1	1	1	1	1	1	1	1	1
KI124155	1	1	1	1	1	1	1	1	1
KI124156	1	1	1	1	1	1	1	1	1
KI124158	1	1	1	1	1	1	1	1	1
KI124162	1	1	1	1	1	1	1	1	1
KI124164	1	1	1	1	1	1	1	1	1
KI124165	1	1	1	1	1	1	1	1	1
KI124166	1	1	1	1	1	1	1	1	1
KI124167	1	1	1	1	1	1	1	1	1
KI124170	1	1	1	1	1	1	1	1	1
KI124173	1	1	1	1	1	1	1	1	1
KI124176	1	1	1	1	1	1	1	1	1
KI124178	1	1	1	1	1	1	1	1	1
KI124180	3	3	3	2	3	3	2	3	2
KI124181	1	1	1	1	1	1	1	0	1
KI124182	1	1	1	1	1	1	1	1	1
KI124186	6	6	6	5	6	6	5	6	4
KI124192	1	1	1	1	1	1	1	1	1
KI124193	1	1	1	1	1	1	1	1	1
KI124194	1	1	1	1	1	1	1	1	1
KI124196	1	1	1	1	1	1	1	1	1
KI124197	1	1	1	1	1	1	1	1	1
KI124202	1	1	1	1	1	1	1	1	1
KI124205	2	2	2	1	2	2	2	2	1
KI124206	1	1	1	1	1	1	1	1	1
KI124209	1	1	1	1	1	1	1	1	1
KI124210	1	1	1	1	1	1	1	1	1
KI124212	1	1	1	1	1	1	1	1	1
KI124214	1	1	1	1	1	1	1	1	1
KI124217	1	1	1	1	1	1	1	1	1
KI124227	1	1	1	1	1	1	1	0	1
KI126016	0	0	0	0	0	0	0	1	1
KI126017	0	0	0	0	0	0	0	0	1
KI126020	0	0	0	0	0	0	0	1	1

Table A-3: Number of Times Transects Were Surveyed in Peatland Complexes, 2015, 2017, 2018, 2020, 2021, and 2023

Complex	Transect	2023	2021	2020	2018	2017	2015
KV022000	KV022001	3	3	2	3	3	3
	KV022002	3	3	2	3	3	3
	KV022003	3	3	2	3	3	3
	KV022004	3	2	2	3	3	3
	KV022005	3	3	2	3	3	3
	KV022006	3	3	2	3	3	3
	KV022007	3	3	2	3	3	3
	KV022008	3	3	2	3	3	3
	KV022009	3	3	2	3	3	3
	KV022010	3	3	2	3	3	3
	KV022011	3	3	2	3	3	3
	KV022012	3	3	2	3	3	3
	KV022013	3	3	2	3	3	3
	KV022014	3	3	2	3	3	3
	KV022015	3	3	2	3	3	3
KV023000	KV023001	3	3	2	3	3	3
	KV023002	2	3	2	3	3	3
KV036000	KV036001	3	3	2	3	3	3
	KV036002	3	3	2	3	3	3
	KV036003	3	3	2	3	3	3
	KV036004	3	3	2	3	3	3
	KV036005	3	3	2	3	3	3
	KV036006	3	3	2	3	3	3
	KV036007	3	3	2	3	3	3
	KV036008	3	3	2	3	3	3
	KV036009	3	3	2	3	3	3
	KV036010	3	3	2	3	3	3
	KV036011	3	3	2	3	3	3
	KV036012	3	3	2	3	3	3
	KV036013	3	3	2	3	3	3
	KV036014	3	3	2	3	3	3
	KV036015	3	3	2	3	3	3
	KV036016	3	3	2	3	3	3
	KV036017	3	3	2	3	3	3
KV037000	KV037001	3	3	2	3	3	3
	KV037002	3	3	2	3	3	3
	KV037003	3	3	2	3	3	3
KV037000	KV037004	3	3	2	3	3	3
KV038000	KV038001	3	3	2	3	3	3

Complex	Transect	2023	2021	2020	2018	2017	2015
	KV038002	3	3	2	3	3	3
	KV038003	3	3	2	3	3	3
	KV038004	3	3	2	3	3	3
	KV038005	3	3	2	3	3	3
	KV038006	3	3	2	3	3	3
	KV038007	3	3	2	3	3	3
	KV038008	3	3	2	3	3	3
	KV038009	3	3	2	3	3	3
	KV038010	3	3	2	3	3	3
	KV038011	3	3	2	3	3	3
	KV038012	3	3	2	3	3	3
	KV038013	3	3	2	3	3	3
	KV038014	3	3	2	3	3	3
	KV038015	3	3	2	3	3	3
	KV038016	3	3	2	3	3	3
	KV038017	3	3	2	3	3	3
	KV038018	3	3	2	3	3	3
	KV038019	3	3	2	3	3	3
	KV038020	3	3	2	3	3	3
KV039000	KV039001	3	3	2	3	3	3
KV044000	KV044001	3	3	2	3	3	3
	KV044002	3	3	2	3	3	3
	KV044003	3	3	2	3	3	3
	KV044004	3	3	2	3	3	3
	KV044005	3	3	2	3	3	3
	KV044006	2	3	2	3	3	3
	KV044007	3	3	2	3	3	3
	KV044008	3	3	2	3	3	3
	KV044009	3	3	2	3	3	3
	KV044010	3	3	2	3	3	3
KV047000	KV047001	3	3	2	3	3	3
	KV047002	3	3	2	3	3	3
	KV047003	3	3	2	3	3	3
	KV047004	3	3	2	3	3	3
	KV047005	3	3	2	3	3	3
	KV047006	3	3	2	3	3	3
KV050000	KV050001	3	3	2	3	2	3
KV050000	KV050002	3	3	2	3	3	3
	KV050003	3	3	2	3	3	3
	KV050004	3	3	2	3	3	3
	KV050005	3	3	2	3	3	3

Complex	Transect	2023	2021	2020	2018	2017	2015
	KV050006	3	3	2	3	3	3
	KV050007	3	3	2	3	3	3
	KV050008	3	3	2	3	3	3
KV058000	KV058001	3	3	2	3	3	3
	KV058002	3	3	2	3	3	3
	KV058003	3	3	2	3	3	3
	KV058004	3	3	2	3	3	3
	KV058005	3	3	2	3	3	3
	KV058006	3	3	2	3	3	3
	KV058007	3	3	2	3	3	3
	KV058008	3	3	2	3	3	3
	KV058009	3	3	2	3	3	3
	KV058010	3	3	2	3	3	3
	KV058011	3	3	2	3	3	3
	KV058012	3	3	2	3	3	3
	KV058013	3	3	2	3	3	3
	KV058014	3	3	2	3	3	3
KV061000	KV061001	3	3	2	3	3	3
	KV061002	3	3	2	3	3	3
	KV061003	3	3	2	3	3	3
KV062000	KV062001	3	3	2	3	3	3
	KV062002	3	2	2	3	3	3
KV063000	KV063001	3	3	2	3	3	3
	KV063002	3	3	2	3	3	3
	KV063003	3	3	2	3	3	3
	KV063004	3	3	2	3	3	3
	KV063005	3	3	2	3	3	3
	KV063006	2	3	2	3	3	3
KV066000	KV066001	3	3	2	3	3	3
	KV066002	3	3	2	3	3	3
	KV066003	3	3	2	2	3	3
KV069000	KV069001	3	3	2	3	3	3
	KV069002	3	3	2	3	3	3
	KV069003	3	3	2	3	3	3
	KV069004	3	3	2	3	3	3
KV069000	KV069005	3	3	2	3	3	3
KV071000	KV071001	3	3	2	3	3	3
KV094000	KV094001	3	3	2	3	3	3
	KV094002	3	3	2	3	3	3
	KV094003	3	3	2	3	3	3
	KV094004	3	2	2	3	3	3

Complex	Transect	2023	2021	2020	2018	2017	2015
	KV094005	3	2	2	3	3	3
	KV094006	3	3	2	3	3	3
	KV094007	3	3	2	3	3	3
KV097000	KV097001	3	3	2	3	3	3
	KV097002	3	3	2	3	3	3
	KV097003	3	3	2	3	3	3
	KV097004	3	3	2	3	3	3
	KV097005	3	3	2	3	3	3
	KV097006	3	3	2	3	3	3
	KV097007	3	3	2	3	3	3
	KV097008	3	3	2	3	3	3
	KV097009	3	3	2	3	3	3
	KV097010	3	3	2	3	3	3
	KV097011	3	3	2	3	3	3
	KV097012	3	3	2	3	3	3
	KV097013	3	3	2	3	3	3
KV098000	KV098001	3	3	2	3	3	3
	KV098002	3	3	2	3	3	3
KV101000	KV101001	3	3	2	3	3	3
	KV101002	3	3	2	3	3	3
	KV101003	3	3	2	3	3	3
	KV101004	3	3	2	3	3	3
	KV101005	3	3	2	3	3	3
KV102000	KV102001	3	3	2	3	3	3
	KV102002	3	3	2	3	3	3
KV103000	KV103001	3	3	2	3	3	3
	KV103002	3	3	2	3	3	3
	KV103003	3	3	2	3	3	3
	KV103004	3	3	2	3	3	3
	KV103005	3	3	2	3	3	3
	KV103006	3	3	2	3	3	3
KV107000	KV107001	3	3	2	3	3	3
	KV107002	3	3	2	3	3	3
KV107000	KV107003	3	3	2	3	3	3
	KV107004	3	3	2	3	3	3
	KV107005	3	3	2	3	3	3
	KV107006	3	3	2	3	3	3
	KV107007	3	3	2	3	3	3
	KV107008	3	3	2	3	3	3
	KV107009	3	3	2	3	3	3
KV113000	KV113001	3	3	2	3	3	3

Complex	Transect	2023	2021	2020	2018	2017	2015
	KV113002	3	3	2	3	3	3
	KV113003	3	3	2	3	3	3
	KV113004	3	3	2	3	3	3
	KV113005	3	3	2	3	3	3
	KV113006	3	3	2	3	3	3
	KV113007	3	3	2	3	3	3
	KV113008	3	3	2	3	3	3
	KV113009	3	3	2	3	3	3
	KV113010	3	3	2	3	3	3
	KV113011	3	3	2	3	3	3
	KV113012	3	3	2	3	3	3
	KV113013	2	3	2	3	3	3
	KV113014	3	3	2	3	3	3
KV116000	KV116001	3	3	2	3	3	3
KV119000	KV119001	3	2	2	3	3	3
	KV119002	3	2	2	3	3	3
	KV119003	3	2	2	3	3	3
	KV119004	3	2	2	3	3	3
	KV119005	3	2	2	3	3	3
	KV119006	3	2	2	3	3	3
KV1260000	KV1260000	3	3	2	3	3	3
	KV1262000	3	3	0	3	3	3
KV1261000	KV1261000	3	3	2	3	3	3
KV622000	KV622000	3	1	2	0	3	3
KV273000	KV273000	3	2	2	3	3	3
KV1224000	KV1224000	3	3	2	3	3	3

Table A-4: Number of Trail Cameras in Peatland Complexes, 2015 to 2023

Complex	2023	2022	2021	2020	2019	2018	2017	2016	2015
KV022000	1	1	1	1	1	1	1	1	1
KV023000	1	1	1	1	1	1	1	1	1
KV036000	1	1	1	1	1	1	1	1	1
KV037000	1	1	1	1	1	1	1	1	1
KV038000	1	1	1	1	1	1	1	1	1
KV039000	1	1	1	1	1	1	1	1	1
KV044000	1	1	1	1	1	1	1	1	1
KV047000	1	1	1	1	1	1	1	1	1
KV050000	1	1	1	1	1	1	1	1	1
KV580000	1	1	1	1	1	1	1	1	1
KV061000	1	1	1	1	1	1	1	1	1
KV062000	1	1	1	1	1	1	1	1	1
KV063000	1	1	1	1	1	1	1	1	1
KV066000	1	1	1	1	1	1	1	1	1
KV069000	1	1	1	1	1	1	1	1	1
KV071000	1	1	1	1	1	1	1	1	1
KV094000	1	1	0	1	1	1	1	1	1
KV097000	1	1	1	1	1	1	1	1	1
KV098000	1	1	1	1	1	1	1	1	1
KV101000	1	1	1	1	1	1	1	1	1
KV102000	1	1	1	1	1	1	1	1	1
KV103000	1	1	1	1	1	1	1	1	1
KV107000	1	1	1	1	1	1	1	1	1
KV113000	1	1	1	1	1	1	1	1	1
KV116000	1	1	1	1	1	1	1	1	1
KV119000	1	1	1	1	1	1	1	1	1
KV1224000	1	1	1	1	1	1	1	1	1
KV1260000	1	1	1	1	1	1	1	1	1
KV1261000	1	1	1	1	1	1	1	1	1
KV273000	1	1	1	1	1	1	1	1	1
KV597000	1	1	1	1	1	1	1	1	1
KV622000	1	1	1	1	1	1	1	1	1

Table A-5: Number of Large Mammal Signs Detected During Three Visits to Tracking Transects on Islands in Lakes, 2021

Species	Transect	Visit 1	Visit 2	Visit 3	Total
Caribou	KI123005	1	0	0	1
	KI123012_1	0	8	3	11
	KI123012_2	1	0	3	4
	KI123207	0	12	0	12
	KI123209	0	0	1	1
	KI123210	0	0	1	1
	KI123219	0	0	2	2
	KI123231	0	2	0	2
	KI124003	0	0	2	2
	KI124004	0	0	1	1
	KI124005	3	0	2	5
	KI124010	0	0	1	1
	KI124016	0	2	0	2
	KI124017	0	4	2	6
	KI124018	0	3	8	11
	KI124019	0	6	0	6
	KI124020	0	0	3	3
	KI124022	0	3	5	8
	KI124024	0	0	4	4
	KI124026	0	0	1	1
	KI124029	0	11	5	16
	KI124030	0	3	1	4
	KI124035	0	3	0	3
	KI124037	0	5	1	6
	KI124038	0	15	1	16
	KI124040	0	4	0	4
	KI124041	0	1	0	1
	KI124043	0	2	1	3
	KI124044	0	0	2	2
	KI124045	0	1	0	1
	KI124046	0	7	0	7
	KI124047	0	0	1	1
	KI124050	0	3	3	6
	KI124055	0	6	1	7
	KI124056	0	0	2	2
	KI124057	0	4	0	4
	KI124058	0	0	7	7
	KI124060	0	6	0	6

Species	Transect	Visit 1	Visit 2	Visit 3	Total
Caribou	KI124063	0	4	1	5
	KI124069	0	0	1	1
	KI124070	0	3	0	3
	KI124072	0	1	0	1
	KI124075	0	1	3	4
	KI124079	0	1	0	1
	KI124082	0	3	4	7
	KI124083	0	0	3	3
	KI124088	0	2	0	2
	KI124089	0	6	0	6
	KI124091	0	13	4	17
	KI124092	0	2	7	9
	KI124096	0	0	1	1
	KI124102	0	0	1	1
	KI124115	3	0	18	21
	KI124117	2	9	0	11
	KI124120	0	3	4	7
	KI124128	0	1	7	8
	KI124136	0	3	0	3
	KI124145	0	1	0	1
	KI124147	0	1	2	3
	KI124151	0	0	2	2
	KI124164	0	1	0	1
	KI124165	0	1	0	1
	KI124166	5	12	2	19
	KI124167	0	0	8	8
	KI124170	0	0	1	1
	KI124173	0	3	4	7
	KI124176	12	4	1	17
	KI124180	0	4	15	19
	KI124181	0	3	2	5
	KI124182	0	0	6	6
	KI124186	0	33	262	295
	KI124193	0	1	4	5
	KI124196	0	8	10	18
	KI124210	0	17	3	20
	KI124212	0	1	5	6
	KI124214	1	0	0	1
	Total	28	253	445	726
Caribou calf	KI124010	0	1	1	2

Species	Transect	Visit 1	Visit 2	Visit 3	Total
Caribou calf	KI124040	0	2	0	2
	KI124050	0	1	0	1
	KI124089	0	2	0	2
	KI124091	0	1	0	1
	KI124115	0	0	1	1
	KI124120	0	1	0	1
	KI124136	0	3	0	3
	KI124173	0	2	0	2
	KI124180	0	0	1	1
	KI124186	0	0	3	3
	KI124196	0	1	0	1
	Total	0	13	6	19
Moose	KI122003	0	3	1	4
	KI122006	0	4	0	4
	KI122200	0	5	3	8
	KI122202	0	0	2	2
	KI123005	0	5	1	6
	KI123012_2	0	1	0	1
	KI123205	0	1	0	1
	KI123206	0	0	5	5
	KI123207	0	0	3	3
	KI123209	0	0	1	1
	KI123210	0	0	1	1
	KI123214	0	3	10	13
	KI123215	0	0	1	1
	KI123216	0	3	9	12
	KI123217	0	1	0	1
	KI123218	0	4	1	5
	KI123219	0	12	0	12
	KI123220	0	5	0	5
	KI123221	0	0	1	1
	KI123226	0	3	5	8
	KI123229	0	8	4	12
	KI123230	0	33	0	33
	KI123231	0	0	3	3
	KI123233	0	0	1	1
	KI123238	7	3	6	16
	KI124004	0	5	0	5
	KI124005	1	0	0	1
	KI124010	0	10	12	22

Species	Transect	Visit 1	Visit 2	Visit 3	Total
Moose	KI124016	0	0	2	2
	KI124017	0	0	3	3
	KI124018	0	0	8	8
	KI124019	0	0	2	2
	KI124022	1	0	0	1
	KI124024	0	7	0	7
	KI124026	0	7	0	7
	KI124029	0	0	2	2
	KI124035	0	0	7	7
	KI124038	0	1	7	8
	KI124040	0	2	9	11
	KI124041	0	0	2	2
	KI124044	0	5	1	6
	KI124045	0	1	0	1
	KI124046	0	1	0	1
	KI124047	3	12	4	19
	KI124050	1	0	1	2
	KI124055	0	0	1	1
	KI124056	0	1	0	1
	KI124057	0	3	2	5
	KI124058	0	5	0	5
	KI124060	0	2	0	2
	KI124063	0	0	1	1
	KI124065	0	9	7	16
	KI124066	1	9	1	11
	KI124072	0	0	3	3
	KI124075	0	11	8	19
	KI124079	0	2	0	2
	KI124082	0	5	1	6
	KI124088	0	0	1	1
	KI124089	0	0	2	2
	KI124092	2	26	18	46
	KI124096	0	2	1	3
	KI124100	0	1	0	1
	KI124102	0	4	0	4
	KI124105	0	4	0	4
	KI124115	0	118	52	170
	KI124117	0	1	4	5
	KI124124	0	4	1	5
	KI124128	0	8	2	10

Species	Transect	Visit 1	Visit 2	Visit 3	Total
Moose	KI124129	0	3	0	3
	KI124133	0	3	0	3
	KI124145	0	1	5	6
	KI124147	0	0	2	2
	KI124153	0	0	1	1
	KI124162	0	0	1	1
	KI124164	0	1	0	1
	KI124166	0	0	1	1
	KI124167	0	2	0	2
	KI124173	0	3	0	3
	KI124176	0	6	1	7
	KI124180	0	12	4	16
	KI124181	1	0	1	2
	KI124182	0	7	3	10
	KI124186	1	17	14	32
	KI124193	0	10	4	14
	KI124196	0	0	5	5
	KI124205	0	1	0	1
	KI124210	0	3	2	5
	KI124212	0	9	5	14
	KI124214	0	6	0	6
	KI124217	0	0	1	1
	Total	18	444	273	735
Moose calf	KI122006	0	1	0	1
	KI122200	0	3	1	4
	KI123214	0	0	1	1
	KI123230	0	2	0	2
	KI124038	0	1	0	1
	KI124044	0	1	0	1
	KI124057	0	0	1	1
	KI124063	0	0	1	1
	KI124066	0	1	0	1
	KI124092	0	1	1	2
	KI124115	0	4	0	4
	KI124129	0	1	0	1
	KI124167	0	1	0	1
	KI124180	0	2	0	2
	KI124182	0	1	0	1
	KI124186	0	1	0	1
	KI124212	0	4	0	4

Species	Transect	Visit 1	Visit 2	Visit 3	Total
Moose calf	Total	0	24	5	29
Black bear	KI123214	0	1	0	1
	KI124016	0	2	0	2
	KI124066	0	1	0	1
	KI124091	0	0	1	1
	KI124092	0	0	1	1
	KI124141	0	0	2	2
	KI124186	0	0	1	1
	KI124193	0	0	1	1
	Total	0	4	6	10
Gray wolf	KI122003	0	0	1	1
	KI124003	1	0	0	1
	KI124180	1	0	0	1
	KI124186	0	1	0	1
	KI124197	0	0	1	1
	Total	2	1	2	5

Table A-6: Number of Camera-days on Islands in Lakes, 2015–2023

Island Type	Island	2023	2022	2021	2020	2019	2018	2017	2016	2015
Project-affected	KI123010	na	152	153	175	167	150	161	154	172
	KI123012	149	155	153	350	334	304	322	308	344
	KI124015	159	156	161	171	165	153	151	157	173
	KI124016	140	156	160	171	166	151	147	151	173
	KI124080	159	158	146	170	165	154	146	160	163
	KI124088	152	156	149	167	166	154	157	159	168
	KI124090	150	155	149	167	163	154	157	107	168
	KI124092	276	310	300	334	327	300	309	320	340
	KI124094	152	156	149	167	163	154	157	160	168
	KI124097	159	159	0	170	165	154	147	160	163
	KI124102	159	158	150	170	165	157	149	160	163
	KI124103	153	155	149	167	163	147	153	159	150
	KI124141	154	155	148	168	167	160	157	160	161
	KI124145	158	158	148	171	165	157	145	58	164
	KI124146	155	154	148	171	167	160	153	159	144
	KI124152	154	154	149	175	163	157	153	159	160
	KI124155	155	154	148	171	163	154	155	159	160
	KI124162	158	159	148	171	165	154	147	159	117
	KI124164	154	155	149	168	167	160	154	159	166
	KI124165	155	154	147	172	163	154	153	159	165
	KI124192	148	154	149	171	163	146	155	161	168
	KI124193	141	154	150	167	164	157	155	159	170
	KI124197	153	159	152	168	165	160	157	160	164
	KI124202	151	154	149	171	163	163	153	160	161
	KI124206	151	159	148	168	165	160	157	160	164
	KI124209	148	154	149	171	163	153	153	160	170
	Total	3,943	4,203	3,901	4,762	4,612	4,327	4,303	4,287	4,579
Project-affected new	KI123225	164	155	0	–	–	–	–	–	–
	KI123226	164	155	153	–	–	–	–	–	–
	KI123231	157	152	153	–	–	–	–	–	–
	KI123233	154	152	153	–	–	–	–	–	–
	KI123237	151	155	153	–	–	–	–	–	–
	KI123238	151	152	153	–	–	–	–	–	–
	KI123240	147	155	0	–	–	–	–	–	–
	KI123253	149	155	153	–	–	–	–	–	–

Island Type	Island	2023	2022	2021	2020	2019	2018	2017	2016	2015
	Total	1,237	1,231	918	–	–	–	–	–	–
Project-affected Total		5,180	5,434	4,819	4,762	4,612	4,327	4,303	4,287	4,579
Unaffected	KI122001	156	155	158	174	168	161	165	154	172
	KI122003	156	155	158	174	168	161	165	154	172
	KI122005	156	155	158	174	168	161	165	154	172
	KI122006	156	155	158	174	168	161	163	155	172
	KI123005	163	155	153	0	0	0	0	0	172
	KI124003	156	155	160	171	166	150	147	152	173
	KI124004	150	155	152	168	168	176	157	0	171
	KI124005	156	156	160	171	166	151	147	151	173
	KI124007	156	156	160	171	166	151	151	152	173
	KI124009	156	156	160	171	166	150	151	181	173
	KI124010	156	156	153	171	166	150	151	181	173
	KI124013	156	156	0	0	166	150	151	151	173
	KI124017	159	156	160	173	166	154	142	158	173
	KI124018	159	156	153	174	165	154	143	181	173
	KI124019	153	156	158	172	167	148	150	184	171
	KI124020	158	156	160	171	166	151	147	151	173
	KI124022	156	156	153	173	166	153	143	152	173
	KI124024	149	156	160	171	166	154	147	151	173
	KI124026	151	156	152	172	183	148	155	161	171
	KI124029	158	156	154	175	166	153	143	158	173
	KI124030	158	156	154	175	166	153	143	158	165
	KI124035	153	156	158	172	167	146	150	184	172
	KI124037	158	155	154	168	167	155	146	152	167
	KI124038	153	156	154	172	167	148	150	184	171
	KI124040	153	156	154	172	167	148	150	184	172
	KI124041	153	156	158	172	167	148	150	184	172
	KI124042	153	156	158	172	167	148	150	155	172
	KI124043	161	156	160	175	167	157	153	158	168
	KI124044	153	156	157	172	167	147	154	184	171
	KI124045	162	156	160	175	166	157	153	158	168
	KI124046	158	155	150	167	168	155	147	158	166
	KI124047	153	156	157	176	167	146	154	184	173
	KI124050	153	156	158	172	167	148	150	184	172
	KI124052	152	155	154	172	167	156	150	184	171
	KI124053	150	156	150	172	167	148	150	184	171
	KI124055	146	156	152	175	168	157	156	158	168

Island Type	Island	2023	2022	2021	2020	2019	2018	2017	2016	2015
	KI124056	150	156	158	172	167	148	150	184	104
	KI124057	150	156	158	172	167	148	150	184	171
	KI124058	146	156	152	175	168	157	156	158	168
	KI124060	150	156	150	176	167	148	150	184	171
	KI124063	150	156	150	175	168	157	153	158	169
	KI124065	150	156	154	176	167	148	157	184	170
	KI124066	296	314	302	340	330	314	296	318	325
	KI124069	148	157	152	170	165	154	148	159	163
	KI124070	153	155	150	172	167	156	148	155	171
	KI124072	153	155	150	172	167	156	150	184	171
	KI124075	148	157	152	167	165	157	147	101	164
	KI124077	149	156	153	175	166	156	0	157	0
Unaffected	KI124079	150	156	152	175	168	156	154	158	166
	KI124082	142	156	153	175	168	161	155	159	168
	KI124083	149	156	153	174	167	161	155	0	282
	KI124086	153	155	154	176	167	151	154	183	170
	KI124089	150	156	152	175	168	157	156	158	167
	KI124091	141	157	154	176	168	157	158	159	165
	KI124096	153	155	154	176	167	151	154	183	170
	KI124105	153	155	154	176	166	145	154	183	172
	KI124113	142	156	153	175	166	167	150	159	0
	KI124115	146	156	157	171	166	161	154	107	171
	KI124117	153	155	154	176	167	151	154	183	169
	KI124120	147	156	154	176	168	157	158	158	165
	KI124124	156	156	153	175	164	161	157	159	167
	KI124125	158	158	146	171	166	157	147	106	163
	KI124128	150	155	155	173	167	161	153	157	175
	KI124129	146	156	157	171	167	161	154	161	171
	KI124131	152	155	154	176	166	161	149	154	0
	KI124133	156	156	153	175	164	161	157	159	167
	KI124136	155	155	158	176	167	157	155	159	170
	KI124147	145	156	150	171	166	160	148	159	166
	KI124151	155	155	152	176	167	157	155	159	170
	KI124153	153	159	149	172	164	160	147	159	164
	KI124156	154	156	154	176	167	157	156	103	166
	KI124158	152	155	151	173	166	161	153	158	175
	KI124166	156	156	157	176	164	161	155	161	167
	KI124167	153	159	149	172	164	165	147	160	162

Island Type	Island	2023	2022	2021	2020	2019	2018	2017	2016	2015
	KI124170	152	155	155	173	166	161	153	158	183
	KI124173	151	155	158	176	167	157	153	159	170
	KI124176	152	156	154	175	164	161	152	161	168
	KI124178	146	155	153	174	167	161	154	183	169
	KI124180	452	474	450	512	493	311	440	475	332
	KI124181	152	156	157	176	164	156	155	0	285
	KI124182	152	155	155	173	166	161	153	157	170
	KI124186	918	930	929	1030	1000	940	935	945	845
	KI124194	152	155	155	174	166	161	155	183	172
	KI124196	147	156	155	171	166	160	99	158	166
	KI124205	207	310	298	336	328	320	304	318	161
	KI124210	138	157	156	174	164	161	154	183	170
	KI124212	143	157	152	174	164	159	154	183	170
	KI124214	140	155	154	172	164	159	153	154	169
	KI124217	154	155	149	168	164	160	152	160	161
	KI124227	160	156	157	172	168	147	146	0	287
	Total	14,964	15,429	15,118	16,765	16,313	15,103	14,695	15,241	16,041
Unaffected new	KI122200	156	155	158	–	–	–	–	–	–
	KI122202	0	0	158	–	–	–	–	–	–
	KI123201	0	155	0	–	–	–	–	–	–
	KI123205	158	155	153	–	–	–	–	–	–
	KI123206	158	155	153	–	–	–	–	–	–
	KI123207	158	155	157	–	–	–	–	–	–
	KI123209	158	155	153	–	–	–	–	–	–
	KI123210	164	155	158	–	–	–	–	–	–
	KI123212	164	152	0	–	–	–	–	–	–
	KI123214	159	155	157	–	–	–	–	–	–
	KI123215	159	155	157	–	–	–	–	–	–
	KI123216	159	155	157	–	–	–	–	–	–
	KI123217	164	158	157	–	–	–	–	–	–
	KI123218	156	155	153	–	–	–	–	–	–
	KI123219	156	155	153	–	–	–	–	–	–
	KI123220	156	155	153	–	–	–	–	–	–
	KI123221	156	155	153	–	–	–	–	–	–
	KI123229	160	155	157	–	–	–	–	–	–
	KI123230	160	155	157	–	–	–	–	–	–
	KI123252	0	0	158	–	–	–	–	–	–
	Total	2,701	2,790	2,802	–	–	–	–	–	–

Island Type	Island	2023	2022	2021	2020	2019	2018	2017	2016	2015
Unaffected total		17,665	18,219	17,920	16,765	16,313	15,103	14,695	15,241	16,041

Table A-7: Period Over which Caribou Were Photographed on 43 Islands in Lakes, 2015–2022

Island Type	Island	2015	2016	2017	2018	2019	2020	2021	2022
Project-affected	KI123010								
	KI123012	June 8–Aug. 27	June 28–July 18	July 30		July 7			July 22–Aug 3
	KI124090								
	KI124092						June 27		
	KI124102								
	KI124103								
	KI124141								
	KI124145					May 29	Aug. 18–19		
	KI124146								
	KI124162		June 17						
	KI124164					May 24		May 14	May 8
	KI124192								
	KI124193			July 16–22		July 26–Aug. 1	June 1–Aug. 19	Sep. 4	Aug. 13–28
	KI124197								
	KI124202								
	KI124206								
Unaffected	KI122003								
	KI124009								July 26–Aug. 18
	KI124010							July 25–26	Aug. 18–19
	KI124017	Aug. 27						June 20	
	KI124018	Aug. 27					July 28–30	June 21–Sep. 15	June 18–Aug. 28

Island Type	Island	2015	2016	2017	2018	2019	2020	2021	2022
	KI124019								
	KI124029				July 16–Aug. 8	July 29	May 30–July 10	May 28–Aug. 10	
	KI124030			June 10–11	June 29	July 12		April 25	Aug. 2
	KI124035					June 12			
	KI124037			Sep. 7	June 12– Sep. 5				Aug. 22–23
	KI124038								
Unaffected	KI124040								
	KI124041								
	KI124043	July 15			July 1–20		June 26	May 31	
	KI124044								
	KI124046	June 22		Aug. 8					
	KI124047								
	KI124050								
	KI124052							May 11	
	KI124053								
	KI124055	Aug. 7–Sep. 7				June 25–Aug. 1	Aug. 17	July 14–Aug. 26	June 4–Sept. 5
	KI124056								
	KI124057								
	KI124058				Aug. 9–11	June 25–July 5		Aug. 7–25	July 18
	KI124060								
	KI124065						Sep. 5		
	KI124066								June 24–July 5

Island Type	Island	2015	2016	2017	2018	2019	2020	2021	2022
	KI124072								
	KI124082						June 27		Aug. 16
	KI124086								
	KI124089					Sep. 8			
	KI124091		July 5		July 16		June 20–21		
	KI124096							July 23	
	KI124105								
	KI124115								Aug. 19–Sept. 3
	KI124117						June 13		
	KI124120		June 27–July 19	July 26–Aug. 1	July 12–23	June 25–July 11		July 26	June 25–July 8
	KI124124								
	KI124128	Aug. 6	Aug. 27	July 16–22	July 8	July 29–30	July 9–19	July 5–Aug. 20	July 5
	KI124129		June 11–14					April 22–24	June 17–June 23
	KI124136	July 15–Aug. 19	June 7–Aug. 21		May 24–Aug. 20	June 6–Aug 9	June 26–Aug. 19	Aug. 14–15	June 20–Sept. 13
	KI124151	June 22–Aug. 31	June 8–Aug. 16	July 10–Aug. 17	June 15–Aug. 27	June 24	Sep. 5	Aug. 12–Sep 12	June 12–July 17
	KI124156						June 30–July 15		May 22
	KI124158			Aug. 5					June 15

Island Type	Island	2015	2016	2017	2018	2019	2020	2021	2022
	KI124166			June 21		June 11	June 1–July 5	June 21–Aug. 17	
	KI124173	June 23–Aug. 31	June 3–30 Aug.	June 13–Sep. 3	May 30–Aug. 27	June 3–Sep. 8	June 20–Sep. 8	June 30–Sep. 8	June 17–Aug. 29
	KI124176		July 9	June 19–July 15	June 13–14	July 16	July 5	June 21	June 20–July 9
	KI124178								
	KI124180				July 8	July 8–Aug. 21	July 9–Aug. 22	July 7–Sep. 7	July 5–25
	KI124182	Aug. 19–21	July 14–Aug. 25	July 8–Aug. 27	June 10–Sep. 8	June 3–Aug. 15	June 10–Aug. 22	July 23–Aug. 27	June 19–July 20
	KI124186	Apr. 24–Sep. 15	May 1–Sep. 16	June 30–Sep. 6	May 27–Sep. 8	June 20–Sep. 19	June 4–Sep. 11	May 18–Sep. 13	May 11–Sept. 23
	KI124194	July 22–23							June 18
	KI124196	June 21–Sep. 16	June 12–Aug. 31		June 22–Aug. 16		June 6–Aug. 4	June 24–Sep. 16	July 4–28
	KI124205						June 4–Aug. 27		
	KI124210		Aug. 14		May 21–July 11	Aug. 15–16		June 20–Aug. 14	
	KI124212	May 22–Sep. 15		June 24–Aug. 13	May 20	July 10–Aug. 29	Aug. 10–Sep. 8	July 23–Aug. 30	July 1–Sept. 8

Table A-8: Number of Large Mammal Signs Detected During Three Visits to Tracking Transects in Peatland Complexes, 2023

Species	Complex	Transect	Visit 1	Visit 2	Visit 3
Caribou	KV022000	KV022001	0	0	1
		KV022002	0	0	2
		KV022003	0	4	0
		KV022006	0	0	1
		KV022007	0	0	3
		KV022008	0	0	3
		KV022011	0	8	0
		KV022013	0	1	1
		KV022014	0	0	4
		KV022015	0	0	5
	KV036000	KV036001	0	1	0
		KV036002	0	3	2
		KV036003	0	3	0
		KV036005	0	5	0
		KV036006	0	7	0
		KV036007	0	2	0
		KV036008	0	2	0
		KV036009	0	2	1
		KV036010	0	0	1
		KV036012	0	3	2
		KV036013	0	0	2
		KV036015	1	4	0
		KV036017	3	0	2
	KV037000	KV037003	0	3	0
		KV037004	0	1	0
	KV038000	KV038001	0	7	0
		KV038002	0	24	1
		KV038003	2	6	0
		KV038005	0	4	0
		KV038006	0	8	0
		KV038007	0	10	1
		KV038010	0	4	0
		KV038012	0	3	0
		KV038013	1	0	0
		KV038017	0	10	0
		KV038019	0	4	0
		KV038020	0	2	0
	KV044000	KV044006	0	1	0
		KV044007	0	1	0

Species	Complex	Transect	Visit 1	Visit 2	Visit 3
		KV044008	0	1	0
		KV044009	0	3	2
	KV047000	KV047001	0	3	0
		KV047002	0	1	0
		KV047003	0	3	0
	KV050000	KV050002	0	2	0
		KV050003	0	1	0
		KV050005	0	2	0
		KV050006	0	4	0
		KV050007	0	2	0
		KV050008	0	2	1
	KV058000	KV058001	0	9	0
		KV058004	0	3	0
		KV058006	0	0	1
		KV058008	0	5	0
		KV058010	0	4	0
		KV058012	0	34	0
		KV058014	0	28	5
	KV061000	KV061003	0	0	1
	KV063000	KV063001	0	1	0
	KV066000	KV066002	0	1	1
		KV066003	0	0	2
	KV069000	KV069003	0	0	3
	KV094000	KV094002	1	2	2
		KV094003	0	0	1
	KV097000	KV097002	0	1	0
		KV097007	0	2	0
		KV097008	0	0	1
		KV097010	0	1	0
		KV097012	0	5	4
	KV098000	KV098002	0	2	0
	KV101000	KV101001	2	0	0
		KV101002	0	1	0
		KV101003	0	2	0
		KV101005	2	0	0
	KV103000	KV103002	0	3	0
	KV107000	KV107001	0	11	2
		KV107002	0	5	0
		KV107003	0	0	1
		KV107005	0	6	1
		KV107006	0	8	0

Species	Complex	Transect	Visit 1	Visit 2	Visit 3
		KV107007	0	5	5
		KV107008	0	1	0
		KV107009	0	12	0
	KV113000	KV113001	0	7	0
		KV113002	0	7	0
		KV113004	0	2	0
		KV113005	0	6	0
		KV113009	0	5	0
		KV113012	0	2	0
		KV113013	0	1	0
	KV116000	KV116001	0	1	0
	KV119000	KV119005	0	1	0
	KV1224000	KV1224000	0	2	1
	KV126000	KV1262000	0	1	0
	Total		**12**	**344**	**66**
Caribou Calf	KV036000	KV036005	0	2	0
		KV036006	0	2	0
		KV036008	0	2	0
		KV036009	0	1	0
		KV036012	0	1	0
		KV036015	0	1	0
	KV101000	KV101003	0	2	0
	KV113000	KV113001	0	2	0
		KV113009	0	4	0
	KV1224000	KV1224000	0	1	0
	Total		**0**	**18**	**0**
Moose	KV022000	KV022001	1	0	0
		KV022002	4	1	0
		KV022003	7	4	2
		KV022004	1	0	0
		KV022005	4	0	0
		KV022006	0	1	0
		KV022007	2	3	0
		KV022008	5	2	0
		KV022009	0	12	0
		KV022010	0	2	1
		KV022012	0	8	2
		KV022013	4	0	0
		KV022014	1	5	0
		KV022015	2	4	0
	KV036000	KV036001	0	1	2

Species	Complex	Transect	Visit 1	Visit 2	Visit 3
		KV036002	0	0	2
		KV036003	0	0	1
		KV036005	1	0	8
		KV036006	0	2	1
		KV036007	0	0	1
		KV036009	0	0	2
		KV036010	0	2	1
		KV036011	0	3	2
		KV036012	1	0	7
		KV036013	0	2	0
		KV036014	0	0	1
		KV036015	0	0	6
		KV036016	1	0	2
		KV036017	0	0	3
	KV037000	KV037001	0	1	0
		KV037002	0	1	0
		KV037003	0	1	0
		KV037004	0	1	0
	KV038000	KV038001	1	1	1
		KV038002	2	13	0
		KV038003	0	4	0
		KV038004	2	0	2
		KV038007	3	8	0
		KV038010	2	1	0
		KV038013	2	1	0
		KV038015	1	1	0
		KV038016	3	2	0
		KV038017	4	3	0
		KV038018	7	3	2
		KV038019	0	3	0
		KV038020	5	1	0
	KV039000	KV039001	1	10	1
	KV044000	KV044001	1	0	0
		KV044002	1	2	0
		KV044006	0	4	1
		KV044009	5	4	0
		KV044010	0	1	0
	KV047000	KV047001	0	2	0
		KV047006	6	5	1
	KV050000	KV050003	0	12	3
		KV050004	0	2	1

Species	Complex	Transect	Visit 1	Visit 2	Visit 3
		KV050006	0	3	1
		KV050007	0	3	0
		KV050008	0	3	2
	KV058000	KV058001	0	1	1
		KV058005	0	5	7
		KV058006	0	1	0
		KV058007	2	0	0
		KV058009	0	0	4
		KV058010	0	0	1
		KV058011	0	1	0
		KV058013	0	2	0
	KV061000	KV061001	0	5	0
		KV061003	0	9	0
	KV062000	KV062002	0	2	0
	KV063000	KV063001	0	3	3
		KV063002	0	2	0
		KV063003	0	1	0
		KV063005	0	2	0
	KV066000	KV066001	0	9	2
		KV066003	0	1	0
	KV069000	KV069002	0	3	0
		KV069003	0	8	0
		KV069004	0	1	0
		KV069005	0	1	0
	KV094000	KV094001	0	1	0
		KV094002	3	3	9
		KV094004	0	1	4
		KV094005	0	3	9
		KV094007	2	4	5
	KV097000	KV097001	0	0	2
		KV097002	0	0	1
		KV097004	0	5	0
		KV097005	0	2	0
		KV097006	1	6	0
		KV097008	0	2	0
		KV097009	0	3	0
		KV097010	0	3	4
		KV097011	0	2	0
		KV097012	3	4	0
	KV098000	KV098001	0	1	0
		KV098002	0	0	1

Species	Complex	Transect	Visit 1	Visit 2	Visit 3
	KV101000	KV101003	4	0	0
		KV101005	0	0	1
	KV102000	KV102002	1	3	0
	KV103000	KV103002	6	5	0
		KV103003	0	1	0
		KV103004	3	1	0
		KV103005	1	1	0
		KV103006	3	0	0
	KV107000	KV107001	0	0	1
		KV107002	0	0	1
		KV107003	0	6	0
		KV107004	0	0	6
		KV107005	0	3	1
		KV107007	0	0	5
		KV107008	0	0	1
	KV113000	KV113001	0	4	0
		KV113002	0	1	1
		KV113003	0	1	0
		KV113004	0	1	0
		KV113005	0	1	0
		KV113006	0	1	0
		KV113007	0	0	2
		KV113008	0	1	1
		KV113009	0	2	1
		KV113010	0	1	0
		KV113011	0	2	0
		KV113014	0	1	1
	KV116000	KV116001	0	4	2
	KV119000	KV119001	0	0	1
		KV119002	0	2	2
		KV119003	0	0	4
		KV119004	0	1	0
		KV119005	0	0	1
		KV119006	0	0	1
	KV622000	KV622000	3	2	0
	KV273000	KV273000	8	10	6
	KV1224000	KV1224000	1	2	0
	KV126000	KV1260000	6	0	1
	Total		**127**	**302**	**152**
Moose Calf	KV022000	KV022014	0	1	0
	KV039000	KV039001	0	2	0

Species	Complex	Transect	Visit 1	Visit 2	Visit 3
	KV044000	KV044002	0	1	0
		KV044009	0	1	0
	KV047000	KV047006	1	2	0
	KV050000	KV050007	0	1	0
	KV058000	KV058005	0	1	0
	KV097000	KV097006	0	3	0
		KV097010	0	0	1
		KV097012	0	2	0
	KV113000	KV113001	0	2	0
	Total		**1**	**16**	**1**
Black Bear	KV022000	KV022011	1	0	0
	KV036000	KV036017	0	0	1
	KV038000	KV038007	0	1	0
		KV038010	0	1	0
	KV050000	KV050005	0	1	0
	KV062000	KV062002	2	0	0
	KV107000	KV107001	0	0	1
		KV107005	0	2	0
		KV107008	0	0	1
	KV622000	KV622000	0	1	0
	Total		**3**	**6**	**3**
Gray Wolf	KV022000	KV022003	3	0	0
	KV036000	KV036012	0	0	1
	KV038000	KV038017	3	0	0
	KV050000	KV050007	0	1	0
	KV061000	KV061003	1	0	0
	KV063000	KV063003	0	1	0
	KV101000	KV101001	2	0	0
	KV107000	KV107005	0	0	1
	KV113000	KV113003	2	0	0
	Total		**11**	**2**	**2**

Table A-9: Number of Camera-days in Peatland Complexes, 2015–2023

Complex Type	Burned in 2013	Complex	2023	2022	2021	2020	2019	2018	2017	2016	2015
Project-affected	Yes	KV094000	153	154	0	169	166	150	146	153	155
		KV102000	153	154	154	164	166	149	145	106	155
		KV103000	152	154	161	164	166	128	51	154	164
		Total	458	462	315	497	498	427	447	413	474
	No	KV039000	154	154	147	176	166	152	149	81	149
		KV047000	159	155	153	165	166	153	146	104	152
		KV061000	157	155	146	165	166	148	149	153	152
		KV062000	155	155	154	176	166	148	64	105	108
		KV063000	158	155	154	176	166	148	152	153	151
		KV066000	158	155	149	168	166	148	154	153	144
		KV069000	158	155	149	168	166	148	153	147	144
		KV071000	160	89	149	172	166	148	145	152	144
		Total	1259	1,173	1,201	1,366	1,328	1,193	1,112	1,048	1,144
	Total		1717	1,635	1,516	1,863	1,826	1,620	1,642	1,557	1,618
Reference	Yes	KV098000	152	158	155	174	167	153	154	154	155
		KV116000	155	155	153	172	168	152	157	155	155
		KV119000	158	155	158	173	167	153	151	154	159
		KV597000	152	155	156	176	170	163	152	155	157
		Total	617	623	622	695	672	621	614	618	626
	No	KV023000	158	154	160	171	163	144	156	151	154
		KV037000	164	155	158	177	163	147	156	48	154
		KV050000	145	154	151	173	168	149	165	155	148
		KV058000	154	155	155	166	166	148	146	48	143

Complex Type	Burned in 2013	Complex	2023	2022	2021	2020	2019	2018	2017	2016	2015
		KV097000	157	156	154	173	168	152	164	155	154
		KV107000	156	155	153	172	168	143	164	155	158
		KV1260000	157	155	154	165	167	148	146	107	162
		KV1261000	157	155	154	165	167	148	146	155	162
Reference	No	Total	1248	1,239	1,239	1,362	1,330	1,179	1,243	974	1,235
	Total		1865	1,862	1,861	2,057	2,002	1,800	1,857	1,592	1,861
Random	Yes	KV036000	152	155	152	173	166	151	161	154	149
		KV1224000	156	155	154	112	167	145	158	155	169
		KV273000	152	155	149	173	169	528	152	155	157
		KV622000	152	155	146	173	169	528	148	143	156
		Total	612	620	601	631	671	1352	619	607	631
Random	No	KV022000	157	155	153	185	166	149	161	154	153
		KV038000	154	155	157	175	166	150	162	154	150
		KV044000	157	155	156	175	168	149	160	154	151
		KV101000	151	156	153	173	168	151	156	155	154
		KV113000	157	155	154	172	168	144	157	155	156
		Total	776	776	773	880	836	743	796	772	764
	Total		1,388	1,396	1,374	1,511	1,507	2,095	1,415	1,379	1,395

Table A-10: Period Over which Caribou Were Photographed in 23 Peatland Complexes, 2015–2022

Complex Type	Complex	2015	2016	2017	2018	2019	2020	2021	2022
Project	KV103000[1]								
	KV047000								
	KV061000								
	KV062000								
	KV063000						June 5		
	KV066000	June 11–Aug. 12	June 8	July 10–Aug. 20					
Reference	KV098000[1]						May 14		
	KV116000[1]								
	KV119000[1]								
	KV597000[1]								
	KV023000				July 4				
	KV050000		Sep. 8	Sep. 1	May 12				
	KV058000								
	KV097000	May 2–June 4			May 2–July 20	June 10–Aug. 31	June 20–Aug 31	May 1–3	May 11–July 24
	KV107000				May 27		Aug. 1	Apr. 21–July 12	Apr. 29–Aug. 6
	KV120000								
	KV121000								
Random	KV036000[1]							Sep. 12	
	KV123000[1]								
	KV124000[1]				June 30	May 8–July 15			
	KV022000								Apr. 27
	KV101000	May 2–Aug. 5	June 6–Aug. 26		June 30–Aug. 29	May 3–Aug. 7	June 1–July 28	June 8–12	May 15–Sept. 10

Complex Type	Complex	2015	2016	2017	2018	2019	2020	2021	2022
	KV113000	Aug. 30				May 3–Aug. 14	Aug. 26		Aug. 6–26

1. Burned in 2013.

Table A-11: Number of Large Mammal Signs Detected During Three Visits to Access Road Tracking Transects, 2023

Species	Access Road	Transect	Visit 1	Visit 2	Visit 3	Total
Caribou	North	N-23	3	1	0	4
		N-24	4	1	17	22
		N-34	0	1	1	2
		N-36	4	1	6	11
		N-38	2	11	2	15
		N-39	0	8	4	12
		N-40	0	0	1	1
		S-18	0	3	13	16
		S-42	0	7	0	7
		S-46	0	17	5	22
		S-51	0	0	20	20
		S-52	0	0	1	1
		S-53	0	0	2	2
	South	S-1	0	29	0	29
		S-10	0	10	0	10
		S-15	0	25	0	25
		S-16	0	14	16	30
		S-8	0	23	9	32
	Total		**13**	**151**	**97**	**261**
Caribou Calf	North	S-46	0	16	0	16
	South	S-8	0	5	0	5
	Total		**0**	**21**	**0**	**21**
Moose	North	N-23	15	37	14	66
		N-24	17	74	37	128
		N-34	25	29	22	76
		N-36	35	153	53	241
		N-38	11	48	9	68
		N-39	6	46	21	73
		N-40	3	38	15	56
		S-42	5	57	26	88
		S-46	30	12	5	47
		S-51	40	12	12	64
		S-52	3	32	3	38
		S-53	10	22	13	45
	South	S-1	28	14	9	51
		S-10	19	37	2	58
		S-15	18	22	2	42

		S-16	34	14	34	82
		S-18	33	8	27	68
		S-8	9	41	13	63
	Total		**341**	**696**	**317**	**1354**
Moose Calf	North	N-23	0	2	1	3
		N-34	1	0	2	3
		N-36	2	6	2	10
		N-38	0	2	0	2
		N-40	0	1	1	2
		S-42	0	1	0	1
		S-46	0	2	0	2
	South	S-16	2	0	1	3
		S-10	0	1	0	1
		S-8	0	2	0	2
	Total		**5**	**17**	**7**	**29**
Black Bear	North	N-24	1	1	3	5
		N-34	0	0	1	1
		N-36	0	1	0	1
		N-38	0	3	0	3
		N-39	0	3	0	3
		S-46	1	0	0	1
		S-51	1	0	0	1
		S-53	0	0	1	1
	South	S-1	0	0	1	1
		S-18	0	1	2	3
		S-8	0	1	1	2
	Total		**3**	**10**	**9**	**22**
Gray Wolf	North	N-23	4	0	0	4
		N-24	1	0	0	1
		N-34	1	1	0	2
		N-36	1	1	0	2
		N-38	2	0	0	2
		N-39	1	0	0	1
		N-40	0	1	0	1
		S-42	17	0	0	17
		S-46	3	0	1	4
		S-51	11	0	0	11
	South	S-10	1	0	0	1
		S-15	3	0	0	3
	Total		**45**	**3**	**1**	**49**