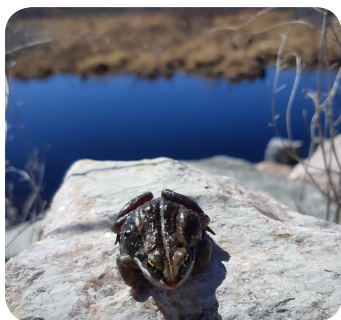




Keeyask Generation Project
Terrestrial Effects Monitoring Plan

Amphibian Habitat Enhancement Monitoring Report

TEMP-2020-07



KEEYASK GENERATION PROJECT

TERRESTRIAL EFFECTS MONITORING PLAN

REPORT #TEMP-2020-07

AMPHIBIAN HABITAT ENHANCEMENT 2019

Prepared for

Manitoba Hydro

By

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June 2020

This report should be cited as follows:

Wildlife Resource Consulting Services MB Inc. 2020. Keeyask Generation Project Terrestrial Effects Monitoring Plan Report #TEMP-2020-07: Amphibian Habitat Enhancement 2019. A report prepared for Manitoba Hydro by Wildlife Resource Consulting Services MB Inc., June 2020.

SUMMARY

Background

Construction of the Keeyask Generation Project (the Project) at Gull Rapids began in July 2014. 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 or not more needs to be done to reduce harmful effects. The objective of this study is to monitor the use of frog habitat enhancement areas by boreal chorus frogs and wood frogs.

Why is the study being done?

In the Environmental Impact Statement (EIS) for the Project, one of the mitigation measures to lessen the effect of the loss of frog habitat was to enhance frog habitat in areas disturbed by the Project, to provide short-term habitat until vegetation is re-established. Overall, since habitat for frogs is widespread throughout the Keeyask region, Project-related effects on frog populations within the region are expected to be low and within the range of natural variability.

Frog breeding habitat consists of shallow fish-free waterbodies. Some nearby forest cover is also important. Adult frogs typically remain in the ponds in which they first bred, and juveniles may move up to 1 km away from their source ponds. A nearby water source is required by foraging adults and juveniles. Slash piles (i.e., piles of woody debris) may benefit frogs by providing nursery cover, food for juveniles, winter cover, and temporary connectivity between breeding ponds and forest habitat. Woody debris was piled in four different locations in a borrow area that was no longer in use on the Project site, near an area of ponded water, to provide habitat and cover for frogs until vegetation in the borrow area is re-established. Monitoring to determine if frogs use the slash piles began in 2017 and continued in 2019.

What was done?

Six pitfall traps were installed in each of the four slash piles in the Km 4 borrow area, located off the North Access Road. Traps were initially set in the afternoon of July 1, 2019 and were checked daily until July 4, 2019. Traps were re-set at the same locations on July 16, 2019 and were checked daily until July 18, 2019. The species, age (mature or juvenile), and condition of trapped frogs were recorded.



Slash Pile in Borrow Area



Pitfall Trap Set in the Ground at a Slash Pile



Location of Frog Habitat Enhancement Area, in the Km 4 Borrow Area

What was found?

One mature wood frog was found the morning of July 2, 2019, after the first night the traps were set. No other frogs were trapped or observed during the 2019 survey. This was similar to the 2017 monitoring, when one frog was observed within a slash pile and three frogs were observed in the nearby pond.

What does it mean?

The presence of a single frog in one slash pile in 2019, and the observation of a few frogs in and around the slash piles in 2017 may indicate that the piles are being used to a limited extent. Further study is required to determine if the slash piles provide suitable habitat, especially for juvenile frogs.

What will be done next?

The next frog habitat enhancement surveys are planned for 2021 and 2023.

STUDY TEAM

We would like to thank Sherrie Mason and Rachel Boone of Manitoba Hydro 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:

Robert Berger – Design and reporting

James Ehnes– Design

Andrea Ambrose – Reporting

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TABLE OF CONTENTS

1.0	INTRODUCTION.....	1
2.0	METHODS.....	2
3.0	RESULTS.....	4
4.0	DISCUSSION	5
5.0	SUMMARY AND CONCLUSIONS.....	6
6.0	LITERATURE CITED.....	7

LIST OF MAPS

Map 1:	Slash Piles in the Km 4 Borrow Area Surveyed for Frogs, 2019.....	3
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LIST OF PHOTOS

Photo 1:	Slash Pile in the Km 4 Borrow Area	2
Photo 2:	Pitfall Trap Set in a Slash Pile	2
Photo 3:	Wood Frog in a Pitfall Trap July 2, 2019	4

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.

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, use of a frog habitat enhancement area by boreal chorus frog (*Pseudacris maculata*) and wood frog (*Lithobates sylvaticus*), during the construction and operation phases of the Project.

Boreal chorus and wood frog breeding habitat consists of shallow, permanent or temporary, fish-free waterbodies (Canadian Herpetological Society 2017). Some nearby forest cover is important (Gibbs 1998). Adult frogs typically remain in the ponds in which they first bred, and juveniles may disperse up to 1 km away from their source ponds (Berven and Grudzien 1990; Lehtinen and Galatowitsch 2001). A nearby water source is required by foraging adults and juveniles, to avoid desiccation.

Slash (i.e., woody debris) piles may benefit frogs by providing nursery cover, food for juveniles, winter cover, and temporary connectivity between breeding ponds. Woody debris from Project clearing was piled in a Project borrow area near suitable breeding habitat, to provide some habitat and cover for frogs until vegetation in the borrow area is re-established. The objective of amphibian monitoring is to determine if frogs use the slash piles.

2.0 METHODS

As done in 2017, six pitfall traps were installed in each of four slash piles in the Km 4 borrow area (Photo 1, Map 1). Each of the 24 traps consisted of a 2.4-litre plastic bucket (i.e., deep enough to keep frogs from escaping) that was placed flush with the surrounding ground (Photo 2). Four traps were installed at the edges of each slash pile corresponding with the four cardinal directions (north, east, south, and west) and two were installed toward the centre of the piles. Soil was added to the traps and wetted and it was ensured that each trap was shaded to prevent trapped frogs from drying out.

Traps were initially set on July 1, 2019 and were checked daily until they were removed on July 4, 2019. Traps were re-set at the same locations on July 16, 2019 and were checked daily until they were removed on July 18, 2019. The length of the survey was expanded in 2019; in 2017, traps were removed the morning after they were set during each of two survey periods. The species, age (mature or juvenile), and condition of trapped frogs was recorded. All trapped frogs or other organisms were released unharmed.



**Photo 1: Slash Pile in the Km 4
Borrow Area**



**Photo 2: Pitfall Trap Set in the
Ground at a Slash Pile**



Map 1: Slash Piles in the Km 4 Borrow Area Surveyed for Frogs, 2019

3.0 RESULTS

A single adult wood frog was found in a trap on the morning of July 2, 2019 (Photo 3) during the first survey. No other frogs were observed in or near the slash piles during either 2019 survey period. No frogs were trapped in the slash piles on the two non-consecutive survey nights in 2017, but a wood frog was observed in a slash pile and three wood frogs were observed at the edge of water that had accumulated in the Km 4 borrow area.



Photo 3: Wood Frog in a Pitfall Trap on July 2, 2019

4.0 DISCUSSION

The presence of a frog in one of the slash piles suggests that the amphibian habitat enhancement piles are being used to some extent. The presence of frogs in the Km 4 borrow area in 2017 and 2019 may indicate that the area provided some suitable habitat for frogs. The survey time in 2017 was limited to two non-consecutive nights, and it was thought that a longer survey period would increase the probability of trapping frogs that may use the piles or could provide a better indication that frogs are not using the piles. The increased survey time in 2019 did not substantially increase the number of frogs trapped, possibly indicating that the slash piles are not commonly used as habitat. The survey is also planned for 2021 and 2023, which will provide more information regarding the efficacy of the habitat enhancement technique as mitigation for the loss of amphibian habitat in due to Project development.

5.0 SUMMARY AND CONCLUSIONS

In July 2017 and 2019, a single frog was trapped in the slash piles placed in the Km 4 borrow area, possibly indicating that the slash piles are being used as habitat to a limited extent. Further monitoring is required to confirm if the slash piles provide suitable, temporary habitat replacement for frogs, as intended.

6.0 LITERATURE CITED

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