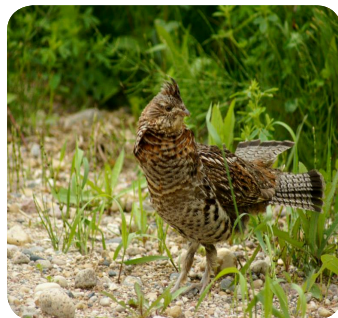




Keeyask Generation Project Terrestrial Effects Monitoring Plan

Ruffed Grouse Habitat Effects Monitoring Report

TEMP-2022-17



KEEYASK GENERATION PROJECT

TERRESTRIAL EFFECTS MONITORING PLAN

REPORT #TEMP-2022-17

RUFFED GROUSE HABITAT EFFECTS MONITORING 2021

Prepared for

Manitoba Hydro

By

Wildlife Resource Consulting Services MB Inc.

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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.

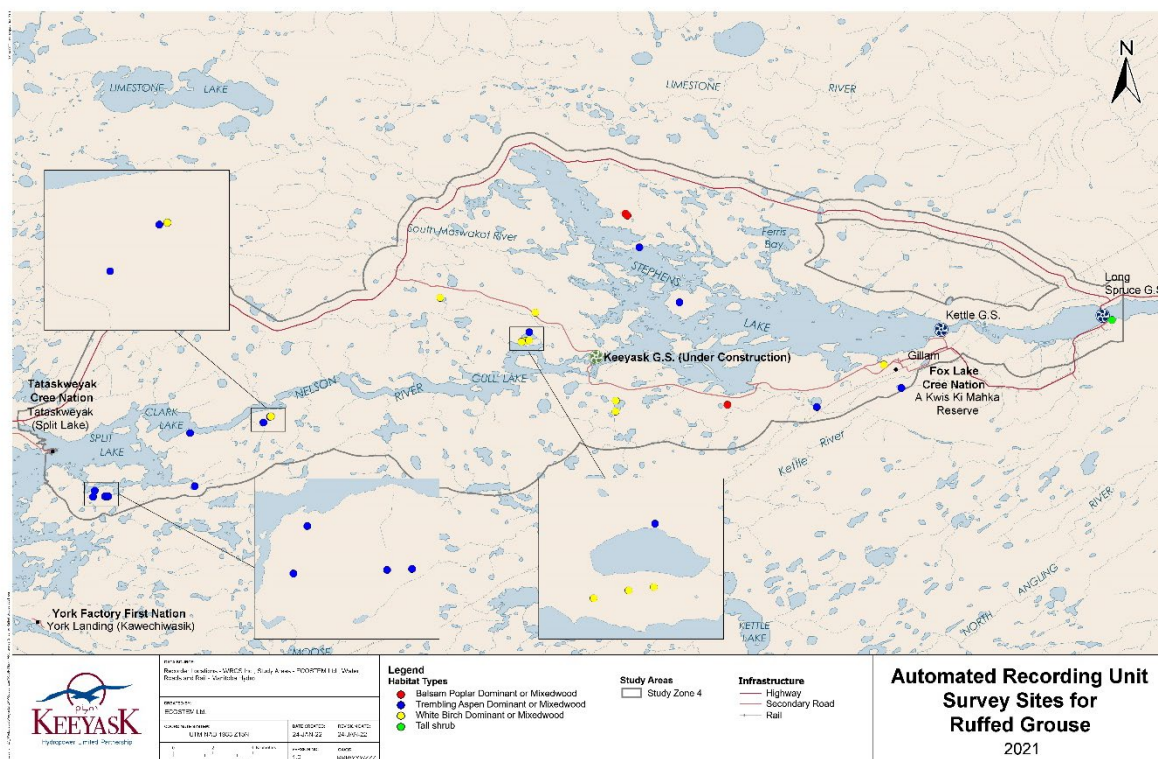
Ruffed grouse are year-round residents at the edge of their range in the Keeyask region. Aspen forest or mixed forest with a large proportion of aspen is preferred for breeding, when males drum by standing on a log and beating their wings. Potential construction-related effects on ruffed grouse identified in the Project's environmental assessment were loss and alteration of some breeding and foraging habitat, with a possible increase in mortality due to traffic on the north and south access roads and potential increased harvest through increased access to the area. Ruffed grouse were rarely detected in the Keeyask region during environmental assessment studies.

Why is the study being done?

Suitable ruffed grouse breeding habitat was limited in the Keeyask region before Project construction began; much of this habitat was temporarily removed by forest fires in 2013. The objectives of ruffed grouse monitoring were to evaluate whether enough ruffed grouse can be found to verify the predictions of the habitat quality model defined in the environmental impact statement and to assess mortality associated with the Project. If possible, the validated and potentially refined habitat quality model will be used to evaluate if the Project has changed the distribution and abundance of ruffed grouse breeding habitat in the Keeyask region.

What was done?

Construction phase monitoring for ruffed grouse that began in 2018 continued in 2021. On April 20, 2021, automated recording units were placed at 26 sites in the Keeyask region, from the Split Lake area to the Long Spruce Generating Station. Recordings were reviewed for ruffed grouse drumming and the number of days grouse drummed at each site was recorded.



Automated Recording Unit Survey Sites for Ruffed Grouse, 2021

What was found?

Ruffed grouse drumming was recorded at six of the 26 sites surveyed in 2021. During pre-construction Project monitoring in 2012, ruffed grouse were found at six of the 24 sites surveyed. While the species was found at the same number of sites both years, the sites were more widely distributed in 2021 and grouse were found over a larger area. No breeding activity was detected immediately north of Gull Lake in 2018, where it was concentrated in 2012. In 2021, ruffed grouse drumming was again detected in the area.

What does it mean?

The greater distribution of sites surveyed during construction monitoring resulted in a larger area where grouse were detected. In 2018, ruffed grouse were absent from the area north of Gull Lake, the only place they were found during the 2012 surveys. As the forest habitat at these sites still appeared to be suitable for ruffed grouse breeding, Project-related disturbances could have resulted in ruffed grouse temporarily avoiding the area. The ruffed grouse detected in this area in 2021 suggests that the habitat remains suitable for breeding.

What will be done next?

Ruffed grouse monitoring will continue during operation. If enough data can be collected to validate and refine the habitat quality model, it will be applied to the post-Project terrestrial habitat map to identify and measure any changes in suitable breeding habitat.

STUDY TEAM

We would like to thank Sherrie Mason and Rachel Boone of Manitoba Hydro for editorial comments, and Ron Bretecher of North/South Consultants Inc. for logistical assistance in the field. We would also like to thank Dr. James Ehnes, ECOSTEM Ltd., for GIS-supported study design and cartography.

Biologists and other personnel who designed or participated in field studies and drafted the results included:

- Robert Berger, Wildlife Resource Consulting Services MB Inc. (WRCS) – Design and reporting
- Andrea Ambrose, WRCS – Analysis and reporting
- Marissa Berard, WRCS – Data collection
- Maryse Gagné, WRCS – Data collection
- Hannah Martin, WRCS – Data collection
- Alex McIlraith, Independent Contractor – Audio recording processing
- Kevin McRae, WRCS – Audio recording analysis
- Levi Warkentine, WRCS – Data collection
- Thomas Wood, WRCS – Data collection

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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 *Keeyask Generation Project 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, ruffed grouse (*Bonasa umbellus*), during the construction phase.

Ruffed grouse are year-round residents at the edge of their range in the Keeyask region (Taylor 2018). They have been identified as important birds that are harvested by members of the partner First Nations. Aspen forest or mixed forest with a large proportion of aspen is preferred for breeding (Taylor 2018). During the breeding season, males drum by standing on a log and beating their wings (Rusch et al. 2000). Predicted Project-related effects on ruffed grouse were mainly loss or alteration of some breeding and foraging habitat, with a possible increase in mortality due to traffic on the north and south access roads and potential increased harvest through increased access to the area. Ruffed grouse were rarely detected in the Keeyask region during EIS studies and suitable breeding habitat appeared to be limited. Much of the ruffed grouse habitat identified during EIS studies was temporarily removed by forest fires in 2013.

The objectives of ruffed grouse monitoring were to evaluate whether the species can be detected in sufficient numbers to verify the predictions of the expert information habitat quality model defined in the EIS and to estimate how Project-related mortality (including accidental mortality and increased harvest) affect ruffed grouse abundance. If possible, the validated and potentially refined habitat quality model will ultimately be used to evaluate how the Project changes the distribution and abundance of ruffed grouse breeding habitat in the Keeyask region.

2.0 METHODS

Ruffed grouse construction-phase monitoring that began in 2018 was continued in 2021. Automated recording units (ARUs) were placed at 26 sites in Study Zone 4, from the Split Lake area to the Long Spruce GS (Map 1) on April 20, 2021 and were removed by September 19, 2021. Eighteen of the sites were also surveyed in 2018 (Appendix 1, Table 1-1). Sites were in hardwood-dominated, mixedwood, and tall shrub habitats thought to be suitable for ruffed grouse breeding (Table 1). Recorders were programmed to record for 5 minutes every 15 minutes from 4:30 a.m. to 7:00 a.m. All waveforms from recordings were visually reviewed for ruffed grouse drumming (Figure 1). The number of days ruffed grouse drumming was detected at each site was recorded. Recordings made over a 20-day period from May 5 to 24 were included in the analysis for consistency with the previous survey year.

Table 1: Habitat at Ruffed Grouse Automated Recording Unit Sites, 2021

Habitat	Number of Automated Recording Units
Balsam poplar dominant or mixedwood	3
Tall shrub	1
Trembling aspen dominant or mixedwood	13
White birch dominant or mixedwood	9

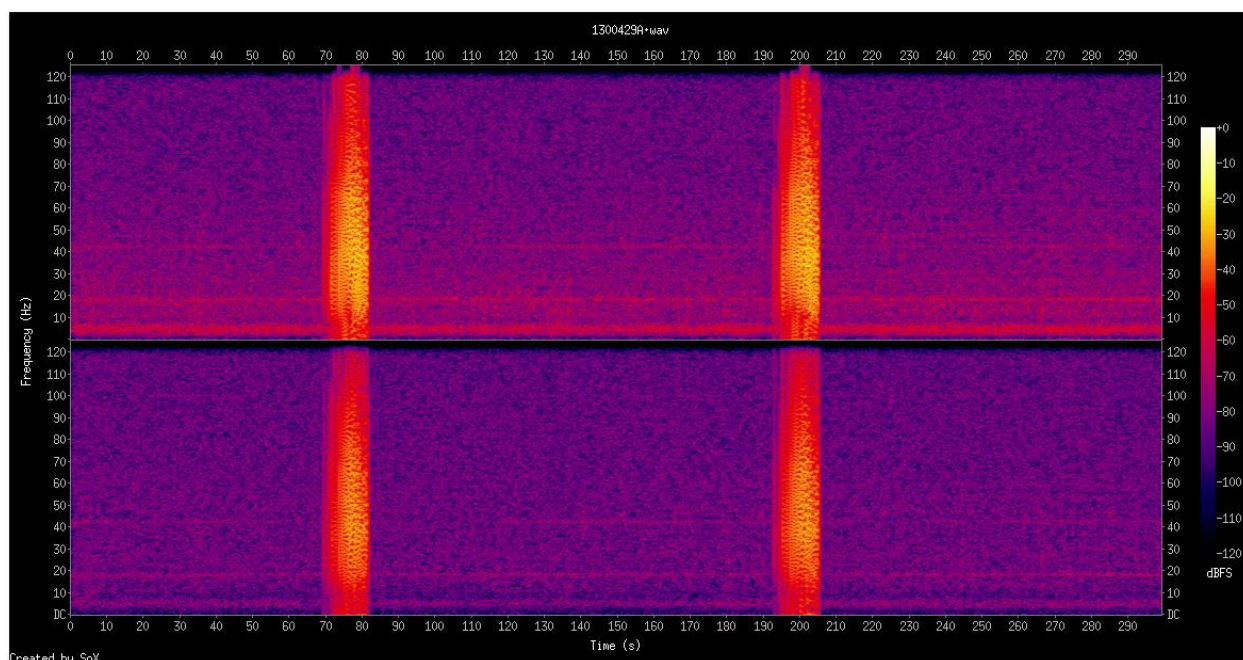
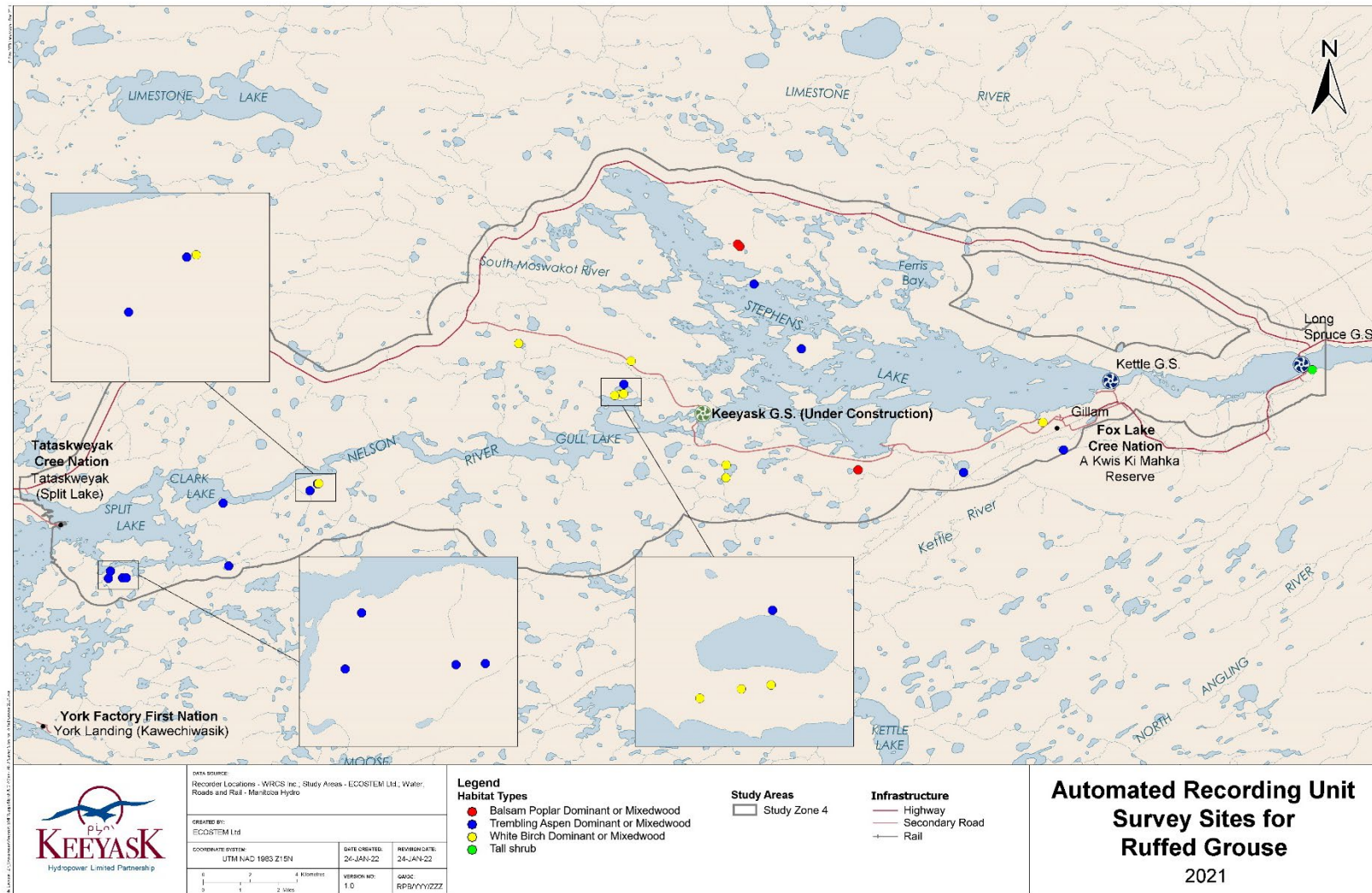


Figure 1: Distinct Waveform of Ruffed Grouse Drumming



Map 1: Automated Recording Unit Survey Sites for Ruffed Grouse, 2021

3.0 RESULTS

When the entire survey period was considered, ruffed grouse drumming was recorded from the western to the eastern portions of Study Zone 4, at six of the 26 sites surveyed in 2021 (Map 2). No ruffed grouse were detected in balsam poplar habitat (Table 2). Drumming began as early as April 22 at site 559 and ended June 28 at site 333 (Table 3).

Table 2: Sites at which Ruffed Grouse Drumming Was Recorded, 2021

Habitat	Number of Sites at which Ruffed Grouse Drumming Was Recorded	Percentage of Sites at which Ruffed Grouse Drumming Was Recorded
Balsam poplar dominant or mixedwood	0	0
Tall shrub	1	100
Trembling aspen dominant or mixedwood	2	15
White birch dominant or mixedwood	3	33

Table 3: Total Number of Days Ruffed Grouse Drumming Was Recorded at Automated Recording Unit Sites, 2021

Site	Habitat	Dates	Number of Days
14	Trembling aspen dominant or mixedwood	May 5–June 19	16
15	Trembling aspen dominant or mixedwood	May 17–June 27	32
326	White birch dominant or mixedwood	June 21, July 8	2
331	White birch dominant or mixedwood	May 7–June 2	27
333	White birch dominant or mixedwood	May 15–June 28	35
559	Tall shrub	April 22–May 2	7

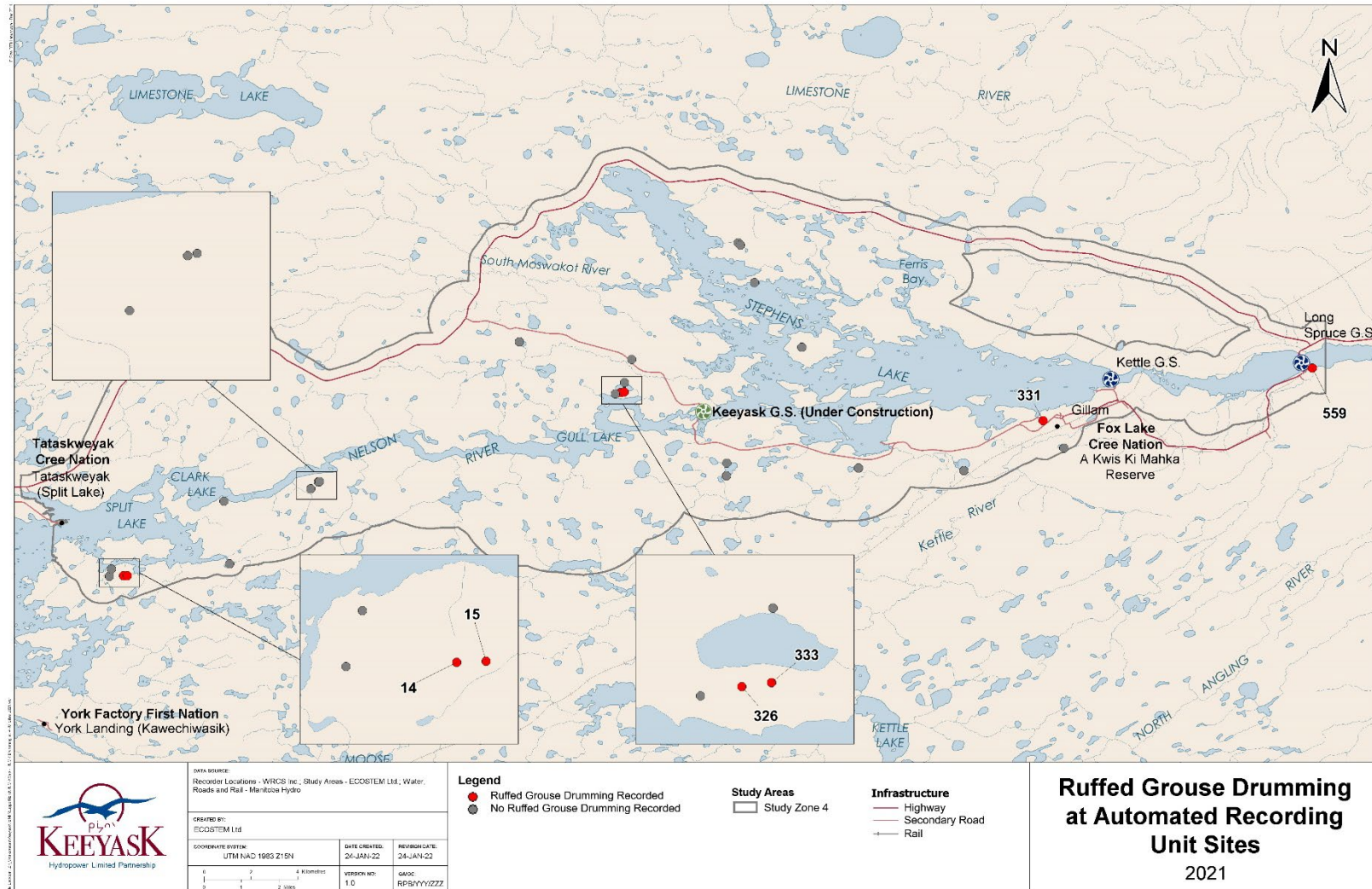
In 2021, no ruffed grouse were recorded during the May 5–24 analysis period at sites 326 and 559. Beginning May 5th, ruffed grouse drumming was detected on four to 18 days at four sites in 2021 (Table 4). Drumming was recorded intermittently at all sites except 331, where it was recorded consecutively from May 7 to 24. Within the analysis period, drumming was recorded at two of the three sites surveyed in both 2018 and 2021.

Table 4: Number of Days Ruffed Grouse Drumming Was Recorded at Automated Recording Unit Sites from May 5 to 24, 2018 and 2021

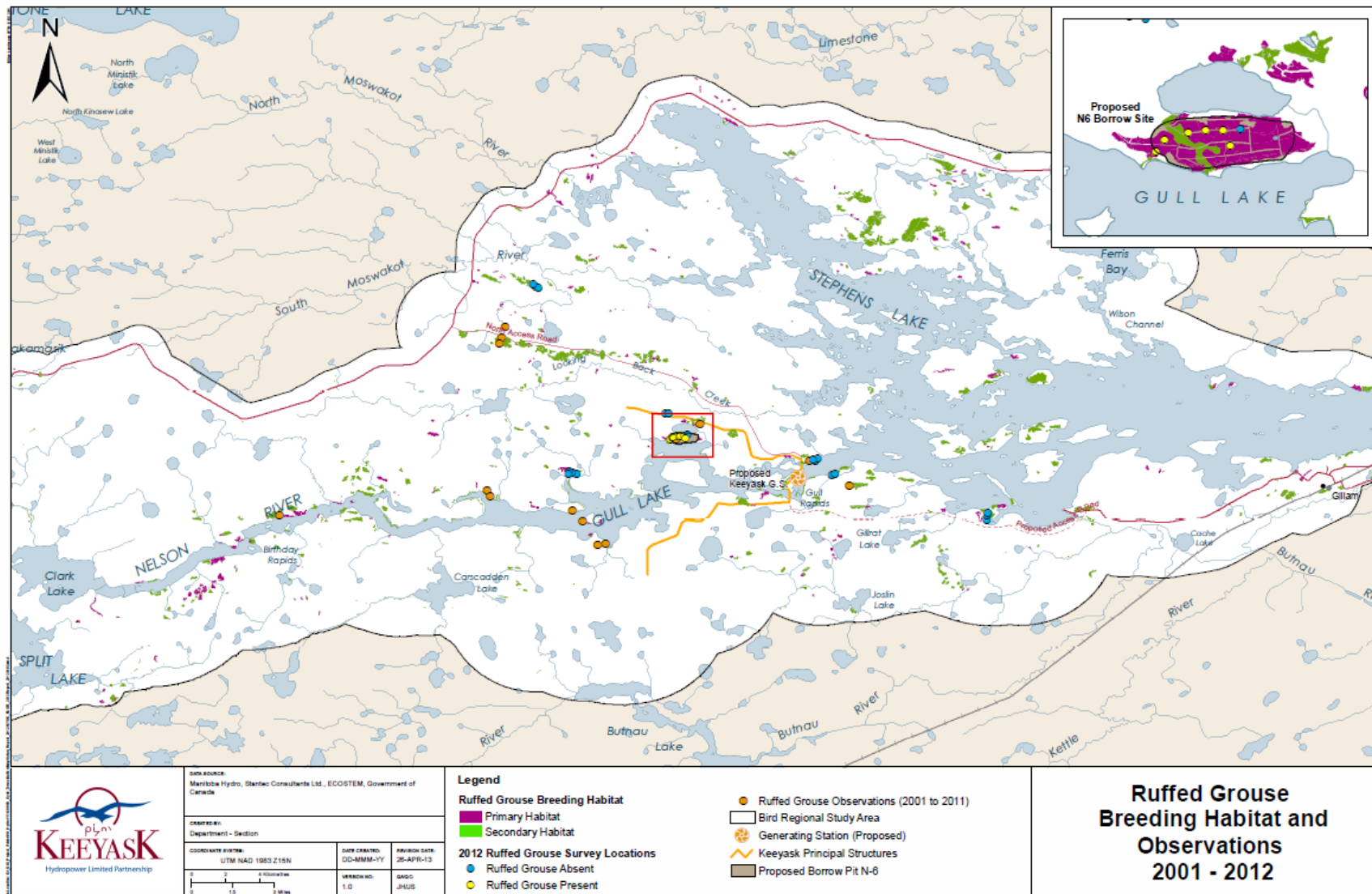
Site	Habitat	2018	2021
12	Trembling aspen dominant or mixedwood	20	–
14	Trembling aspen dominant or mixedwood	–	4
15	Trembling aspen dominant or mixedwood	20	5
27	Balsam poplar dominant or mixedwood	20	–
30	Trembling aspen dominant or mixedwood	7	–
331	White birch dominant or mixedwood	16	18
333	White bird dominant or mixedwood	–	7
559	Tall shrub	6	0

Pre-construction ruffed grouse surveys were conducted near Gull and Stephens lakes in spring 2012 (Stantec Consulting 2013). Ruffed grouse were found at six of the 24 stops surveyed, all immediately north of Gull Lake in trembling aspen or white birch mixedwood habitat (Map 3). Three sites surveyed in 2018 and 2021 (326, 332, and 333) were in the same area but the only ruffed grouse detected during construction monitoring was at site 333 in 2021. While ruffed grouse were found at the same number of sites in 2018 and 2021 as in 2012, the sites were more widely distributed during construction monitoring and grouse were found over a larger area.

No ruffed grouse mortalities were reported during Project construction. No grouse harvest was reported near the Keeyask GS during construction (Eaton 2016; Eaton and Bretecher 2017; Mazur and Eaton 2019; Assuah and Eaton 2020). Ten grouse were harvested by a member of the workforce in 2015, in the Thompson area; the species was not identified (Eaton 2016).



Map 2: Ruffed Grouse Drumming at Automated Recording Unit Sites, 2021



Map 3: Ruffed Grouse Observations, Spring 2012 (Stantec Consulting 2013)

4.0 DISCUSSION

Ruffed grouse were detected in three of four hardwood and shrub habitats in 2021. Drumming was recorded at six sites, including two at which it was also detected in 2018. Detections of ruffed grouse were in the western and eastern portions of Study Zone 4 and near Gull Lake in 2021. No drumming was recorded near Gull Lake in 2018.

Ruffed grouse were found at the same number of sites in 2018 and 2021 as in 2012. However, the greater distribution of sites surveyed during construction monitoring resulted in a wider distribution of the grouse detected. In 2018, ruffed grouse were absent from the area north of Gull Lake, the only place they were found during the 2012 surveys. As the forest habitat at these sites still appeared to be suitable for ruffed grouse breeding, Project-related disturbances could have resulted in ruffed grouse temporarily avoiding the area. Ruffed grouse were detected in the area again in 2021, suggesting that the habitat remains suitable and that Project-related disturbances from construction activities have subsided.

5.0 SUMMARY AND CONCLUSIONS

Project-related sensory disturbances may have affected the suitability of ruffed grouse breeding habitat north of Gull Lake. However, the physical habitat appeared to remain suitable, as breeding activity was detected in 2021. No Project-related effects on ruffed grouse mortality have been identified.

Ruffed grouse monitoring will continue during Project operation. If enough data can be collected to validate and refine the habitat quality model, it will be applied to the post-Project terrestrial habitat map to identify and measure any changes in suitable breeding habitat.

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APPENDIX 1: AUTOMATED RECORDER UNIT LOCATIONS 2018 AND 2021

Table 1-1: Automated Recorder Unit Locations, 2018 and 2021

Site	Location	Habitat	Surveyed in 2018	Surveyed in 2021
2	15 V 366867 6261771	Balsam poplar dominant on uplands		✓
3	15 V 377245 6242354	Balsam poplar dominant on uplands	✓	✓
4	15 V 367062 6261575	Balsam poplar mixedwood on uplands	✓	✓
12	14 V 684853 6232565	Trembling aspen	✓	
13	14 V 684843 6232918	Trembling aspen		✓
14	14 V 686056 6233071	Trembling aspen		✓
15	15 V 314231 6233086	Trembling aspen	✓	✓
17	15 V 330042 6240570	Trembling aspen		✓
24	15 V 386328 6242142	Trembling aspen		✓
27	15 V 392856 6246862	Balsam poplar	✓	
30	15 V 386697 6241855	Trembling aspen dominant on uplands	✓	
57	15 V 357081 6249728	Trembling aspen dominant on uplands	✓	✓
102	15 V 368296 6258347	Trembling aspen dominant on uplands	✓	✓
113	15 V 402853 6249336	Trembling aspen dominant on uplands	✓	
141	15 V 322580 6239517	Trembling aspen dominant on uplands	✓	✓
204	15 V 365582 6246628	Trembling aspen mixedwood on uplands	✓	✓
230	15 V 372369 6252762	Trembling aspen mixedwood on uplands		✓
239	15 V 323044 6234103	Trembling aspen mixedwood on uplands		✓
254	14 V 684972 6233550	Trembling aspen mixedwood on uplands	✓	✓
312	15 V 394942 6244070	Trembling aspen mixedwood on uplands	✓	✓
326	15 V 356739 6248854	White birch dominant on uplands	✓	✓
327	15 V 365873 6241693	White birch dominant on uplands	✓	✓
331	15 V 393144 6246450	White birch dominant on uplands	✓	✓
332	15 V 356269 6248747	White birch dominant on uplands	✓	✓
333	15 V 386347 6242088	White birch dominant on uplands	✓	✓
343	15 V 365871 6242779	White birch dominant on uplands	✓	✓
345	15 V 348009 6253244	White birch dominant on uplands	✓	✓
347	15 V 330793 6241194	White birch mixedwood on uplands	✓	✓
355	15 V 357694 6251728	White birch mixedwood on uplands		✓
559	15 V 416361 6250975	Tall shrub on mineral soil	✓	✓