



Keeyask Generation Project  
Terrestrial Effects Monitoring Plan

Amphibian Habitat Enhancement Monitoring Report

TEMP-2018-15



# **KEEYASK GENERATION PROJECT**

## **TEMP EFFECTS MONITORING PLAN**

REPORT #TEMP-2018-15

## **AMPHIBIAN HABITAT ENHANCEMENT MONITORING**

Prepared for

Manitoba Hydro

By

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# 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 (*Pseudacris maculata*) and wood frogs (*Lithobates sylvaticus*).

## Why is the study being done?

In the Environmental Impact Statement (EIS) for the Project, a mitigation measure 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. 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, near suitable frog breeding habitat, to provide habitat and cover for frogs until vegetation in the borrow area is re-established. Monitoring is being done to determine if frogs use the slash piles.



One of the Slash Piles in Km 4 Borrow Area

## What was done?

Six pitfall traps were installed in each of the four slash piles in the Km 4 borrow area. Traps were initially set in the afternoon of July 13, 2017 and were checked and removed the following morning. Traps were re-set at the same locations on July 20, 2017 and were checked and removed the following morning. The species, age (mature or juvenile), and condition of trapped frogs were to be recorded.



## Location of Frog Habitat Enhancement

## What was found?

No frogs were found in the pitfall traps in 2017, but a wood frog was observed in one of the slash piles during the first July survey. Three wood frogs were also found in an area of ponded water near a slash pile during the same survey. No frogs were found in or near slash piles during the second survey. A tiger beetle and an unidentified spider were collected in the pitfall traps.

## What does it mean?

The survey time was limited to two non-consecutive nights, but the presence of a frog in one slash pile may indicate that the piles are being used to some extent. The presence of frogs in the recently disturbed borrow area could indicate that the area is providing suitable habitat for

frogs. Further study is required to determine if the slash piles provide suitable habitat, especially for juvenile frogs.

**What will be done next?**

The survey will be repeated in the summer of 2019, and is also planned for 2021 and 2023.

# 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:

- Robert Berger (M.N.R.M) – Design and reporting
- James Ehnes (Ph.D.) – Design
- Andrea Ambrose (B.Sc.) – Reporting
- Kevin McRae (B.Env.St.) – Survey personnel
- Justin Spence (War Lake First Nation) – Survey personnel
- James Chornoby (War Lake First Nation) – 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.

*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 the monitoring is to determine if frogs use the slash piles.

## 2.0 METHODS

Six pitfall traps were installed in each of four slash piles in the Km 4 borrow area (Photo 1, Photo 2, 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 3). 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 in the afternoon of July 13, 2017 and were checked and removed the following morning. Traps were re-set at the same locations on July 20, 2017 and were checked and removed the following morning. The species, age (mature or juvenile), and condition of trapped frogs was to be recorded. All trapped frogs or other organisms were to be released unharmed.



**Photo 1: Two of the Slash Piles in the Km 4 Borrow Area**



**Photo 2:      Slash Pile in the Km 4 Borrow Area**



**Photo 3:      Pitfall Trap Set in a Slash Pile**





**Map 1: Slash Piles in the Km 4 Borrow Area Surveyed for Frogs, 2017**



### 3.0 RESULTS

No frogs were trapped in the slash piles during the two July 2017 surveys. A wood frog was observed at site 4 and three wood frogs were observed at the edge of the water (Photo 4) near site 1 during the first survey (Photo 5). No frogs were observed in or near the slash piles during the second survey. An oblique-lined tiger beetle (*Cicindela tranquebarica*) (Photo 6) and an unidentified spider (Photo 7) were trapped during the July 13 survey.



**Photo 4: Water Accumulated in Km 4 Borrow Area**



**Photo 5: Wood Frog near Site 4**



**Photo 6: Tiger Beetle in a Pitfall Trap**



**Photo 7: Unidentified Spider Species in a Pitfall Trap**

## 4.0 DISCUSSION

The presence of a frog in one of the slash piles could indicate that the amphibian habitat enhancement piles are being used to some extent. The presence of frogs in the Km 4 borrow area may indicate that the recently disturbed area provided suitable habitat for frogs. The survey time in 2017 was limited to two non-consecutive nights, and a longer survey period could 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 survey will be repeated in the summer of 2019, and 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, frogs were found in and near the slash piles placed in the Km 4 borrow area, possibly indicating that the slash piles provide suitable amphibian habitat. 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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