Keeyask Generation Project

Terrestrial Effects Monitoring Plan

Waterfowl Habitat Effects Monitoring Report

TEMP-2022-14

KEEYASK

Manitoba Environment, Climate and Parks Client File 5550.00
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2021 -2022

KEEYASK GENERATION PROJECT

TERRESTRIAL EFFECTS MONITORING PLAN

REPORT #TEMP-2022-14

WATERFOWL HABITAT EFFECTS MONITORING 2021

Prepared for

Manitoba Hydro

By

Wildlife Resource Consulting Services MB Inc.

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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 including waterfowl. 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.

Canada geese and mallard are identified as Valued Environmental Components in the Project's environmental assessment and Terrestrial Effects Monitoring Plan due to their abundance in the area and importance as a food source for local First Nations members. Canada geese, mallard, and other species of waterfowl are relatively abundant in the Keeyask area during the spring and fall migration periods. Numerous waterbodies provide waterfowl habitat, including the Nelson River and Gull Lake, which often support migrating waterfowl in the spring and fall. Nesting and brood-rearing (raising young birds) habitat occurs in wetlands, and along the shorelines of many ponds, creeks, rivers, and lakes.

Previous waterfowl surveys have occurred in the Keeyask region as part of pre-construction and construction monitoring. Pre-construction waterfowl surveys were conducted from 2001-03 and in 2011. Construction-phase waterfowl surveys occurred in 2015, 2017, 2019, and 2020. Results from these studies showed that large numbers of waterfowl use the Keeyask region during the spring and fall migrations, and that waterfowl often use inland (off-system) lakes during these times.

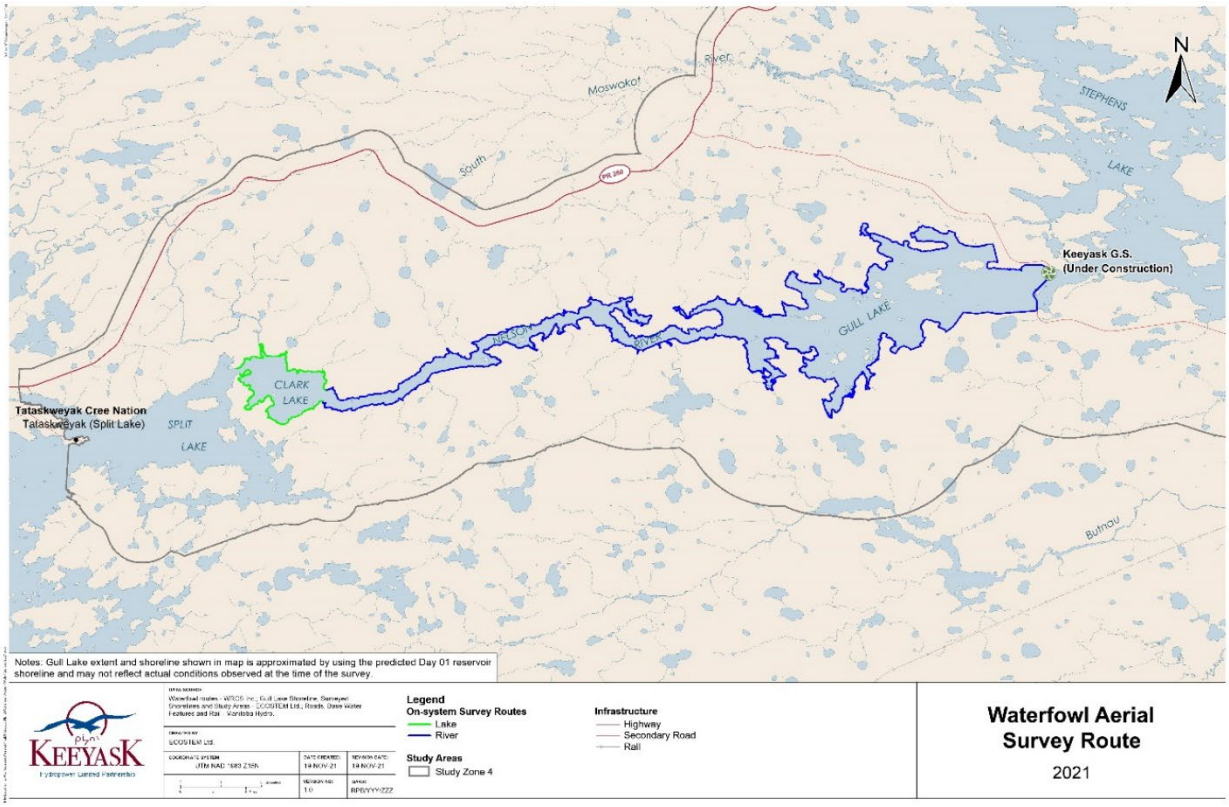
Large Flock of Waterfowl Observed during the Fall Migration

Why is the study being done?

According to the environmental assessment done for the Project, change to habitat availability is the main predicted Project effect for Canada goose and mallard. Project construction was anticipated to cause an indirect loss of waterfowl habitat due to noise and disturbance caused by construction activities. Project operation is anticipated to reduce the amount and quality of waterfowl habitat in the Nelson River and Gull Lake due to flooding of the reservoir. To assess the Project impacts of habitat loss and alteration on Canada geese, mallard, and other waterfowl species, the relative number and location of waterfowl during construction and operation are being monitored.

What was done?

A series of aerial (helicopter) waterfowl surveys were conducted in 2021, starting in early spring and continuing into the fall. The 2021 survey was focused on shorelines along the Nelson River between Gull Rapids and Clark Lake (i.e., the newly formed reservoir area). To assess potential impacts of the Project on waterfowl in the area, waterfowl densities (number of birds/km) observed in the reservoir area in 2021 were compared to the densities observed during pre-construction surveys, conducted from 2001-2003 and in 2011, and during the construction surveys conducted in 2015, 2017, 2019, and 2020.



What was found?

The number of waterfowl observed in 2021 were higher than or within the ranges observed during the previous construction and pre-construction surveys. The reservoir, flooded in fall 2020, provided areas of shallow water mixed with vegetation that several species of waterfowl, including the Canada goose and mallard, were observed using for feeding.

What does it mean?

The filling of the reservoir did not appear to affect waterfowl use of the area. In some surveyed areas, the shallow submerged peatlands likely created good waterfowl habitat for feeding. These areas are expected to disintegrate over time and will become less appealing to waterfowl.

What will be done next?

The 2021 waterfowl survey was the final construction-phase survey for the Project. As the Project moves into the operation phase, waterfowl habitat effects monitoring will continue during operation for the next 10 years. The next waterfowl survey is scheduled for spring 2022.

STUDY TEAM

We would like to thank Sherrie Mason and Rachel Boone of Manitoba Hydro for editorial comments. We would also like to thank Dr. James Ehnes, ECOSTEM Ltd., for GIS support, study design, and cartography.

Biologists and other personnel who designed, participated in, and drafted the survey results included:

- Robert Berger, WRCS – Design, analysis, and reporting
- Mark Baschuk, WRCS – Survey personnel, analysis, and reporting
- Maryse Gagné, 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. 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. In 2020, waterfowl habitat within the Project's reservoir footprint experienced large changes due to the water-up phase and impoundment of the reservoir. Water-up included the transfer of water into work areas contained by temporary and permanent structures up to the prevailing upstream water levels and occurred from February 26 to April 16, 2020. Reservoir impoundment, which is the flooding of the full reservoir area, occurred from August 31 to September 5, 2020. The construction phase monitoring for the Project was completed in 2021 and will shift to the operation phase monitoring in 2022.

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* (TESV). 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, waterfowl habitat effects, during the construction phase.

Waterfowl surveys during construction focused on Canada goose (*Branta canadensis*) and mallard (*Anas platyrhynchos*), which were identified as Valued Environmental Components (VECs) during the environmental assessment for the Project. These species were chosen as VECs based on their importance to local communities and their protection under the *Migratory Birds Convention Act*.

Previous waterfowl surveys have occurred in the Keeyask region as part of pre-construction and construction monitoring. Pre-construction waterfowl surveys were conducted from 2001-03 and in 2011. Waterfowl surveys during construction occurred in 2015, 2017, and 2019 throughout Study Zone 5 (WRCS 2016; WRCS 2018; WRCS 2020) and in 2020 in the reservoir and surrounding area that included Clark Lake and Gull Rapids (WRCS 2021). Results from these studies showed that large numbers of waterfowl use the Keeyask region during the spring and fall migrations, and that waterfowl often use inland (off-system) lakes during these times (WRCS 2016; WRCS 2018; WRCS 2020). Additionally, in 2020 the newly flooded reservoir increased the amount of shoreline and shallow flooded peatland areas, creating additional foraging habitat for waterfowl that is expected to disintegrate over time and become less attractive (WRCS 2021).

The objectives of waterfowl monitoring during Project construction are to identify changes in abundance or distribution due to construction activities. The main concerns of construction activities on waterfowl are sensory disturbance, loss of habitat, and increased hunter access. To identify potential Project construction effects, several components that influence waterfowl

populations were monitored, including habitat, mortality, and habitat enhancement efficacy. This report presents findings of the aerial waterfowl surveys conducted in 2021 within and around the Project reservoir.

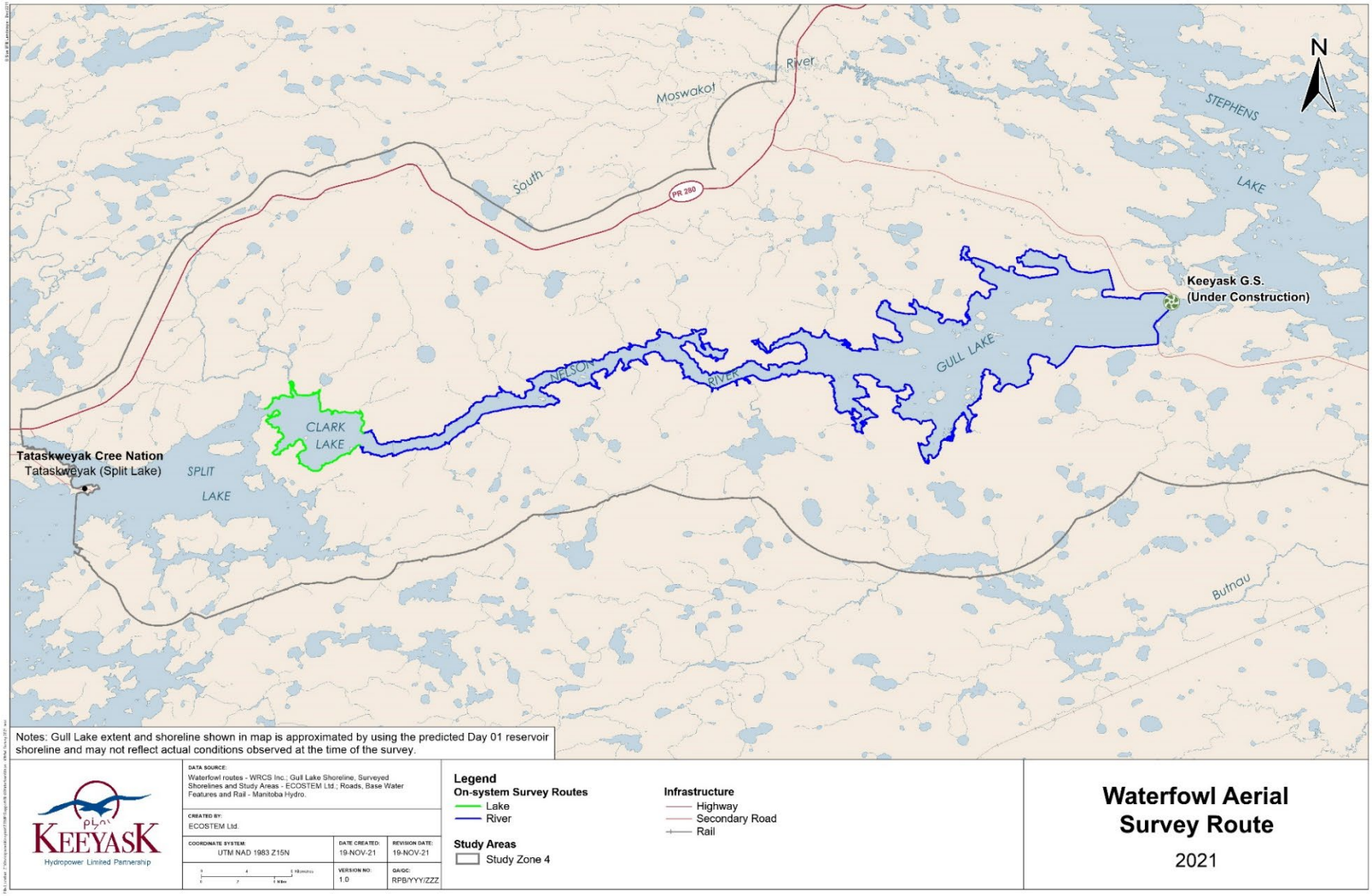
2.0 METHODS

2.1 AERIAL SURVEYS

Aerial surveys for waterfowl were conducted five times, from early May to mid-September 2021, within the Project reservoir and surrounding area, including Clark Lake and Gull Rapids, which consisted of 361 km of shoreline (Map 1). The surveys in 2021 were timed to be as similar as possible with the surveys that were conducted in 2020, 2019, 2017, and 2015.

The survey was conducted from a helicopter, equipped with bubble windows in the rear, that travelled approximately 80 km/hr at an altitude of approximately 20-30 m. The survey route followed the general contours of the new reservoir shoreline, and areas slightly beyond the reservoir. The survey was conducted under clear weather conditions, with wind speeds below 25 km/hr and the absence of rain, fog, etc., that may obscure visibility. Two observers, on the left side of the aircraft (front and rear seats), recorded all waterfowl observed using a dependent double-observer technique (Koneff *et al.* 2008). The front-seat observer recorded all waterfowl observed and indicated this through the aircraft's communication system to the rear-seat observer. The rear-seat observer recorded all waterfowl not observed by the front-seat observer. Bird species, sex, and flock arrangement (*e.g.,* pair [drake and hen], flock of three drakes and two hens, etc.) were recorded, as well as opportunistic observations of other waterbird species (*e.g.*, loons, grebes, cranes, etc.).

All swans observed were classified as "unknown swans" due to the difficulty distinguishing between the trumpeter swan (*Cygnus buccinator*) and tundra swan (*Cygnus columbianus*) from a distance. Despite a relatively low probability of observing trumpeter swans in northern Manitoba, a pair with cygnets was observed in the area in 2020 and there are several areas within the regional bird study area containing possible breeding evidence of trumpeter swans (Manitoba Breeding Bird Atlas 2015). Similarly, greater scaup (*Aythya marila*) and lesser scaup (*Aythya affinis*) were recorded as "unknown scaup" due to the difficulty in distinguishing between the two species from a distance.



Map 1: Overview of Waterfowl Aerial Survey Route in 2021

2.2 DATA ANALYSIS

2.3 WATERFOWL DENSITIES

To assess the potential effects of Project construction on waterfowl, waterfowl densities (birds/km) in and around the reservoir area, from Clark Lake to Gull Rapids were compared between the pre-construction surveys (2001-2003 and 2011), and construction surveys in 2015, 2017, 2019, 2020, and 2021 using a Mann-Whitney U test (α=0.05). Only observations of ducks, geese, and swans were included (all merganser, common loon (*Gavia immer*), grebe, and sandhill crane (*Grus canadensis*) observations were removed as these species have different habitat requirements than the most common waterfowl species observed). The length of the surveyed shoreline in and around the reservoir was calculated to be 279 km for the pre-construction surveys and the 2015, 2017, and 2019 construction surveys, prior to reservoir filling. Following reservoir filling, for the 2020 and 2021 surveys, the shoreline length was calculated to be 361 km.

2.4 INDICATED BREEDING PAIRS

Data from the late May and June breeding surveys were used to determine the number of indicated breeding pairs (IBPs) of waterfowl, as a measure of the number of breeding waterfowl in the reservoir and surrounding area. Data from the late May survey were used to determine the number of indicated breeding pairs of early-nesting species, including mallard, northern pintail (*Anas acuta*), and Canada goose. Data from the June survey were used to determine the number of indicated breeding pairs for all other species, including American wigeon (*Anas americana*), ring-necked duck (*Aythya collaris*), scaup, and common loon.

The definition of an IBP was based on work conducted by Lemelin *et al.* (2010) and Messmer *et al.* (2015). Indicated breeding pairs of Canada geese were defined as observations of one to three birds. For dabbling ducks (*e.g.,* mallard, America wigeon, etc.), IBPs were classified as the number of males observed singly or in groups up to four individuals, including females and unsexed individuals, with the exception of groups consisting of three males and one female. For diving ducks, IBPs were classified based on the number of males observed singly or in groups up to four, including females and unsexed individuals (Lemelin *et al.* 2010; Messmer *et al.* 2015). Observations of one or two common loons were considered one IBP (Lemelin *et al.* 2010; Messmer *et al.* 2015).

Indicated breeding pair density was calculated using the same method that was used for calculating total waterfowl density.

3.0 RESULTS

3.1 WATERFOWL DENSITIES

In 2021, during the early May survey, 77 birds, consisting of 4 species, were observed (Table 1; Map 2). The majority of observations (57%) consisted of mallard, while Canada goose was the next most common species observed (27% of all observations).

The reservoir was mostly frozen during the early May survey. The majority of waterfowl observations in early May were concentrated at areas of open water, which occurred at creek mouths or in areas where water flow was sufficiently fast to prevent freezing. These findings were consistent with those observed during other construction-period surveys.

During the late May survey, a total of 2,945 birds, consisting of 19 species, were observed (Table 1; Map 3). Unknown scoter was the most common bird observed and relatively large numbers of other diving ducks, including unknown scaup and unknown diving duck species were also observed. Canada goose and mallard made up 11% and 5% of the total observations, respectively.

In the June survey, a total of 751 birds, consisting of 13 species, were observed (Table 1; Map 4). There was a large decrease of scoter and diving ducks in the reservoir. The most common species observed were Canada goose and mallard, which made up 29% and 21% of all observations, respectively.

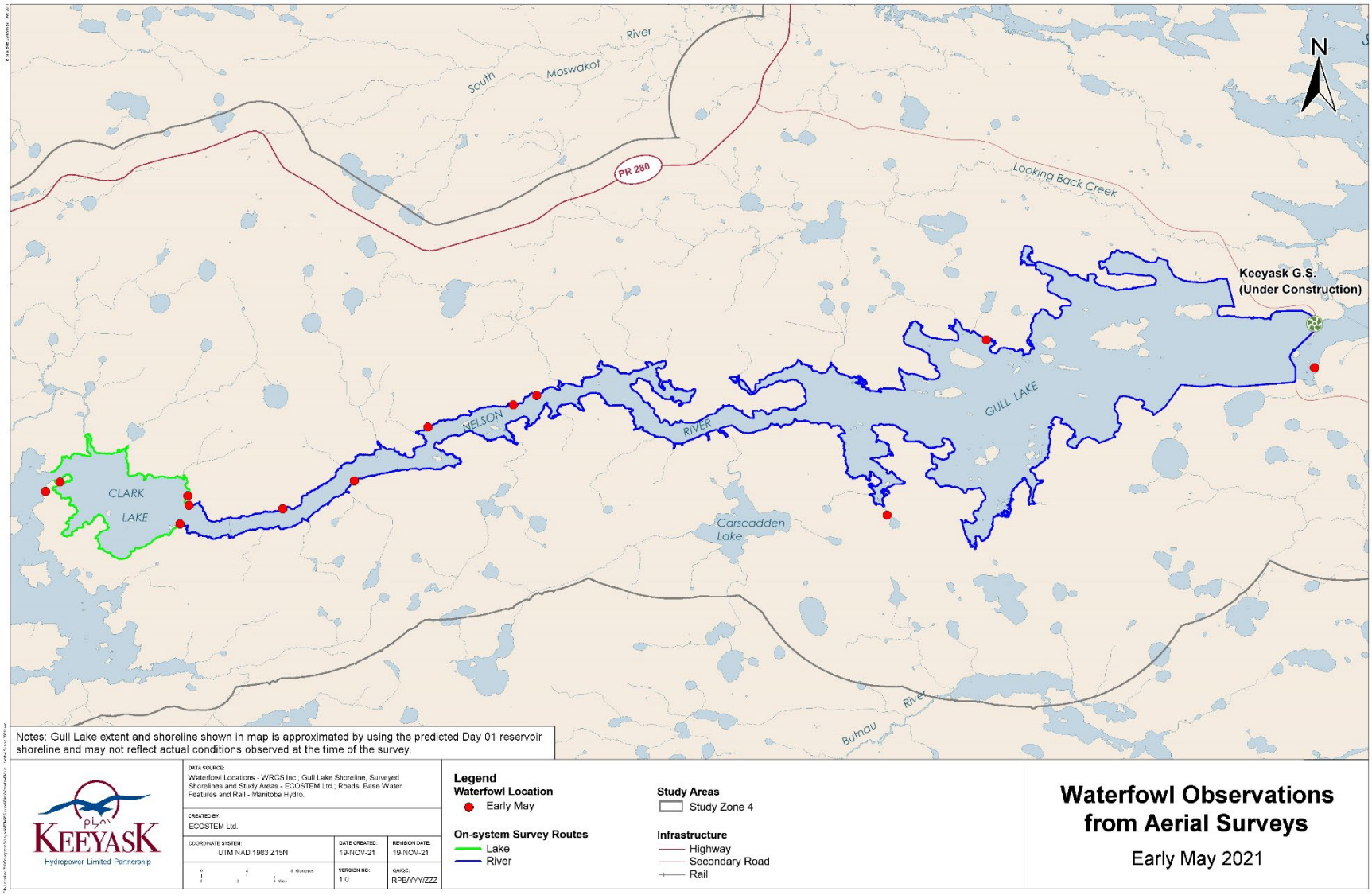
In the July survey a total of 524 birds, consisting of 10 species were observed (Table 1; Map 5). Canada goose and mallard and were the most common observations, consisting of 49% and 32% of all observations, respectively.

In the September survey, 1,600 birds, consisting of 11 different species, were observed (Table 1; Map 6). Mallard and unknown diving ducks were the most common observations, comprising 40% and 24% of all observations, respectively.

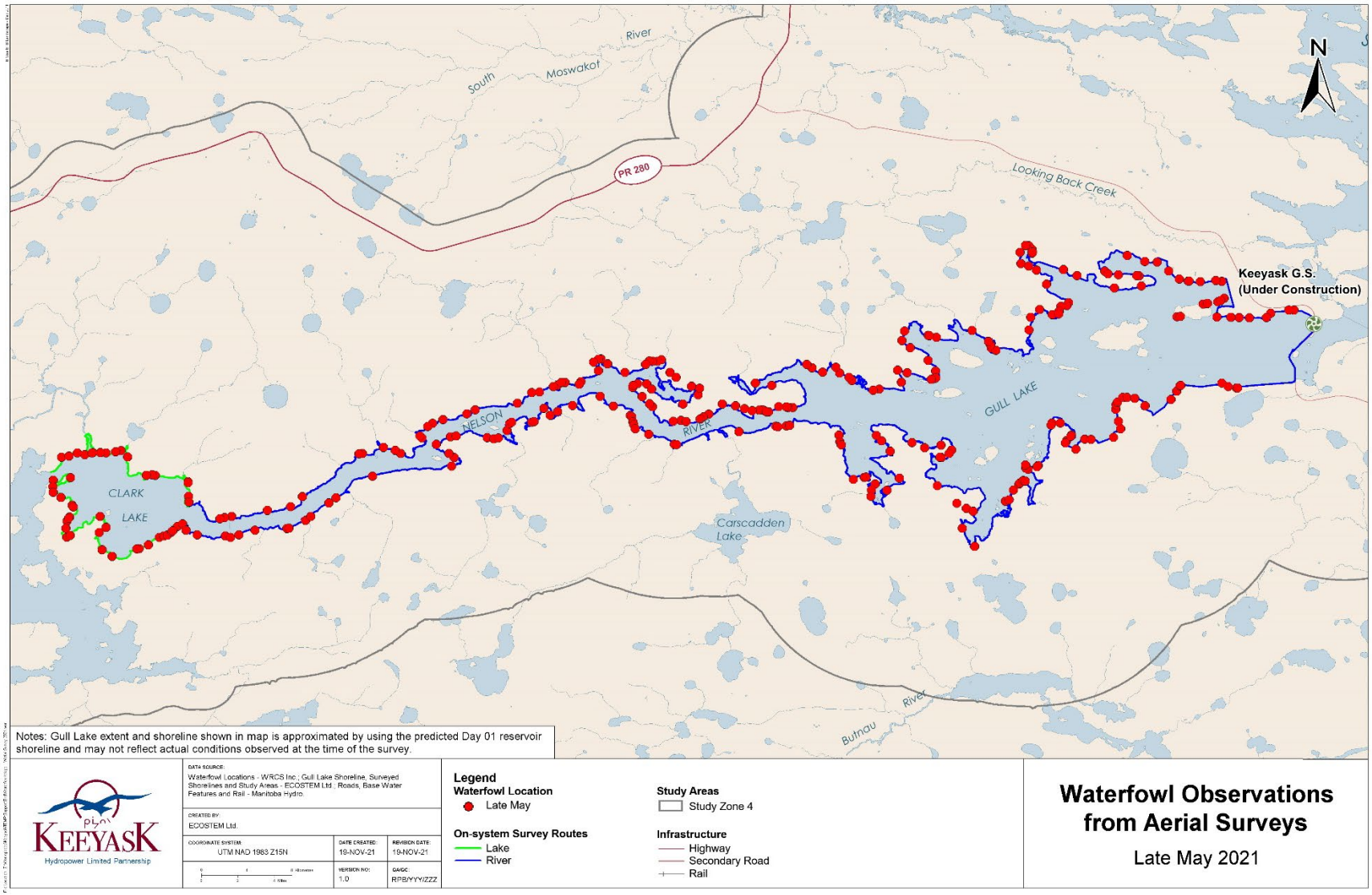
Waterfowl observations often occurred where peatland areas had recently become submerged within the reservoir, creating shallow water areas interspersed with vegetation that many species of waterfowl prefer for feeding and roosting (Photo 1).

Table 1: Total Number of Waterfowl Observed During Aerial Surveys in 2021

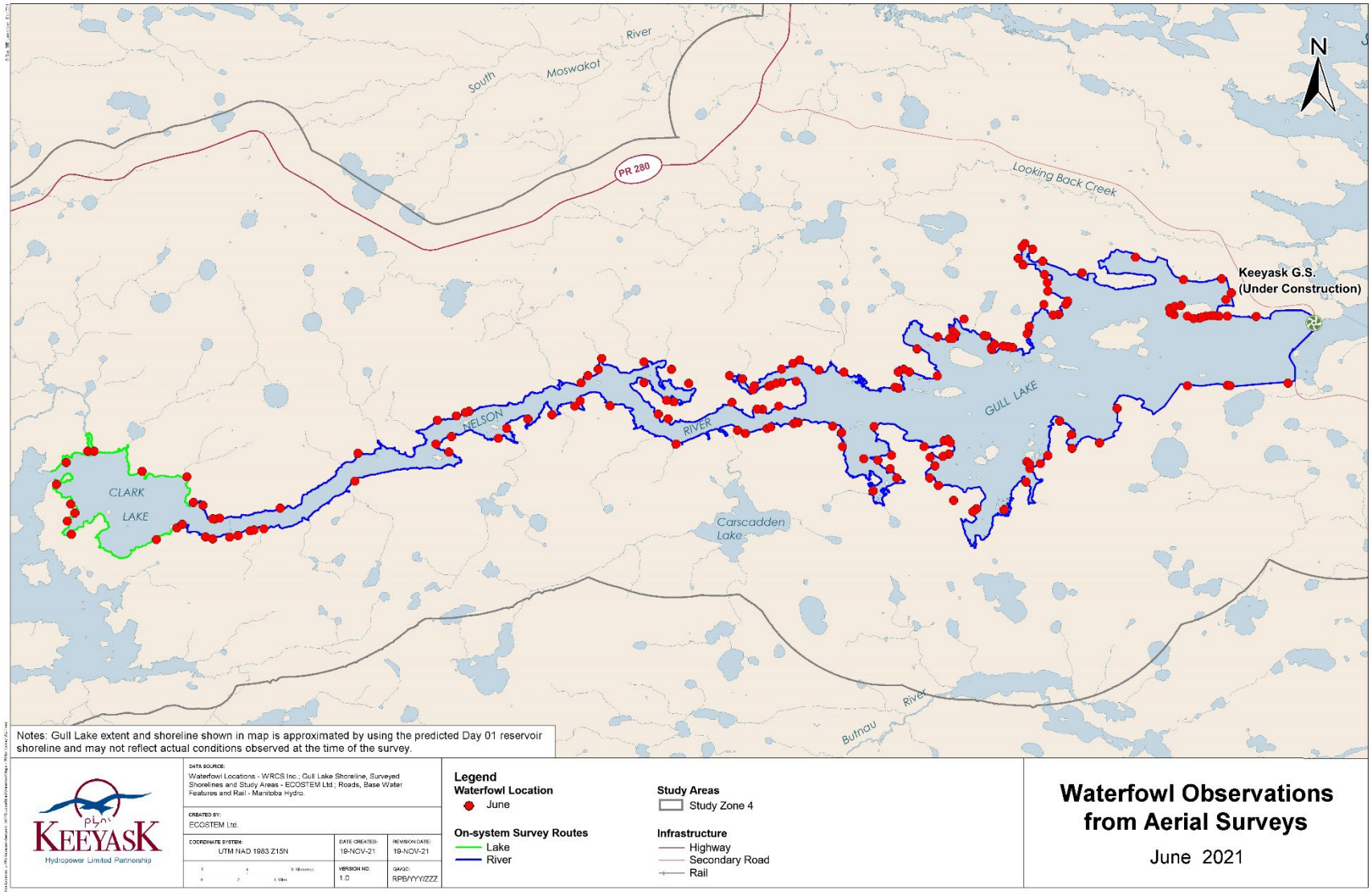
Species	05-May	30-May	June	July	September	Total
American Black Duck (*Anas rubripes*)	0	2	0	0	0	2
American Wigeon (*Anas americana*)	0	30	57	18	35	140
Black Scoter (*Melanitta americana*)	0	61	0	0	0	61
Bufflehead (*Bucephala albeola*)	0	39	5	0	2	46
Blue-winged Teal (*Anas discors*)	0	7	25	0	19	51
Canada Goose (*Branta canadensis*)	21	336	216	257	222	1,052
Common Goldeneye (*Bucephala clangula*)	1	51	0	0	0	52
Common Loon (*Gavia immer*)	0	33	4	5	3	45
Common Merganser (*Mergus merganser*)	0	137	93	3	1	234
Green-winged Teal (*Anas carolinensis*)	0	74	53	27	61	215
Mallard (*Anas platyrhynchos*)	44	159	155	169	633	1,160
Northern Pintail (*Anas acuta*)	0	29	10	1	0	40
Northern Shoveler (*Anas clypeata*)	0	30	19	0	0	49
Ring-necked Duck (*Aythya collaris*)	0	82	10	25	153	270
Sandhill Crane (*Grus canadensis*)	4	2	1	2	0	9
Surf Scoter (*Melanitta perspicillata*)	0	1	0	0	0	1
Unknown Dabbler	7	34	29	0	73	143
Unknown Diver	0	224	60	15	386	685
Unknown Duck	0	2	0	0	0	2
Unknown Scaup (*Aythya affinis/marila*)	0	388	14	0	8	410
Unknown Swan (*Cygnus buccinator/columbianus*)	0	5	0	2	4	11
Unknown Scoter	0	1,136	0	0	0	1,136
White-winged Scoter (*Melanitta deglandi*)	0	83	0	0	0	83
Total	77	2,945	751	524	1,600	5,897



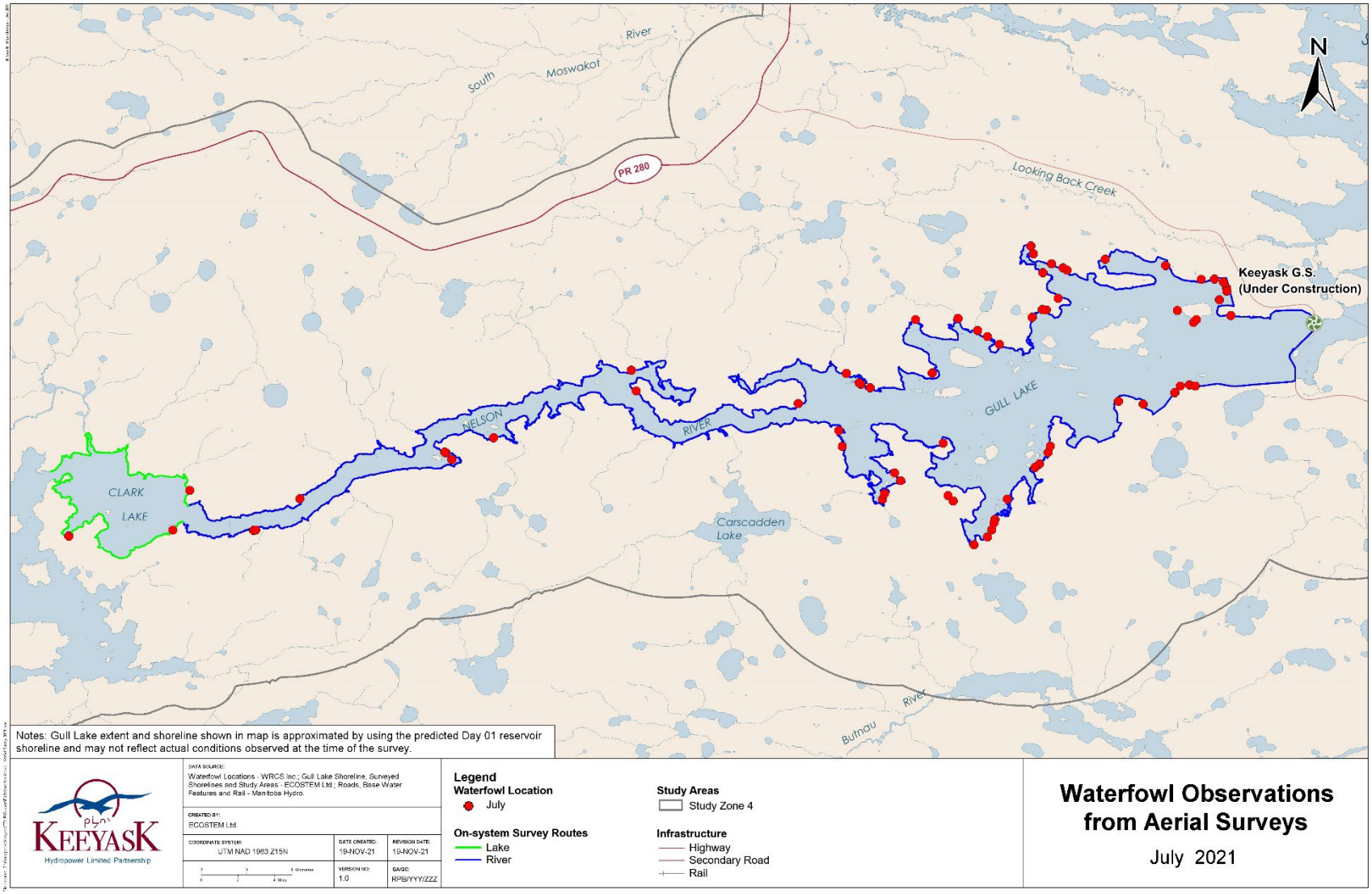
Map 2: Waterfowl Observations from Aerial Surveys in Early May 2021



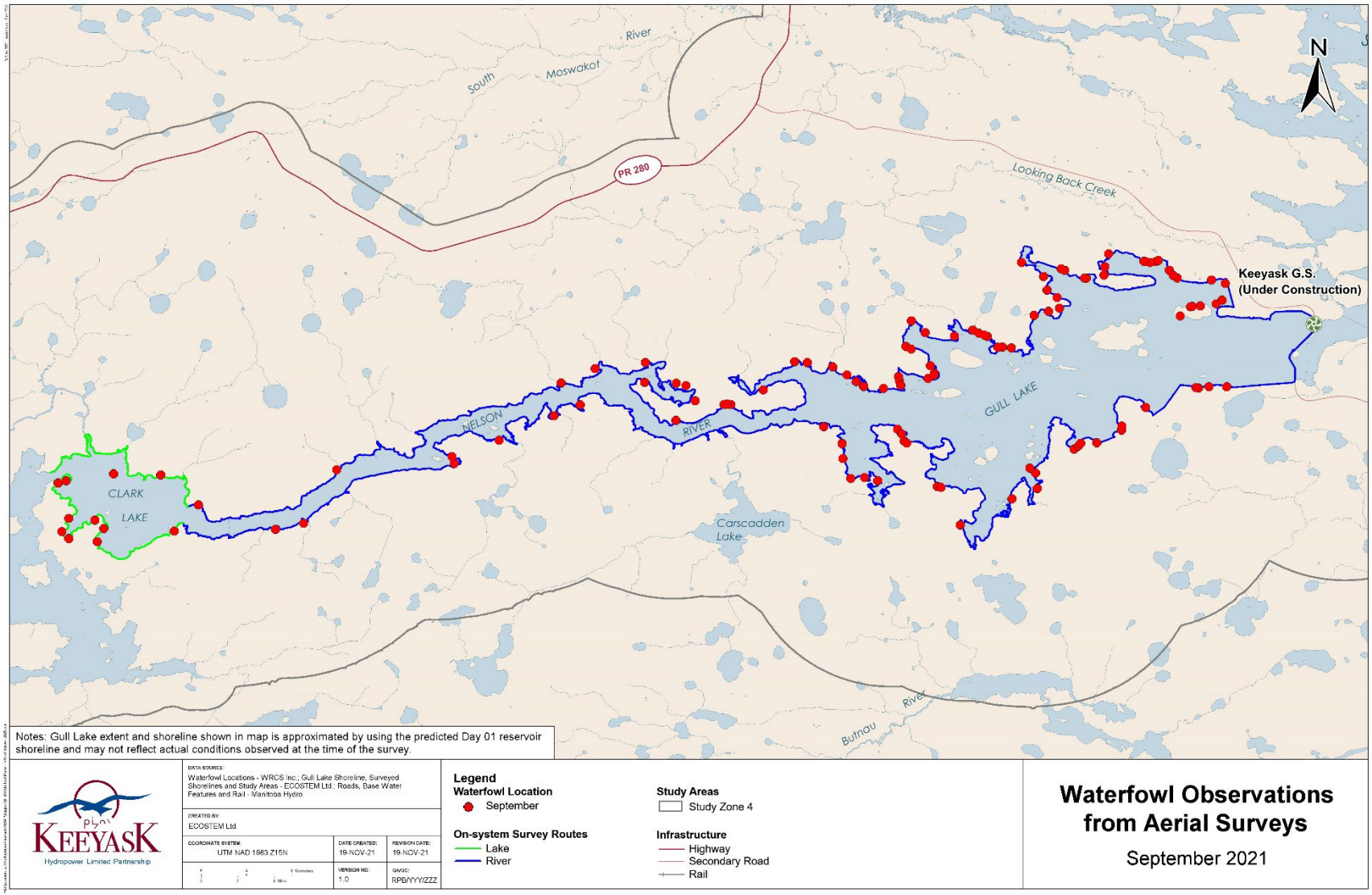
Map 3: Waterfowl Observations from Aerial Surveys in Late May 2021



Map 4: Waterfowl Observations from Aerial Surveys in June 2021



Map 5: Waterfowl Observations from Aerial Surveys in July 2021



Map 6: Waterfowl Observations from Aerial Surveys in September 2021

Photo 1: Submerged Peatland in the Reservoir Providing Waterfowl with Shallow Water Interspersed with Vegetation, September 2021

There was no significant difference between the waterfowl densities from the pre-construction surveys and the construction surveys in the reservoir area (P=0.31). The waterfowl densities observed in and around the reservoir in 2021 were higher for most periods (June, July, and September) compared to the densities observed during other construction surveys (Table 2). The densities were also higher (May) or within the ranges (July and September) observed during previous pre-construction surveys (Table 2). It should be noted that the waterfowl numbers from the 2001-2003 pre-construction surveys also include observations made from inland lakes that were adjacent to the future reservoir area as well as within the area that was predicted to be inundated during reservoir filling and may not be directly comparable.

Table 2: Waterfowl Densities (birds/km) During Aerial Surveys in and Around the Keeyask Reservoir Footprint from 2001-2021 (TetrES 2004; TetrES 2005a; TetrES 2005b; Stantec 2013; WRCS 2016; WRCS 2018; WRCS 2020)

Year		April/May	May	June	July	August	September
2001*	Pre-construction	NA	3.95	NA	0.47	NA	2.43
2002*	Pre-construction	NA	NA	6.92	2.28	NA	6.31
2003*	Pre-construction	NA	6.05	NA	1.55	NA	5.98
2011	Pre-construction	NA	5.82	NA	0.33	0.25	0.52
2015	Construction (Pre-reservoir)	0.52	3.63	1.24	0.66	NA	1.65
2017	Construction (Pre-reservoir)	1.24	8.75	1.18	0.61	NA	1.09
2019	Construction (Pre-reservoir)	0.63	0.95	1.06	0.68	NA	2.34
2020	Construction (Reservoir present)	NA	NA	NA	NA	NA	0.84
2021	Construction (Reservoir present)	0.20	7.68	1.81	1.42	NA	4.42

*From 2001-2003, waterfowl counted on Gull Lake also included segments of inland lakes that were predicted to be inundated following reservoir filling.

Photo 2: Flock of Canada Geese Observed during the Aerial Survey, July 2021

3.2 INDICATED BREEDING PAIRS

A total of 242 indicated breeding pairs were observed in the reservoir and surrounding area in late May/June 2021 (Table 3; Map 7). Mallard were the most common species of indicated breeding pairs observed and American wigeon, green-winged teal, and common merganser were also common (Table 3).

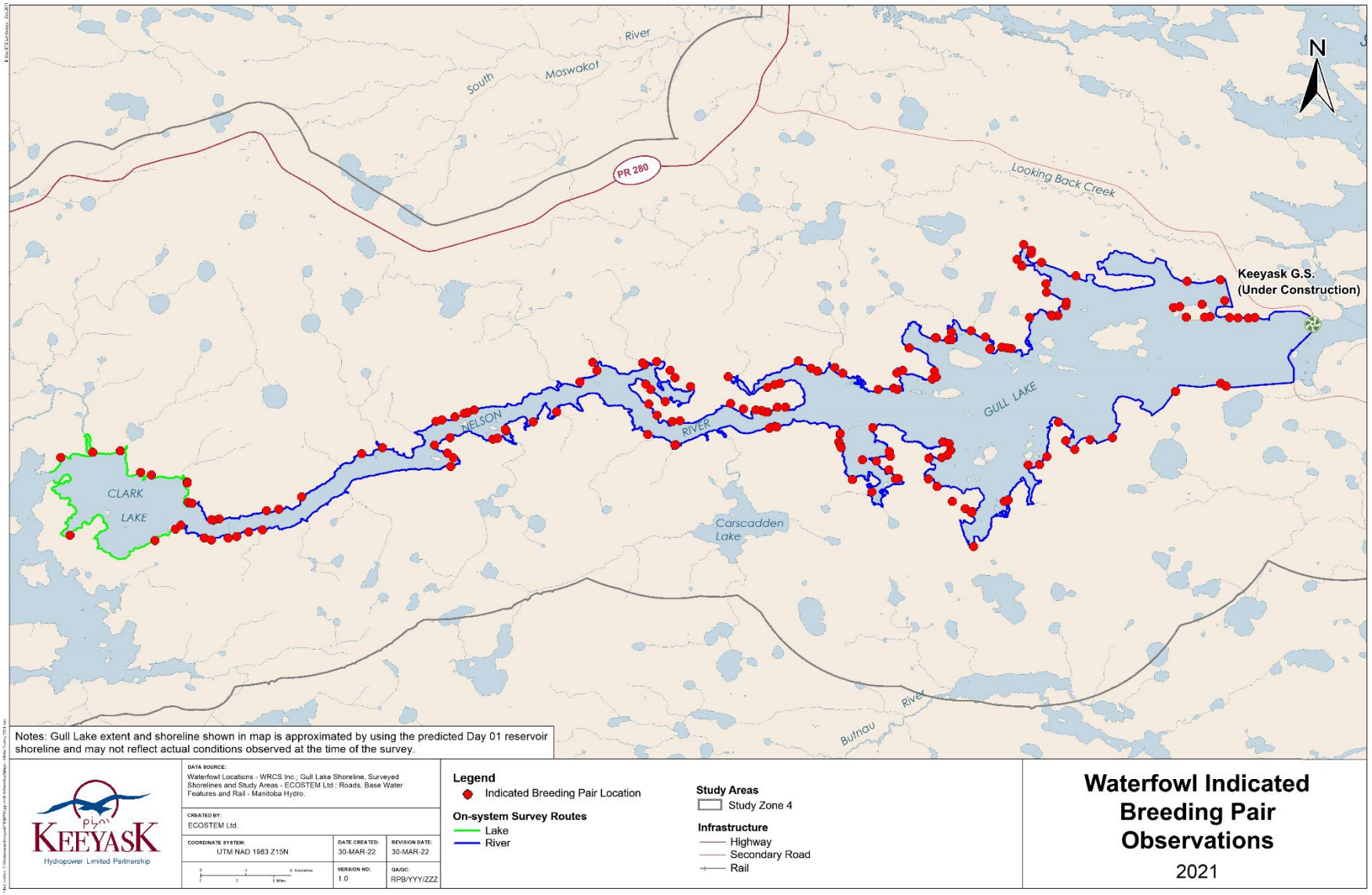
Table 3: Number of Indicated Breeding Pairs Observed in the Reservoir and Surrounding Area (Clark Lake and Gull Rapids) in 2021

Species	No. Indicated Breeding Pairs
American Wigeon	45
Bufflehead	3
Blue-winged Teal	12
Canada Goose	19
Common Merganser	23
Green-winged Teal	29
Mallard	70
Northern Pintail	16
Northern Shoveler	13
Ring-necked Duck	8
Unknown Scaup	4
Total	242

The density of indicated breeding pairs in the reservoir and surrounding area ranged from 0.14-0.36 breeding pairs/km of shoreline prior to reservoir filling and increased to 0.67 breeding pairs/km of shoreline in 2021 after reservoir filling (Table 4).

Table 4: Indicated Breeding Pair Density (Indicated Breeding Pairs/km Shoreline) Observed during the Construction Period from 2015-2021

Year	Period	Indicated Breeding Pairs/km Shoreline
2015	Construction (Pre-reservoir)	0.36
2017	Construction (Pre-reservoir)	0.14
2019	Construction (Pre-reservoir)	0.16
2021	Construction (Reservoir present)	0.67



Map 7: Waterfowl Indicated Breeding Pair Observations from Aerial Surveys in 2021

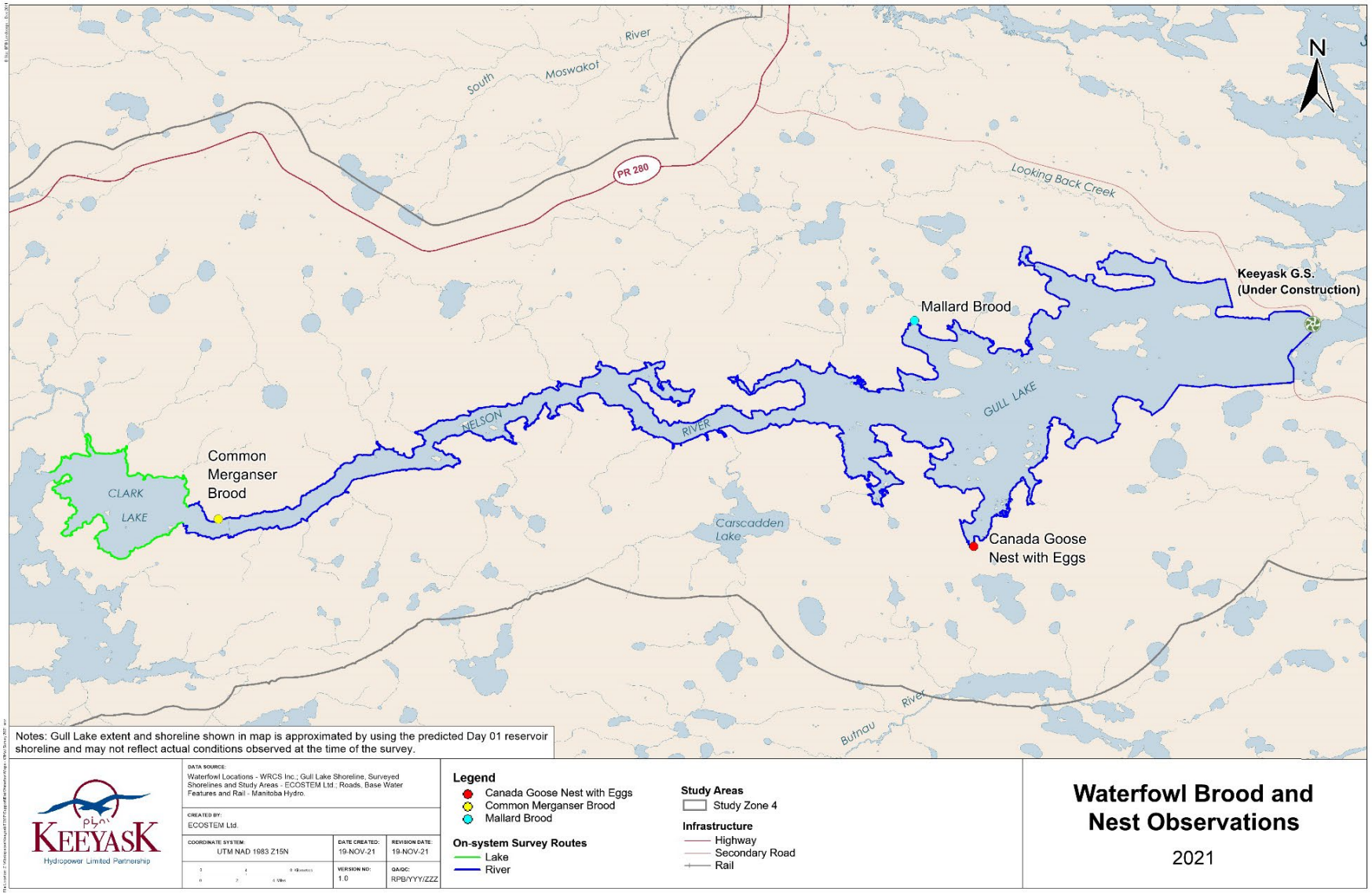
3.3 WATERFOWL BROODS

In 2021, two waterfowl broods, a common merganser and mallard, were observed in the reservoir and surrounding area, including Clark Lake and Gull Rapids (Table 5; Map 8). A Canada goose nest that contained eggs was also observed on the south side of the reservoir in a shallowly flooded peatland area (Map 8).

The number of waterfowl broods observed during Project construction was variable, ranging from 1 to 25 (Table 5). The number of broods in 2019 appeared to be exceptionally high but was consistent with the high number of broods observed in the entire study area that year. The most common species of waterfowl broods observed were Canada goose and mallard, which was consistent with observations in the entire study area (Table 5).

Table 5: Species and Number of Broods Observed in the Reservoir and Surrounding Area (Clark Lake and Gull Rapids) from 2015-2021

Year	American Wigeon	Canada Goose	Common Merganser	Mallard	Unknown Spp.	Total
2015	1	1	0	4	0	6
2017	0	1	0	0	0	1
2019	1	13	0	8	2	25
2021	0	0	1	1	0	2
Total	2	15	1	13	2	34



Map 8: Waterfowl Brood and Nest Observations from Aerial Surveys in 2021

3.4 HUNTING GROUPS

No waterfowl hunting groups were observed during the surveys in 2021 in the Project reservoir and surrounding area. This differed from previous surveys in 2015, 2017, and 2019, when there were two or three hunting groups observed (WRCS 2016; WRCS 2018; WRCS 2020). Generally, hunting groups were observed on Clark Lake at the mouth of the Assean River, and on the Nelson River between Birthday Rapids and Clark Lake.

4.0 DISCUSSION

Project construction was anticipated to cause the temporary avoidance of foraging habitat for Canada goose and cause the temporary avoidance and reduction of foraging and nesting habitat for mallard from sensory disturbance (KHLP 2012). Additional habitat effects were also anticipated after reservoir filling, which was expected in inundated shallow water areas, reducing their attractiveness for Canada goose and mallard (KHLP 2012).

The waterfowl densities observed during Project construction, from 2015-2021, were not significantly different from those observed during pre-construction surveys, and some of the highest waterfowl densities were observed in the reservoir area in 2021. This suggests sensory disturbance during construction did not cause avoidance or reduce the amount of foraging habitat in and around the reservoir. The increased amount of shoreline created by reservoir filling and the inundation of peatland areas appeared to have provided increased foraging opportunities for waterfowl and a short-term benefit during 2021. The waterfowl densities observed in 2021 were the highest observed (May 2021) or close to the highest observed (June, July, September 2021) during any of the pre-construction or other construction surveys. Numerous flocks of waterfowl were observed feeding in the newly submerged peatland areas, which consisted of shallow water interspersed with vegetation that many waterfowl species prefer. However, the inundated peatland areas are expected to disintegrate over time and the reservoir habitat will likely become less attractive to waterfowl in the long-term.

Areas in the Nelson River, between Clark Lake and Gull Rapids, offered some of the earliest open water in Study Zone 5 when other waterbodies were typically still ice-covered. This open water supported numerous species of waterfowl that arrived at this time and appeared to provide important staging habitat to waterfowl during the early spring.

The number of indicated breeding pairs and broods observed in the reservoir and surrounding area during construction also suggests that Project construction did not have a large impact on available nesting habitat. The density of indicated breeding pairs nearly doubled in 2021 (0.67 indicated breeding pairs/km shoreline) compared to the next highest density that was observed in 2015 (0.36 indicated breeding pairs/km shoreline). This suggests that more waterfowl may be breeding and nesting in the survey area, following reservoir filling. However, the number of broods observed in the reservoir and surrounding area in 2021 did not indicate an increase and remained consistent with the number observed during previous construction surveys.

Project features, including roads and the reservoir were considered to have the potential to increase access to previously inaccessible areas and could result in increased waterfowl hunting pressure (KHLP 2012). During Project construction the number of waterfowl hunters observed remained relatively consistent and a decrease of hunters may have occurred in the reservoir in 2021. The number of waterfowl hunters in the reservoir in 2021 may have decreased due to accessibility or perceived safety/accessibility issues following reservoir filling, or due to the presence of hunters not coinciding with the waterfowl surveys. Local resource users were advised not to use the reservoir area for boat travel in late 2020 due to safety concerns of travelling within

a newly created reservoir. This may have affected travel in the area the following year as well. Access to the main Project site (generating station, spillway, camp) and North Access Road were still restricted in 2021, and it is possible that waterfowl hunting pressure may increase in these areas once they are accessible by the public. Waterfowl surveys conducted during Project operation will continue to monitor for changes in hunting pressure.

5.0 SUMMARY AND CONCLUSIONS

Waterfowl densities observed in 2021 in and around the newly formed reservoir were higher than or similar to those observed during the pre-construction and previous construction surveys. This suggests that waterfowl use in the general reservoir area has been consistent since the start of construction and the disturbances related to Project construction activities, including reservoir filling, do not appear to be limiting waterfowl use. Data collected from all the construction monitoring surveys will be used to generate a habitat selection model to predict the amount of habitat disturbance as a result of the Project and its potential impact on Canada goose, mallard, and other waterfowl species.

The 2021 waterfowl survey was the final construction-phase survey for the Project. As the Project moves into the operation phase, waterfowl habitat effects monitoring will continue during operation for the next 10 years. The next waterfowl survey is scheduled for spring 2022.

6.0 LITERATURE CITED

KHLP (Keeyask Hydropower Limited Partnership). 2012. Keeyask Generation Station Project Environmental Impact Statement – Response to EIS Guidelines. Prepared by Keeyask Hydropower Partnership Limited, Winnipeg, Manitoba. June 2012. 1208 pp.

Koneff, M.D., Royle, J.A., Otto, M.C., Wortham, J.S., and Bidwell, J.K. 2008. A double-observer method to estimate detection rate during aerial waterfowl surveys. The Journal of Wildlife Management 72 (7): 1641-1649.

Manitoba Breeding Bird Atlas. 2015. http://www.birdatlas.mb.ca/ [Accessed November 27, 2015].

Stantec (Stantec Consulting Ltd.). 2013. Keeyask Project - Avian 2011 Field Studies Report. Report # TERR-11-01. Prepared for Manitoba Hydro. May 2013. 160 pp.

TetrES (TetrES Consultants Inc.). 2004. Gull (Keeyask) Project – Avian Field Studies Report 2001. Tataskweyak Cree Nation – Manitoba Hydro Joint Environmental Studies Report # 01-09. July 2004. 222 pp.

TetrES. 2005a. Gull (Keeyask) Project – Avian Field Studies Report 2002. Report # 02-11. Prepared for Manitoba Hydro. February 2005. 179 pp.

TetrES. 2005b. Keeyask Project – Avian Field Studies Report 2003. Report # 03-04. Prepared for Manitoba Hydro. June 2005. 170 pp.

WRCS (Wildlife Resource Consulting Services MB Inc). 2016. Waterfowl Habitat Effects Monitoring Report. Keeyask Generation Project. Terrestrial Effects Monitoring Plan, Report #TEMP-2016-02. June 2016. Prepared for Manitoba Hydro.

WRCS. 2018. Keeyask Generation Project, Terrestrial Effects Monitoring Plan Report #TEMP 2018-11, Waterfowl Habitat Effects Monitoring. A report prepared for Manitoba Hydro by Wildlife Resource Consulting Services MB, Inc., June 2018.

WRCS. 2020. Keeyask Generation Project, Terrestrial Effects Monitoring Plan Report #TEMP 2020-13, Waterfowl Habitat Effects Monitoring 2019. A report prepared for Manitoba Hydro by Wildlife Resource Consulting Services MB, Inc., June 2020.

WRCS. 2021. Keeyask Generation Project, Terrestrial Effects Monitoring Plan Report #TEMP-2021-09, Waterfowl Habitat Effects Monitoring. A report prepared for Manitoba Hydro by Wildlife Resource Consulting Services MB, Inc., June 2021.