



Keeyask Generation Project
Terrestrial Effects Monitoring Plan

Provincially Very Rare and Rare Plants Monitoring Report

TEMP-2018-04



KEEYASK GENERATION PROJECT

TERRESTRIAL EFFECTS MONITORING PLAN

REPORT #TEMP-2018-04

PROVINCIALY VERY RARE AND RARE PLANT MONITORING

Prepared for

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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.

This report describes the results of rare plant monitoring conducted during 2017, the fourth summer of Project construction.

Why is the study being done?

Terrestrial plants perform important functions in ecosystems. Some terrestrial plants are particularly important for ecological reasons (e.g., rare species) and/or social reasons (e.g., food and cultural importance to the Keeyask partner First Nations).

Provincially very rare to rare plant species are particularly important because it is possible that the loss of a few patches of these plants can have a large effect on the species in the Project region. The environmental assessment studies did not find any of these rare species in the areas that will be affected by the Project. However, these plants could still be present but not yet discovered as rare plants can be hard to find. The Provincially Very Rare and Rare Plant study is conducting additional searches for these rare species in Project areas and, if any are found, appropriate mitigation will be proposed.

What was done?

Rare plant monitoring in 2017 covered Project areas which had not been previously searched during the environmental assessment studies, and which had the highest potential to support rare plant species.

Rare plant surveys were completed on July 6, 2017 in the planned Ellis Esker borrow area and its access road corridor. A botanist (plant specialist) walked in these areas to search for rare plants. Also, any rare plants seen during other plant surveys (e.g., invasive plant monitoring) were recorded. If rare plants are found during field surveys, they are documented by taking pictures, taking notes, recording coordinates and flagging the location so it can be found again. If any rare to uncommon plants of importance to the Keeyask partner First Nations are found, they are recorded in the same way as a rare plant.

What was found?

No rare to uncommon plants of importance to the Keeyask partner First Nations were seen during these surveys.

About 30 Scheuchzeri's cotton-grass plants were found growing at five locations, which were close to each other, in the Ellis Esker access road corridor. The Manitoba Conservation Data Centre classifies Scheuchzeri's cotton-grass as probably rare within Manitoba as a whole, but it is uncertain whether it actually is either more common or more rare.

What does it mean?

Avoidance of the Scheuchzeri's cotton-grass plant locations was not recommended for two reasons. Rerouting the Ellis Esker road corridor was not feasible. Additionally, this species is not a listed species at risk, nor is it very rare in the Province.

What will be done next?

Additional searches outside of the Project-affected areas, but within the general Project area (Study Zone 4) will be conducted during the summer of 2018. Results from these searches will be used to evaluate whether Scheuchzeri's cotton-grass is actually more common in the Keeyask region than suggested by its provincial conservation concern ranking.

No other pre-clearing rare plant surveys are anticipated for the remainder of the construction phase of the Project since all of the general areas where clearing is planned have already been searched.

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Diana Bizecki Robson (Manitoba Museum) is also gratefully acknowledged for reviewing the identification of one of the plant specimens collected for lab confirmation.

STUDY TEAM

Dr. James Ehnes was the project manager and study designer.

Fieldwork was conducted by Brock Epp and Nathan Ricard.

Data analysis and report writing were completed by Brock Epp and James Ehnes. Cartography was completed by Nathan Ricard. Jackie Krindle (Calyx Consulting) reviewed the identification of plant specimens collected for lab confirmation.

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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 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, rare plants, during the construction and operation phases.

Priority plants are defined as those plants that are particularly important for ecological and/or social reasons. Priority plants are the native plant species that are highly sensitive to Project features, make high contributions to ecosystem function and/or are of particular interest to the partner First Nations. A plant species is considered to be highly sensitive to human features if it is globally, nationally, provincially or regionally rare, near a range limit, has low reproductive capacity, depends on rare environmental conditions and/or depends on the natural disturbance regime (wildlife studies monitor plant species that are critical for the survival and/or reproduction of an animal species). The partner First Nations have noted a variety of plants of traditional importance that are present in the Project area, such as *wihkis* (sweet flag; *Acorus americanus*) and northern Labrador tea (tea leaves; *Rhododendron tomentosum*).

The Priority Plants and Their Habitats study (see KHLP 2015, Section 3.1.3) verifies actual Project effects on known priority plant locations and priority plant habitats, including those plants that are important to the partner First Nations. This study commences in the final year of construction.

Because it is possible that existing locations of provincially very rare to rare plant species were not found during EIS studies, the Provincially Very Rare and Rare Plant study (i.e., this study) conducts additional searches and, in the unlikely event any of these species are found, prescribes appropriate mitigation.

The objectives of the Provincially Very Rare and Rare Plant study are to:

- Determine if any provincially very rare or rare plants occur within the Project zone of influence; and,
- In the unlikely event that a provincially very rare or rare plant is discovered:

- Confirm that any identified locations are well marked for avoidance where avoidance is practicable;
- Develop a transplanting plan for provincially very rare plant locations where avoidance is not practicable; and,
- Monitor the survival and vigor of all plants in any identified locations.

Monitoring for this study was conducted from 2014 to 2017. Several previous reports (ECOSTEM 2015; 2016; 2017) provide results for the pre-clearing rare plant surveys conducted from 2014 to 2016. This document presents results from the monitoring surveys conducted during 2017.

2.0 METHODS

Section 3.1.2 of the Terrestrial Effects Monitoring Plan (TEMP) details the methods for this study. The following summarizes the activities conducted during 2017.

The rare plant species included in this study were generally those which the Manitoba Conservation Data Centre has classified as being provincially very rare to rare. This included species with conservation concern ranks of S1, S1?, S1S2, S2 or S2?. The two initial exceptions were small pondweed (*Potamogeton pusillus* spp. *tenuissimus*) and Robbins pondweed (*P. robbinsii*), since the EIS analysis concluded that, while these species are classified as being provincially rare, they are not rare in the Keeyask region. Muskeg lousewort (*Pedicularis macrodonta*; S2 species) was later excluded after it was found at more than 20 locations outside of the Project zone of influence on plants (Study Zone 2; Map 2-1).

Uncommon plants of importance to the Keeyask partner First Nations recorded during field surveys included northern Labrador tea and *wihkis* (sweet flag).

Pre-clearing rare plant surveys were conducted in areas that met all of the following three criteria:

- Could be directly or indirectly affected by the Project (Study Zone 2; Map 2-1);
- Had not been previously surveyed for rare plants; and,
- Had the highest potential for supporting provincially very rare to rare species.

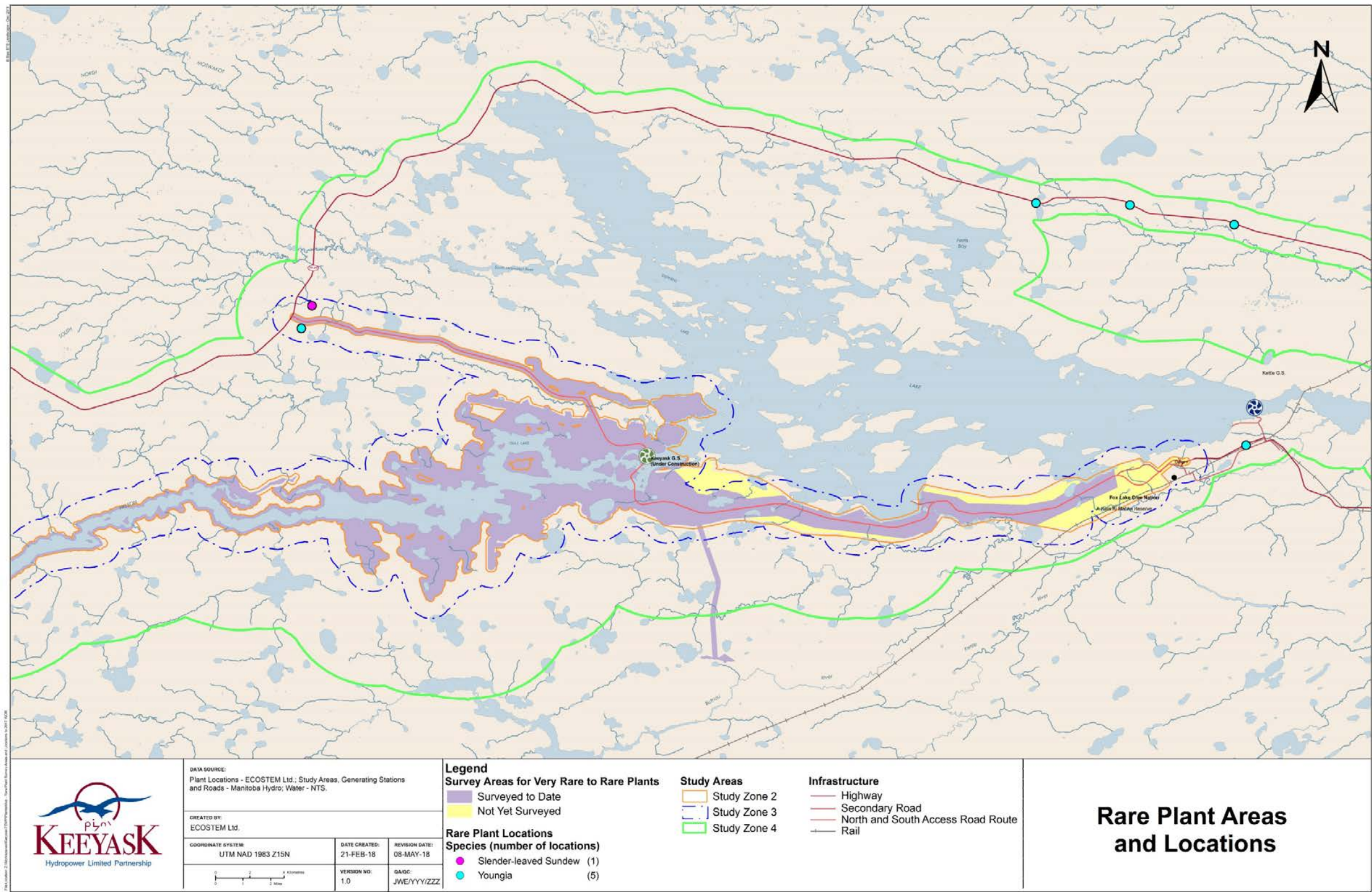
Map 2-1 shows the general areas searched to date during the Project EIS studies and TEMP monitoring, as well as for the Keeyask Infrastructure Project. This map also shows the locations observed to date for provincially very rare to rare plants, but excludes those species that are more common than initially thought in the Keeyask region (*i.e.*, map does not include small pondweed, Robbin's pondweed and muskeg lousewort). All of these plant locations were outside of the predicted Project zone of influence on plants (Study Zone 2; Map 2-1).

Using the above criteria, areas selected for pre-clearing rare plant surveys in 2017 included the future Ellis Esker borrow area and its access road corridor (Map 2-2). The stand-level habitat map produced for the EIS was used to select sample locations representing the highest potential for including rare plant species that could possibly occur in Study Zone 2.

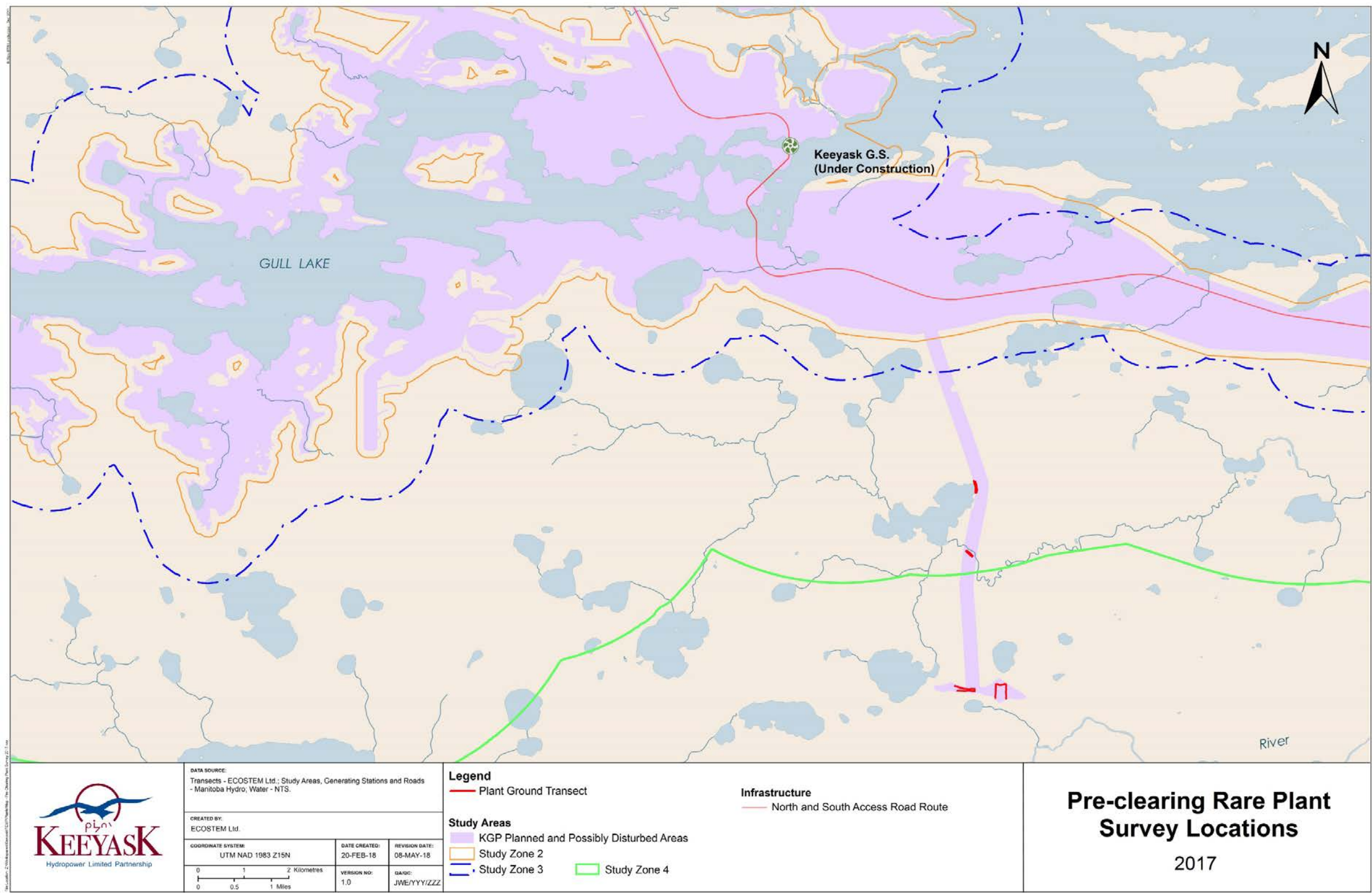
The pre-identified habitat patches were sampled by walking along a combination of systematic and meandering transects. Depending on the size and shape of the habitat patch, one or two parallel transects ran lengthwise through the patch in predetermined locations. In the field, the botanist added meandering surveys through other portions of these areas that appeared to have potential for harboring the target plant species.

Rare plants were also recorded if they were incidentally encountered during all plant surveys (e.g., invasive plants).

A botanist surveyed, on foot, approximately 2.8 km of rare plant transects on July 6, 2017 in the future Ellis Esker borrow area and its access road corridor (Map 2-2). Any patches of provincially very rare to rare plant species discovered during the surveys were documented with notes and geo-referenced photographs. Recorded information included attributes such as location, plant species, plant vigor, site conditions and surrounding habitat. If a provincially very rare to rare plant was found, bright flagging tape was placed around the location to prevent disturbance. The locations and sizes of the plant patches were later mapped in a GIS (a “patch” could consist of one or a few individual plants). The locations of any provincially very rare or rare species that could be identified in the field were immediately reported to Manitoba Hydro. Methods were the same for the uncommon plants of importance to the Keeyask partner First Nations.



Map 2-1: Project areas searched to date for very rare to rare plants, and locations where these plants (except for small pondweed, Robbin's pondweed, muskeg lousewort) were observed prior to 2017



Map 2-2: Pre-clearing rare plant transects surveyed in 2017

3.0 RESULTS

Pre-clearing surveys conducted in 2017 in the future Ellis Esker borrow area and access road corridor found one plant species ranked as an S2? by the Conservation Data Centre (CDC). No additional plants classified as provincially rare or uncommon were found during invasive plant monitoring surveys. Rare to uncommon plants of importance to the Keeyask partner First Nations were not observed during the 2017 field surveys.

In 2016, a single elegant hawksbeard (*Crepis elegans* [also called *Askellia elegans*]) plant had been found near the edge of the borrow area adjacent to the start-up camp. This plant was not found there when the location was revisited during 2017 surveys. The flagging tape marking the buffer around the plant was intact, and there was no evidence that the site had been disturbed since the plant was found. No other elegant hawksbeard plants were found in the area.

Of the provincially very rare to rare species potentially occurring in the Project zone of influence on plants (Study Zone 2; Map 2-1), muskeg lousewort (*Pedicularis macrodonta*; S2 species) was of particular interest as it had been observed in five locations within the planned Project footprint during the 2014 pre-clearing rare plant surveys (ECOSTEM 2015). Subsequent surveys brought the total number of known muskeg lousewort patches that would remain undisturbed to 22, which was higher than the 20 needed to have Project effects remain at an ecologically acceptable level (ECOSTEM 2016). Rare and invasive plant surveys in 2017 did not identify any additional muskeg lousewort locations.

3.1 SCHEUCHZERI'S COTTON-GRASS

Scheuchzeri's cotton-grass (*Eriophorum scheuchzeri*; Photo 3-1, Photo 3-2), an S2? ranked species, was found during the 2017 rare plant surveys. The S2? rank indicates that the species is likely provincially rare, but could possibly be either provincially very rare or provincially uncommon.

The Scheuchzeri's cotton-grass identification was made in the lab after the field season was over. Five field specimens with potential to be this species were sent to J. Krindle (Calyx Consulting) for identification. The single specimen identified as Scheuchzeri's cotton-grass was confirmed by D. Bizecki Robson (Curator of Botany, The Manitoba Museum).

Scheuchzeri's cotton-grass is difficult to identify in the field for several reasons: (i) it is similar in appearance to other cotton-grass species; (ii) a microscope is preferred for identification; (iii) other cotton-grass species are widespread and can be locally abundant, which means that one or a few Scheuchzeri's plants can be intermingled with many other cotton-grass plants; and, (iv) vegetative (i.e., non-flowering) plants would be easily overlooked as they are almost impossible to distinguish from other species using the leaves only.

Scheuchzeri's cotton-grass was not expected to be present since the previously known locations indicated that the Project footprint is bordering on the southern limit of its range. This species is much more common in the arctic (Porsild and Cody 1980).

Scheuchzeri's cotton-grass is a perennial herb growing from long-creeping rhizomes in solitary to a few stalks (FNA 2018). Flower heads are composed of bright white bristles (Photo 3-1), with anthers no longer than 1.5 mm, and fertile scale margins not more than 1 mm wide. The plant is typically found in tundra, on wet marshy ground and peaty soils, along riverbanks, and on lake and pond shores. As indicated above, this species is more common in the arctic, and is likely at the southern limit of its range in the Project area.

Based on the lab identifications of all field specimens, more than 30 Scheuchzeri's cotton-grass plants were determined to be growing at five locations southwest of the stream that will be crossed by the Ellis Esker access road (Map 3-1). These five locations were within 150 m of each other. The number of plants at each location ranged from one to approximately 20. For sites with multiple plants, the maximum separation of the plants was approximately 50 m.

The Scheuchzeri's cotton-grass plants were found growing on a peatland with black spruce and tamarack dominated vegetation near the stream bank (Photo 3-3). Shrub species included speckled alder, bog birch, leatherleaf and bog bilberry. Sedges, sphagnum mosses and feathermosses dominated the ground cover. This habitat is among the types described in the literature.

Black spruce and tamarack-dominated peatlands are widespread and somewhat common in the Keeyask region. Over 2 ha of this habitat was immediately adjacent to the planned Ellis Esker access road clearing. There is approximately 32 ha of similar habitat within about one km of the Ellis Esker borrow area and access road.



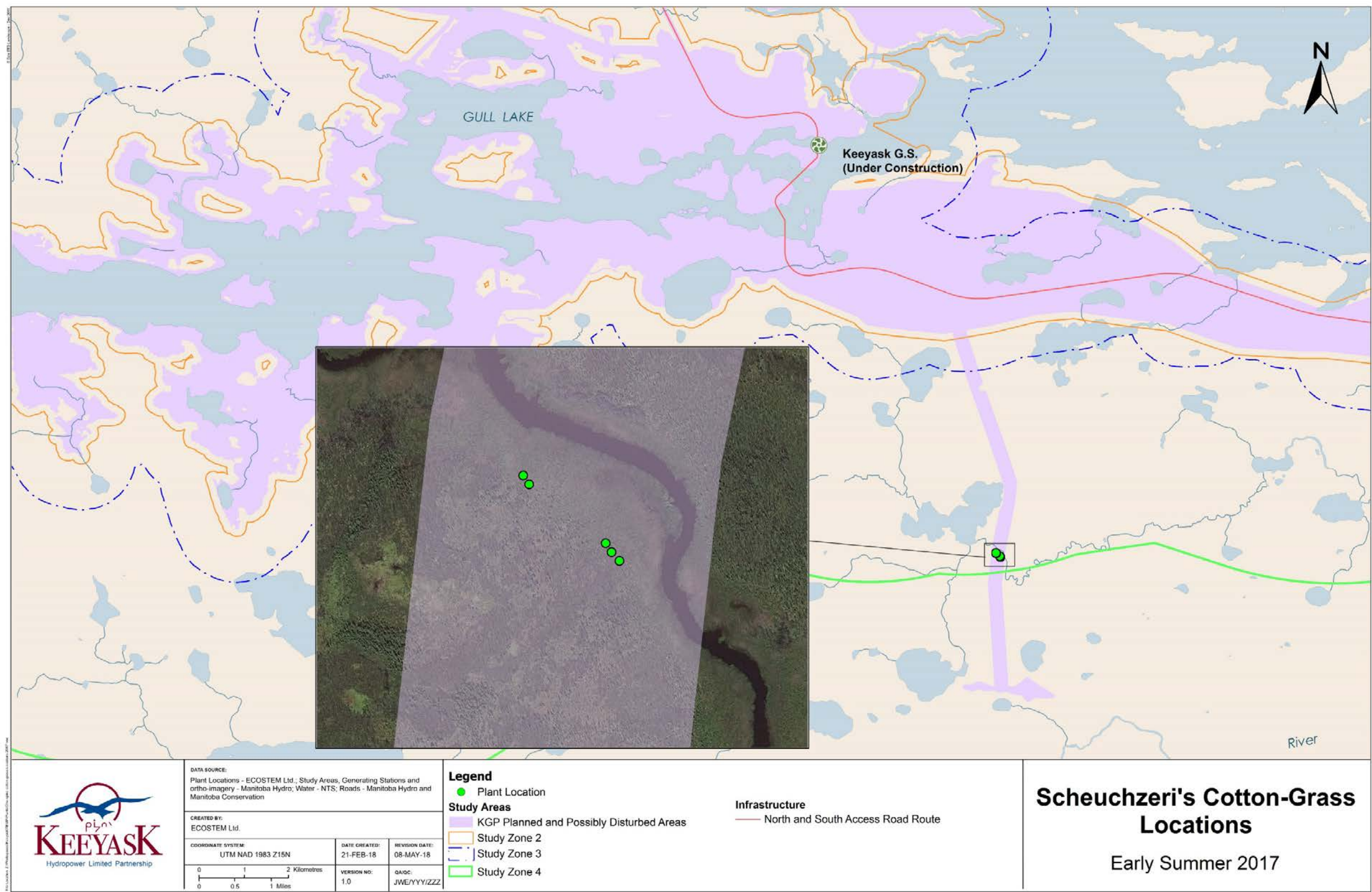
Photo 3-1: Scheuchzeri's cotton-grass flower in the Ellis Esker access road corridor



Photo 3-2: Scheuchzeri's cotton-grass plant in the Ellis Esker access road corridor



Photo 3-3: Scheuchzeri's cotton-grass habitat within the Ellis Esker access road corridor



Map 3-1: Scheuchzeri's cotton-grass plants or plant patches observed during 2017 field surveys

4.0 SUMMARY AND CONCLUSIONS

4.1 PROVINCIALY VERY RARE AND RARE PLANTS MONITORING

The 2017 pre-clearing surveys found one provincially rare plant species, Scheuchzeri's cotton-grass (*Eriophorum scheuchzeri*). The Manitoba Conservation Data Centre classifies Scheuchzeri's cotton-grass as probably rare within Manitoba as a whole, but it is uncertain whether it actually is either more common or more rare. Scheuchzeri's cotton-grass was not expected to be present since the previously known locations indicate that the Project footprint is bordering on the southern limit of its range.

About 30 Scheuchzeri's cotton-grass plants were found growing at five locations, which were close to each other, near the stream that the Ellis Esker access road would cross. The five locations, which were close to each other.

Avoidance of the Scheuchzeri's cotton-grass plant locations was not recommended for two reasons. Rerouting the Ellis Esker road corridor was not feasible given the length of corridor that would be affected and the potential for equal or greater effects in an altered route due to the proximity to the stream. Additionally, this species is not a listed species at risk, nor is it considered very rare in the Province (MBCDC 2018).

No other rare plants were found incidentally during other plant monitoring surveys in 2017. Additionally, no rare to uncommon plants of importance to the Keeyask partner First Nations were seen during any of the 2017 plant surveys.

4.2 NEXT STEPS

Additional searches outside of Project-affected areas, but within the general Project area (Study Zone 4), will be conducted during the summer of 2018. Results from these searches will be used to evaluate whether Scheuchzeri's cotton-grass is more common in the general Project area than suggested by its provincial conservation concern ranking.

No other additional pre-clearing rare plant surveys are planned for the remainder of the construction phase of the Project since it appears that such surveys have already been conducted in all of the Project areas that will be cleared.

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