



Keeyask Generation Project
Terrestrial Effects Monitoring Plan

Provincially Very Rare and Rare Plants Monitoring Report
TEMP-2019-04



KEEYASK GENERATION PROJECT

TERRESTRIAL EFFECTS MONITORING PLAN

REPORT #TEMP-2019-04

PROVINCIALY VERY RARE AND RARE PLANT MONITORING



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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 the rare plant monitoring conducted during 2018, the fifth summer of Project construction.

Why is the study being done?

Plants perform important functions in land ecosystems. Some plants are particularly important for ecological reasons (e.g., rare species) and/or social reasons (e.g., traditional 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 small number of these plants can have a large effect on the species in the Project region.

The environmental assessment studies carried out for the Project did not find any very rare to rare species in the areas that may be affected by Project development. However, because 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. If any rare plants are found, appropriate mitigation will be proposed.

What was done?

Pre-clearing rare plant searches were not conducted in 2018 since new clearing was not anticipated at the time of the surveys.

Rare plant surveys conducted in 2017 had found five sites along the Ellis Esker access road corridor that likely had Scheuchzeri's cotton-grass, a species that is thought to be rare throughout the Province. In 2018, a botanist (plant specialist) conducted rare plant surveys on July 6, 8 and 9, 2018 near the Ellis Esker access road corridor and within the surrounding region (Study Zone 4). These surveys were done to search for additional Scheuchzeri's cotton-grass sites, to see if this species is more common in the region than originally thought; additional plant specimens were also collected to confirm that the plants found in 2017 were Scheuchzeri's cotton-grass.

If rare plants or rare to uncommon plants of importance to the Keeyask partner First Nations are found while doing this study, or any of the other plant monitoring studies (e.g., invasive plant monitoring), their locations are recorded.

When rare plants are found during any of the habitat or plant monitoring studies, they are documented by taking pictures, taking notes, recording coordinates and flagging the location so the plants can be found again and avoided, where possible.

What was found?

No additional sites with Scheuchzeri's cotton-grass were found during monitoring surveys in 2018. Monitoring also determined that the sites found in 2017 had not been disturbed by clearing or traffic on the access road to the Ellis Esker borrow area.

Three single elegant hawksbeard plants were incidentally found growing at three sites in Borrow Area B-6 during other plant surveys. The Manitoba Conservation Data Centre classifies elegant hawksbeard as very rare within Manitoba as a whole.

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

What does it mean?

Clearing for the Ellis Esker access road avoided the Scheuchzeri's cotton-grass plant locations found in 2017. The sites nearest the access road corridor were marked with flagging tape in December, 2018 to help prevent disturbance during construction activities in the winter of 2018/2019. If the rare plant monitoring in 2019 shows that these sites have been avoided, no further mitigation or monitoring will be needed.

For elegant hawksbeard, disturbance near the sites located in the Project footprint should be avoided or minimized, if possible.

What will be done next?

No additional pre-clearing rare plant surveys are planned for the remainder of the construction phase of the Project since new clearing is not anticipated at this time. The known Scheuchzeri's cotton-grass sites will be surveyed in summer 2019 to determine if construction activities avoided them. Also, the elegant hawksbeard sites in Borrow Area B-6 will be revisited to monitor the condition of the plants and to determine if they have been disturbed.

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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 (KHLP 2012a). 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; KHLP 2012b). The *Keeyask Generation Project Terrestrial Effects Monitoring Plan* (TEMP) was developed as part of the licensing process for the Project (KHLP 2015). 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 impacts, 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 Project impacts 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, including *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 the environmental assessment 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 vigour of all plants in any identified locations.

Monitoring for this study was conducted from 2014 to 2018. Several previous reports (ECOSTEM 2015; 2016; 2017a; 2018) provide results for the pre-clearing rare plant surveys conducted from 2014 to 2017. This document presents results from the monitoring surveys conducted during 2018.

2.0 METHODS

2.1 APPROACH

Section 3.1.2 of the Terrestrial Effects Monitoring Plan (TEMP) details the methods for this study. The following summarizes the activities conducted during 2018.

The rare plant species included in this study were generally those which the Manitoba Conservation Data Centre (MBCDC) 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 these species are actually not rare in the Keeyask region. Muskeg lousewort (*Pedicularis macrodonta*) was ranked as S2 (rare) by the MBCDC when construction monitoring began. The species was later excluded after it was found at more than 20 locations outside of the potential Project zone of influence on plants (Study Zone 2; Map 2-1). Additionally, the MBCDC has recently changed the species rank to S2S3 (potentially rare).

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

This monitoring study conducts pre-clearing rare plant surveys in areas that meet all of the following three criteria:

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

Map 2-1 shows the general areas searched to date for rare plants, including during the Project EIS studies and during monitoring for the TEMP and the Keeyask Infrastructure Project.

Map 2-1 also shows the provincially very rare to rare plants locations recorded to date during the pre-clearing surveys, as well as during the environmental assessment studies and other monitoring studies in the area, with the exception that species that have been found to be more common in the Keeyask region than indicated by their MBCDC conservation concern ranking are excluded. Excluded species include small pondweed, Robbin's pondweed and muskeg lousewort.

All of the recorded provincially very rare to rare plant locations were outside of the potential Project zone of influence on plants (Study Zone 2; Map 2-1).

Pre-clearing rare plant surveys were not conducted in 2018 since new Project clearing was not anticipated at the time of the surveys.

2.2 SCHEUCHZERI'S COTTON-GRASS

Rare plant surveys were conducted in 2018 for a different reason than in previous years. Searches for Scheuchzeri's cotton-grass (*Eriophorum scheuchzeri*) in 2018 were conducted because this species was found during the 2017 pre-clearing rare plant survey. Scheuchzeri's cotton-grass is ranked as an S2? species by the MBCDC (2018). An S2? ranking means that the species is thought to be provincially rare but the uncertainty associated with this ranking means that it could actually be either provincially very rare or provincially uncommon.

Scheuchzeri's cotton-grass is difficult to identify in the field for several reasons: (i) it is very similar in appearance to other cotton-grass species; (ii) 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; (iii) a microscope is preferred for identification; and, (iv) vegetative (i.e., non-flowering) plants would be easily overlooked in the field as they are almost impossible to spot or distinguish from other grasses and sedges when only the leaves are present.

Five field specimens had been collected at various sites in 2017 to represent the possible Scheuchzeri's cotton-grass plants at each site. Only one of these five field specimens was subsequently identified as Scheuchzeri's cotton-grass.

This single identification was somewhat uncertain despite having been provided by three independent botanists (ECOSTEM 2018). This uncertainty arose because the plants were found after they had already gone to seed. In the field, they are typically identified from their solitary or few fertile stems growing from creeping rhizomes with a single white, obovoid spikelet (FNA 2018). Other species growing in the area can have a similar appearance, and it can be difficult to isolate rhizomes in the peaty substrate to confirm their presence. The flower anthers are ≤ 1.5 mm long, and fertile scales have hyaline margins ≤ 1 mm wide.

Two activities were subsequently undertaken to provide greater certainty for the species identification. First, the 2017 samples were sent to Dr. Bruce Ford (botany professor at the University of Manitoba; curator of the University of Manitoba's Vascular Plant Herbarium). Second, additional field specimens were collected.

The objectives of the Scheuchzeri's cotton-grass surveys in 2018 were twofold. First, to provide further evidence to confirm whether or not the specimen collected in 2017 was, in fact, Scheuchzeri's cotton-grass. Second, in the event it was determined that, in fact, Scheuchzeri's was growing in the Project zone of influence, to determine whether the Project could have substantial effects on the Scheuchzeri's cotton-grass population.

To address the first objective, a botanist collected additional specimens at the sites where the Scheuchzeri's cotton-grass plant was found in 2017. Two other locations, within 150 m of the Ellis Esker access road, and one within Study Zone 2, were also searched because they appeared to have a high potential for supporting the species.

For the second objective, new locations within the surrounding region were searched. These locations were selected using two criteria: (i) they had the highest potential for including Scheuchzeri's cotton-grass plants; and, (ii) they were not expected to be affected by any phase of the Project. For the initial selection, locations with the highest potential for including Scheuchzeri's cotton-grass plants were selected from the stand-level habitat map produced for the EIS. Next, locations not expected to be affected by the Project were the subset of those from the initial selection that were more than 150 m away from the Ellis Esker road clearing and outside of Study Zone 2. The Ellis Esker road was buffered because it is outside of Study Zone 2 as the EIS assumed it was highly unlikely that it would be used by the Project. It is noted that the potential additional effects of this Project component were assessed separately in the EIS, and predicted cumulative effects with the Project were still not significant.

The pre-identified habitat sites were sampled by a botanist meandering through the site. If the botanist noticed sites outside of the pre-identified site with potential for supporting the target plant species, then these sites were surveyed as well.

On July 6, 8 and 9, 2018, a botanist covered approximately 6.7 ha of potential Scheuchzeri's cotton-grass habitat during meandering foot surveys. These potential habitat sites were at four locations more than 150 m away from the approved Project footprint, at one location within Study Zone 2 near the South Access Road, and at two locations within 150 m of the Ellis Esker access road, in the same general area where plants were found in 2017 (Map 2-1).

Any sites of Scheuchzeri's cotton-grass or other 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 vigour, site conditions and surrounding habitat. If a provincially very rare to rare plant was found, brightly coloured flagging tape was placed around the location to prevent disturbance.

The locations and sizes of the plant sites were later mapped in a GIS (a "site" 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.

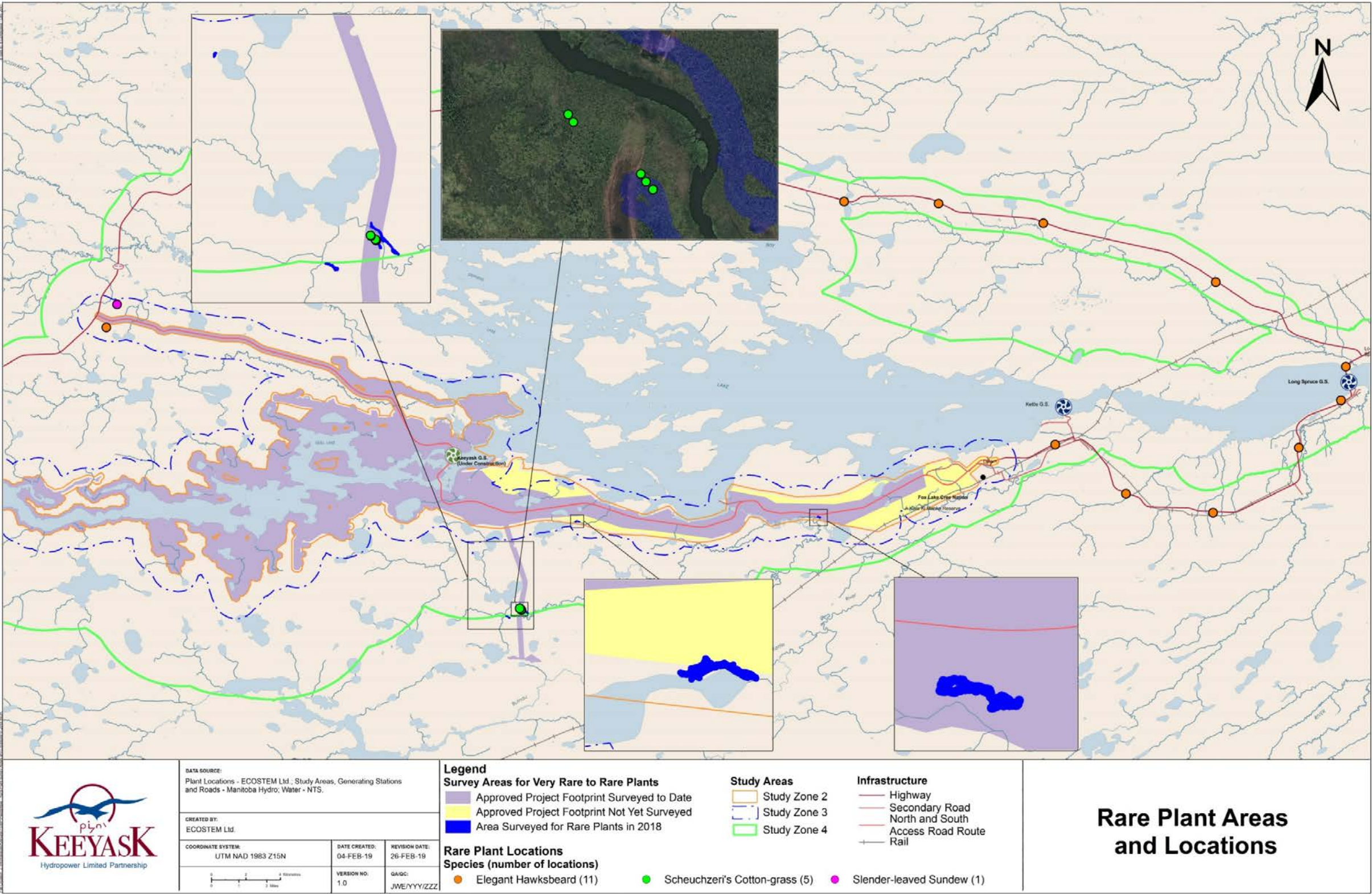
In addition to this study, all rare plant species incidentally encountered during any of the terrestrial habitat and plant monitoring studies (e.g., invasive plant monitoring) were recorded. All incidental observations are included in this study report.



Photo 2-1: Scheuchzeri's cotton-grass flower found in the Ellis Esker access road corridor in 2017



Photo 2-2: Scheuchzeri's cotton-grass plant found in the Ellis Esker access road corridor in 2017



Map 2-1: General Project areas searched to date for provincially very rare to rare plants, and locations where these plants (except for small pondweed, Robbin's pondweed, muskeg lousewort) were observed from 2001 to 2018

3.0 RESULTS

3.1 SCHEUCHZERI'S COTTON-GRASS

Nine field specimens with potential to be Scheuchzeri's cotton-grass plants were collected at 17 sites during the targeted 2018 surveys. These specimens were sent to J. Krindle (Calyx Consulting) for identification. All nine specimens were identified as closed-sheath cotton-grass (*Eriophorum brachyantherum*).

An unanticipated and important finding from the 2018 plant surveys and detailed mapping of cleared and disturbed areas (ECOSTEM 2019) was that none of the five Scheuchzeri's cotton-grass sites found in 2017 had been disturbed by Project clearing for the Ellis Esker access road (Map 2-1). The minimum distance from the road clearing to the nearest Scheuchzeri's cotton-grass site was approximately 2 m. The distances of the remaining sites from the road clearing ranged from 9 m to 68 m.

3.2 INCIDENTAL RARE PLANT OBSERVATIONS

No plants classified as provincially rare or uncommon were found during the 2018 terrestrial habitat and plant monitoring. Rare to uncommon plants of importance to the Keeyask partner First Nations were not observed during the 2018 field surveys.

The 2018 invasive plant surveys incidentally found one species ranked as provincially very rare (i.e., S1) by the Manitoba Conservation Data Centre (MBCDC 2018), which is detailed below.

3.2.1 ELEGANT HAWKSBEARD

Elegant hawksbeard (*Crepis elegans* [also called *Ascellia elegans*]; Photo 3-1) was the species incidentally found during the 2018 invasive plant surveys. One elegant hawksbeard plant was found at three sites for a total of three plants. These plants were growing on previously disturbed bare mineral substrate. All plants appeared to be healthy at the time of the survey.

All three elegant hawksbeard sites were within Borrow Area B-6, and in the portion of the borrow area adjacent to the South Access Road security gate (Map 3-1). The plants were widely separated within this general area. The borrow area did not appear to have been used or disturbed in 2018.

Flagging tape was not installed at the sites at the time of the survey due to the absence of features to tie it to (Photo 3-2), and because it appeared that this borrow area was not being

used. A map showing the locations of the elegant hawksbeard sites was provided in the September field report. It is recommended that these sites be flagged for avoidance.

Elegant hawksbeard had previously been found at ten sites within the Keeyask study areas during EIS studies, and at one site during Project monitoring in 2016. In 2016, a single elegant hawksbeard plant had been found near the edge of the borrow area adjacent to the start-up camp. This site was revisited in 2017 and 2018 to monitor the condition of the plant, but the plant was no longer present. The flagging tape marking the buffer around the plant was present, but no longer intact in 2018. There was no evidence that the site had been disturbed after the plant was found in 2016.

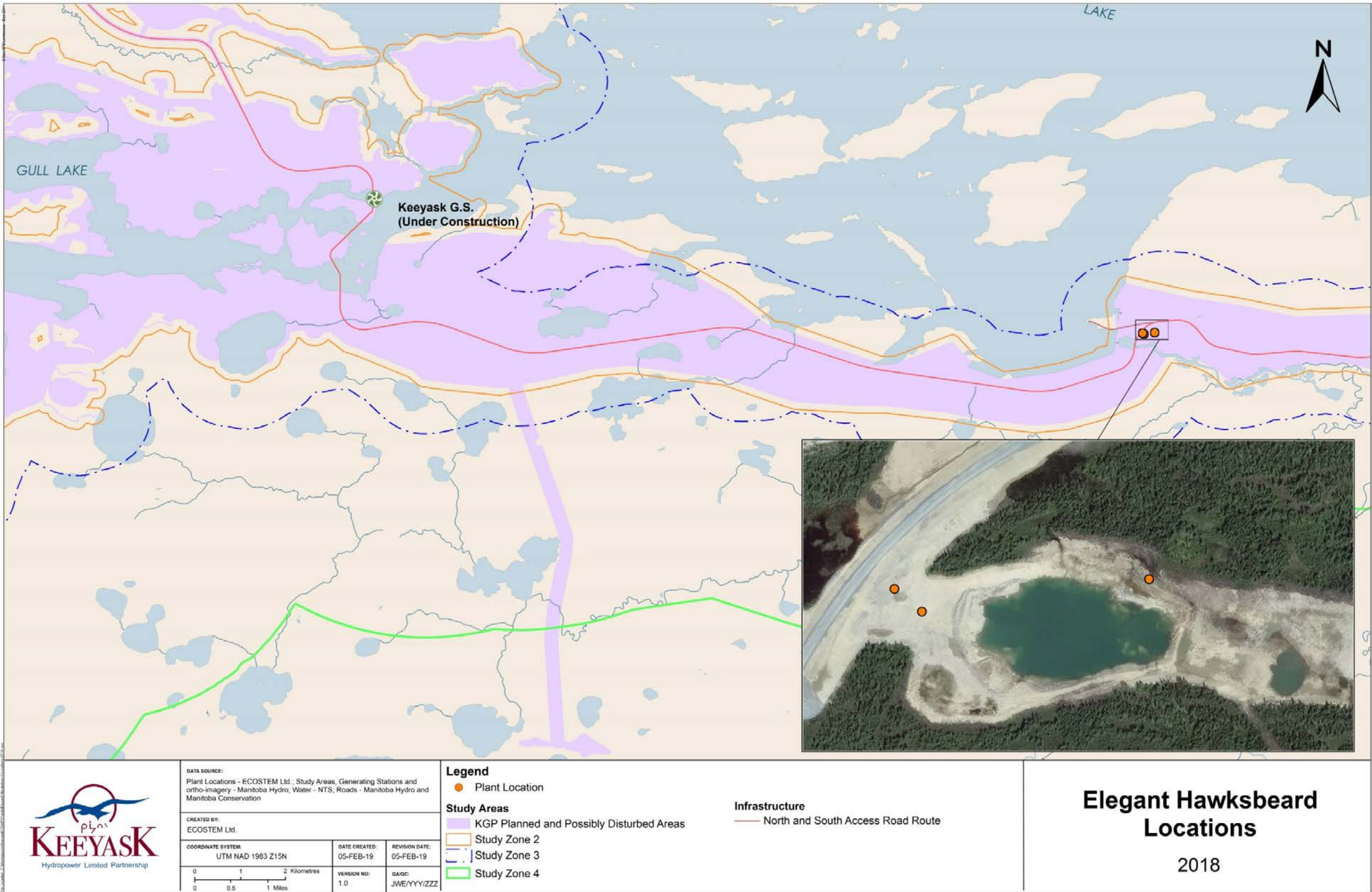
In 2017 and 2018, additional searches for elegant hawksbeard were conducted in the area surrounding the 2016 site, but no other elegant hawksbeard plants were found.



Photo 3-1: Elegant hawksbeard plant growing in Borrow Area B-6 in 2018



Photo 3-2: One of the elegant hawksbeard sites in Borrow Area B-6 (plant is visible at bottom centre of photo)



Map 3-1: Elegant hawksbeard sites found in 2018

4.0 DISCUSSION

4.1 SCHEUCHZERI'S COTTON-GRASS

The 2018 priority plant surveys determined that none of the five Scheuchzeri's cotton-grass sites found in 2017 had been disturbed by Project clearing, and that no new Scheuchzeri's cotton-grass sites were found near the existing roadway clearing. These additional findings indicated that it could be possible for the Project to completely avoid direct effects on Scheuchzeri's cotton-grass by reusing the same cleared access road to the Ellis Esker borrow area during the winter of 2018/2019.

In addition to the absence of direct Project effects as of the 2018 surveys, the potential indirect effects of the road clearing and traffic on the known sites were much lower than from a typical access road for two reasons. For this access road, clearing and vehicle use took place when the ground was frozen, which minimized ground vegetation and ground disturbance. Additionally, the frozen ground was used as the road bed.

In fall 2018, a recommendation was made to install flagging to identify areas to be avoided during winter 2018/2019. On December 12, 2018, Manitoba Hydro field staff installed flagging tape around these locations (Photo 4-1) to identify areas to be avoided during winter 2018/2019 construction activity.



Source: Manitoba Hydro 2018

Photo 4-1: Flagging tape identifying Scheuchzeri's cotton-grass location near the Ellis Esker access road corridor on December 12, 2018

4.1.1 ELEGANT HAWKSBEARD

Elegant hawksbeard, which the MBCDC classifies as a provincially very rare plant, was incidentally found during other plant monitoring surveys conducted in 2016 and 2018. All of these plants were found on mineral substrates in highly disturbed sites in Project borrow areas.

Finding elegant hawksbeard in newly developed borrow areas was not surprising. Under natural conditions, this species is typically found growing on recently disturbed coarse substrates such as stream banks, gravelly flats, sandbars and roadsides (FNA 2018). Additionally, this species was previously found on disturbed bare gravel and mineral sites in the Project area and in the Wuskwatim Generation Project footprint. All of the elegant hawksbeard sites found in the Project area prior to the Project were along Highway 280 and 290, which are continually disturbed environments. In the Wuskwatim Generation Project footprint, elegant hawksbeard was found on disturbed bare gravel and mineral sites, and was becoming widespread in some areas (ECOSTEM 2017b).

Based on the findings from monitoring for the Project and the Wuskwatim Generation Project, it is possible that this species will continue to appear on exposed, coarse mineral substrates that are no longer being used by the Project.

It is recommended that disturbance of the known elegant hawksbeard sites be avoided or minimized, where possible. Preserving these plants provides a seed source for the local seedbank and for dispersal to other areas. It is possible that the elegant hawksbeard plants found during monitoring surveys will persist for at least several years since all of the plants appeared healthy and this species is a perennial.

5.0 SUMMARY AND CONCLUSIONS

5.1 PROVINCIALY VERY RARE AND RARE PLANTS MONITORING

Priority plant monitoring in 2018 focused on Scheuchzeri's cotton-grass (*Eriophorum scheuchzeri*) for two reasons: firstly, because it was found during the 2017 rare plant monitoring and because the Manitoba Conservation Data Centre classifies it as likely rare within Manitoba as a whole (it is uncertain whether it actually is either more common or more rare); and secondly, because it was uncertain whether or not the plants found in 2017 were actually Scheuchzeri's cotton-grass as opposed to another cotton-grass species. For the second reason, surveys in 2018 collected additional plant specimens for identification in the lab.

An additional professional botanist reviewed the cotton-grass specimens collected in 2017 and confirmed that only one of them was Scheuchzeri's cotton-grass. This specimen represented possible Scheuchzeri's cotton-grass plants at five different sites.

Monitoring in 2018 did not find any new sites with Scheuchzeri's cotton-grass.

An unexpected and important finding from the 2018 priority plant monitoring was that the clearing and use of the Ellis Esker access road corridor did not impact any of the five sites assumed to include Scheuchzeri's cotton-grass. Consequently, in fall 2018, it was recommended that the existing cleared roadway be reused and the known sites be avoided, if possible. In response, Manitoba Hydro confirmed that no new clearing was planned within the access road corridor, and installed flagging tape to identify sensitive areas that construction activity should avoid during the winter of 2018/2019. Priority plant monitoring in 2019 will revisit these sites and, if they have been avoided, further mitigation and monitoring will not be needed.

The 2018 invasive plant monitoring incidentally found one provincially very rare plant species, elegant hawksbeard (*Crepis elegans*) growing at three sites within Borrow Area B-6. It was not surprising that this species was found within the Project footprint because previous monitoring at this and the Wuskwatim Generation Project has shown that elegant hawksbeard can appear on coarse substrates in borrow and other human-disturbed areas.

It is recommended that disturbance of the known elegant hawksbeard sites be avoided or minimized, where possible. Preserving these plants provides a seed source for the local seedbank and for dispersal to other areas.

No other rare plants were found incidentally during any of the terrestrial habitat and plant monitoring surveys in 2018. Additionally, no rare to uncommon plants of importance to the Keeyask partner First Nations were seen during any of the 2018 plant surveys.

5.2 NEXT STEPS

No additional pre-clearing rare plant surveys are planned for the remainder of the construction phase of the Project since new clearing is not anticipated at this time.

The known Scheuchzeri's cotton-grass sites will be surveyed in summer 2019 to determine if the Project was able to avoid them. Also, the elegant hawksbeard sites in Borrow Area B-6 will be revisited to monitor the condition of the plants and to determine if they have been disturbed. In the meantime, Project activity in the vicinity of the elegant hawksbeard sites should be avoided or minimized if possible.

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