



Keeyask Generation Project
Terrestrial Effects Monitoring Plan

Amphibian Habitat Enhancement Report

TEMP-2024-06



KEYYASK GENERATION PROJECT

TERRESTRIAL EFFECTS MONITORING PLAN

REPORT #TEMP-2024-06

AMPHIBIAN HABITAT ENHANCEMENT YEAR 2 OPERATION 2023

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 and wood frogs.

Why is the study being done?

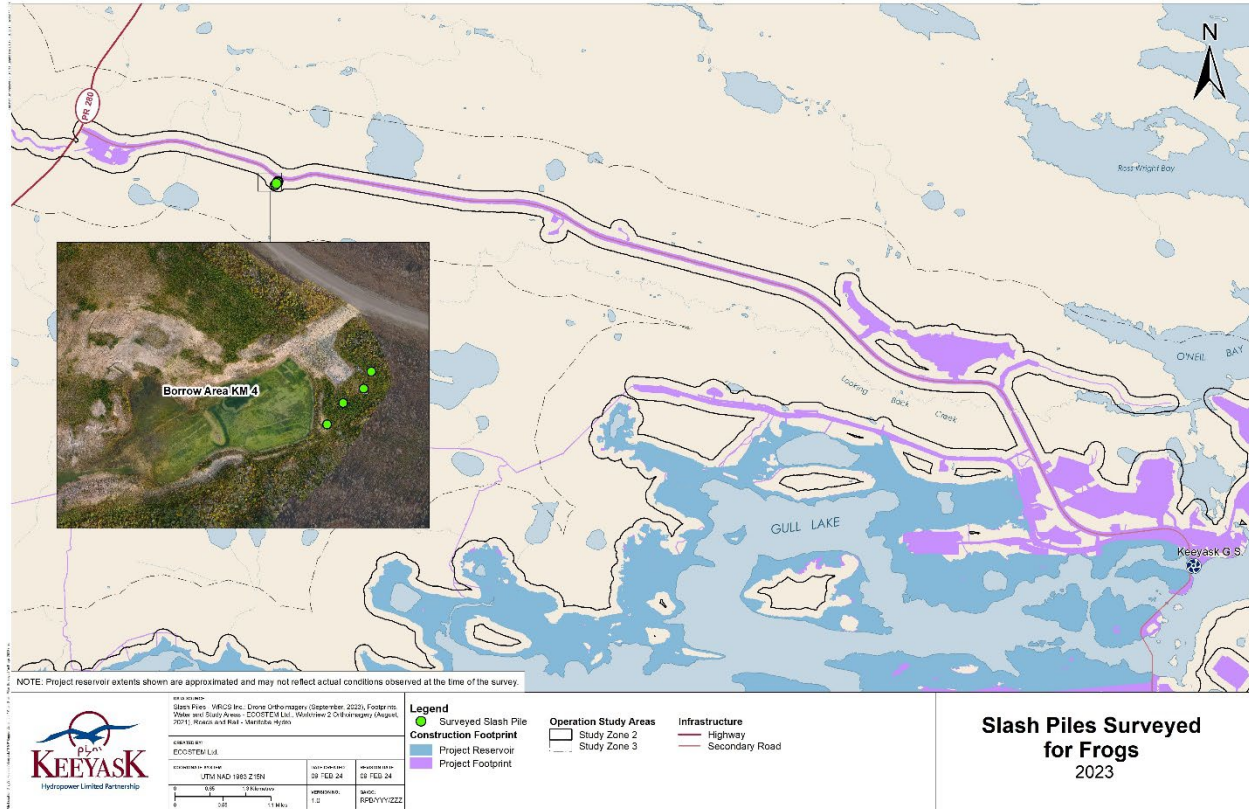
In the Environmental Impact Statement (EIS) for the Project, a mitigation measure identified to lessen the effect of the loss of frog habitat due to the Project was to enhance frog habitat in areas disturbed by the Project, to provide short-term habitat until vegetation is re-established. Providing slash 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 to determine if frogs use these slash piles occurred in 2017, 2019, and 2023.

What was done?

Six pitfall traps were installed near each of the four slash piles in the Km 4 borrow area, located off the North Access Road. Traps were initially set on July 17, 2023 and were checked on July 18, 2023. The species, age (mature or juvenile), and condition of trapped frogs were recorded.



Pitfall Trap in a Slash Pile



Location of Slash Piles in the Km 4 Borrow Area

What was found?

No frogs were observed during the 2023 survey. Substantial vegetation cover has been re-established in the Km 4 borrow area including in the areas near the four slash piles.



One of the Slash Piles in Km 4 Borrow Area in 2017 versus 2023

What does it mean?

Traps were deployed for a single night in 2023, making it hard to rule out slash pile occupation by frogs; however, sampling in previous years has repeatedly shown limited use of the piles. The slash piles are no longer needed to serve as short term habitat now that vegetation cover is establishing well within the Km 4 borrow area.

What will be done next?

Amphibian habitat enhancement monitoring is now concluded.

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, WRCS – Design and reporting
- Thomas Wood, WRCS – Reporting
- Levi Warkentine, WRCS – Survey personnel
- Ellyse Olafson, WRCS – 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 and became fully operational in March 2022. The Project is located at the former 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 decommissioned 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 and 2019, six pitfall traps were installed at 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. 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.

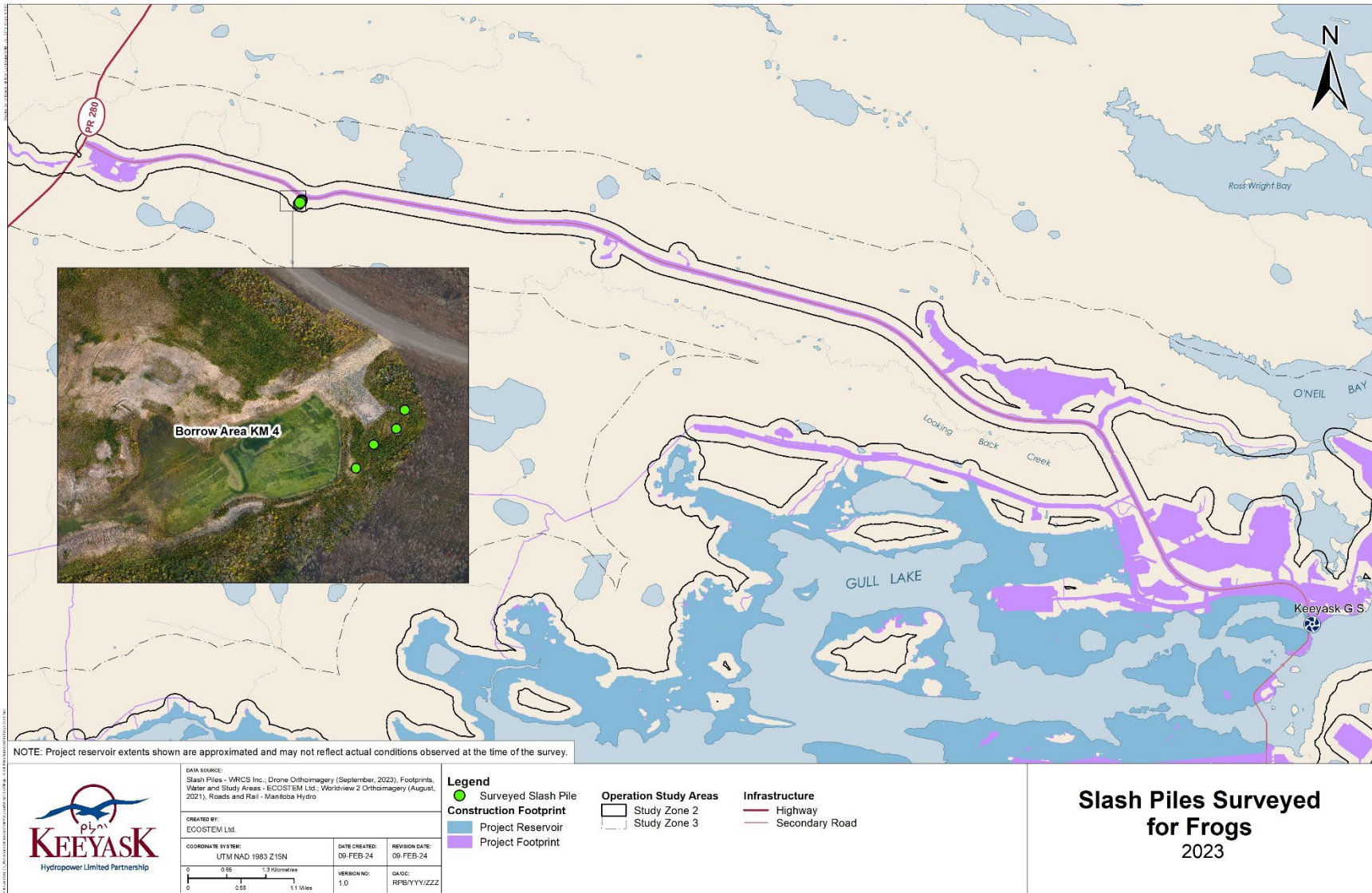
Traps were set on July 17, 2023, and were checked and removed July 18, 2023. The species, age (mature or juvenile), and condition of trapped frogs was recorded. All trapped frogs or other organisms were released unharmed. The survey was ended early due to the well-established plant cover of the Km 4 borrow area, which was planted with trees in 2016 as part of the Project's revegetation efforts.



Photo 1: Slash Pile in the Km 4 Borrow Area, 2023



Photo 2: Pitfall Trap Set in the Ground at a Slash Pile, 2023



Map 1: Slash Piles in the Km 4 Borrow Area Surveyed for Frogs, 2023

3.0 RESULTS

No frogs or other organisms were found in the traps in 2023. No frogs were observed in or near the slash piles. Plant cover on the site in 2023 (Photo 3) was greatly increased as compared to 2017 and 2019 (Photo 4).



Photo 3: Overall Plant Regeneration in Km 4 Borrow Area, 2023



Photo 4: Km 4 Borrow Area, in 2017 (top left), 2019 (top right), and 2023 (bottom)

4.0 DISCUSSION

Boreal chorus and wood frogs require shallow, fish-free waterbodies for breeding habitat (Canadian Herpetological Society 2017). Some juveniles disperse from the waterbody they hatched in across upland habitat to new breeding waterbodies (Berven and Grudzien 1990). Adult frogs migrate to and from breeding waterbodies from forest floor hibernacula each year. Plant cover protects frogs from desiccation and predation during these important movements. Wood frog juveniles actively avoid moving through areas lacking plant cover (Popescu and Hunter 2011) and wood frogs were found to be absent in a forest gradient where forest cover was below 30% (Gibbs 1998).

During Project construction, granular material was excavated from the Km 4 borrow area. A shallow pond formed in the resulting low-lying area, and it contained suitable breeding habitat for frogs. Plant cover surrounding the pond was initially sparse. As described in the Project's *Terrestrial Mitigation Implementation Plan*, 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 the Km 4 borrow area near suitable breeding habitat, to provide some habitat and cover for frogs until vegetation in the borrow area is re-established. Amphibian use of the slash piles was monitored from 2017 to 2023 under the *Terrestrial Environment Monitoring Plan*.

The presence of frogs near the slash piles in the Km 4 borrow area in 2017 and 2019 indicated that the area provided some suitable habitat for frogs (WRCS 2020). No frogs were detected near the slash piles in 2023, but due to the short survey length in that year, it is unclear whether frogs were still using the slash piles for shelter as observed in previous years.

Coniferous tree seedlings were planted in the Km 4 borrow area in 2016 as part of the Project's revegetation efforts. Plant cover in the Km 4 borrow area has increased considerably since 2016, and most of the planted tree saplings continue to grow (ECOSTEM 2024). With increased plant cover now likely providing adequate shelter for frogs in the Km 4 borrow area, slash piles are less likely to be needed as temporary sources of shelter for frogs as they move across the landscape.

5.0 SUMMARY AND CONCLUSIONS

The frogs observed in or near the slash piles in July 2017 and 2019 indicate that they were used as habitat to a limited extent by frogs. Although frogs were not found using slash piles in 2023, vegetation re-establishment on the site now provides the necessary shelter for frog movements from nearby breeding ponds to upland forests. Planted conifer trees and naturally regenerating vegetation has made the temporary slash pile frog habitat obsolete. Amphibian habitat enhancement monitoring is now concluded.

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