Keeyask Generation Project

Terrestrial Effects Monitoring Plan

Beaver Habitat Effects and Mortality Monitoring Report

TEMP-2021-07

KEEYASK

Manitoba Conservation and Climate Client File 5550.00
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2020 -2021

KEEYASK GENERATION PROJECT

TERRESTRIAL EFFECTS MONITORING PLAN

REPORT #TEMP-2021-07

BEAVER HABITAT EFFECTS AND MORTALITY 2020

Prepared for

Manitoba Hydro

By

Wildlife Resource Consulting Services MB, Inc.

June 2021

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SUMMARY

Background

Construction of the Keeyask Generation Project (the Project) at Gull Rapids began in July 2014 and the reservoir was impounded in early September 2020. 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.

This report describes the results of beaver habitat effects monitoring conducted during the fall of 2020, the seventh year of Project construction.

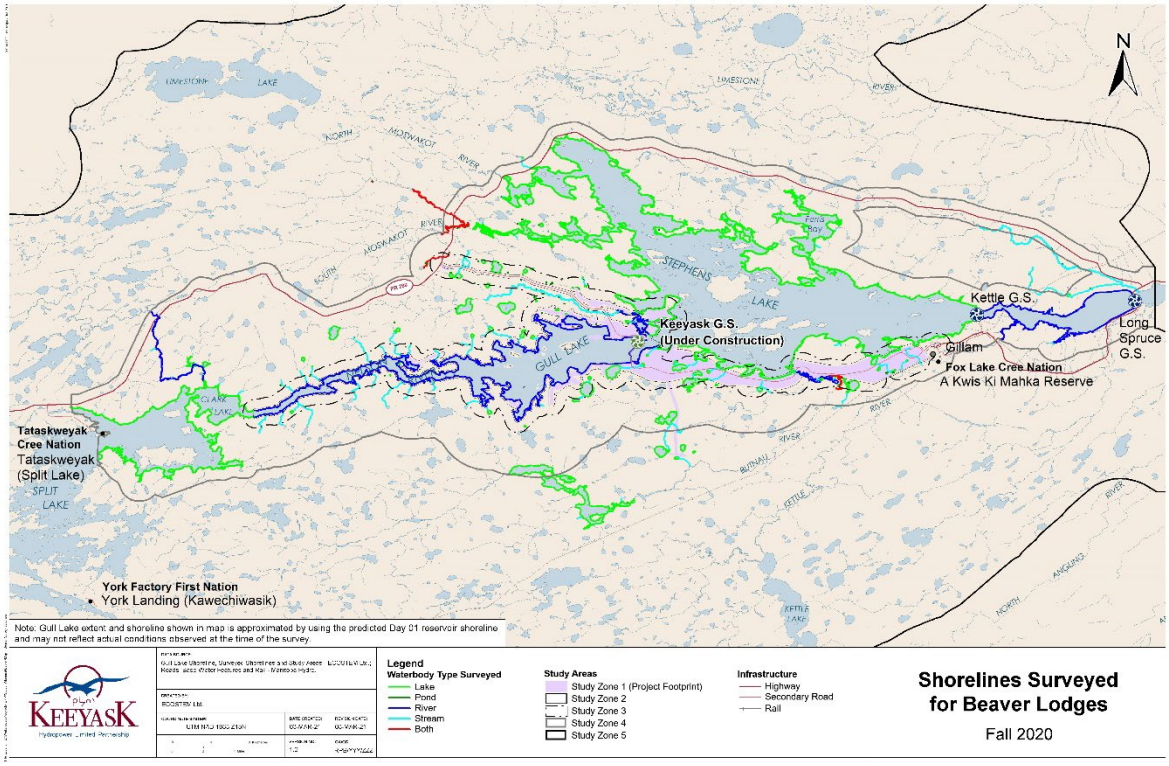
Why is the study being done?

Predicted Project effects on beavers included habitat loss or alteration, sensory disturbance, and increased mortality. Reservoir impoundment has resulted in a permanent loss of local beaver habitat as creeks, tributaries, and small ponds and lakes were flooded. The objective of the study is to monitor the regional beaver population to verify predicted Project effects.

Active Beaver Lodge in the Keeyask Region

What was done?

Aerial surveys along the shorelines of water bodies in Study Zone 4 (the Keeyask region; see map below) were conducted from October 6 to 11, 2020 to determine the number and location of active and inactive beaver lodges near the new reservoir and within the larger region. Characteristics of some beaver lodges observed during the aerial survey were also measured to establish a regional baseline and to explore whether the Project is affecting beaver lodges during construction and operation. Lodge characteristics in Study Zones 1–3 were compared with those in Study Zones 4–5 (see map below). Additional surveys were conducted daily from August 25 to September 4, 2020 to monitor beaver lodges shortly before and during reservoir impoundment.



What was found?

An estimated 23 beaver lodges were expected to be flooded as a result of reservoir impoundment, most of which were humanely trapped out during Project construction. Six active lodges were observed in the reservoir during the impoundment monitoring surveys, three of which were new in 2020 and were not observed in previous survey years and three of which were either not completely trapped out or were re-occupied in 2020. Thirteen active lodges and 16 inactive lodges beyond the reservoir area were also surveyed; all were intact.

During the fall 2020 aerial survey a total of 326 beaver lodges, including 304 standard lodges and 22 bank burrows, were observed. Of these, 85 standard lodges and 21 bank burrows were active. The number of active beaver lodges in Study Zone 1 (the Project footprint) declined during construction, from 34 in 2016 to 2 in 2020, due to the removal of beavers from lodges in the future

reservoir area as part of the Project's trapping program; tree clearing and noise disturbance in the future reservoir area, which likely reduced the quality of habitat nearby; the inundation of four lodges in the reservoir during impoundment; and another two lodges in the reservoir becoming inactive following impoundment.

No significant differences in lodge characteristics were observed in Study Zones 1–3 and 4–5.

What does it mean?

Beavers were successfully trapped out of most active lodges in the reservoir area prior to impoundment. Although there was a small local decrease in beaver lodges due to the Project in 2020, the density of beaver lodges in the Keeyask region was similar to the density before construction began. The regional density of beaver lodges was generally unchanged before the reservoir was impounded. No substantial Project-related effects on the regional beaver population were detected.

Where characteristics of active lodges were measured, there were no differences in lodge and cache sizes among study zones. This suggests that food and lodge materials were adequate throughout the region.

What will be done next?

Construction monitoring for beaver habitat effects has now concluded. A multi-year monitoring synthesis report will provide an evaluation of Project construction effects on beavers and their habitat using all results from this monitoring study.

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 Dr. James Ehnes of ECOSTEM Ltd. for GIS cartographic services. Biologists and other personnel who contributed to the study included:

- Robert Berger, Wildlife Resource Consulting Services MB Inc. (WRCS) – Design and report review, survey personnel
- Andrea Ambrose, WRCS – Data analysis and reporting
- Kevin McCrae, WRCS –Survey personnel
- Marissa Berard, WRCS – Survey personnel
- Leslie Flett, Tataskweyak Cree Nation – Boat operator/survey personnel

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1.0 INTRODUCTION

Construction of the Keeyask Generation Project (the Project), a 695-megawatt hydroelectric generating station (GS) and associated facilities, began in July 2014. The Project is located at Gull Rapids on the lower Nelson River in northern Manitoba where Gull Lake flows into Stephens Lake, 35 km upstream of the existing Kettle GS. Reservoir impoundment began August 31, 2020 and was completed on September 5, 2020.

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, beaver (*Castor canadensis*), during the construction phase.

The beaver is a medium-sized aquatic furbearer that inhabits waterbodies in forested areas. Beavers are common in the Regional Study Area (Study Zones 1–4) and are an important furbearer species, having cultural, economic, and ecological value (Keeyask Hydropower Limited Partnership [KHLP] 2012). By building dams and through their feeding activities, beavers alter aquatic ecosystems, increase the diversity of species and habitat on a landscape, and create habitat for other species that use wetlands (e.g., Naiman et al. 1988; Wright et al. 2002). Beavers do not typically inhabit the main channel of the Nelson River due to strong currents (KHLP 2012). However, the nearby creeks, ponds, and lakes provide suitable habitat.

Predicted Project effects on beavers included habitat loss or alteration, sensory disturbance, and increased mortality. Reservoir impoundment has resulted in a permanent loss of local beaver habitat as creeks, tributaries, and small ponds and lakes were flooded. Additional, long-term habitat loss due to shoreline erosion and peatland disintegration is anticipated. Water level fluctuations in the future reservoir will make any potential habitat along the shorelines unsuitable. However, the formation of floating peatlands in the reservoir could attract beavers to these habitats and temporarily increase their abundance in the reservoir. Once these peatlands break down, beavers will most likely abandon the reservoir and seek habitat in the surrounding area.

2.0 METHODS

2.1 RESERVOIR IMPOUNDMENT MONITORING

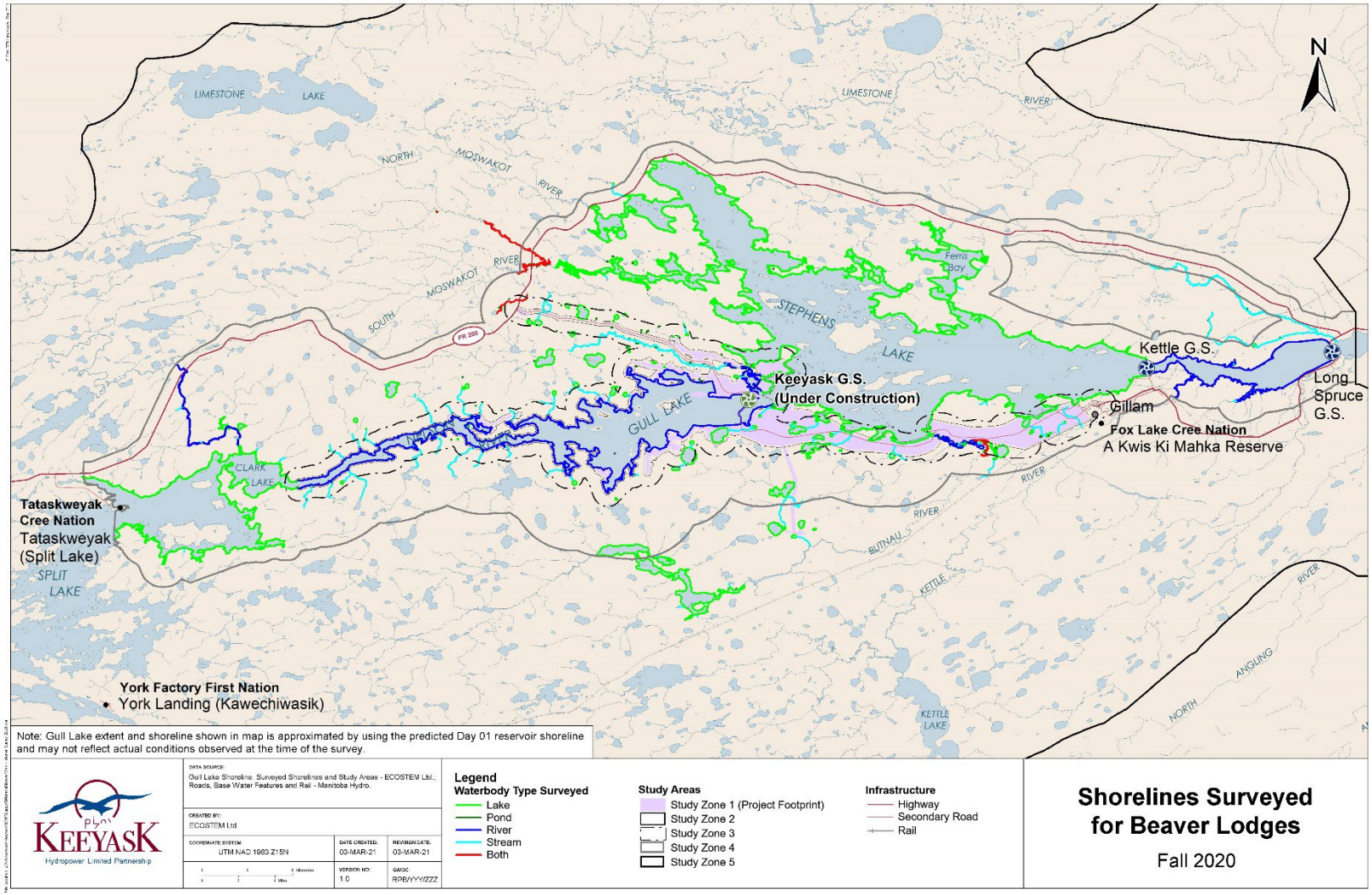
Pre-impoundment surveys for beaver were conducted daily from August 25 to 31, 2020. Impoundment of the reservoir started in the evening on August 31, 2020. Impoundment monitoring began September 1, 2020 and continued daily until September 4. Lodges in the approximate extent of the reservoir area ("the reservoir area") were surveyed by helicopter and their condition was recorded. Lodges beyond the reservoir area were also surveyed for comparison.

2.2 AERIAL SURVEY

Aerial surveys for construction-phase beaver monitoring began in 2016 and continued in 2017. The survey was expanded in 2018 and repeated in 2019 and 2020 along shorelines in waterbodies and waterways in the Regional Study Area (Study Zones 1–4; Map 1). In 2020, the survey was conducted after reservoir impoundment was complete and included the newly expanded Gull Lake shoreline.The density of beaver lodges along the survey route (lodges/km) was compared among study zones to explore potential Project effects in the reservoir area. Direct Project effects (habitat loss and alteration) were anticipated in Study Zone 1 (the Project footprint), while direct and indirect (e.g., sensory disturbance) Project effects were expected in Study Zones 2 and 3 which, along with Study Zone 1, comprised the Local Study Area. Study Zones 1–4 were the regional reference area for the beaver population.

From October 6 to 11, 2020 survey routes were flown in a Bell 206 Jet Ranger helicopter along preselected waterbodies and watercourses, at a speed of approximately 100 km/hr and approximately 50 m above ground level. Observers were stationed on the left side of the helicopter. Beaver lodge locations were recorded with a handheld Global Positioning System (GPS) unit and photographed. The presence of food caches and whether lodges were active or inactive was recorded. Beaver lodges were classified as either standard lodges or bank burrows. Standard lodges (Photo 1, Photo 2) are commonly freestanding conical mounds of branches and logs plastered with mud with one or more underwater openings to tunnels that meet at a cavity in the center of the mound (Novak 1999). Bank burrows (Photo 3) are dug into shoreline banks where the water is deep or fast, are often covered in sticks and mud, and are occasionally connected to an extensive underground network of tunnels (Novak 1999). Active beaver lodges were characterized by signs of lodge maintenance (fresh mud and timber), nearby recent foraging, and the presence and condition of a food cache (see Photo 1). Lodges lacking these characteristics were considered inactive (see Photo 2).

Waterbodies in Study Zone 4 were classified by size using a hybrid dataset created from shorelines produced by ECOSTEM Ltd. for the Nelson River and a few nearby lakes and with the National Topographic Data Base (NTDB) 1:50,000 dataset for the remainder of the study zone. Waterbodies larger than 0.5 km^2 were classified as lakes and those smaller than 0.5 km^2 were categorized as ponds. Watercourses appearing as dual polyline sections on a 1:50,000 topographic map were classified as rivers and those appearing as single polyline sections were classified as creeks. Some watercourses were temporarily categorized as 'both' (river and stream) as their classification was uncertain. Not all waterbodies and watercourses outside Study Zone 4 were classified to type.



Map 1: Shorelines Surveyed for Beaver Lodges, Fall 2020

Photo 1: Active Standard Beaver Lodge with Food Cache

Photo 2: Inactive Standard Beaver Lodge

Photo 3: Active Beaver Bank Burrow

A complete census of beaver lodges was conducted along shorelines within the Local Study Area (Study Zones 1–3), while a sample of waterbodies and watercourses was surveyed in Study Zone 4. A small portion of Study Zone 5 was also included, for a total of 1,611.6 km of shoreline surveyed (Table 1). Because the reservoir had been impounded at the time of the fall survey, the shoreline length surveyed in Study Zone 1 had changed from 235.2 km in 2018 and 2019 to 214.6 km in 2020. The decrease in survey length after impoundment was due to the loss of shoreline around inundated waterbodies in the reservoir, which was greater than the increase in reservoir shoreline. There was no change in the length of shoreline outside the Project footprint in 2020, where a total of 1,397.0 km was surveyed.

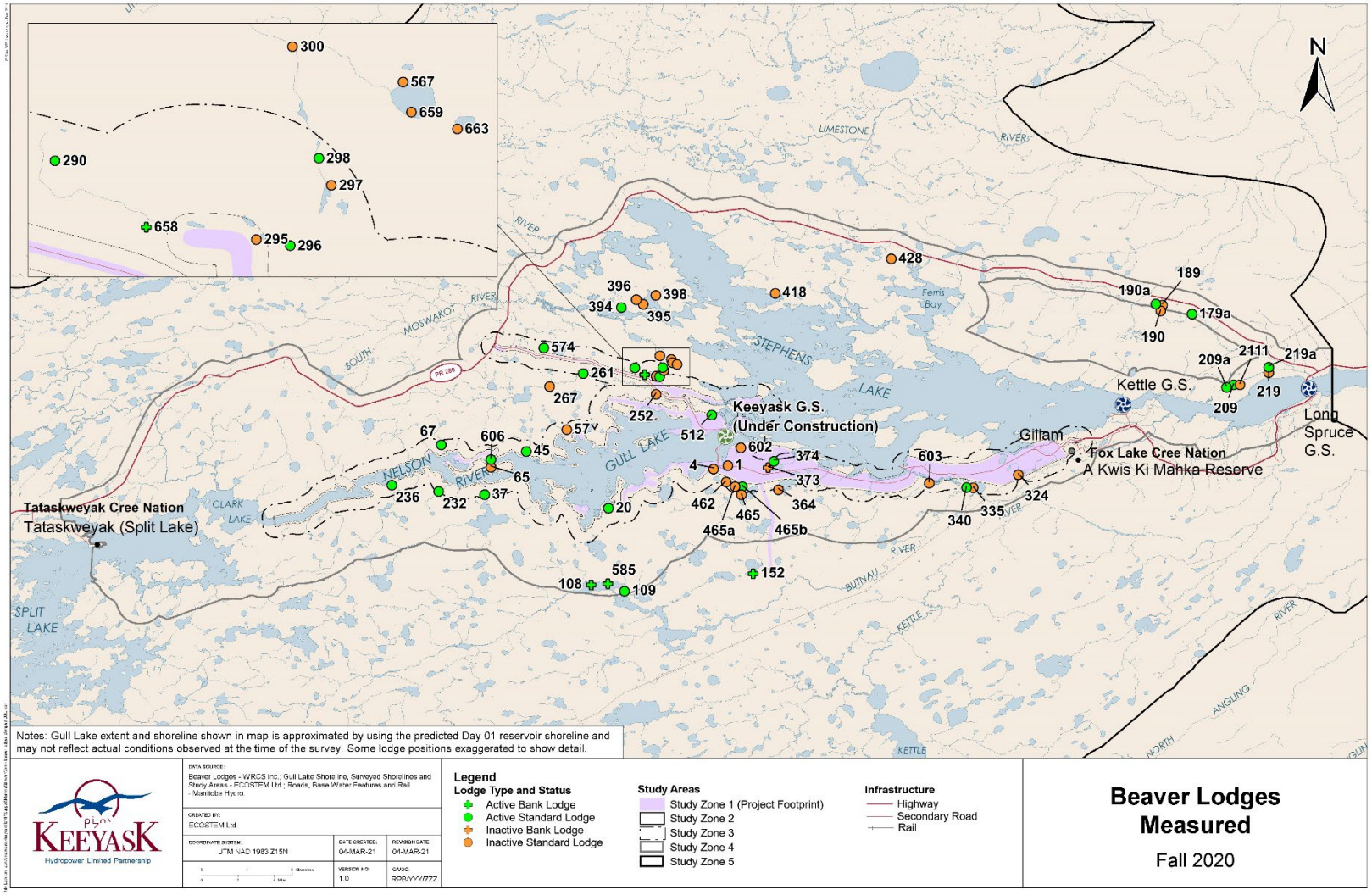
Table 1: Length of Shorelines Surveyed for Beaver Lodges, 2020

Study Zone	Length (km)
1 (Project footprint)	214.6
2	72.9
3	220.6
1–3 (Local Study Area)	508.1
4	1,003.5
1–4 (Regional Study Area)	1,511.6
5	100.0
1–5 Total	1,611.6

2.3 BEAVER LODGE CHARACTERISTICS

A sample of active and inactive standard lodges and bank burrows observed during the aerial survey was selected for measurement of lodge characteristics (Map 2). Lodges were visited from October 9 to 11, 2020. The length, width, and height of the above-water portion of each lodge was measured with a measuring tape. Water depth at the lodges was measured from the surface of the water to the point at which the lodge met the bottom of the waterbody. To calculate total lodge height, water depth was added to the above-water height of each lodge. Size measurements taken for beaver lodges were approximate due to their irregular shape. Lodge volume for standard lodges was based on a cubic structure by multiplying the length, width, and total height measurements, which is not a precise measure of actual lodge size but allowed relative comparisons among lodges. The volume of bank burrows is difficult to determine due to their subterranean construction and was not calculated.

Characteristics of the surrounding area were also recorded at beaver lodges. The width and length of the portion of food caches visible above the water were estimated from their associated lodges. The depth of food caches could not be measured from the lodges. At bank burrows, shoreline slope was measured in degrees with a clinometer from the edge of the water up the bank. Shoreline slope was not assessed at standard lodges as they were often far from shore. For standard lodges, the distance to nearest bank was measured from the shoreline over open water to the nearest portion of the beaver lodge. Bank burrows were, by definition, on the banks of shorelines. The general height of nearby trees was estimated, as was the distance to the nearest standing food source. To explore whether the Project affected beaver lodges during construction, lodge characteristics in Study Zones 1–3 were compared with lodges in Study Zones 4–5 using a Student's *t*-test. Statistical significance was determined at the $\alpha = 0.05$ level.



Map 2: Beaver Lodges Measured, Fall 2020

3.0 RESULTS

3.1 RESERVOIR IMPOUNDMENT MONITORING

An estimated 23 active lodges were expected to be flooded as a result of reservoir impoundment (KHLP 2012). While beavers were humanely trapped out of these lodges over several years to reduce potential starvation and drowning deaths during/after flooding (Wildlife Resource Consulting Services MB Inc. [WRCS] 2018, 2019, 2020), six active lodges were observed in the reservoir area (Map 3) during the impoundment monitoring surveys (Table 2). Three of the active lodges were new in 2020 and were not observed in previous survey years, while the other three had either not been completely trapped out or were re-occupied in 2020. Four of the six active lodges within the reservoir were submerged during impoundment and were not observed during the fall aerial survey; the remaining two had become inactive. Thirteen active lodges and 16 inactive lodges beyond the reservoir area were also surveyed. All were intact and food was being cached near active lodges.

Table 2: Active Beaver Lodges in the Approximate Extent of the Reservoir Area During Impoundment, 2020

Lodge	UTM	Previous Observations	Status During Fall Aerial Survey
17	15 V 350893 6247017	2018, 2019	Inactive
41	15 V 349788 6246612	2018, 2019	Submerged
51a	15 V 348102 6241330	2018, 2019	Submerged
604	15 V 362328 6244562	None	Inactive
605	15 V 357896 6249315	None	Submerged
607	15 V 348053 6240534	None	Submerged

A river otter (*Lontra canadensis*; Photo 4*)* and three young were also observed in the future reservoir area on August 29, 2020, during pre-impoundment surveys.

Photo 4: River Otter in the Future Reservoir Area

3.2 AERIAL SURVEY

A total of 326 beaver lodges, including 304 standard lodges and 22 bank burrows were observed along the survey route during the fall 2020 aerial survey (Map 4 to Map 7). Eighty-five standard lodges were active and 219 were inactive. All bank burrows but one were active. Other lodges (n = 112) were observed off the survey route and were treated as incidental; all beaver lodges observed during the fall aerial survey are listed in Appendix 1, Table 1-1.

In 2020, the density of active lodges was 0.07 lodges/km and of inactive lodges was 0.14 lodges/km in Study Zones 1–5. In each of Study Zones 1 to 4 the density of active beaver lodges was lower in 2020 than in previous study years throughout the study area (Table 3). The decline in Study Zone 1 (the Project footprint) was due mainly to the submergence of four lodges as a result of flooding. There were two additional active lodges in the Project footprint that were beyond the reservoir area. The density of inactive lodges in Study Zone 1 also declined in 2020, because of lodge submergence during impoundment.

There was no change in the length of shoreline surveyed outside Study Zone 1 from 2018 to 2020. In Study Zones 2, 3, and 4, there was relatively little change in active lodge density over the three-year study period. There was also relatively little variation in the density of inactive lodges outside Study Zone 1.

Table 3: Number and Density of Beaver Lodges in Study Zones 1 to 5, 2018 to 2020

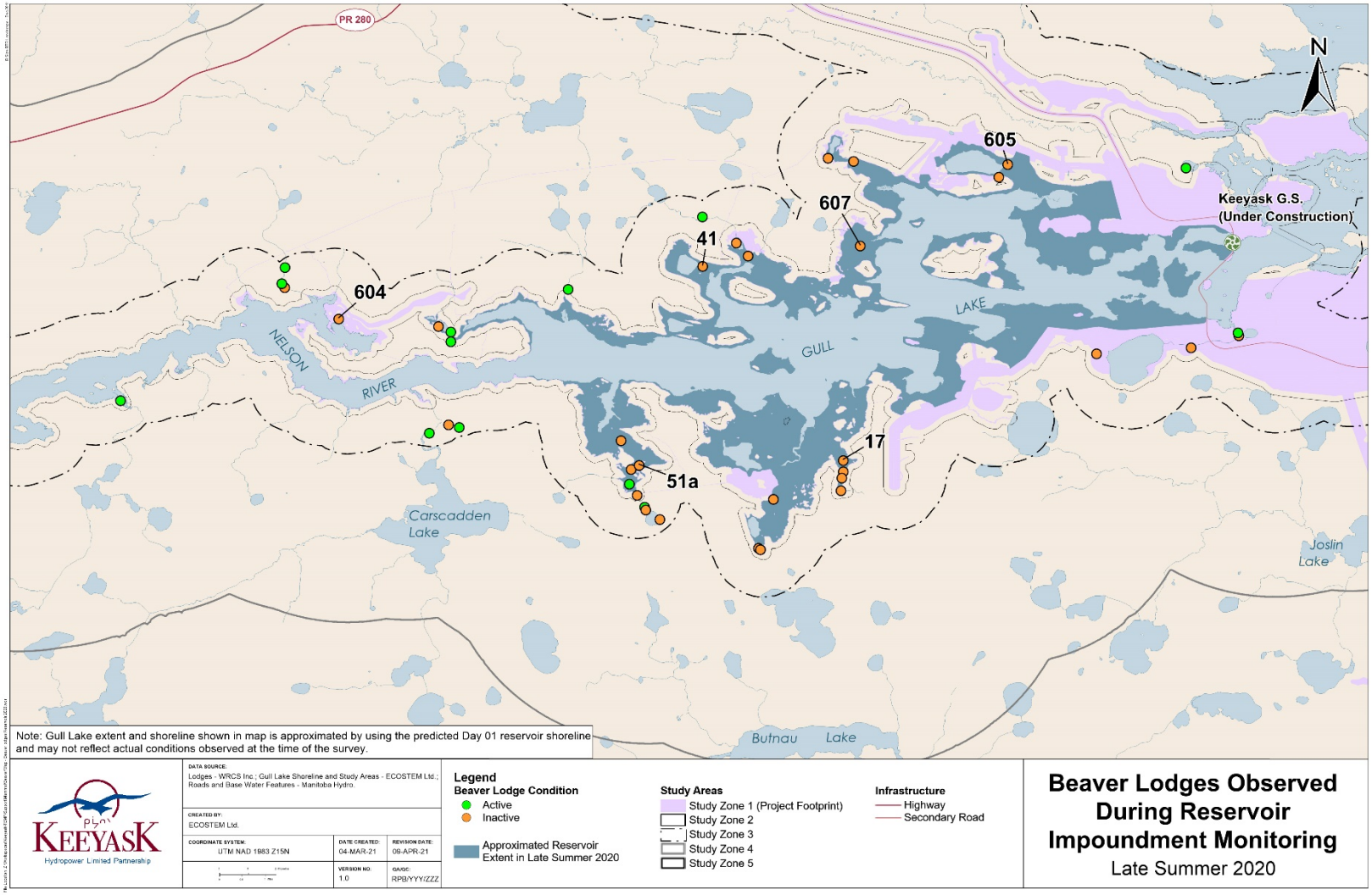
Study Zone	Lodge Status	2018		2019		2020	
		Number of Lodges	Density (lodges/km)	Number of Lodges	Density (lodges/km)	Number of Lodges	Density (lodges/km)
1	Active	4	0.02	7	0.03	2	0.01
	Inactive	28	0.12	37	0.16	15	0.07
2	Active	4	0.05	7	0.10	2	0.03
	Inactive	6	0.08	10	0.14	11	0.15
3	Active	47	0.21	42	0.19	33	0.15
	Inactive	43	0.19	78	0.35	72	0.33
1–3	Active	55	0.10	56	0.11	37	0.07
	Inactive	77	0.15	125	0.24	98	0.19
4	Active	59	0.06	56	0.06	51	0.05
	Inactive	60	0.06	104	0.10	78	0.08
1–4	Active	114	0.07	112	0.07	88	0.06
	Inactive	137	0.09	229	0.15	176	0.12
5	Active	29	0.29	30	0.30	18	0.18
	Inactive	35	0.35	56	0.56	44	0.44
1–5	Active	143	0.09	142	0.09	106	0.07
	Inactive	172	0.11	285	0.17	220	0.14

While the density of active beaver lodges in Study Zones 1–3 (the Local Study Area) and Study Zones 1–4 (the Regional Study Area) was slightly reduced in 2020 after reservoir impoundment, the number of lodges in both study areas was comparable to or greater than the number of lodges in 2001 and 2003, before Project construction began (Table 4).

Table 4: Number and Density (lodges/km) of Active Beaver Lodges in the Local (Study Zones 1–3) and Regional (Study Zones 1–4) Study Areas Before (2001, 2003) and During (2018–2020) Project Construction

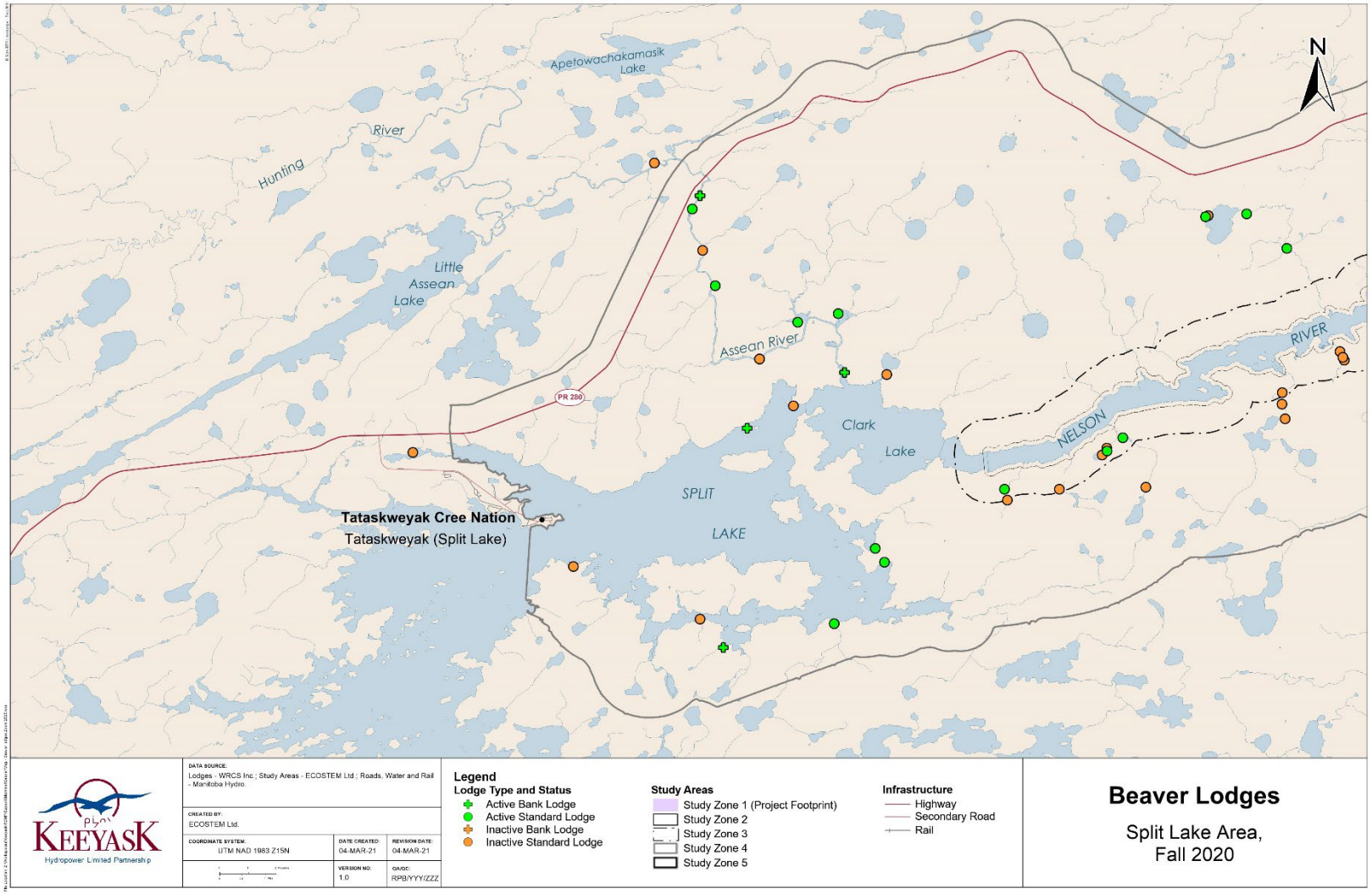
Study Zone	2001[1]		2003[1]		2018		2019		2020	
	Number	Density	Number	Density	Number	Density	Number	Density	Number	Density
1–3	39	0.12	16	0.08	55	0.10	56	0.11	37	0.07
1–4	97	0.11	52	0.08	117	0.07	112	0.07	88	0.06

1. KHLP (2012).

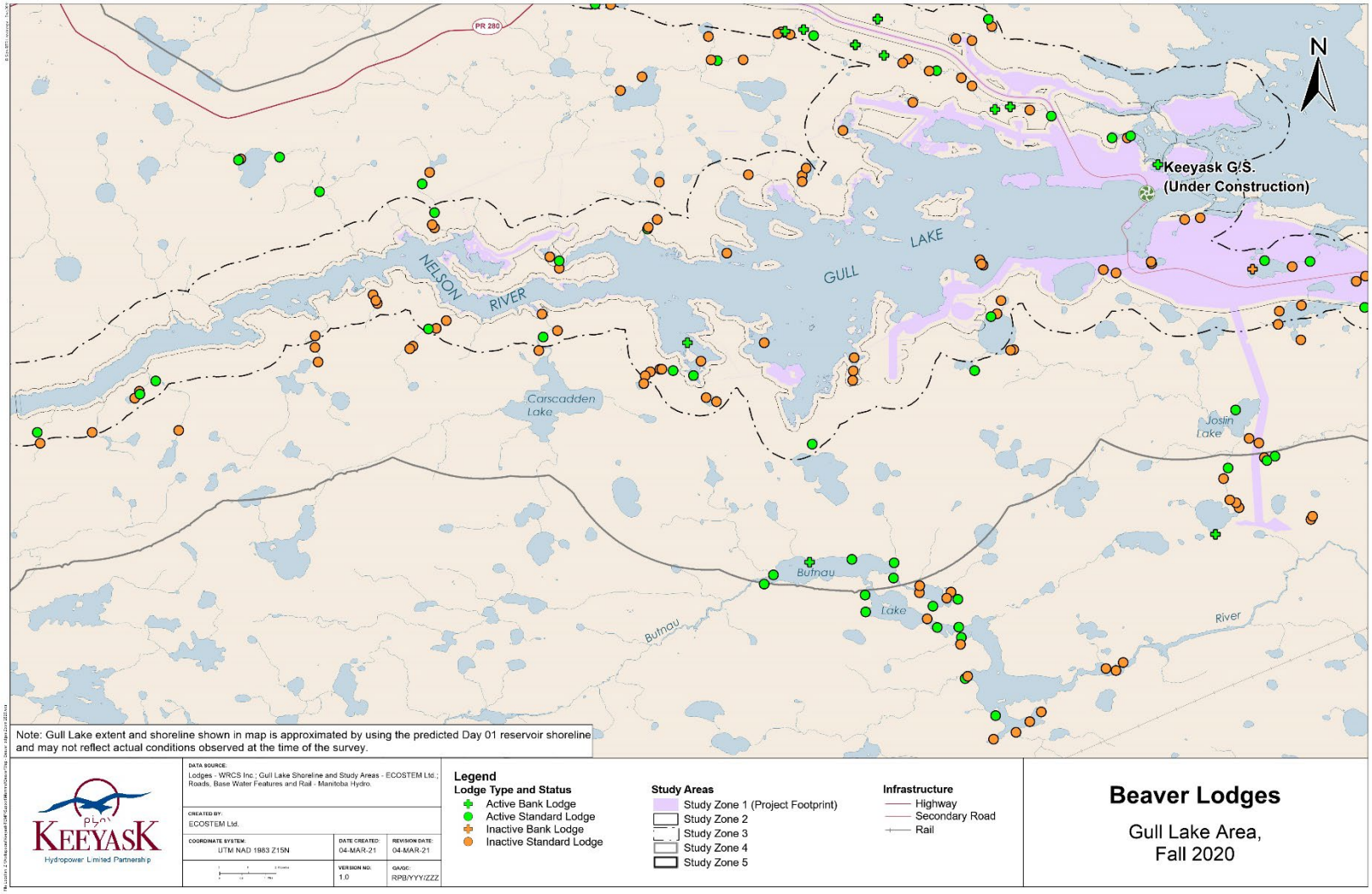


NOTE: Numbered lodges were active during pre-impoundment surveys.

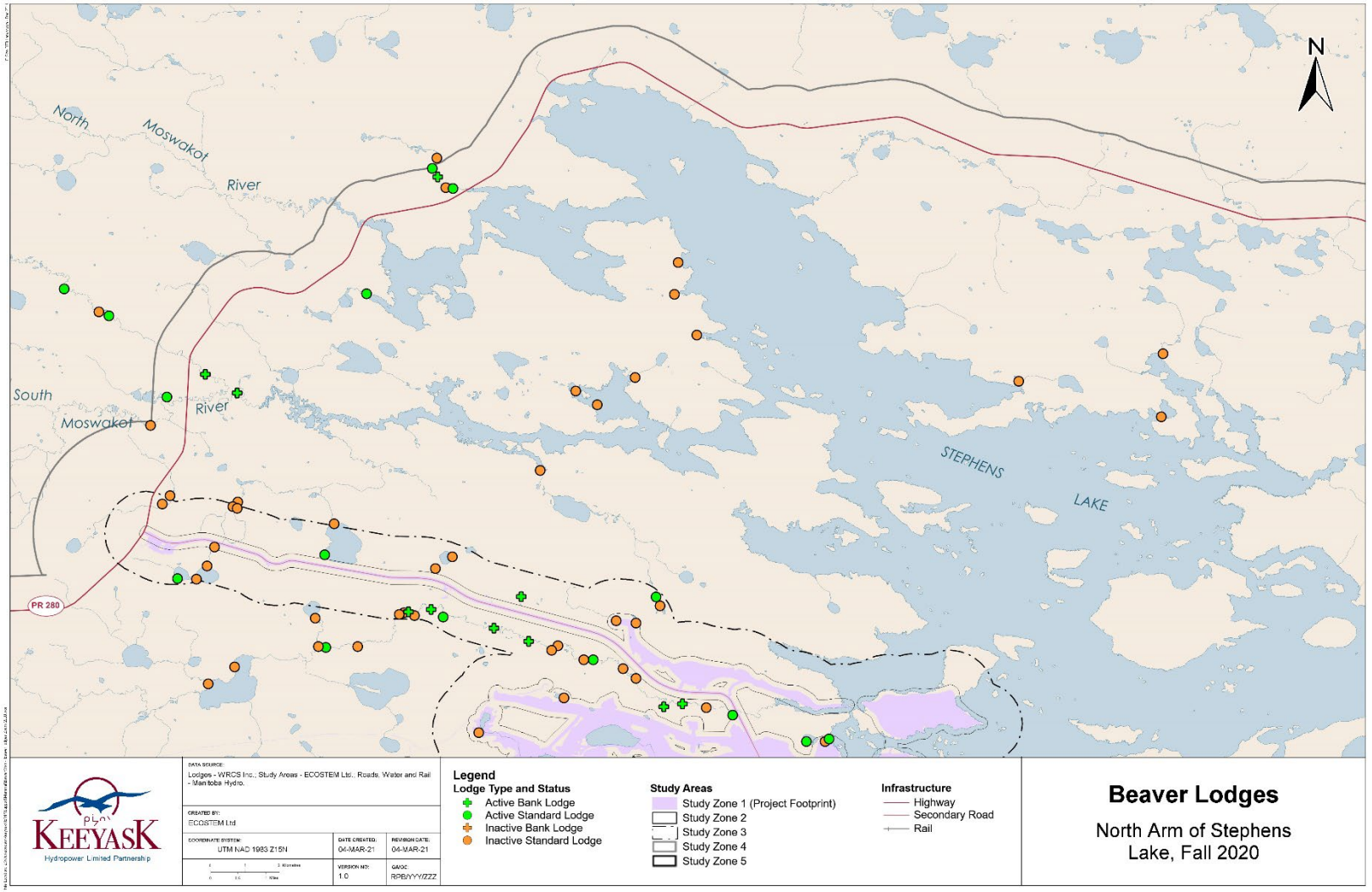
Map 3: Beaver Lodges Observed During Reservoir Impoundment Monitoring, Late Summer 2020



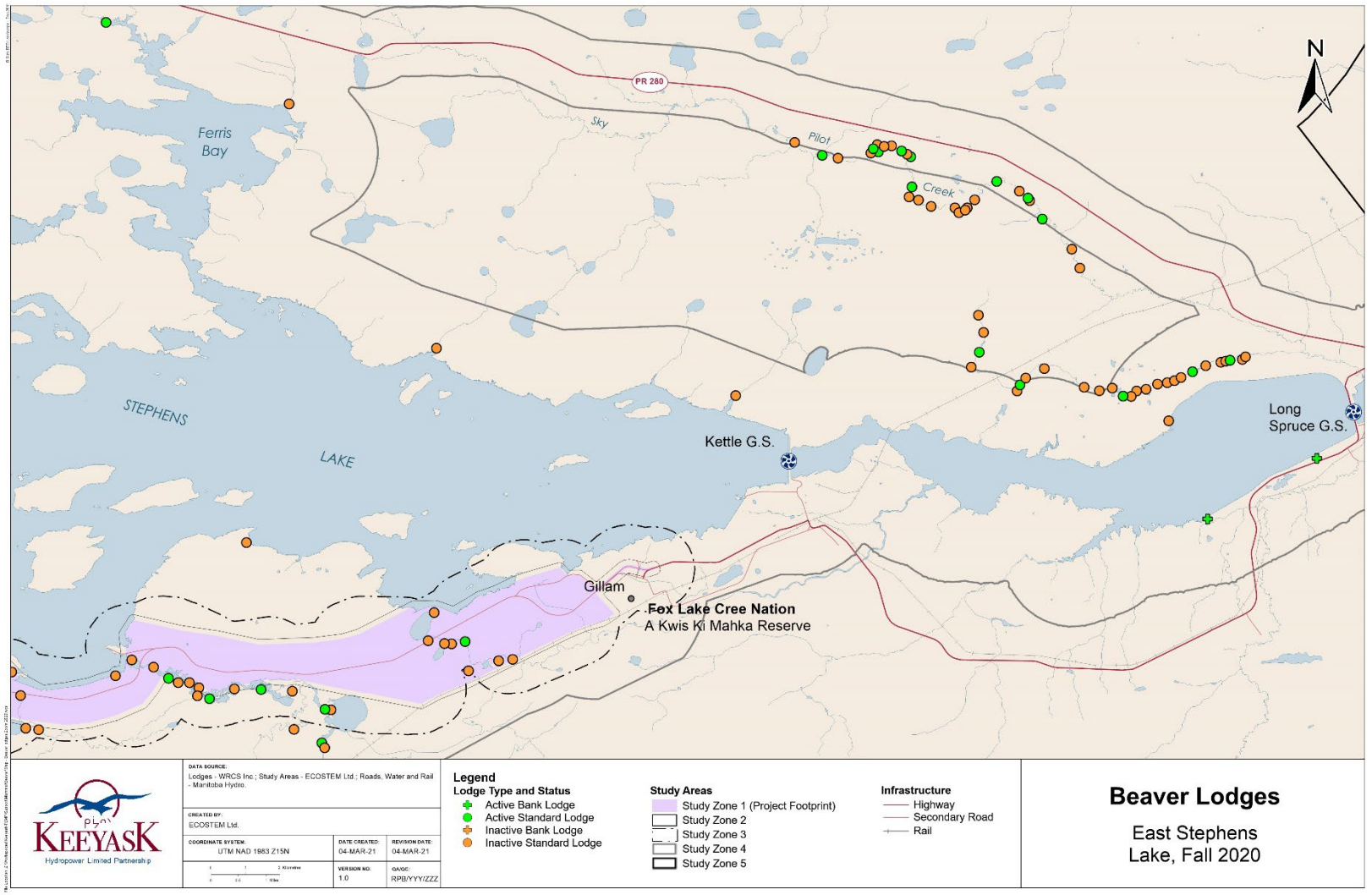
Map 4: Locations of Beaver Lodges in the Split Lake Area, Fall 2020



Map 5: Locations of Beaver Lodges in the Gull Lake Area, Fall 2020



Map 6: Locations of Beaver Lodges in the North Arm of Stephens Lake, Fall 2020



Map 7: Locations of Beaver Lodges in East Stephens Lake, Fall 2020

3.3 BEAVER LODGE CHARACTERISTICS

During the fall 2020 beaver lodge ground survey, characteristics of 58 beaver lodges in Study Zones 1 through 5 were measured and described (Appendix 2, Table 2-1). Of these, 53 were standard lodges and 5 were bank burrows. Twenty-three of the standard lodges were active and 30 were inactive. Four active bank burrows and one inactive burrow were measured.

Sixteen active standard lodges were measured in Study Zones 1–3 and seven were measured in Study Zones 4–5. On average, characteristics of active standard lodges in Study Zones 1–3 were not significantly different from active standard lodges in Study Zones 4–5 (Table 5). Thirteen inactive standard lodges were measured in Study Zones 1–3 and 17 were measured in Study Zones 4–5. There was no significant difference in characteristics of inactive standard lodges between Study Zones 1–3 and Study Zones 4–5 (Table 6). While characteristics of bank lodges were measured (Table 7), no statistical comparisons were made due to the small sample size.

Table 5: Comparisons Between Active Standard Lodge Characteristics in Study Zones 1–3 and 4–5, 2020

	Study Zones 1–3		Study Zones 4–5			
Lodge Characteristics	**X**	**SD**	**X**	**SD**	**t**	**p**
Lodge volume (m^3)	92.1	63.0	74.2	49.0	2.08	0.51
Distance to nearest shore (m)	31.6	24.9	51.1	28.5	2.08	0.11
Tree height (m)	16.3	5.5	16.6	5.1	2.08	0.92
Shrub height (m)	2.6	3.4	1.7	1.0	2.09	0.36
Distance lodge to food (m)	25.1	36.7	62.9	72.0	2.36	0.23
Food cache size (m^2)	19.1	10.0	36.2	34.5	2.26	0.18

Table 6: Comparisons Between Inactive Standard Lodge Characteristics in Study Zones 1–3 and 4–5, 2020

	Study Zones 1–3		Study Zones 4–5			
Lodge Characteristics	**X**	**SD**	**X**	**SD**	**t**	**p**
Lodge volume (m^3)	56.0	28.5	74.0	51.4	2.06	0.23
Distance to nearest shore (m)	31.7	24.1	35.4	19.3	2.05	0.64
Tree height (m)	17.2	4.7	14.4	5.0	2.04	0.13
Shrub height (m)	2.0	0.5	1.8	1.0	2.06	0.52
Distance lodge to food (m)	41.8	24.5	66.9	62.6	2.07	0.15

Table 7: Characteristics of Beaver Bank Lodges in Study Zones 1–3 and 4–5, 2020

Study Zone	Lodge Status	Number of Lodges	Average Shoreline Slope (°)	Average Tree Height (m)	Average Shrub Height (m)	Average Distance Lodge to Food (m)	Average Cache Size (m^2)
1–3	Active	1	40	6	2	0	24
	Inactive	1	10	16	1	72	–
4–5	Active	3	17	14	3	0	28

4.0 DISCUSSION

The number of active beaver lodges observed in the Project footprint (Study Zone 1) during the fall aerial survey declined during construction, from 34 in 2016 (WRCS 2018) to 2 in 2020, due to the removal of beavers from lodges in the future reservoir area as part of the Project's trapping program (WRCS 2018, 2020); tree clearing and noise disturbance in the future reservoir area, which likely reduced the quality of habitat nearby; the inundation of four lodges in the reservoir during impoundment; and another two lodges in the reservoir becoming inactive following impoundment.

The density of active beaver lodges was relatively consistent in the Local Study Area (Study Zones 1–3) and the Regional Study Area (Study Zones 1–4) during the pre-construction (2001, 2003) and construction monitoring (2018, 2019) periods, despite the ongoing removal of beavers from the future reservoir area from 2017 to 2019. As such, Project effects did not appear to extend beyond the Project footprint during construction.

Following reservoir impoundment in early September 2020, there was a slight decline in the density of active beaver lodges in the Local and Regional study areas, due at least in part to the submergence of the few remaining lodges in the reservoir area. Although it is unclear what happened to beaver in the few lodges that were submerged, it is likely that they moved out of the reservoir and found other suitable habitat nearby. The density of active lodges in the Local Study Area fluctuated over the pre-construction and construction periods. While active lodge density was lowest after reservoir impoundment in 2020 (0.07 lodges/km), it was comparable to that in 2003 (0.08 lodges/km), before construction began. The density of active lodges in the Regional Study Area declined somewhat over the pre-construction and construction periods but there was little variation after 2001. No substantial decline in the density of active lodges was observed from the pre-construction to construction period, suggesting that reservoir impoundment had a small effect on the Local or Regional beaver population in 2020.

While active lodge density declined in the Regional and Local study areas, lodge characteristics were not significantly different in Study Zones 1–3 and 4–5. This suggests that the availability of food and lodge materials was adequate in both areas, since no differences in lodge or cache size could be detected. However, food caches were not measured in three dimensions (only width and length could be measured) and it is possible that some food caches were significantly larger than others. Consequently, confidence that food cache size was not statistically different in Study Zones 1–3 and Study Zones 4–5 is low.

5.0 SUMMARY AND CONCLUSIONS

Beavers were successfully trapped out of most known active lodges in the future reservoir area prior to impoundment. The density of active beaver lodges was relatively consistent in the Local and Regional study areas from 2001 to 2019, then declined after reservoir impoundment in 2020 due mainly to the submergence of four remaining lodges. No substantial Project-related effects on the regional beaver population were detected.

Where characteristics of active lodges were measured, there were no differences in lodge and cache sizes among study zones. This suggests that food and lodge materials were adequate throughout the study area.

Construction monitoring for beaver habitat effects has concluded. A multi-year monitoring synthesis report will provide an integrated evaluation of Project construction effects on beaver numbers and location and the availability of suitable habitat using all results from this monitoring study.

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APPENDIX 1:
AERIAL SURVEY OBSERVATIONS 2020

Table 1-1: Location and Status of Beaver Lodges Observed During the Fall 2020 Aerial Survey

Study Zone	Waterbody Type	Lodge Status	Lodge Type	Lodge	Observed in 2018	Observed in 2019	Observed in 2020	UTM
1 (Project footprint)	Lake	Inactive	Standard	10	✓	✓	✓	15 V 350340 6241985
				13	✓	✓		15 V 351400 6239812
				40	✓	✓	✓	15 V 342769 6245016
				42	✓	✓		15 V 350893 6247017
				42a	✓	✓		15 V 350894 6247016
				46	✓	✓	✓	15 V 353122 6249484
				47	✓	✓		15 V 356235 6249205
				48	✓	✓		15 V 357659 6248977
				61	✓	✓		15 V 349495 6244954
				90	✓	✓		15 V 351017 6239887
				294	✓	✓	✓	15 V 357113 6252729
				305	✓	✓	✓	15 V 355593 6250487
				316	✓	✓	✓	15 V 358077 6244726
				479		✓		15 V 351273 6239255
				544		✓		15 V 353342 6249485
	River	Active	Standard	236	✓	✓		15 V 334324 6243045
				606			✓	15 V 355593 6250487
		Inactive	Standard	7	✓	✓	✓	15 V 357953 6244918
				22	✓	✓		15 V 347053 6242142
				33	✓	✓	✓	15 V 342489 6242996
				41	✓	✓		15 V 349788 6246612
				49	✓			15 V 360821 6245253
				50	✓			15 V 349836 6243243
				52	✓			15 V 347692 6242573
				423	✓	✓		15 V 350997 6246887
				473		✓	✓	15 V 358014 6244765
				475		✓		15 V 351943 6241349
				476		✓		15 V 351844 6241297

Study Zone	Waterbody Type	Lodge Status	Lodge Type	Lodge	Observed in 2018	Observed in 2019	Observed in 2020	UTM
1	River	Inactive	Standard	539			✓	15 V 349018 6245146
(Project				604			✓	15 V 340125 6245213
footprint)	Stream	Active	Standard	24	✓	✓		15 V 347731 6241880
				26	✓	✓	✓	15 V 347840 6240828
			Bank	51a	✓	✓		15 V 348102 6241330
				88	✓			15 V 351618 6240248
		Inactive	Standard	17	✓	✓	✓	15 V 353522 6241457
				18	✓	✓		15 V 353521 6241424
				19	✓	✓		15 V 353529 6241161
				20	✓	✓	✓	15 V 353486 6240991
				21	✓	✓		15 V 351673 6240424
				23	✓	✓		15 V 347618 6241985
				25	✓	✓		15 V 347886 6241224
				27	✓	✓		15 V 348054 6240533
				51	✓	✓	✓	15 V 348102 6241330
				89	✓	✓		15 V 351560 6240039
				211	✓	✓	✓	15 V 353468 6240653
				474		✓		15 V 353073 6241744
				477		✓		15 V 351732 6241005
				478		✓		15 V 351835 6240671
	Unknown	Inactive	Standard	14	✓	✓		15 V 351273 6239131
				15	✓			15 V 351355 6239079
				29	✓			15 V 348739 6241404
				43	✓	✓		15 V 353799 6249401
				315	✓	✓		15 V 360221 6244857
				458		✓	✓	15 V 365747 6246397
				480		✓	✓	15 V 351325 6239087
2	Lake	Active	Standard	514		✓	✓	15 V 363288 6249298
		Inactive	Standard	65	✓	✓	✓	15 V 343104 6244610
				66	✓			15 V 343099 6244888

Study Zone	Waterbody Type	Lodge Status	Lodge Type	Lodge	Observed in 2018	Observed in 2019	Observed in 2020	UTM
2	Lake	Inactive	Standard	318	✓	✓	✓	15 V 388542 6244813
				513		✓	✓	15 V 363171 6249221
			Bank	373	✓	✓	✓	15 V 367593 6244584
	Pond	Inactive	Standard	295	✓	✓	✓	15 V 357687 6252666
	River	Active	Standard	79	✓			15 V 329558 6242865
			Bank	444		✓		15 V 384569 6243606
		Inactive	Standard	80	✓			15 V 329530 6242840
				307	✓	✓	✓	15 V 364015 6244850
				492		✓		15 V 334453 6243094
	Stream	Active	Standard	565		✓	✓	15 V 360491 6249991
			Bank	248	✓			15 V 360668 6250126
		Inactive	Standard	353	✓	✓	✓	15 V 376700 6243224
				360	✓	✓	✓	15 V 372670 6243769
				441		✓	✓	15 V 389022 6244733
				455		✓	✓	15 V 371590 6244337
	Unknown	Inactive	Standard	2	✓	✓	✓	15 V 360253 6244291
				306	✓	✓	✓	15 V 355212 6250778
				359	✓	✓	✓	15 V 374056 6243541
				553		✓	✓	15 V 345449 6254876
				612			✓	15 V 380349 6244414
3	Lake	Active	Standard	37	✓	✓	✓	15 V 342531 6242185
				274	✓	✓		15 V 348138 6253402
				282	✓	✓	✓	15 V 348647 6254648
				289	✓			15 V 352816 6254603
				340	✓	✓	✓	15 V 385550 6242826
				374	✓	✓	✓	15 V 368019 6244891
				465a		✓	✓	15 V 365072 6242911
				481		✓	✓	15 V 352037 6238394
				485		✓		15 V 348275 6240142
				512		✓	✓	15 V 362628 6249222

Study Zone	Waterbody Type	Lodge Status	Lodge Type	Lodge	Observed in 2018	Observed in 2019	Observed in 2020	UTM
3	Lake	Active	Standard	555		✓	✓	15 V 344370 6253959
				574		✓	✓	15 V 347759 6255157
				616			✓	15 V 358350 6242909
			Bank	446		✓		15 V 385394 6243203
				642			✓	15 V 364251 6248278
		Inactive	Standard	28	✓	✓	✓	15 V 348651 6239895
				60	✓	✓		15 V 348847 6248304
				287	✓	✓	✓	15 V 351858 6254251
				288	✓	✓		15 V 352816 6254603
				297	✓	✓	✓	15 V 358384 6253168
				308	✓	✓	✓	15 V 358705 6243474
				309	✓	✓	✓	15 V 358570 6243005
				317	✓	✓	✓	15 V 388721 6245630
				326	✓	✓	✓	15 V 379931 6244256
				333	✓	✓	✓	15 V 382911 6243420
				335	✓	✓	✓	15 V 385725 6242805
				342	✓	✓		15 V 385001 6243549
				352	✓	✓	✓	15 V 379456 6243798
				354	✓	✓	✓	15 V 376260 6242455
				355	✓	✓	✓	15 V 376202 6242220
				356	✓	✓	✓	15 V 376851 6242273
				357	✓	✓	✓	15 V 377230 6242231
				358	✓	✓	✓	15 V 376445 6243911
				356a	✓	✓	✓	15 V 376851 6242273
				367	✓	✓	✓	15 V 368538 6243100
				368	✓	✓	✓	15 V 369321 6243305
				370	✓	✓	✓	15 V 371260 6244156
				372	✓	✓	✓	15 V 369000 6244670
				461		✓	✓	15 V 357753 6242019
				463		✓	✓	15 V 364205 6243313

Study Zone	Waterbody Type	Lodge Status	Lodge Type	Lodge	Observed in 2018	Observed in 2019	Observed in 2020	UTM
3	Lake	Inactive	Standard	464		✓	✓	15 V 364329 6243277
				465		✓	✓	15 V 365072 6242911
				465b		✓	✓	15 V 365072 6242911
				467		✓	✓	15 V 365556 6242519
				468		✓	✓	15 V 365644 6242427
				469		✓	✓	15 V 366533 6242798
				484		✓		15 V 348250 6240220
				541		✓	✓	15 V 351681 6247888
				543		✓	✓	15 V 351821 6248160
				552			✓	15 V 345232 6254321
				554		✓	✓	15 V 344922 6253935
				573		✓	✓	15 V 352353 6254587
				619			✓	15 V 348288 6240042
				622			✓	15 V 328103 6240022
				641			✓	15 V 351684 6247677
				655			✓	15 V 343928 6256120
			Bank	91	✓			15 V 352068 6238360
				369	✓	✓		15 V 369910 6243415
	Pond	Active	Bank	657			✓	15 V 354349 6253427
		Inactive	Standard	452		✓		15 V 384348 6243452
				577		✓	✓	15 V 345980 6256049
	River	Active	Standard	328	✓	✓	✓	15 V 380998 6243723
				332	✓			15 V 382853 6243455
				334	✓	✓		15 V 383089 6243526
				343	✓			15 V 384688 6242629
				346	✓			15 V 383688 6243499
				347	✓	✓	✓	15 V 382191 6243133
				443		✓	✓	15 V 383688 6243397
			Bank	341	✓			15 V 384905 6243221
		Inactive	Standard	327	✓	✓	✓	15 V 380564 6244053

Study Zone	Waterbody Type	Lodge Status	Lodge Type	Lodge	Observed in 2018	Observed in 2019	Observed in 2020	UTM
3	River	Inactive	Standard	329	✓	✓	✓	15 V 381283 6243596
				330	✓	✓	✓	15 V 381604 6243597
				331	✓	✓	✓	15 V 381884 6243449
				345	✓	✓		15 V 384152 6243145
				445		✓	✓	15 V 384600 6243353
				534		✓		15 V 329818 6243756
				603			✓	15 V 381839 6243213
	Stream	Active	Standard	45	✓	✓	✓	15 V 346215 6246002
				56	✓	✓		15 V 350001 6247788
				58	✓			15 V 349787 6247922
				67	✓	✓	✓	15 V 338695 6246581
				70	✓	✓		15 V 335821 6245626
				82	✓			15 V 328951 6243756
				226	✓	✓	✓	15 V 347120 6240994
				232	✓	✓	✓	15 V 338480 6242468
				249	✓			15 V 359449 6250277
				251	✓			15 V 357444 6250894
				254	✓	✓	✓	15 V 356439 6251595
				257	✓			15 V 354000 6252462
				259	✓	✓	✓	15 V 352084 6252841
				260	✓			15 V 351464 6253094
				298	✓	✓	✓	15 V 358267 6253420
				320	✓	✓	✓	15 V 389621 6244789
				363	✓	✓	✓	15 V 371557 6243233
				371	✓	✓	✓	15 V 369628 6244855
				496		✓	✓	15 V 328835 6240626
				623			✓	15 V 328281 6240165
				624			✓	15 V 324658 6238808
				647			✓	15 V 354975 6252210
			Bank	35	✓		✓	15 V 347627 6241981

Study Zone	Waterbody Type	Lodge Status	Lodge Type	Lodge	Observed in 2018	Observed in 2019	Observed in 2020	UTM
3	Stream	Active	Bank	250	✓	✓	✓	15 V 358494 6250228
				256	✓	✓	✓	15 V 354572 6252133
				258	✓	✓		15 V 353436 6252532
				560		✓	✓	15 V 351736 6253055
				566		✓		15 V 361164 6249895
				601			✓	15 V 353562 6252511
				645			✓	15 V 359033 6250315
				648			✓	15 V 354834 6251901
				649			✓	15 V 354391 6252354
				650			✓	15 V 354247 6252437
				652			✓	15 V 351081 6252986
		Inactive	Standard	1	✓	✓	✓	15 V 364033 6244770
				3	✓	✓	✓	15 V 362328 6244562
				4	✓	✓	✓	15 V 362770 6244449
				34	✓			15 V 342802 6242456
				38	✓	✓	✓	15 V 338752 6242490
				39	✓	✓	✓	15 V 338688 6246045
				54	✓	✓	✓	15 V 338612 6246151
				57	✓	✓	✓	15 V 349786 6247923
				59	✓	✓		15 V 349134 6248086
				59a	✓	✓		15 V 349134 6248086
				59b	✓	✓		15 V 349134 6248086
				59c	✓	✓		15 V 349134 6248086
				62	✓	✓	✓	15 V 346564 6246337
				71	✓	✓		15 V 335559 6246013
				81	✓			15 V 329249 6243728
				227	✓	✓	✓	15 V 346656 6241043
				228	✓	✓	✓	15 V 346321 6240955
				229	✓	✓	✓	15 V 346132 6240818
				230	✓	✓	✓	15 V 343041 6242407

Study Zone	Waterbody Type	Lodge Status	Lodge Type	Lodge	Observed in 2018	Observed in 2019	Observed in 2020	UTM
3	Stream	Inactive	Standard	235	✓	✓	✓	15 V 336517 6243676
				237	✓			15 V 334456 6242191
				239	✓	✓	✓	15 V 326598 6238810
				252	✓	✓	✓	15 V 357683 6251058
				253	✓	✓	✓	15 V 357311 6251341
				255	✓	✓	✓	15 V 355414 6252004
				261	✓	✓	✓	15 V 351253 6252879
				262	✓	✓	✓	15 V 350942 6252967
				319	✓	✓	✓	15 V 389231 6244722
				361	✓	✓	✓	15 V 372383 6243641
				362	✓	✓		15 V 372313 6243567
				457		✓		15 V 365138 6246141
				466		✓	✓	15 V 365450 6242611
				486		✓	✓	15 V 346726 6241046
				489		✓	✓	15 V 339106 6242764
				490		✓	✓	15 V 336667 6243375
				491		✓	✓	15 V 336623 6243472
				493		✓	✓	15 V 334479 6242221
				495		✓	✓	15 V 334464 6241818
				499		✓	✓	15 V 324842 6239008
				500		✓	✓	15 V 324758 6238427
				538		✓	✓	15 V 346244 6246061
				559		✓	✓	15 V 350815 6252911
				562		✓	✓	15 V 355235 6251875
				563		✓	✓	15 V 356171 6251594
				564		✓	✓	15 V 359721 6250210
				621			✓	15 V 328265 6240268
				654			✓	15 V 346106 6255995
	Unknown	Active	Standard	32	✓			15 V 344840 6242872
				231	✓	✓	✓	15 V 343319 6242337

Study Zone	Waterbody Type	Lodge Status	Lodge Type	Lodge	Observed in 2018	Observed in 2019	Observed in 2020	UTM
3	Unknown	Active	Standard	296	✓	✓	✓	15 V 358001 6252608
				462		✓	✓	15 V 363881 6243301
				571		✓	✓	15 V 355926 6253095
				658			✓	15 V 356666 6252781
			Bank	312	✓	✓		15 V 357538 6242074
				572a		✓	✓	15 V 355693 6253486
		Inactive	Standard	31	✓			15 V 344734 6243126
				36	✓			15 V 342528 6242237
				275	✓	✓	✓	15 V 343918 6254337
				286	✓	✓	✓	15 V 351856 6254693
				286a	✓	✓		15 V 351857 6254692
				292	✓			15 V 355899 6253130
				293	✓	✓	✓	15 V 356225 6253023
				303	✓	✓	✓	15 V 356322 6250445
				304	✓	✓	✓	15 V 355996 6250444
				313	✓	✓	✓	15 V 357294 6242176
				462a		✓	✓	15 V 363881 6243301
				572		✓	✓	15 V 355693 6253486
				602			✓	15 V 365195 6246335
4	Lake	Active	Standard	84	✓			15 V 331812 6248447
				86	✓	✓	✓	15 V 333218 6248544
				95	✓	✓	✓	15 V 318768 6245020
				100	✓	✓	✓	15 V 317343 6244714
				107	✓	✓	✓	15 V 350663 6233779
				109	✓	✓	✓	15 V 354907 6233666
				158	✓	✓	✓	15 V 366997 6239604
				240	✓	✓	✓	15 V 320082 6236718
				244	✓	✓	✓	15 V 318626 6234056
				314	✓	✓	✓	15 V 357771 6240998
				402	✓	✓		15 V 360637 6259619

Study Zone	Waterbody Type	Lodge Status	Lodge Type	Lodge	Observed in 2018	Observed in 2019	Observed in 2020	UTM
4	Lake	Active	Standard	405	✓			15 V 358800 6262213
				407	✓	✓	✓	15 V 349859 6262224
				426	✓	✓	✓	15 V 379185 6262756
				431		✓	✓	15 V 378696 6260849
				431a		✓	✓	15 V 378696 6260849
				502		✓	✓	14 V 685327 6231579
				507		✓	✓	15 V 317609 6246401
				536		✓		15 V 331754 6247369
				537		✓	✓	15 V 331760 6248439
				585		✓	✓	15 V 353435 6234320
				586		✓	✓	15 V 354927 6234206
				613			✓	15 V 372121 6242671
				629			✓	15 V 320408 6236231
				631			✓	14 V 685142 6231150
				660			✓	15 V 344061 6259229
			Bank	108	✓	✓	✓	15 V 351944 6234227
				245	✓	✓	✓	15 V 314706 6233214
				460		✓		15 V 357329 6240948
				634			✓	15 V 315551 6240965
				635			✓	15 V 318997 6242932
				661			✓	15 V 346104 6259344
		Inactive	Standard	53	✓	✓	✓	15 V 342379 6241708
				63	✓	✓	✓	15 V 346635 6247656
				64	✓	✓		15 V 346671 6247952
				69	✓	✓	✓	15 V 338523 6248008
				83	✓	✓	✓	15 V 331850 6248481
				85	✓			15 V 331919 6248690
				92	✓	✓	✓	14 V 681306 6235671
				96	✓			15 V 317608 6244987
				105	✓	✓	✓	15 V 320484 6242870

Study Zone	Waterbody Type	Lodge Status	Lodge Type	Lodge	Observed in 2018	Observed in 2019	Observed in 2020	UTM
4	Lake	Inactive	Standard	116	✓	✓		15 V 353858 6233616
				159	✓	✓		15 V 367810 6240075
				160	✓	✓	✓	15 V 367477 6238600
				165	✓	✓	✓	15 V 388786 6253300
				166	✓	✓	✓	15 V 397483 6251929
				246	✓	✓	✓	14 V 685931 6234208
				272	✓	✓	✓	15 V 345266 6250902
				273	✓	✓	✓	15 V 348371 6252808
				280	✓	✓	✓	15 V 348921 6255547
				310	✓	✓	✓	15 V 359157 6241737
				311	✓	✓	✓	15 V 359045 6241721
				325	✓	✓	✓	15 V 383265 6247667
				364	✓	✓	✓	15 V 368505 6242635
				364a	✓	✓	✓	15 V 368505 6242635
				365	✓			15 V 368506 6242634
				376	✓	✓	✓	15 V 354899 6257097
				395	✓	✓	✓	15 V 356558 6259006
				396	✓	✓	✓	15 V 355931 6259402
				398	✓	✓	✓	15 V 357656 6259799
				403	✓	✓	✓	15 V 359453 6261031
				404	✓	✓	✓	15 V 358799 6262214
				406	✓	✓		15 V 359029 6263207
				417	✓	✓	✓	15 V 368795 6259685
				419	✓	✓	✓	15 V 372940 6258651
				421	✓	✓	✓	15 V 372990 6260488
				424	✓	✓		15 V 378303 6259666
				429	✓	✓	✓	15 V 384505 6260387
				430		✓		15 V 375058 6257731
				454		✓	✓	15 V 369304 6242081
				497		✓	✓	15 V 329512 6238532

Study Zone	Waterbody Type	Lodge Status	Lodge Type	Lodge	Observed in 2018	Observed in 2019	Observed in 2020	UTM
4	Lake	Inactive	Standard	498		✓	✓	15 V 326940 6238566
				501		✓	✓	14 V 685032 6232067
				504		✓	✓	14 V 683790 6231832
				505		✓	✓	14 V 683552 6231416
				506		✓	✓	15 V 317188 6241757
				516		✓	✓	15 V 358978 6262204
				517		✓	✓	15 V 358909 6263134
				532		✓	✓	15 V 320710 6243381
				556		✓	✓	15 V 346026 6251387
				567		✓	✓	15 V 359049 6254125
				615			✓	15 V 365917 6241786
				659			✓	15 V 359127 6253844
			Bank	375	✓			15 V 360021 6256905
				503		✓	✓	14 V 685166 6231310
	Pond	Active	Standard	276	✓	✓		15 V 346021 6256083
		Inactive	Standard	324	✓	✓	✓	15 V 389720 6243940
	River	Active	Standard	103	✓	✓	✓	14 V 684396 6248627
				106	✓	✓	✓	15 V 350339 6233453
				223	✓			15 V 409082 6247827
				351	✓			15 V 380259 6242271
				439		✓		15 V 409041 6247686
				508		✓	✓	14 V 685450 6245999
			Bank	101	✓	✓		15 V 314400 6243206
				102	✓	✓		14 V 684774 6246428
				336	✓	✓		15 V 386632 6241904
				344	✓			15 V 384641 6242313
				383	✓			15 V 344891 6259144
				436		✓	✓	15 V 414373 6250102
				438		✓	✓	15 V 411202 6248343
				448		✓		15 V 384875 6242427

Study Zone	Waterbody Type	Lodge Status	Lodge Type	Lodge	Observed in 2018	Observed in 2019	Observed in 2020	UTM
4	River	Inactive	Standard	636			✓	15 V 315987 6243409
				637			✓	14 V 684635 6249117
				167	✓			15 V 406593 6250531
				168	✓	✓	✓	15 V 410064 6251192
				224	✓	✓		15 V 408088 6247267
				349			✓	15 V 380959 6242768
				349a	✓			15 V 380959 6242768
				449		✓	✓	15 V 384647 6242241
				450		✓	✓	15 V 384216 6242222
				509		✓	✓	14 V 684896 6247209
				636a			✓	15 V 315987 6243409
			Bank	510		✓		14 V 684087 6249964
	Stream	Active	Standard	68	✓	✓	✓	15 V 338254 6247593
				72	✓			15 V 335504 6246162
				73	✓	✓		15 V 335395 6246195
				76	✓	✓	✓	15 V 334634 6247326
				176	✓	✓	✓	15 V 405980 6257658
				178	✓	✓		15 V 405317 6258170
				179a	✓	✓	✓	15 V 405067 6258143
				187	✓	✓		15 V 402527 6258477
				188	✓	✓	✓	15 V 402569 6258858
				190a	✓	✓	✓	15 V 402306 6259023
				192	✓			15 V 401645 6259028
				193	✓	✓	✓	15 V 401632 6258996
				195	✓			15 V 401417 6258969
				204	✓	✓	✓	15 V 405747 6252236
				209	✓	✓	✓	15 V 408745 6251908
				209a	✓	✓	✓	15 V 408745 6251908
				210	✓			15 V 408746 6251907
				219a	✓	✓	✓	15 V 411850 6252957

Study Zone	Waterbody Type	Lodge Status	Lodge Type	Lodge	Observed in 2018	Observed in 2019	Observed in 2020	UTM
4	Stream	Active	Standard	264	✓	✓	✓	15 V 348683 6251958
				266	✓			15 V 348466 6251981
				338	✓	✓	✓	15 V 385454 6241850
				348	✓		✓	15 V 381214 6242950
				348a	✓		✓	15 V 381214 6242950
				348b	✓		✓	15 V 381214 6242950
				350	✓		✓	15 V 380624 6242509
				411	✓	✓	✓	15 V 351766 6265871
				413	✓	✓	✓	15 V 352367 6265284
				521		✓	✓	15 V 401484 6259091
				529		✓	✓	15 V 406392 6257051
				589		✓	✓	15 V 410760 6252620
				611			✓	15 V 385189 6241052
				620			✓	15 V 346089 6240542
			Bank	173	✓			15 V 406882 6256611
				409	✓	✓	✓	15 V 351927 6265620
				548		✓	✓	15 V 345184 6259889
				557		✓		15 V 347631 6251532
		Inactive	Standard	74	✓	✓		15 V 335369 6246487
				75	✓	✓		15 V 335308 6246576
				161	✓	✓	✓	15 V 367824 6238440
				169	✓	✓	✓	15 V 411141 6252791
				174	✓	✓		15 V 406198 6257347
				175	✓	✓	✓	15 V 406030 6257584
				177	✓	✓	✓	15 V 405729 6257862
				179	✓	✓	✓	15 V 405067 6258143
				189	✓	✓	✓	15 V 402460 6258937
				190	✓	✓	✓	15 V 402306 6259023
				191	✓	✓	✓	15 V 401598 6259211
				194	✓	✓	✓	15 V 401416 6258970

Study Zone	Waterbody Type	Lodge Status	Lodge Type	Lodge	Observed in 2018	Observed in 2019	Observed in 2020	UTM
4	Stream	Inactive	Standard	198	✓	✓	✓	15 V 399197 6259275
				203	✓	✓	✓	15 V 405665 6252061
				212	✓	✓	✓	15 V 409413 6252110
				213	✓	✓		15 V 409729 6252246
				214	✓	✓	✓	15 V 410027 6252301
				215	✓	✓	✓	15 V 410236 6252358
				216	✓	✓	✓	15 V 410430 6252456
				217	✓	✓	✓	15 V 411581 6252892
				218	✓	✓	✓	15 V 411723 6252931
				219	✓	✓	✓	15 V 411850 6252957
				220	✓	✓	✓	15 V 412208 6252982
				221	✓	✓	✓	15 V 412298 6253056
				222	✓	✓		15 V 412897 6253065
				233	✓	✓	✓	15 V 337932 6241861
				234	✓	✓	✓	15 V 337820 6241767
				238	✓	✓	✓	15 V 329654 6238879
				263	✓	✓	✓	15 V 349603 6251982
				265	✓	✓	✓	15 V 348465 6251982
				267	✓		✓	15 V 348281 6251752
				267a	✓	✓		15 V 348282 6251751
				279	✓	✓	✓	15 V 344158 6256363
				322	✓	✓	✓	15 V 390597 6244233
				322a	✓	✓	✓	15 V 390597 6244233
				323	✓	✓	✓	15 V 391001 6244274
				339	✓	✓	✓	15 V 385537 6241707
				412	✓	✓	✓	15 V 352159 6265309
				414	✓		✓	15 V 356974 6269524
				494		✓	✓	15 V 334578 6241306
				522		✓	✓	15 V 402017 6259176
				528		✓		15 V 405462 6258110

Study Zone	Waterbody Type	Lodge Status	Lodge Type	Lodge	Observed in 2018	Observed in 2019	Observed in 2020	UTM
4	Stream	Inactive	Standard	535		✓		15 V 335151 6246783
				551		✓	✓	15 V 343591 6258408
				558		✓		15 V 349034 6251850
				568		✓	✓	15 V 358681 6254049
				575		✓	✓	15 V 346264 6256473
				576		✓	✓	15 V 346120 6256178
				590			✓	15 V 409747 6252258
				591		✓	✓	15 V 409134 6252065
				592		✓	✓	15 V 408425 6252141
				620a			✓	15 V 346089 6240542
				626			✓	15 V 401801 6259154
				2111		✓	✓	15 V 408973 6251902
			Bank	170	✓	✓		15 V 410528 6254700
				549		✓		15 V 345778 6259547
	Unknown	Active	Standard	77	✓	✓	✓	15 V 334604 6247391
				78	✓	✓	✓	15 V 334662 6247613
				268	✓	✓	✓	15 V 348901 6250897
				270	✓	✓	✓	15 V 347438 6251575
				284	✓	✓	✓	15 V 351238 6255170
				285	✓	✓	✓	15 V 351217 6255396
				290	✓		✓	15 V 355820 6253395
				321a	✓	✓	✓	15 V 390407 6244015
				377	✓	✓	✓	15 V 354867 6256548
				389	✓			15 V 350992 6259642
				394	✓	✓	✓	15 V 354613 6258714
				397	✓	✓		15 V 354979 6259756
				400	✓	✓		15 V 358264 6260083
				401	✓			15 V 358264 6260083
				401a	✓			15 V 358264 6260083
				416	✓			15 V 356749 6269200

Study Zone	Waterbody Type	Lodge Status	Lodge Type	Lodge	Observed in 2018	Observed in 2019	Observed in 2020	UTM
4	Unknown	Active	Standard	437		✓	✓	15 V 411853 6248487
				610			✓	15 V 389649 6243677
				633			✓	14 V 681620 6233319
				639			✓	15 V 320918 6243197
			Bank	393	✓			15 V 353385 6259114
		Inactive	Standard	87	✓	✓	✓	15 V 333473 6248591
				97	✓	✓		15 V 317743 6246038
				98	✓	✓	✓	15 V 317446 6246574
				99	✓	✓	✓	15 V 317555 6246892
				241	✓			15 V 323471 6234152
				242	✓			15 V 323638 6234304
				243	✓			15 V 323812 6234386
				247	✓	✓		14 V 684859 6232159
				269	✓	✓	✓	15 V 347864 6251700
				271	✓	✓	✓	15 V 347272 6251607
				277	✓	✓	✓	15 V 346242 6256599
				278	✓			15 V 344335 6256699
				291	✓	✓	✓	15 V 355490 6254124
				299	✓	✓	✓	15 V 358064 6254030
				300	✓	✓	✓	15 V 358023 6254454
				301	✓			15 V 359087 6253764
				302	✓	✓		15 V 359418 6253827
				321	✓	✓	✓	15 V 390407 6244015
				337	✓	✓	✓	15 V 385369 6242066
				366	✓	✓	✓	15 V 368288 6242609
				378	✓			15 V 349278 6257888
				379	✓			15 V 349334 6257543
				380	✓	✓	✓	15 V 351216 6256796
				381	✓	✓	✓	15 V 351713 6256097
				382	✓	✓	✓	15 V 351923 6256187

Study Zone	Waterbody Type	Lodge Status	Lodge Type	Lodge	Observed in 2018	Observed in 2019	Observed in 2020	UTM
4	Unknown	Inactive	Standard	390	✓			15 V 350823 6259633
				391	✓	✓		15 V 352752 6259385
				391a	✓	✓		15 V 352752 6259385
				392	✓	✓		15 V 353053 6259274
				399	✓	✓		15 V 357924 6259886
				408	✓	✓	✓	15 V 349416 6262235
				415	✓			15 V 356847 6269358
				418	✓	✓	✓	15 V 368231 6259980
				422	✓	✓	✓	15 V 373520 6261035
				428	✓	✓	✓	15 V 378498 6263009
				432		✓	✓	15 V 378472 6263221
				435		✓	✓	15 V 384560 6260987
				482		✓		15 V 398575 6248966
				610a			✓	15 V 389649 6243677
				632			✓	14 V 682031 6233671
				663			✓	15 V 359553 6253692
5	Lake	Active	Standard	114	✓	✓	✓	15 V 357181 6232917
				115	✓	✓	✓	15 V 356307 6232668
				117	✓		✓	15 V 357220 6231926
				118	✓	✓	✓	15 V 357310 6231563
				120	✓			15 V 358647 6232151
				123	✓	✓		15 V 361173 6230403
				124	✓	✓		15 V 361814 6230224
				138	✓	✓	✓	15 V 358520 6228794
				139		✓	✓	15 V 357444 6230110
				144	✓	✓	✓	15 V 356453 6231917
				145	✓	✓	✓	15 V 353924 6232462
				146	✓	✓	✓	15 V 353903 6233064
				147	✓			15 V 367960 6235098
			Bank	94	✓	✓		14 V 674416 6238974

Study Zone	Waterbody Type	Lodge Status	Lodge Type	Lodge	Observed in 2018	Observed in 2019	Observed in 2020	UTM
5	Lake	Inactive	Standard	152	✓	✓	✓	15 V 366287 6235206
				384	✓			15 V 343302 6259285
				93	✓	✓	✓	14 V 675300 6239201
				110	✓	✓	✓	15 V 355828 6233141
				111	✓	✓		15 V 356019 6233332
				112	✓	✓	✓	15 V 355832 6233392
				113	✓	✓	✓	15 V 356939 6233167
				119	✓			15 V 357764 6232158
				121	✓	✓		15 V 360749 6230037
				122	✓	✓		15 V 361100 6229878
				125	✓	✓	✓	15 V 362412 6230461
				128	✓	✓	✓	15 V 362773 6230389
				132	✓	✓	✓	15 V 359730 6228582
				133	✓	✓	✓	15 V 360130 6228927
				134	✓	✓	✓	15 V 359238 6228214
				137	✓	✓	✓	15 V 358444 6227961
				139	✓	✓		15 V 357445 6230109
				139a	✓	✓		15 V 357445 6230109
				141	✓	✓	✓	15 V 357528 6230195
				142	✓	✓	✓	15 V 357282 6231320
				143	✓	✓		15 V 357126 6231238
				148	✓	✓		15 V 368473 6235918
				150	✓	✓	✓	15 V 369659 6235734
				151	✓	✓	✓	15 V 369714 6235847
				153	✓	✓	✓	15 V 367114 6236157
				579		✓		15 V 368697 6236093
				580		✓		15 V 369824 6236670
				581		✓	✓	15 V 369968 6236477
				587		✓	✓	15 V 356788 6232955
				588		✓	✓	15 V 356097 6232223

Study Zone	Waterbody Type	Lodge Status	Lodge Type	Lodge	Observed in 2018	Observed in 2019	Observed in 2020	UTM
5	River	Active	Standard	597		✓	✓	15 V 363027 6230679
				104	✓	✓	✓	14 V 683290 6250725
				131	✓	✓		15 V 363960 6231358
				599		✓	✓	15 V 365146 6231497
			Bank	386	✓	✓		15 V 341073 6262779
		Inactive	Standard	129	✓	✓	✓	15 V 363627 6231175
				130	✓	✓	✓	15 V 364068 6231392
				388	✓	✓		15 V 341961 6261872
				511		✓	✓	14 V 683362 6250271
				598		✓	✓	15 V 364653 6231236
				600		✓	✓	15 V 365839 6231637
				638			✓	14 V 682922 6250134
			Bank	225	✓	✓		15 V 401357 6247302
	Stream	Active	Standard	157	✓	✓	✓	15 V 366732 6237551
				163	✓			15 V 368011 6237914
				164	✓	✓		15 V 368420 6237993
				186	✓	✓	✓	15 V 402603 6257983
				197	✓	✓	✓	15 V 399994 6258899
				385	✓	✓	✓	15 V 342382 6261586
				387	✓	✓		15 V 340477 6262821
				470		✓	✓	15 V 368393 6237965
				471		✓		15 V 366810 6237918
				545		✓	✓	15 V 341079 6262371
				578		✓	✓	15 V 368106 6237822
				596		✓	✓	15 V 404565 6253187
			Bank	518		✓	✓	15 V 351628 6266303
		Inactive	Standard	154	✓	✓	✓	15 V 367018 6236327
				155	✓	✓	✓	15 V 366789 6236430
				156	✓	✓	✓	15 V 366574 6237173
				162	✓	✓	✓	15 V 368010 6237915

Study Zone	Waterbody Type	Lodge Status	Lodge Type	Lodge	Observed in 2018	Observed in 2019	Observed in 2020	UTM
5	Stream	Inactive	Standard	171	✓	✓	✓	15 V 407483 6255627
				172	✓	✓		15 V 407369 6255687
				180	✓	✓		15 V 404592 6257777
				181	✓	✓		15 V 404481 6257690
				182	✓			15 V 404308 6257508
				183	✓	✓	✓	15 V 404216 6257373
				184	✓	✓	✓	15 V 403854 6257375
				185	✓	✓	✓	15 V 403159 6257419
				196	✓	✓	✓	15 V 400460 6258814
				199	✓			15 V 404401 6254292
				200	✓	✓	✓	15 V 404685 6253764
				201	✓	✓		15 V 404571 6253331
				202	✓	✓	✓	15 V 404331 6252756
				205	✓	✓	✓	15 V 406449 6252708
				207	✓	✓		15 V 407230 6252386
				208	✓	✓	✓	15 V 407613 6252174
				410	✓	✓	✓	15 V 351905 6266166
				447		✓	✓	15 V 384881 6240409
				520		✓		15 V 399630 6258871
				523		✓	✓	15 V 402525 6257690
				524		✓	✓	15 V 402793 6257599
				525		✓	✓	15 V 403971 6257233
				526		✓	✓	15 V 404151 6257311
				527		✓	✓	15 V 404433 6257607
				530			✓	15 V 407254 6256176
				546		✓	✓	15 V 342092 6261699
				593		✓	✓	15 V 408049 6252072
				595		✓	✓	15 V 405910 6252437
				625			✓	15 V 404534 6254261
			Bank	531		✓		15 V 408108 6254850

Study Zone	Waterbody Type	Lodge Status	Lodge Type	Lodge	Observed in 2018	Observed in 2019	Observed in 2020	UTM
5	Unknown	Active	Standard	126	✓	✓		15 V 362539 6230842
				136	✓	✓		15 V 359745 6227870
				127	✓	✓		15 V 362281 6231025
				135	✓	✓	✓	15 V 359505 6227901
				140	✓	✓	✓	15 V 356909 6230030
				584		✓	✓	15 V 359665 6227902
			Bank	149	✓	✓		15 V 368838 6235645

APPENDIX 2:
BEAVER LODGE AND FOOD CACHE CHARACTERISTICS 2020

Table 2-1: Characteristics of Beaver Lodges and Food Caches in Fall 2020

Study Zone	Lodge Type	Lodge Status	Lodge	Lodge Material	Lodge Volume (m^3)	Food Cache Composition	Cache Size (m^2)
1 (Project footprint)	Standard	Active	20	Peat, alder, black spruce	52	Willow, alder	9
			236	Mud, willow, black spruce	72	Willow	12
			606	Black spruce, peat, willow	70	Willow, alder	24
2	Bank	Inactive	373	Peat, white spruce, alder, grass	54	–	–
	Standard	Inactive	65	Peat, alder, willow, white spruce, black spruce	66	–	–
			295	Peat, black spruce, birch	34	–	–
3	Bank	Active	658	Willow, black spruce,mud	92	Unknown	24
	Standard	Active	37	Peat, birch, white spruce, alder	69	Alder, black spruce, willow	24
			45	Alder, willow, black spruce, peat	137	Willow, alder	12
						Willow, alder	24
			67	Peat, black spruce, alder	120	Willow, alder	36
			232	Alder, black spruce, peat	103	Alder	9
			261	Peat, mud, black spruce, grass	48	–	–
			290	Willow, peat	57	Willow, alder	40
			296	Balsam poplar, black spruce, mud	127	Balsam poplar, alder	18
			298	Balsam poplar, black spruce, willow, alder, mud	62	Willow	9
			340	Black spruce, willow, birch	50	Willow, poplar	6
			374	White spruce, birch, alder	103	White spruce, willow, alder	16
			512	Peat, black spruce, balsam poplar, alder, willow	299	Willow, balsam poplar	28
			574	Black spruce, peat, willow, balsam poplar	67	Willow	21
			465b	Birch, black spruce, peat	38	Black spruce, birch, willow, alder	18

Study Zone	Lodge Type	Lodge Status	Lodge	Lodge Material	Lodge Volume (m^3)	Food Cache Composition	Cache Size (m^2)
3	Standard	Inactive	1	Peat, black spruce, willow, grass	45	–	–
			4	Peat, black spruce, willow	42	–	–
			57	Peat, black spruce, willow	100	–	–
			252	Willow, alder, black spruce, peat	36	–	–
			297	Black spruce, peat	36	–	–
			335	Black spruce, willow, peat	116	–	–
			462	Alder, peat, birch	76	–	–
			465	Peat, black spruce, birch	43	–	–
			602	Peat, poplar, willow, grass	72	–	–
			603	Mud, willow, black spruce	46	–	–
			465a	Birch, black spruce, peat	15	–	–
4	Bank	Active	108	Peat, alder, black spruce	60	Willow	24
			585	Willow, birch, black spruce, mud	65	Black spruce, willow, alder	52
		Inactive	428	Peat, alder, grass	103	Birch, willow	8[1]
	Standard	Active	109	Peat, black spruce, willow	108	Willow	6
						Willow	4
			209	Peat, willow, black spruce	78	Willow, alder, black spruce	60
			394	Peat, black spruce, grass	95	Willow	6
			179a	Mud, alder, black spruce	39	Willow, alder, black spruce	102
			190a	Black spruce, alder, mud, grass	33	Alder	4
			209a	Peat, willow, black spruce	14	Willow, alder	60
			219a	Peat, black spruce, mud, willow	153	Willow, black spruce, alder	48
						Willow, black spruce, alder	36
		Inactive	179	Willow, black spruce, grass	53	–	–
			189	Alder, willow, peat, grass	171	–	–

Study Zone	Lodge Type	Lodge Status	Lodge	Lodge Material	Lodge Volume (m^3)	Food Cache Composition	Cache Size (m^2)
4	Standard	Inactive	190	Alder, black spruce, willow, peat	63	–	–
			219	Peat, black spruce, willow, grass	55	–	–
			267	Alder, black spruce, peat, grass	26	–	–
			300	Black spruce, peat, grass	81	–	–
			324	Black spruce, peat, willow	127	–	–
			364	Peat, grass, black spruce, birch	31	–	–
			395	Peat, black spruce	11	–	–
			396	Peat, black spruce, grass	174	–	–
			398	Black spruce, peat	41	–	–
			418	Black spruce, peat, willow, grass	48	–	–
			567	Black spruce, peat, grass	45	–	–
			659	Black spruce, mud, grass	60	–	–
			663	Peat, black spruce, alder	25	–	–
			2111	Peat, black spruce, alder, willow	144	Willow, alder	12[1]
5	Bank	Active	152	White spruce, birch, mud	–	Willow, alder, black spruce	9
						Willow, alder, black spruce	4

1. Old food cache partially covered in sediment; not being used.