Keeyask Generation Project

Aquatic Effects Monitoring Plan

Juvenile Lake Sturgeon Population Monitoring Report

AEMP-2024-05

KEEYASK

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KEEYASK GENERATION PROJECT

AQUATIC EFFECTS MONITORING PLAN

REPORT #AEMP-2024-05

JUVENILE LAKE STURGEON POPULATION MONITORING, FALL 2023: YEAR 2 OPERATION

Prepared for

Manitoba Hydro

By

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SUMMARY

Background

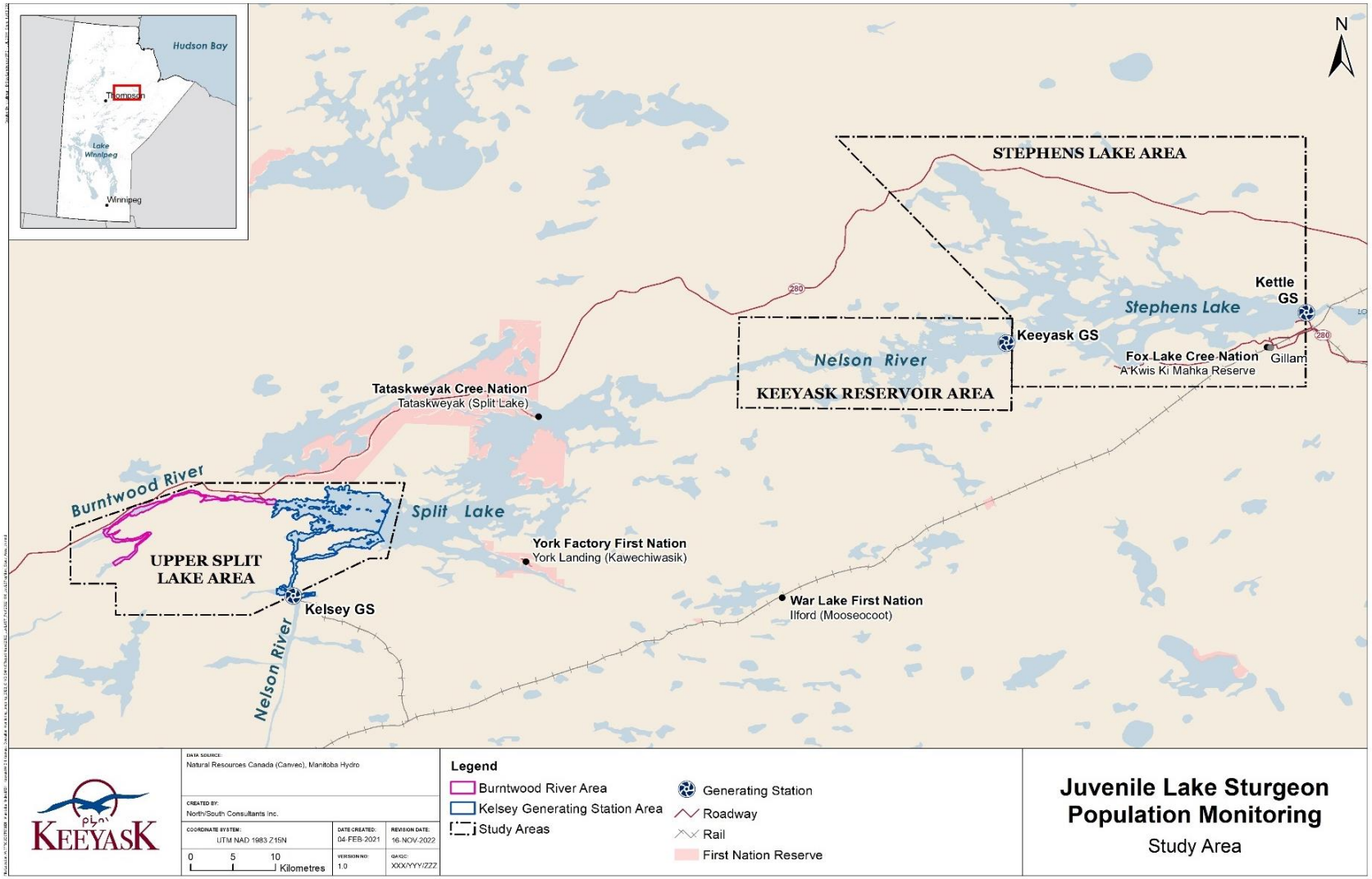
The Keeyask Hydropower Limited Partnership (KHLP) was required to prepare a plan to monitor the effects of construction and operation of the Keeyask Generating Station (GS) on the environment. Monitoring results provide information to assess the accuracy of predictions, information to determine the actual effects of construction and operation of the GS on the environment, and whether more needs to be done to reduce harmful effects.

Construction of the Keeyask GS began in mid-July 2014 and instream work was completed in 2020. The reservoir was impounded with water levels being raised to full supply level between August 31 and September 5, 2020. Commissioning of the powerhouse turbines was initiated after impoundment. They were brought into service one at a time with the final of seven turbines completed on March 9, 2022.

Lake Sturgeon (sturgeon) are one of the key species for monitoring because they are culturally important to Partner First Nations, local sturgeon populations have been previously impacted, and construction and operation of the GS will change or negatively impact important habitat. The plan to monitor the impacts of GS construction and operation on sturgeon includes several types of studies:

- Estimating the number of adults;
- Estimating the number and growth of juveniles (less than 800 millimetres [mm] in length);
- Identifying spawning locations and numbers of spawning fish; and
- Movement studies to record seasonal habitat use, long distance movements, and movements past barriers (*i.e.*, over GSs).

The mitigation and offsetting plan for sturgeon included a commitment to a long-term stocking program. This plan addressed the predicted decrease of spawning habitat at Birthday and Gull rapids during construction, impoundment, and initial years of operation by releasing young sturgeon into the Keeyask reservoir and Stephens Lake. Stocking will also support the recovery of sturgeon populations in the Keeyask reservoir, Stephens Lake, and the Upper Split Lake Area (see map below). Stocking began in 2014, with locations alternated between years (Keeyask reservoir and Stephens Lake were stocked with fish born in 2014, 2016, 2018, and 2021 and Burntwood River was stocked with fish born in 2013, 2015, 2017, 2019) and its effectiveness is assessed through juvenile population monitoring.



Map of the study area for the juvenile sturgeon population monitoring program. Sampling is done in the Upper Split Lake Area (every second year), the Keeyask reservoir (yearly), and Stephens Lake (yearly). Sampling was conducted in the Keeyask reservoir and Stephens Lake in fall 2023.

This report presents results of juvenile sturgeon population monitoring conducted during fall 2023. Data from juvenile populations in the study area have been collected intermittently since 2007 and the juvenile population monitoring study was conducted for the first time in 2014. Juvenile population monitoring will be conducted each year until 2044. Each year, sampling will be conducted using the same capture methods, so that results can be compared between different years and trends can be seen.

Juvenile (left) and young-of-the-year (right) sturgeon.

Why is the study being done?

Juvenile sturgeon population monitoring is being done to answer several questions:

Does recruitment of wild sturgeon occur upstream and/or downstream of the GS during construction and/or operation?

This question is important because if no young sturgeon are born during construction and operation of the GS, then in the future fewer adult sturgeon will be reproducing.

Does spawning habitat need to be created/modified (if recruitment of wild fish is not observed)?

This question is important because if there is no recruitment of wild fish then measures can be taken to improve habitat in the area and make spawning more successful.

What is the survival rate of stocked sturgeon?

This question is important because if the survival rate is high then the number of fish stocked may be reduced. If the survival rate is low, then the stocking plan would be adjusted (*e.g.*, may change time or location of release).

What is the proportion of hatchery-reared to wild recruits within a birth year (i.e., how successful is the stocking program)?

The answer to this question will also tell us about the effectiveness of the stocking program.

Do stocking rates need to be adjusted?

This question is important because if the number of stocked fish in the catch is too high or too low then the stocking plan would be adjusted (*e.g.*, increasing or decreasing the number of hatchery fish released).

Is there a change in condition factor and growth of juvenile sturgeon during construction and/or operation?

This question is important because if sturgeon become fatter or skinnier than they used to be, then something is changing in their environment. If the condition of juveniles decreases, it can also mean that stocking is adding too many fish to the environment, and they cannot find enough food. In that case, the stocking plan will be adjusted.

Will the locations that young-of-the-year (YOY) and juvenile sturgeon are found change in the Keeyask reservoir and Stephens Lake after impoundment?

Flooding of the Keeyask reservoir will cause changes to available habitat in the area. This may cause juvenile sturgeon to move away or to use different areas of the river.

Does additional YOY habitat need to be created in the Keeyask reservoir or in Stephens Lake?

This question is important because if there is no habitat for YOY sturgeon to grow, they will not survive. If this happens, habitat will have to be created.

What was done?

Sampling was conducted in the Keeyask reservoir (the Nelson River between the outlet of Clark Lake and the Keeyask GS) and Stephens Lake in the fall of 2023. Gill nets were used to catch juvenile sturgeon, defined as those that are less than 800 mm in length. The gill nets were set in deep water habitats preferred by juveniles. When a fish was caught, it was measured and weighed. If the fish was not already tagged, then two different tags were applied: an external Floy-tag and a small internal PIT tag to make sure the fish is identifiable if one tag is lost. If the captured fish had already been tagged, then the tag numbers were recorded before the fish was released. Tagging and recapturing fish makes it possible to determine how much a fish grew or the distance they moved. It also makes it possible to estimate how many sturgeon are in a population. An ageing structure (a small piece of fin) was also collected to determine the year that the fish was born.

Measuring (left), weighing (middle), and releasing (right) juvenile sturgeon captured during population monitoring studies.

What was found?

A total of 303 sturgeon (298 juveniles and five adults) were caught in the Keeyask reservoir, including one fish born in 2023 (young-of-the-year [YOY]). Of the 303 sturgeon captured, 47 had been tagged in a previous year (between 2014 and 2022), and 84 (28%) were tagged hatchery-reared sturgeon released as one-year-olds in either the Burntwood River (three fish stocked in 2014) or the Keeyask reservoir (81 fish released in either 2015, 2017, 2019, or 2022). Including the three fish caught in 2023, a total of 15 hatchery-reared fish released in the Burntwood River have been caught in the Keeyask reservoir since stocking began in 2014. Young hatchery fish (age 1–5) released in the Keeyask reservoir are generally longer than wild fish of the same age. By age-5 the lengths of hatchery and wild fish are similar, and after age-5, wild fish are longer.

In Stephens Lake, a total of 173 sturgeon (157 juveniles and 16 adults) were captured, including two wild YOY fish (born in 2023). Of the 173 fish captured, 30 were tagged in a previous year (14 in the Keeyask reservoir and 16 in Stephens Lake) and 60 were hatchery-reared sturgeon (released as one-year-olds). Ten of the 14 fish tagged in the Keeyask reservoir and recaptured in Stephens Lake were juveniles (*i.e.*, measured <800 mm in length). Hatchery-reared sturgeon accounted for 35% of the total catch in Stephens Lake. Twenty-three of the hatchery-reared sturgeon were stocked in the Keeyask reservoir and 37 were stocked in Stephens Lake. In Stephens Lake, age 1–4 hatchery fish are generally longer than wild fish of the same age. By age-5 the lengths of hatchery and wild fish are similar, and after age-5, wild fish are longer.

A computer model was used to generate estimates of population size and survival for wild juvenile sturgeon in the Keeyask reservoir and Stephens Lake. In 2023, the Keeyask reservoir population was estimated at 3,197 wild fish, and the Stephens Lake population was estimated at 2,703 wild fish. The estimate for the Keeyask reservoir was similar to previous years, and the estimate for Stephens Lake was similar to 2022, but higher than any earlier year. It was estimated that 78% of all wild juvenile sturgeon survive each year in the Keeyask reservoir and 81% survive in Stephens Lake, which is slightly higher than estimates from previous years.

A different model was used to generate survival estimates for hatchery-reared fish. The percentage of stocked fish that survive each year was estimated at 95% in the Keeyask reservoir and 86% in Stephens Lake. In the Keeyask reservoir, the hatchery population was estimated to be 1,317 individuals (29% of the population). In Stephens Lake, 959 hatchery-raised fish were estimated to be present (26% of the population).

What does it mean?

Sampling happened three full years after flooding of the Keeyask reservoir, and juvenile sturgeon were still captured in the same general areas and in similar numbers upstream and downstream of the station. In 2023, wild sturgeon born in 2021, 2022, and 2023 were captured in both the Keeyask reservoir and Stephens Lake, showing that successful spawning and recruitment has occurred every year since impoundment.

The capture of many hatchery-reared sturgeon released as one-year-olds in the Keeyask reservoir and Stephens Lake over the last six study years suggests that the stocking program is

having a positive effect on sturgeon abundance in these areas. It shows that stocked sturgeon are surviving in the wild and that they are growing after release.

What will be done next?

Monitoring in 2023 represents the third full year that juvenile sturgeon were living in the impounded reservoir (flooding of the Keeyask reservoir was completed on September 5, 2020, shortly before the 2020 sampling program). It was also the second year of sampling in Stephens Lake after the Keeyask GS was completed. Continued monitoring will show whether sturgeon can successfully reproduce (*i.e.*, do newly hatched fish survive to age 1?) and whether juveniles can successfully survive and grow in the Keeyask reservoir and Stephens Lake. Monitoring will continue each fall until 2044, every year in the Keeyask reservoir and Stephens Lake and every second year in the Upper Split Lake Area. In 2024, monitoring will occur in the Keeyask reservoir, Stephens Lake, and the Upper Split Lake Area.

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1.0 INTRODUCTION

The Keeyask Generation Project (the Project) is a 695-megawatt (MW) hydroelectric generating station (GS) on the lower Nelson River in northern Manitoba. The GS is approximately 725 kilometres (km) northeast of Winnipeg, 35 km upstream of the existing Kettle Generating Station, 60 km east of the community of Split Lake, 180 km east-northeast of Thompson, and 30 km west of Gillam. Construction of the GS began in July 2014 and the seven generating units were all in-service in March 2022.

The *Keeyask Generation Project: Response to EIS Guidelines*, completed in June 2012, provides a summary of predicted effects and planned mitigation for the Project. Technical supporting information for the aquatic 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: Aquatic Environment Supporting Volume* (AESV). As part of the licensing process for the Project, an *Aquatic Effects Monitoring Plan* (AEMP) was developed detailing the monitoring activities of various components of the aquatic environment, including the focus of this report, juvenile Lake Sturgeon populations, for the construction and operation phases of the Project.

For the purposes of this monitoring program, Lake Sturgeon that are 800 mm in fork length or longer are classified as adults and smaller sturgeon are considered juveniles. Although sturgeon greater than 800 mm length may not yet be sexually mature and may not reach sexual maturity for some years, this length was used as the threshold to distinguish between juveniles and adults because the smallest mature fish captured to date has been 809 mm (captured in 2016 in Stephens Lake; Legge *et al.* 2017).

Juvenile population monitoring is a key component of the overall Lake Sturgeon monitoring program. The Project is predicted to affect sturgeon recruitment by altering spawning habitat at the Keeyask GS and Birthday Rapids. Stocking aims to assist the recovery of sturgeon populations in the Upper Split Lake Area (*i.e.*, the Burntwood River and the Nelson River between the Kelsey GS and Split Lake) and in the Keeyask reservoir and Stephens Lake. Stocking locations alternate between years. The Burntwood River was stocked in 2014, 2016, 2018, 2020, 2021, and 2023. The Keeyask reservoir and Stephens Lake were stocked in 2015, 2017, 2019, and 2022. Results of juvenile population monitoring will determine the impact of the loss of spawning habitat earlier than would be possible using adult population monitoring data, allowing timely adaptive management and mitigation, if required. Results of juvenile population monitoring will also assist in assessing the effectiveness of stocking and identify whether changes to the stocking plan are required. Data collected during juvenile population monitoring will be used to measure population size and cohort strength, identify changes in condition factor, determine whether natural reproduction is occurring, assess the need for young-of-the-year (YOY) habitat creation, and determine whether stocked fish are surviving and growing.

Juvenile Lake Sturgeon studies have been conducted in the Keeyask reservoir and Stephens Lake since 2007. Surveys were initiated in the Burntwood River in 2012 and in the Nelson River

downstream of the Kelsey GS and Split Lake in 2015. These studies have increased the understanding of YOY and juvenile abundance, distribution, habitat use, condition, size, and year-class strength (MacDonald 2009; Michaluk and MacDonald 2010; Henderson and Pisiak 2012; Henderson *et al.* 2011, 2013, 2015; Burnett *et al.* 2016, 2017, 2018, 2021, 2022, 2023; Burnett and Hrenchuk 2019, 2020). In both the Keeyask reservoir and Stephens Lake, recruitment has also occurred consistently over the past ten years, but until recently, the cohort-frequency distribution has been dominated by a single cohort produced in 2008 (Henderson *et al.* 2011, 2013, 2015; Henderson and Pisiak 2012; Burnett *et al.* 2017, 2018; Burnett and Hrenchuk 2019, 2020). As new, younger cohorts emerge, fish from the 2008 cohort are becoming too large for the juvenile sampling gear and are therefore making up a smaller proportion of the catch in each waterbody.

Lake Sturgeon stocking is being conducted using wild caught broodstock from the Burntwood River and the Keeyask reservoir. To maintain the genetic structure of each population, progeny from each broodstock location are released back into their respective rivers (*i.e.*, Burntwood River progeny released back into the Burntwood River and Keeyask reservoir progeny released back to the reservoir and Stephens Lake). Stocking occurred for the first time in 2014 and has since occurred annually with a variety of life stages (larvae, fingerlings, yearlings) being released (Table 1; Klassen *et al.* 2017, 2018, 2019, 2020, 2021, 2022, 2023).

Table 1: Summary of Lake Sturgeon stocking since 2014. Numbers of stocked fish are from Klassen *et al.* 2024.

Year[a]	Burntwood River/Split Lake			Keeyask reservoir[b]			Stephens Lake		
	Larvae	Fingerlings	Age-1+	Larvae	Fingerlings	Age-1	Larvae	Fingerlings	Age-1
2014	-	-	595	152,926	4,656	-	-	-	-
2015	-	-	-	-	-	423	-	-	418
2016	-	-	23	192,167	780	-	184,134	799	-
2017	71,740	3,765	-	-	-	463	-	-	720
2018	-	-	739	-	933	-	-	1,009	-
2019	-	3,681		-	-	398	-	-	390
2020	-	-	574	-	-	-	-	-	-
2021	-	-	188[c]	-	-	-	-	1,050	-
2022	-	5,197	-	-	-	402	-	-	400
2023	-	-	795	-	-	-	-	-	-
Total	**71,740**	**12,643**	**2,914[d]**	**345,093**	**6,369**	**1,686**	**184,134**	**2,858**	**1,928**

a. Stocking year.
b. Previously referred to as Gull Lake and the future Keeyask reservoir.
c. Due to the cancellation of spring field activities resulting from COVID-19 in 2020, a total of 188 Burntwood River yearlings remained at the hatchery for the 2020/2021 winter. They were released in spring 2021 as age-2 fish.
d. Includes eight fish that were released without a PIT tag due to insufficient body size at time of tagging.

This report presents results from juvenile population monitoring conducted in the Keeyask reservoir and Stephens Lake in 2023. Data collected during this field program are relevant to the juvenile population monitoring and movement monitoring programs. The key questions set out in the AEMP for juvenile population monitoring were:

- Does recruitment of wild sturgeon occur upstream and/or downstream of the GS during construction and operation?
- Is there a biologically meaningful (and statistically significant) change in condition factor and growth of juvenile sturgeon during construction and operation?
- What is the survival rate of stocked sturgeon?
- What is the proportion of hatchery-reared to wild recruits within a cohort (*i.e.*, how successful is the stocking program)?
- Do stocking rates need to be adjusted?
- Where in the reservoir and in Stephens Lake will YOY rearing habitat be located, and will the distribution of YOY and juvenile Lake Sturgeon change following reservoir creation?
- Does spawning habitat need to be created/modified (if recruitment of wild fish is not observed)?
- Does additional YOY habitat need to be created in the Keeyask reservoir or in Stephens Lake?

Juvenile population monitoring will continue until 2044 and will be conducted annually in the Keeyask reservoir and Stephens Lake and biennially in the Upper Split Lake Area.

2.0 STUDY SETTING

Juvenile population monitoring in 2023 was conducted at two locations: 1) the Keeyask reservoir (*i.e.*, the reach of the Nelson River between the outlet of Clark Lake and the Keeyask GS), and 2) Stephens Lake (Map 1).

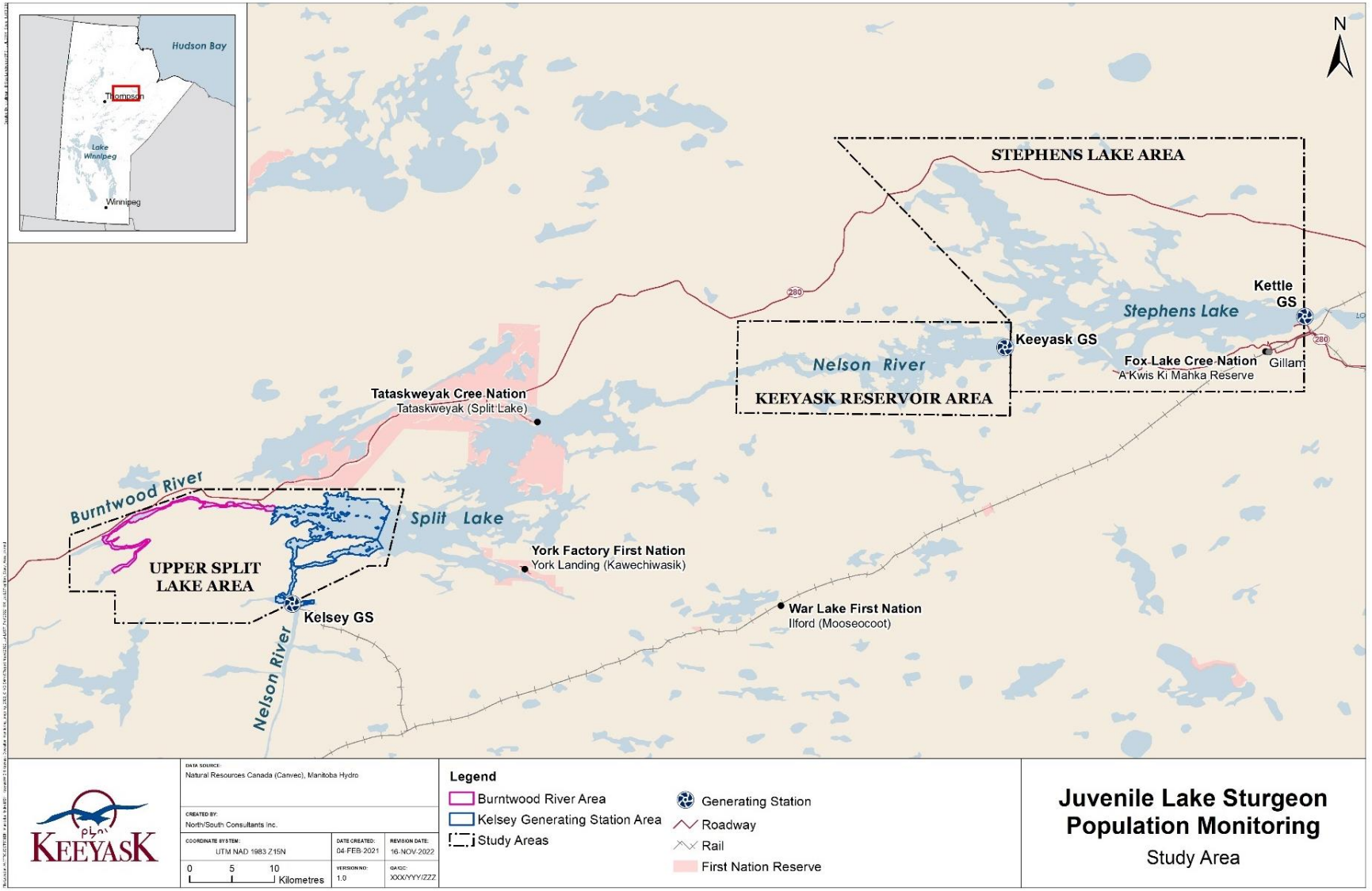
Clark Lake is located immediately downstream of Split Lake, and approximately 42 km upstream of the Keeyask GS. Current is restricted to the main section of the lake, with off-current bays outside the main channel. The Assean River is the only major tributary to Clark Lake and flows into the north side. Downstream from the outlet of Clark Lake, the Nelson River narrows and water velocity increases for a 3 km stretch, known as Long Rapids. For the next 7 km, the river widens, and water velocity decreases. The area between Clark Lake and Birthday Rapids is referred to herein as the upper Keeyask reservoir.

Birthday Rapids is located approximately 10 km downstream of Clark Lake and 30 km upstream of the Keeyask GS and marks the upstream end of major water level changes because of impoundment by the Keeyask GS. The drop in elevation from the upstream to downstream side of Birthday Rapids was approximately 2 m prior to impoundment but is now nearly level, albeit a fast-flowing section of river. The 14 km reach of the Nelson River between Birthday Rapids and Gull Lake was characterized as a large and somewhat uniform channel with medium to high water velocities and a few large bays. This area is now within the Keeyask reservoir, though flooding was limited to mainly shoreline areas, and is referred to herein as the middle Keeyask reservoir.

Prior to impoundment, Gull Lake was a widening of the Nelson River, with moderate to low water velocity beginning approximately 20 km upstream the Keeyask GS. Water levels on Gull Lake increased by several metres following impoundment and flooding along the shoreline and small tributaries entering this reach was extensive. Although this area is larger than before impoundment, the portion of the Keeyask reservoir is referred to herein as Gull Lake.

Just below the Keeyask GS, the Nelson River enters Stephens Lake. Stephens Lake was formed in 1971 by construction of the Kettle GS. Construction of the Keeyask GS has altered the flow distribution immediately downstream of the station.

Construction of the Kettle GS flooded Moose Nose Lake (north arm) and several other small lakes that previously drained into the Nelson River, as well as the old channels of the Nelson River that now lie within the southern portion of the lake. Major tributaries of Stephens Lake include the North and South Moswakot rivers that enter the north arm of the lake. Looking Back Creek is a second order stream that drains into the north arm of Stephens Lake. Kettle GS is located approximately 40 km downstream of the Keeyask GS.



Map 1: **Map of Nelson River showing the site of Keeyask Generating Station and the juvenile Lake Sturgeon population monitoring study setting. The Keeyask reservoir and Stephens Lake were monitored in 2023.**

3.0 METHODS

3.1 GILLNETTING

A standardized methodology has been developed for sampling juvenile sturgeon in Boreal Shield rivers using data sets collected from several populations in the Hudson Bay drainage basin (McDougall *et al.* 2014a). This standardized methodology (described below) is being used to enable comparisons of cohort strength, abundance, growth, and condition among years. The gillnetting methods described below have been used to capture juvenile Lake Sturgeon during environmental studies related to the Keeyask Generation Project since 2008.

Gillnetting was conducted in the Keeyask reservoir and the upper 10 km of Stephens Lake between September 11 and September 20, 2023. Gill nets were composed of five panels of 1, 2, 3, 5, and 6" twisted nylon stretched mesh (25, 51, 76, 127, and 152 mm). Each panel was 25 yards (yd) (22.9 m) long and 2.7 yd (2.5 m) deep. Mesh sizes were staggered in the order of 1, 5, 2, 6, and 3" to capture small and large juveniles across the length of each gang.

Gill nets were set in deep-water habitats (average depth = 15.4 m) since YOY and juvenile Lake Sturgeon have been found to prefer these areas in the Winnipeg, Burntwood, and Nelson rivers (Barth *et al.* 2009; Michaluk and MacDonald 2010; McDougall *et al.* 2013; Henderson *et al.* 2014). Each gill net set was given a unique identification number, and net locations were recorded using a Garmin Etrex GPS receiver (Garmin International Inc., Olathe, Kansas). Water depth at each end of the net was measured using a PiranhaMax Series 150 Portable Sonar (Humminbird, Eufaula, Alabama). Water temperature was measured daily in each area using a hand-held thermometer (±0.5°C). HOBO Water Temperature Pro data loggers (±0.2°C), set approximately 1 m off the substrate, were also used to log water temperature at 6-hour intervals in the Keeyask reservoir and Stephens Lake. Gill nets were checked approximately every 24-hours, weather permitting.

For comparability among years, gillnetting locations used in 2023 were similar to those used during juvenile monitoring programs conducted from 2014 to 2022. However, some sites have changed between years depending on water levels and flows, especially in the Keeyask reservoir. Locations and site-specific physical measurements collected at gillnetting sites in 2023 are found in Appendix 1.

3.2 BIOLOGICAL SAMPLING

All fish captured were counted by species and location. Lake Sturgeon were measured for fork length (FL; ±1 mm), total length (TL; ±1 mm), and weight (±5 g using a digital scale, or nearest 25 g for fish greater than 4,000 g).

For age analysis, the first ray of the left pectoral fin was removed immediately adjacent to its articulation from each juvenile Lake Sturgeon captured for the first time. If fish appeared to have been aged previously, or had deformed pectoral fins, ageing structures were not collected. All collected fin rays were placed in individually numbered envelopes, air dried, and brought back to the NSC laboratory for ageing (Section 3.4).

Small samples (1–2 cm^2) were removed from the left pelvic fin of each Lake Sturgeon and preserved in 95% Biological Grade Ethanol for potential future genetic analysis.

Ageing structures and genetic samples were not taken from YOY fish due to concerns of harming the small fish. Rather, ages were inferred based on size (*i.e.*, fish smaller than 150 mm FL were considered YOY).

3.3 TAGGING

Lake Sturgeon greater than 250 mm FL were marked with individually numbered external Floy-FD-94 T-bar anchor tags (Floy-tag Inc., Seattle, Washington). Floy-tags were inserted into the base of the dorsal fin using a Dennison Mark II tagging gun (Avery Dennison Corporation, Pasadena, California).

Uniquely numbered Passive Integrated Transponder (PIT) tags from Oregon RFID (Oregon RFID Ltd., Portland, Oregon) were also used to mark Lake Sturgeon. Those measuring greater than 250 mm FL received 12 mm HDX tags (12.0 mm x 2.12 mm; 0.1 g) and those measuring less than 250 mm FL (smallest fish tagged was 196 mm) received 8 mm FDX-B tags (8.0 mm x 1.4 mm; 0.027 g). Each Lake Sturgeon was scanned for an existing PIT tag using an Agrident APR 350 Reader (Agrident Ltd., Barsinghausen, Germany). For each untagged fish, a PIT tag was injected under the third dorsal scute using an Oregon RFID tag injector needle, dipped in Polysporin® to minimize the risk of infection. Tags were injected parallel to the horizontal axis of the fish, into muscle tissue (not the body cavity). Following implantation or upon recapture, the tags were logged, and the last six digits manually recorded. Injector needles were sterilized in boiling water prior to the start of sampling and again upon sampling completion.

3.4 AGEING ANALYSIS

Lake Sturgeon fin rays were hardened in an epoxy resin (Cold Cure™) and two 0.7 mm fin sections were cut distally within 5 mm of the articulation using a Struers Minitom (Struers Inc., Cleveland, Ohio) low-speed sectioning saw. Fin sections were mounted on glass slides using Cytoseal-60 (Thermo Scientific, Waltham, Massachusetts) and viewed at five times magnification under a compound microscope. Annuli (growth rings) were counted by three experienced readers (independently), without prior knowledge of fish length or weight, or ages assigned by other readers. If readers assigned different ages to a fish, either the modal age or the median age was

chosen. The rate of three-reader agreement was calculated in percent (percentage). Examples of Lake Sturgeon ageing structures are provided in Appendix 3.

Lake Sturgeon ageing structures exhibit well-defined banding patterns characteristic of repeated summer (fast-growth) and winter (slow/non-growth) periods (McDougall and Pisiak 2014; Figure A3-1). Ageing structures from hatchery-reared Lake Sturgeon have different banding patterns that complicate the ageing process (described in Burnett and Hrenchuk 2019; Figure A3-2). In fish stocked at age-1, the weak annulus is often followed by the presence of a false annulus, not corresponding to slowed winter growth, but instead to stocking and the subsequent establishment period. The false annuli decrease ageing accuracy because they are difficult to distinguish from true annuli. Ageing structures collected from known hatchery fish were not analyzed, instead their known ages were used. All sturgeon caught without a hatchery assigned PIT tag were deemed wild for the purpose of this report.

3.5 DATA ANALYSIS

As was done in previous years, data were analysed for all sizes of Lake Sturgeon captured (as opposed to only those measuring less than 800 mm FL). Mesh sizes used select for small Lake Sturgeon, but larger fish are also captured; therefore, including all fish in the summary statistics ensures comparability among years.

To better describe sampling locations, relative abundance, and fish movements, each sampling area was divided into distinct geographical zones.

Mean FL (mm), weight (g), and condition factor (K) were calculated for all Lake Sturgeon by location. In the Keeyask reservoir and Stephens Lake, known hatchery and wild fish were presented separately. Lake Sturgeon not confirmed as being either hatchery or wild (based on ageing structure analysis; described in Section 3.4) were only included in totals. Condition factor was calculated based on the following equation (after Fulton 1911, in Ricker 1975):

$$K = W / (FL^3 / 10^5)$$

Where:

W = round weight (g); and

FL = fork length (mm).

Ageing structures were only collected for fish measuring <800 mm FL. Because fish approach this length by age nine, all age analyses were restricted to fish aged 0–9 years as the full range of sizes for older fish would not be included in the sample.

A von Bertalanffy growth curve was generated from all age and length data collected during the study to compare the growth of wild vs. hatchery-reared fish, as well as wild fish captured during baseline vs. construction for fish aged as nine years or less. Fish older than age-9 were not included in the analysis as they are not fully represented in the catch (ageing structures are not

collected from fish >800 mm fork length, which corresponds to fish older than age-9). The curve was calculated using the following equation:

$$L = L_{\infty} (1 - e^{-k(t - t_0)})$$

Where:

t = age (years)

t_0 = is the theoretical age at which FL is 0;

L = is the fork length (mm) of the fish at age t;

L_{∞} = is the theoretical maximum TL that an individual in the population can attain; and

k = growth rate.

Length-frequency distributions were plotted in 50 mm length class intervals (*e.g.*, 300–349 mm) and length-weight regression equations were derived using least squares analysis on logarithmic transformations of fork lengths and weights according to the following relationship:

$$\ln(W) = \ln(a) + \ln(FL)*b$$

Where:

W = weight (g);

FL = fork length (mm);

a = Y-intercept; and

b = slope of the regression line.

Cohort frequency distributions were plotted for each location.

Gillnetting hours (*i.e.*, effort) was calculated as the number of sampling hours per 100 m of net set using the following equation:

$$\text{Effort (hours)} = \text{set duration} \times (\text{net length}/100\ \text{m})$$

Catch-per-unit-effort (CPUE) was calculated and expressed as the number of fish captured in 100 m of net per 24-h period using the following formula:

$$\text{CPUE} = \sum \#\ \text{Lake Sturgeon} / \sum \text{Effort} \times 24\ \text{h}$$

Where: Σ = sum of the number of fish or gillnetting hours at all sites.

CPUE was calculated by geographical zone for each study location and study year.

Hatchery-reared Lake Sturgeon are released as fingerlings and yearlings (and were also released as larvae in earlier years). However, without additional analysis (genetics or isotopic signature in fin rays) fish can only be conclusively identified as hatchery-reared based on the presence of a PIT tag, which are exclusive to fish stocked at age-one. In order to facilitate data analysis, all fish not definitively identified as hatchery-reared (based on the presence of a PIT tag) were classified as “wild”. As the additional analysis (genetics or isotopic signature in fin rays) has not been

undertaken, the definitive origin (hatchery or wild) of fish belonging to cohorts corresponding to years in which larvae or fingerlings were stocked cannot be determined.

3.6 POPULATION ESTIMATE

Mark-recapture population estimates have been calculated for the Keeyask reservoir (years: 2010 and 2012–2023) and Stephens Lake (years: 2010 and 2012–2023). The Jolly-Seber model (POPAN formulation; Arnason and Schwarz 2002), as implemented within MARK, was used to estimate the annual abundance of wild juvenile Lake Sturgeon. Detailed methods can be found in Appendix 5. Estimates are reported as a mean with 95% confidence intervals (CI).

A Cormack-Jolly-Seber model was used to calculate a survival estimate for hatchery-reared juvenile Lake Sturgeon cohorts with a minimum number of recaptures (n = 25) stocked in the Keeyask reservoir and Stephens Lake, using the probability of recapture in each year. The population of hatchery-reared Lake Sturgeon was estimated based on the total number of fish released multiplied by the survival estimate (*e.g.*, 1,000 fish released and an 80% survival estimate would generate a population estimate of 800 individuals). The estimate is recalculated every year between stocking and the study year, to get the final estimate (*e.g.*, 1,000 fish released in 2017 at 80% survival would generate a population estimate of 800 individuals in 2018, and 640 in 2019). The model assumes that the survival rate remains constant between years.

4.0 RESULTS

Gill net site data is presented in Appendix 1 and biological and tagging information for Lake Sturgeon captured in 2023 are provided in Appendix 2.

4.1 KEEYASK RESERVOIR

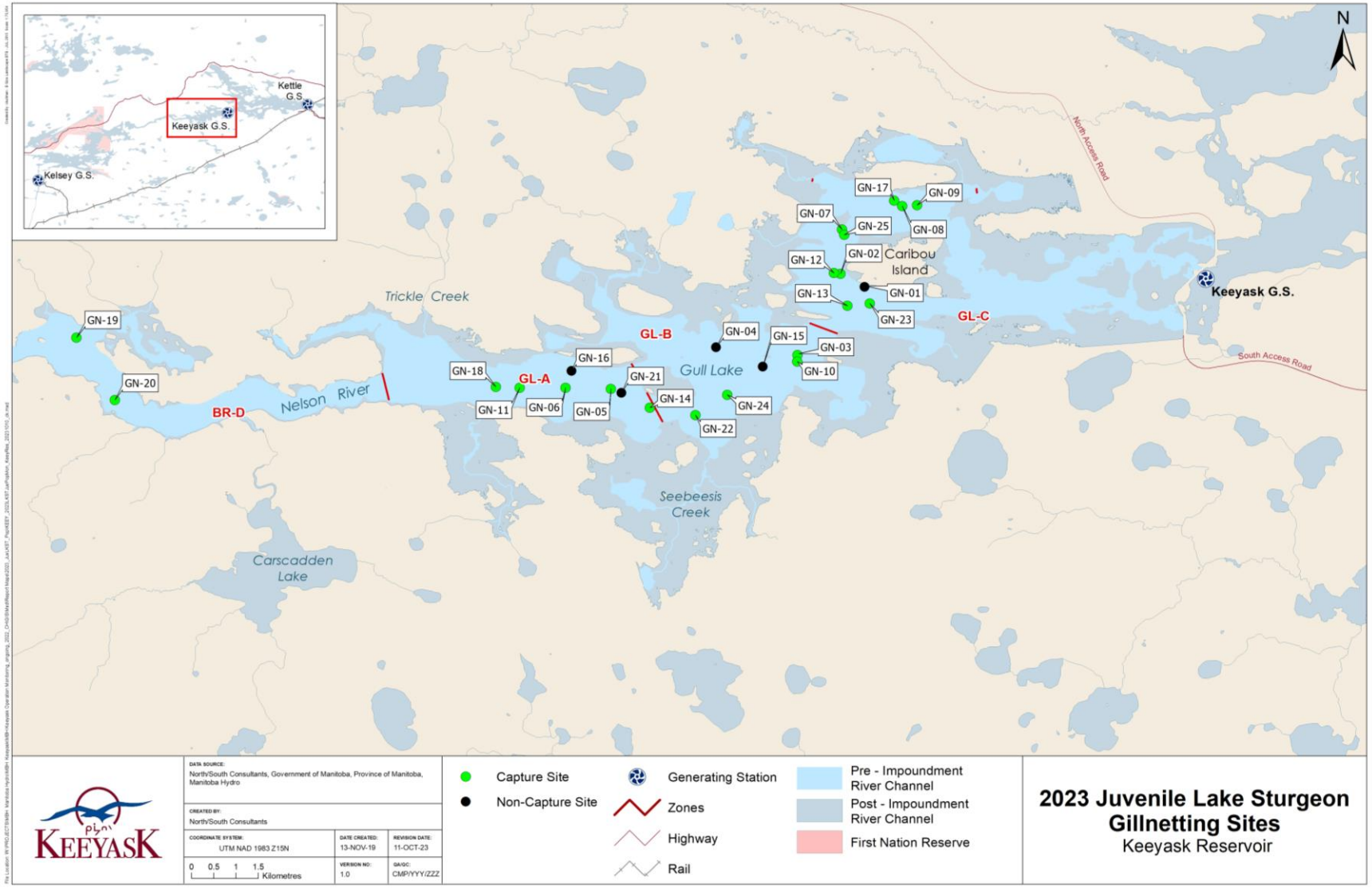
A total of 467 fish from nine species were captured at 25 sites between September 11 and 20, 2023 (Map 2). Water temperature during sampling ranged from 13.0°C to 14.0°C (Table A1-1). Lake Sturgeon (n = 303; 64.9%) were the most abundant species captured (Table 2). Gill net site data as well as biological and tagging information for all Lake Sturgeon captured are provided in Appendices A1-1 and A2-1.

Table 2: Number (n) and frequency of occurrence (%), by species, of fish captured during juvenile Lake Sturgeon monitoring in the Keeyask reservoir (Birthday Rapids to the Keeyask GS), fall 2023.

Species	Scientific Name	n[a]	%
Burbot	*Lota lota*	2	0.4
Freshwater Drum	*Aplodinotus grunniens*	1	0.2
Lake Sturgeon	***Acipenser fulvescens***	***303*** [b]	***64.9***
Longnose Sucker	*Catostomus catostomus*	60	12.8
Northern Pike	*Esox lucius*	4	0.9
Sauger	*Sander canadensis*	53	11.3
Shorthead Redhorse	*Moxostoma macrolepidotum*	6	1.3
Walleye	*Sander vitreus*	28	6.0
White Sucker	*Catostomus commersoni*	10	2.1
Total		**467**	**100**

a. Number of fish caught.
b. Does not include Lake Sturgeon recaptured more than once in the same study.

In total, 298 juvenile and five adult Lake Sturgeon were captured in 1,410 gill net hours, producing an overall CPUE of 5.16 LKST/100 m net/24 h (Table 3). Total CPUE in 2023 was higher than any other sampling year on record. Three Lake Sturgeon mortalities were recorded during sampling: one on September 13 (322 mm FL; 230 g weight), one on September 17 (512 mm FL; 850 g weight), and one on September 19 (500 mm FL; 870 g weight). Gill nets were set throughout Gull Lake (*i.e.*, in zones GL-A, GL-B, and GL-C), as well as in the middle Keeyask reservoir (*i.e.*, BR-D) (Map 2). Total CPUE by zone since 2007 is presented in Table 4.



Map 2: Map of sites fished with gill nets in the Keeyask reservoir, fall 2023.

Table 3: Lake Sturgeon catch-per-unit-effort (CPUE; # LKST/100 m net/24 h) for gill nets set to target juvenile Lake Sturgeon in the Keeyask reservoir (Birthday Rapids to the Keeyask GS) since 2007. Grey highlighted rows indicate construction monitoring, and the blue highlighted rows indicate post-impoundment monitoring.

Year	Start Date	Completion date	Mesh Size	# Sites	Effort (gillnet hrs)[a]	# Lake Sturgeon[b]	CPUE
2007	28-Sep	03-Oct	8mm - 5"	26	175	0	0
2008	12-Sep	27-Sep	1.5"- 8"	15	2,820	122[c]	1.04
2010	21-Sep	29-Sep	1" - 5"	27	853	69	1.94
2011	18-Sep	24-Sep	1" - 5"	25	662	121	4.38
2012	29-Aug	09-Sep	1" - 6"	30	747	101	3.25
2014	08-Sep	16-Sep	1" - 6"	30	765	112	3.51
2015	11-Sep	20-Sep	1" - 6"	34	912	139	3.66
2016	12-Sep	23-Sep	1" - 6"	37	997	96	2.31
2017	09-Sep	19-Sep	1" - 6"	51	1,551	177	2.74
2018	09-Sep	19-Sep	1" - 6"	50	1,377	150	2.61
2019	10-Sep	20-Sep	1" - 6"	39	1,561	244	3.75
2020	15-Sep	23-Sep	1" - 6"	38	1,599	205	3.08
2021	14-Sep	26-Sep	1" - 6"	31	1,570	266	4.07
2022	14-Sep	24-Sep	1" - 6"	32	1,621	185	2.74
2023	**11-Sep**	**20-Sep**	**1" - 6"**	**25**	**1,410**	**303**	**5.16**

a. Gill net set durations were standardized to 100 m of net and then summed to calculate the total gill net hours for each study.
b. Does not include Lake Sturgeon recaptured more than once in the same study.
c. This total was previously reported as 126, however, this included four fish captured multiple times in the same year that have since been removed from the total.

Table 4: Lake Sturgeon catch-per-unit effort (CPUE; # LKST/100 m net/24 h) by zone, for gill nets set during juvenile Lake Sturgeon monitoring in the Keeyask reservoir (Birthday Rapids to the Keeyask GS) between 2007 and 2023. Grey highlighted rows indicate construction monitoring, and the blue highlighted rows indicate post-impoundment monitoring.

Sample Year	BR-D			GL-A			GL-B			GL-C		
	Effort (gillnet hours)[a]	# of Lake Sturgeon[b]	CPUE	Effort (gillnet hours)[a]	# of Lake Sturgeon[b]	CPUE	Effort (gillnet hours)[a]	# of Lake Sturgeon[b]	CPUE	Effort (gillnet hours)[a]	# of Lake Sturgeon[b]	CPUE
2007	67	0	0.00	9	0	0.00	50	0	0.00	49	0	0.00
2008	133	0	0.00	584	3	0.12	956	72	1.50	1,147	47	1.04
2010	-	-	-	222	5	0.54	247	25	2.43	384	39	2.44
2011	-	-	-	-	-	-	157	15	2.30	505	106	5.04
2012	-	-	-	284	17	1.45	251	53	5.07	212	31	3.51
2014	65	5	1.85	167	18	2.59	305	53	4.18	229	36	3.77
2015	106	2	0.45	273	14	1.32	285	90	7.57	248	33	3.19
2016	120	5	1.00	320	14	1.05	290	43	3.55	267	34	3.05
2017	106	6	1.36	532	69	3.11	455	74	3.90	458	24	1.26
2018	135	5	0.89	315	17	1.30	480	60	3.00	447	68	3.65
2019	156	19	2.92	297	19	1.53	547	119	5.22	561	87	3.72
2020	135	11	1.96	242	10	0.99	532	76	3.43	690	108	3.76
2021	162	24	3.55	222	53	5.74	457	68	3.57	730	121	3.98
2022	144	16	2.67	141	23	3.91	435	50	2.76	901	96	2.56
2023	**103**	**9**	**2.10**	**456**	**98**	**5.16**	**267**	**45**	**4.05**	**584**	**151**	**6.20**

a. Gill net set durations were standardized to 100 m of net and then summed to calculate the total gill net hours for each study.
b. Does not include Lake Sturgeon recaptured more than once in the same study.

Of the 303 Lake Sturgeon captured, 84 were known hatchery-reared fish (*i.e.*, stocked as age-1 and marked with PIT tags; discussed in further detail in Section 4.1.5). Total CPUE for wild and hatchery-reared Lake Sturgeon since 2014 is presented in Table 5. In 2023, CPUE for both wild (3.73 LKST/100 m net/24 h) and hatchery-reared (1.43 LKST/100 m net/24 h) Lake Sturgeon was the highest since stocking efforts began in 2014.

Table 5: Catch-per-unit-effort (CPUE; # LKST/100 m net/24 h) for hatchery (*i.e.*, stocked as age-1 and marked with PIT tags) and wild Lake Sturgeon captured in the Keeyask reservoir (Birthday Rapids to the Keeyask GS) between 2014 and 2023.

Year	Effort (gillnet hours)[a]	# of Lake Sturgeon[b]		Total CPUE	
		Wild	Hatchery	Wild	Hatchery
2014	765	111	1	3.48	0.03
2015	912	136	3	3.58	0.08
2016	997	89	7	2.14	0.17
2017	1,551	149	21	2.31	0.32
2018	1,377	128	17	2.23	0.30
2019	1,561	187	57	2.88	0.88
2020	1,599	169	36	2.54	0.54
2021	1,570	209	57	3.19	0.87
2022	1,621	137	48	2.03	0.71
2023	**1,410**	**219**	**84**	**3.73**	**1.43**

a. Gill net set durations were standardized to 100 m of net and then summed to calculate the total gill net hours for each study.
b. Does not include Lake Sturgeon recaptured more than once in the same study.

4.1.1 YEAR-CLASS STRENGTH

Ages were assigned to 285 of the 303 Lake Sturgeon captured including 201 wild and 84 hatchery-reared fish. Ageing structures were not collected from 17 Lake Sturgeon including seven large fish that were of or approaching adult size (*i.e.*, nearly 800 mm FL), one fish that was in poor condition at the time of capture, and nine that were released prior to a structure being taken. One ageing structure had a crystalline center and was unreadable.

Lake Sturgeon (both wild and hatchery) captured in 2023 ranged in age from 0 to 17 years (2006–2023 cohorts; Figure 1), with the 2016 cohort captured most frequently (n = 76; 27%). The 2018 and 2014 cohorts were also relatively abundant in the catch, accounting for 14% (n = 40) and 10% (n = 29), respectively. One wild YOY, four age-one, and one age-2 fish were captured in the Keeyask reservoir in 2023, all of which were spawned after impoundment. Known hatchery-reared fish accounted for 12%, 52%, 17%, 88%, and 95% of the 2013, 2014, 2016, 2018, and 2021 cohorts, respectively. Wild fish from all cohorts since 2003 have been represented in the catch since studies began (Table 6).

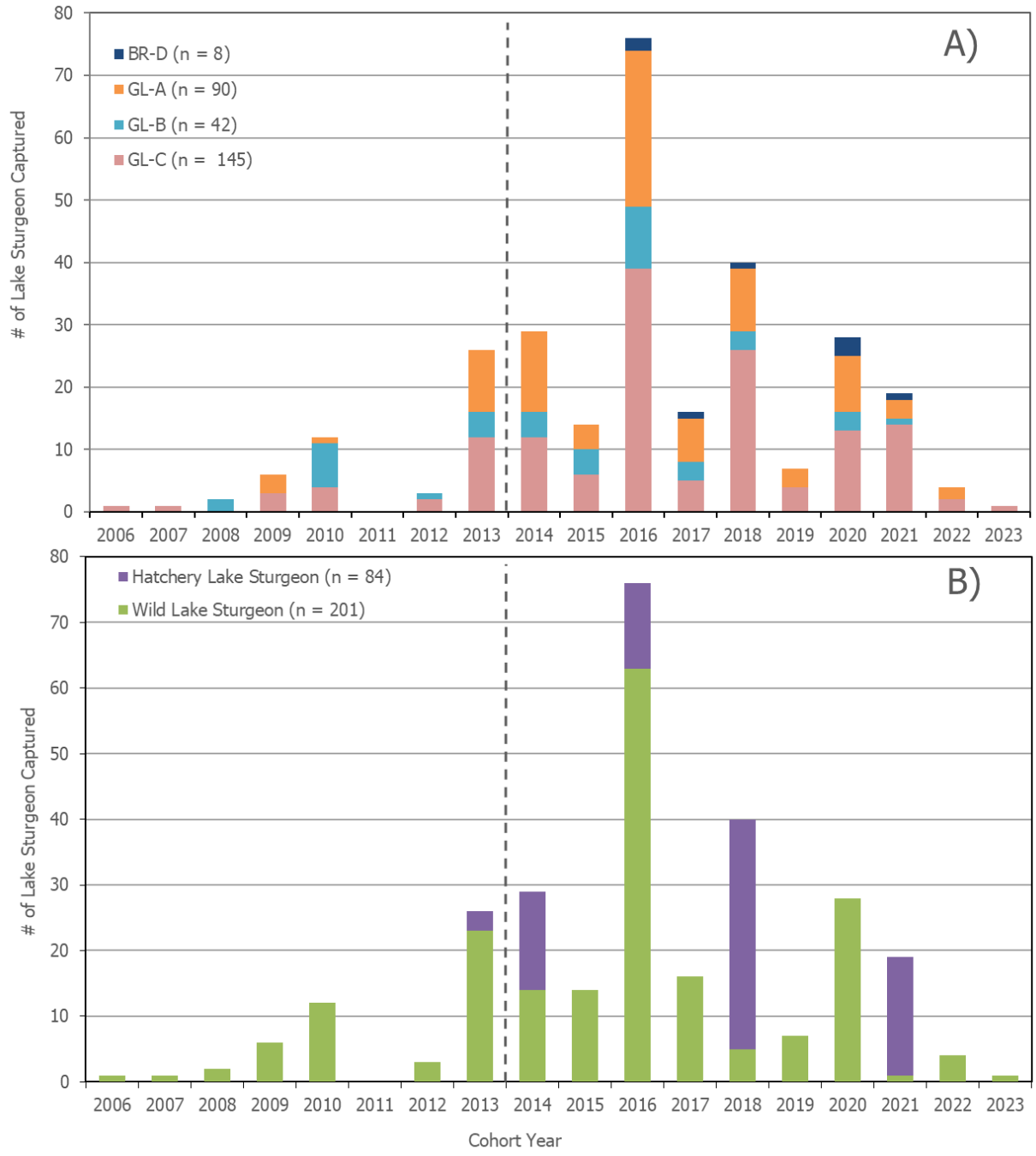


Figure 1: **Cohort frequency distributions for all aged juvenile Lake Sturgeon captured by zone in the Keeyask reservoir (A) and by hatchery and wild Lake Sturgeon (B), fall 2023. Cohorts prior to 2014 (*i.e.*, age-9 fish) are not fully represented as ageing structures are not collected from fish ≥800 mm fork length (indicated by vertical dashed line).**

Table 6: Number of wild Lake Sturgeon captured in the Keeyask reservoir (Birthday Rapids to the Keeyask GS) from 2008 to 2023, from which ages and cohorts were determined. Grey highlighted columns indicate cohorts spawned during Keeyask GS construction, blue highlighted cells indicate cohorts spawned after impoundment of the Keeyask reservoir, and red values indicate cohorts absent from the corresponding study year.

Location	Cohort																				
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
2008 Study Year	0	0	0	12	2	14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2010 Study Year	6	3	1	3	5	18	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-
2011 Study Year	5	2	2	7	5	94	1	2	0	-	-	-	-	-	-	-	-	-	-	-	-
2012 Study Year	2	2	2	12	6	60	3	1	4	0	-	-	-	-	-	-	-	-	-	-	-
2014 Study Year	1	0	1	6	2	58	3	4	7	3	9	0	-	-	-	-	-	-	-	-	-
2015 Study Year	0	1	3	10	7	71	1	1	3	6	11	3	4	-	-	-	-	-	-	-	-
2016 Study Year	0	0	1	15	0	29	2	1	5	6	13	6	4	4	-	-	-	-	-	-	-
2017 Study Year	1	1	0	6	3	56	2	2	11	7	20	10	10	10	1	-	-	-	-	-	-
2018 Study Year	0	0	0	3	4	33	5	3	6	4	9	5	9	34	5	1	-	-	-	-	-
2019 Study Year	0	0	0	2	1	30	2	3	6	6	20	20	17	44	15	1	4	-	-	-	-
2020 Study Year	0	1	1	1	0	18	3	1	6	5	24	16	13	57	12	1	5	1	-	-	-
2021 Study Year	0	0	1	0	1	6	6	4	5	9	30	22	17	52	14	2	3	17	0	-	-
2022 Study Year	0	0	0	0	0	3	4	3	4	3	5	11	9	43	13	5	8	22	1	0	-
2023 Study Year	0	0	0	1	1	2	6	12	0	3	23	14	14	63	16	5	7	28	1	4	1
Total	**15**	**10**	**12**	**78**	**37**	**492**	**38**	**37**	**57**	**52**	**164**	**107**	**97**	**307**	**76**	**15**	**27**	**68**	**2**	**4**	**1**
Present in the Catch	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**

4.1.2 POPULATION ESTIMATE

The 2023 estimate for the Keeyask reservoir population was 3,197 wild juvenile Lake Sturgeon (95% CI: 2,224–4,594; Figure 2; Table A5-1). This is similar to population estimates calculated since 2018. The estimated annual survival rate for wild juvenile Lake Sturgeon was 78%.

Survival of hatchery-reared Lake Sturgeon stocked in the Keeyask reservoir was estimated at 95% (Table A5-2). Based on this survival estimate, 278, 338, 322 and 379 hatchery-reared individuals from the 2014, 2016, 2018, and 2021 cohorts are predicted to still be present in the Keeyask reservoir, contributing to a population estimate of 1,317 hatchery fish. Based on these numbers, it is estimated that hatchery fish currently make up 29% of the total juvenile Lake Sturgeon population in the Keeyask reservoir.

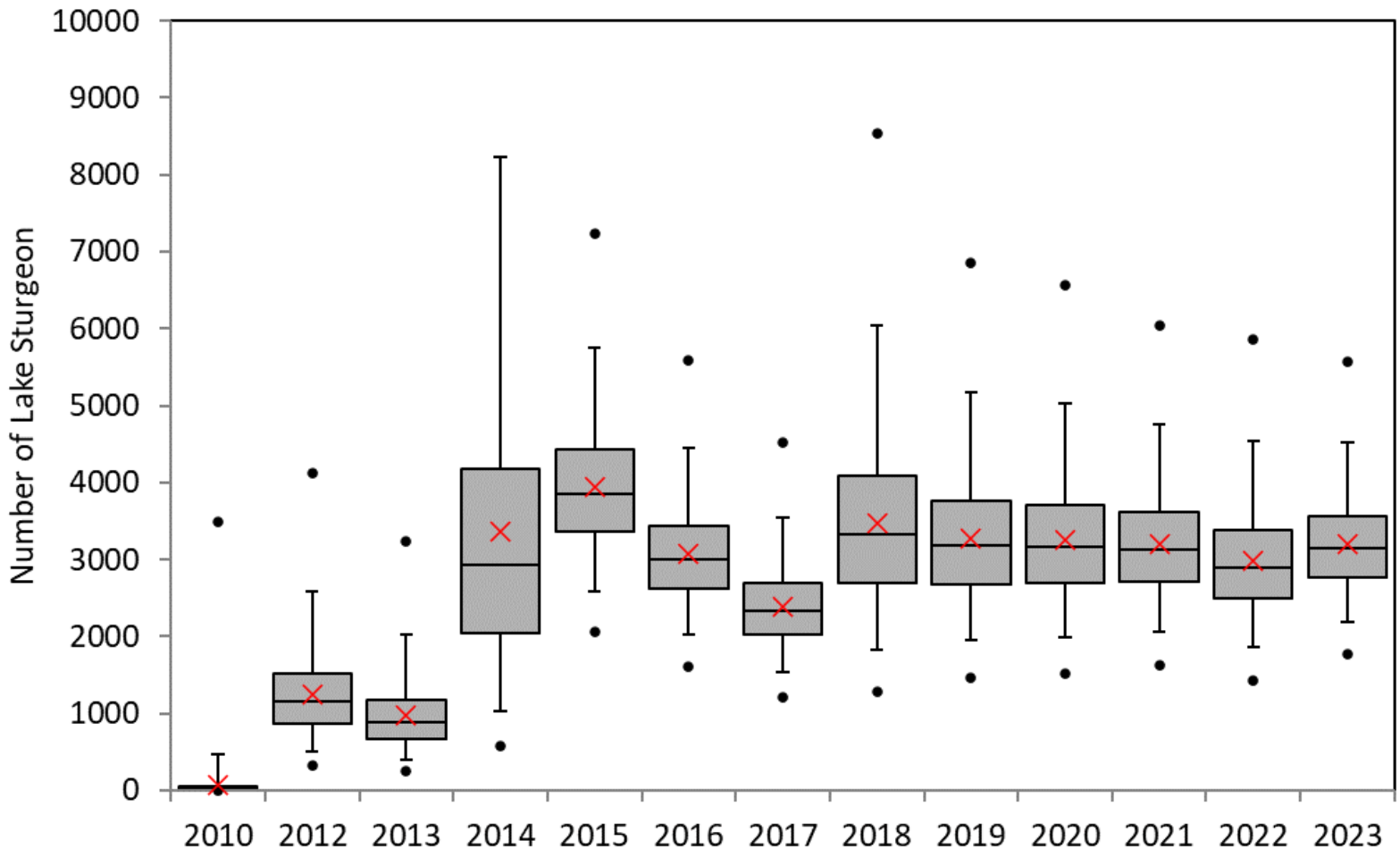


Figure 2: **Juvenile Lake Sturgeon abundance (*i.e.*, fish <800 mm fork length) estimates based on POPAN best model for the Keeyask reservoir (2010, 2012–2023). Each red x marks the estimated abundance for each year (*i.e.*, the number of juvenile Lake Sturgeon), the black dots represent the min and max estimates, and the vertical bar lines represent the upper and lower 95% confidence intervals.**

4.1.3 GROWTH AND CONDITION

Length-weight relationships for wild and hatchery-reared Lake Sturgeon captured in the Keeyask reservoir are presented in Figure 3. Mean length, weight, and condition factor of wild Lake Sturgeon captured during juvenile Lake Sturgeon monitoring since 2008 is presented in Table 7.

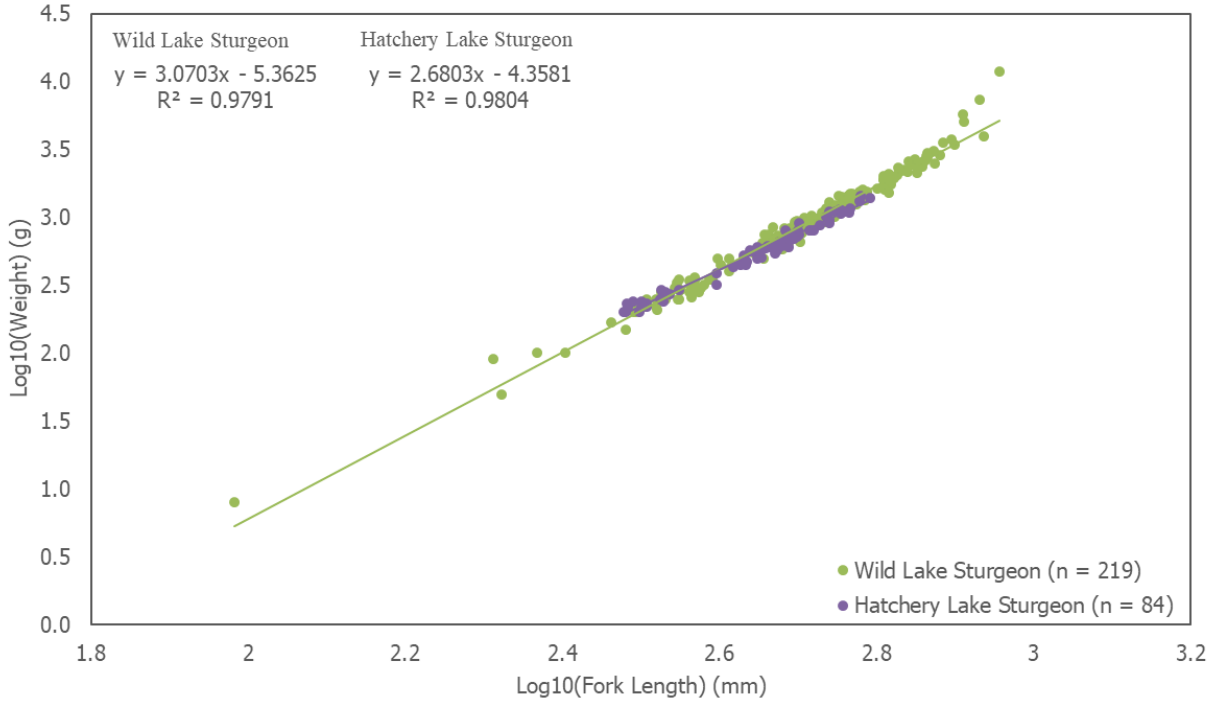


Figure 3: Comparison of weight (g) at-fork length (mm) (log transformed) for Lake Sturgeon captured in the Keeyask reservoir, fall 2023.

Wild Lake Sturgeon captured in 2023 had a:

- Mean FL of 524 mm (n = 219; StDev = 130 mm; range 96–905 mm);
- Mean weight of 1,211 g (n = 219; StDev = 1,195 g; range 8–11,800 g); and
- Mean condition factor of 0.68 (n = 219; range 0.52–1.59).

Wild Lake Sturgeon in the 500-549 mm FL interval were captured most frequently, representing 21% (n = 45) of the wild catch (Figure 4). Fish measuring 450–499 mm FL were also frequently captured, representing 20% (n = 43) of the wild catch.

Table 7: Mean length, weight, and condition factor of wild Lake Sturgeon captured during juvenile Lake Sturgeon monitoring in the Keeyask reservoir (Birthday Rapids to the Keeyask GS), since 2008. Grey highlighted rows indicate construction monitoring and blue highlighted rows indicate post-impoundment monitoring.

Year	Fork Length (mm)				Weight (g)				K		
	n[a]	Mean	Std[b]	Range	n	Mean	Std	Range	n	Mean	Range
2008	112	607	169	132-1,200	53	1,663	1,138	110-6,804	53	0.74	0.62-1.03
2010	69	389	119	292-780	68	514	620	150-3,250	68	0.69	0.48-1.03
2011	121	433	90	263-835	121	657	648	100-4,950	121	0.68	0.42-0.99
2012	101	488	99	250-842	99	825	541	75-3,150	99	0.66	0.45-1.16
2014	112	533	140	225-946	111	1,279	995	50-5,750	111	0.72	0.11-1.20
2015	136	537	177	101-908	131	1,583	1,189	11-7,257	131	0.75	0.55-1.68
2016	89	534	181	98-836	86	1,601	1,177	8-4,560	86	0.75	0.42-1.10
2017	152	560	171	129-919	147	1,706	1,255	100-6,100	147	0.72	0.47-0.96
2018	133	518	205	87-1,031	132	1,519	1,620	50-8,500	132	0.72	0.32-1.30
2019	187	502	178	95-1,060	183	1,294	1,430	100-8,550	183	0.68	0.25-1.24
2020	169	508	140	104-860	169	1,151	1,043	6-5,300	169	0.68	0.46-1.35
2021	209	518	142	160-819	208	1,109	859	50-4,750	208	0.66	0.43-1.22
2022	137	476	135	224-815	137	840	719	50-4,050	137	0.60	0.39-0.80
2023	**219**	**524**	**130**	**96-905**	**219**	**1,211**	**1,195**	**8-11,800**	**219**	**0.68**	**0.52-1.59**

a. Number of fish measured.
b. Standard deviation.

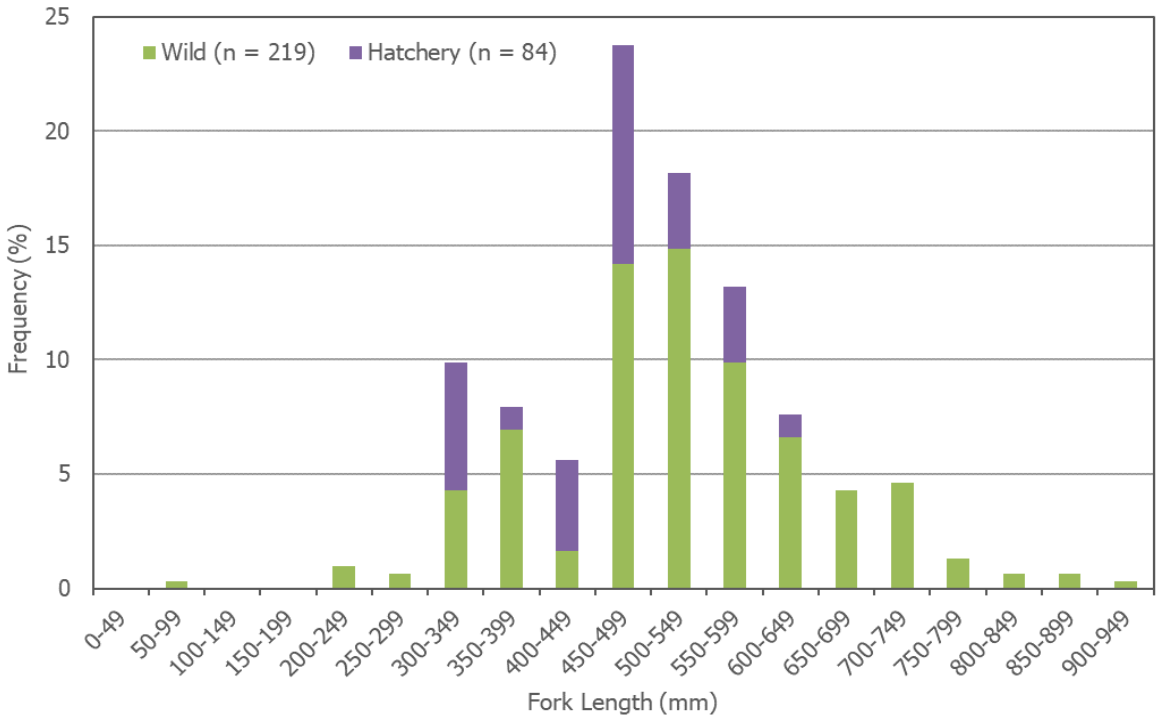


Figure 4: Fork length frequency distributions for Lake Sturgeon captured in gill nets set in the Keeyask reservoir, fall 2023.

Hatchery-reared Lake Sturgeon captured in 2023 had a:

- Mean FL of 456 mm (n = 84; StDev = 84 mm; range 301–619 mm);
- Mean weight of 636 g (n = 84; StDev = 302 g; range 200–1,430 g); and
- Mean condition factor of 0.63 (n = 84; range 0.52–0.83) (Table 8).

Hatchery-reared Lake Sturgeon in the 450–499 mm FL interval were captured most frequently, representing 35% of the hatchery catch (n = 29). Hatchery fish measuring 300–349 mm and 400–449 mm were also frequently captured, representing 20% (n = 17) and 14% (n = 12) of the catch, respectively.

A comparison of von Bertalanffy growth curves for wild fish captured during baseline (2008–2012), construction (2014–2020), and post-impoundment (2021–2023) monitoring shows that young fish (*i.e.*, age-1 and -2) captured post-impoundment are longer than those captured during baseline and construction (Figure 5). Growth curve analysis of hatchery and wild fish shows young hatchery fish (1–5 years-old) are longer than wild fish of the same cohort. At approximately age-6, the lengths of wild and hatchery fish become similar, and after age-6, wild fish are longer (Figure 6).

Table 8: Mean length, weight, and condition factor of hatchery Lake Sturgeon captured during juvenile Lake Sturgeon monitoring in the Keeyask reservoir (Birthday Rapids to the Keeyask GS), fall 2023. Grey highlighted rows indicate construction monitoring and blue highlighted rows indicate post-impoundment monitoring.

Year	Fork Length (mm)				Weight (g)				K		
	n[a]	Mean	Std[b]	Range	n	Mean	Std	Range	n	Mean	Range
2014	1	272	-	-	1	150	-	-	1	0.75	
2015	3	310	26	280-330	2	200	35	175-225	2	0.58	0.54-0.63
2016	7	366	25	320-396	7	335	44	280-400	7	0.69	0.52-0.85
2017	21	380	69	285-465	21	355	176	100-600	21	0.59	0.43-0.74
2018	17	396	57	255-479	17	394	148	100-700	17	0.60	0.53-0.72
2019	57	364	72	265-530	56	307	214	75-950	56	0.54	0.28-0.95
2020	36	422	62	337-573	36	476	244	200-1,175	36	0.58	0.44-0.71
2021	57	475	69	373-636	57	679	334	300-1,650	57	0.59	0.48-0.76
2022	48	418	116	240-620	48	518	397	75-2,000	48	0.58	0.46-0.95
2023	**84**	**456**	**84**	**301-619**	**84**	**636**	**302**	**200-1,430**	**84**	**0.63**	**0.52-0.83**

a. Number of fish measured.
b. Standard deviation.

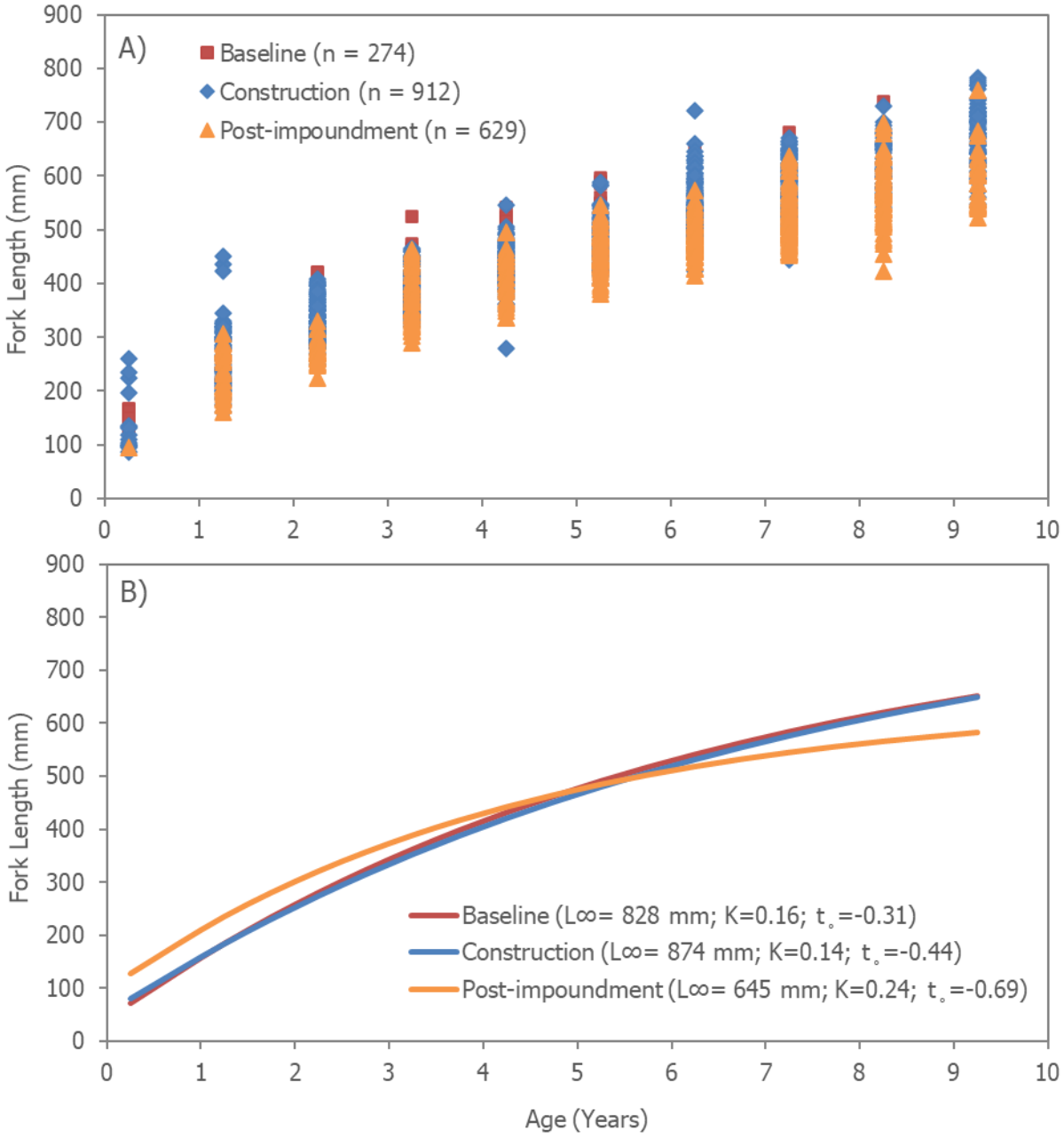


Figure 5: **Fork length-at-age (A) and von Bertalanffy growth curve analysis (B) for all wild aged Lake Sturgeon caught during baseline (red; 2008–2012), construction (blue; 2014–2020), and post-impoundment (orange; 2021-2023) monitoring years in the Keeyask reservoir. Fish older than age-9 were not included in the analysis as they are not fully represented in the catch (ageing structures are not collected from fish ≥800 mm fork length, which corresponds to fish older than age-9).**

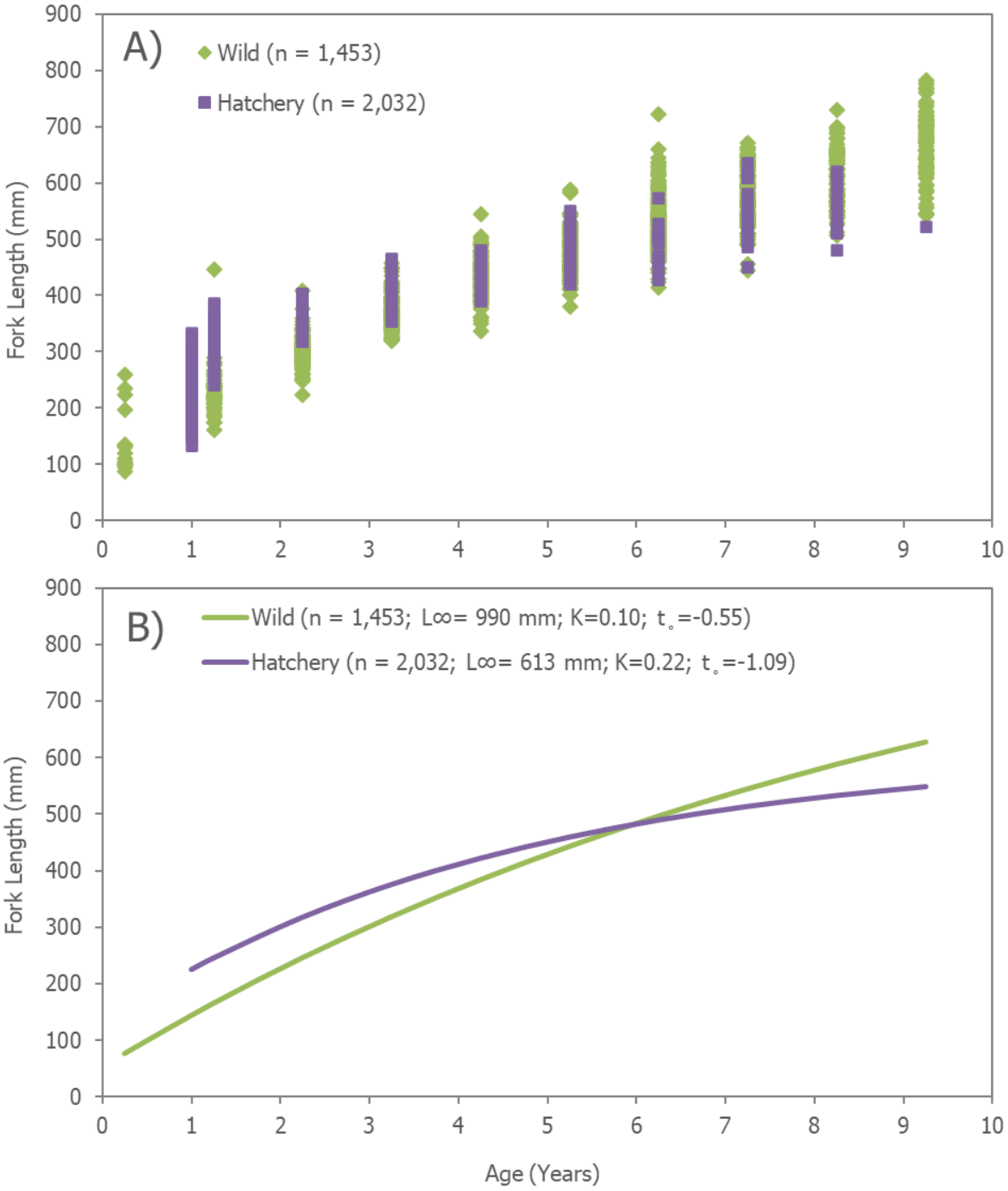


Figure 6: **Fork length-at-age (A) and von Bertalanffy growth curve analysis (B) for all wild (green) and hatchery-reared (purple) Lake Sturgeon released and/or recaptured in the Keeyask reservoir since stocking began in 2014. Fish older than age-9 were not included in the analysis as they are not fully represented in the catch (ageing structures are not collected from fish ≥800 mm fork length, which corresponds to fish older than age-9).**

4.1.4 RECAPTURES

A total of 47 wild Lake Sturgeon tagged in a previous year were recaptured in 2023, all of which were originally tagged in the Keeyask reservoir (Table 9; Table A4-1). These recaptures represent 21% of the wild catch and 16% of the total catch.

Table 9: Recapture summary for wild Lake Sturgeon from the Keeyask reservoir (Birthday Rapids to the Keeyask GS) between 2008 and 2023. Grey highlighted rows indicate construction monitoring and blue highlighted rows indicate post-impoundment monitoring.

Sampling Year	Tagging Location		
	Upper Split Lake Area	Keeyask reservoir[b]	Stephens Lake
	n[a]	n	n
2008	0	9	0
2010	0	2	0
2011	0	4	0
2012	0	8	0
2014	0	17	0
2015	0	20	0
2016	0	11	0
2017	0	17	0
2018	0	18	0
2019	0	21	0
2020	0	26	0
2021	0	30	0
2022	0	31	0
2023	**0**	**47**	**0**

a. Number of fish.
b. Birthday Rapids to the Keeyask GS.

Recaptured fish moved varying distances from their original capture locations:

- Eleven moved less than 1.0 km.
- Thirty-five moved between 1.0 and 9.3 km.
- One was recaptured in lower Gull Lake, 21.1 km downstream of its initial capture location near Birthday Rapids in 2016.

4.1.5 HATCHERY CAPTURES

Eighty-four known hatchery-reared fish (*i.e.,* those PIT tagged and stocked as age-1) were caught in 2023, representing 28% of the total Lake Sturgeon catch (Table 10). Fifteen of the hatchery-reared fish were caught during a previous study, three in 2019, six in 2020, four in 2021, and two

in 2022. An age breakdown of all hatchery-reared fish captured between 2014 and 2023 is presented in Table 11.

Table 10: Number (n) and percentage (%) of catch of hatchery-reared Lake Sturgeon caught in the Keeyask reservoir (Birthday Rapids to the Keeyask GS) between 2014 and 2023.

Sample Year	Release Location				Total	% of Total Catch
	Burntwood River		Keeyask reservoir			
	n[a]	% of Catch	n[a]	% of Catch		
2014	1	0.9	-	-	1	0.9
2015	1	0.7	2	1.4	3	2.2
2016	0	0.0	7	7.3	7	7.3
2017	1	0.6	20	11.6	21	11.9
2018	1	0.7	16	10.7	17	11.3
2019	2	0.8	55	22.5	57	23.4
2020	1	0.5	35	17.1	36	17.6
2021	4	1.5	53	19.9	57	21.4
2022	1	0.5	47	25.4	48	25.9
2023	**3**	**1.0**	**81**	**26.7**	**84**	**27.7**

a. Number of fish.

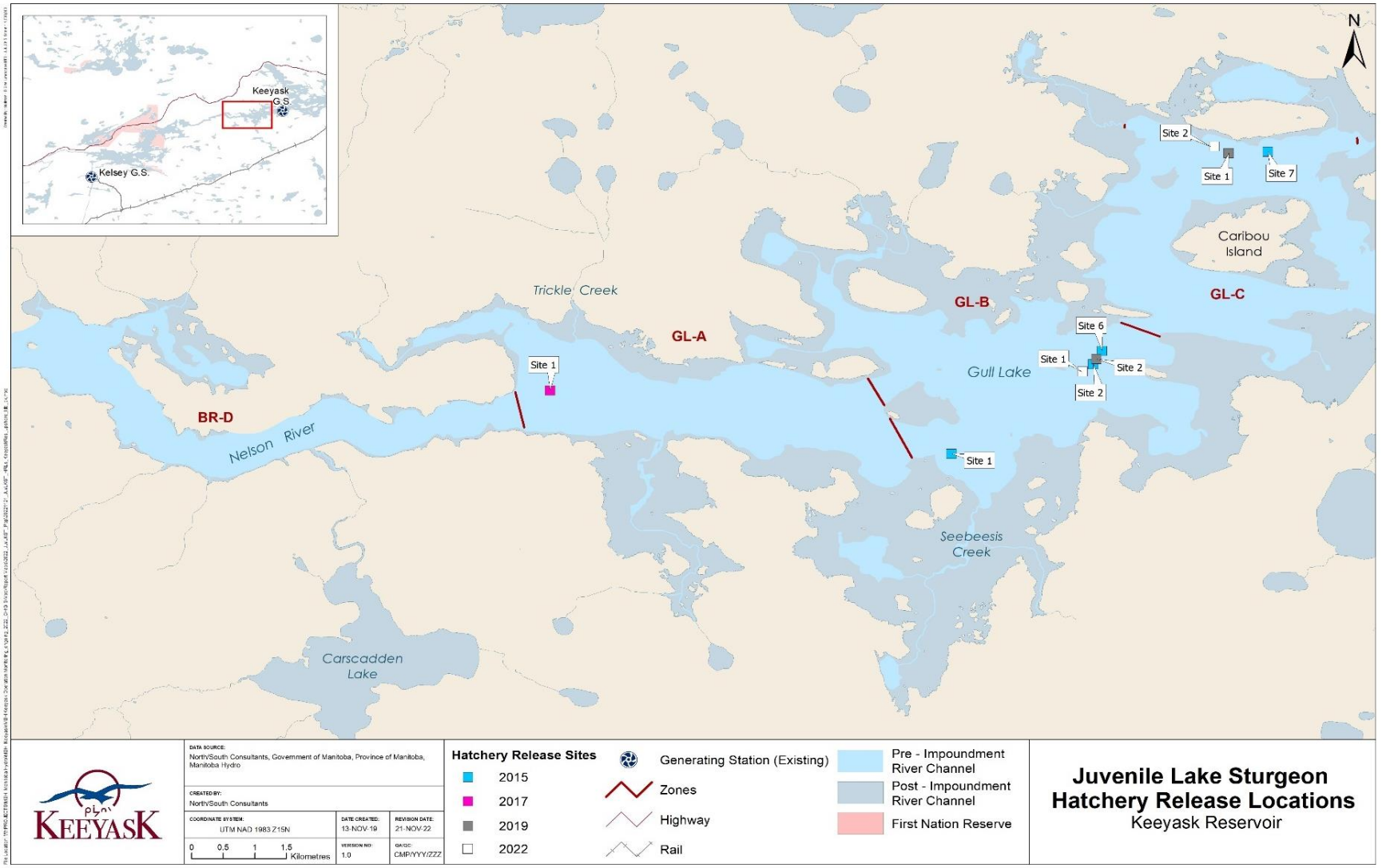
Eighty-one hatchery-reared Lake Sturgeon were stocked in the Keeyask reservoir (Map 3):

- Nine were stocked on June 22, 2015, at Sites 1 and 2 (Zone GL-B). These fish were captured between 0.9 and 4.8 km of their stocking location.
- Six were stocked on September 16, 2015, at Sites 6 (Zone GL-B) and 7 (Zone GL-C) and were caught between 1.9 and 10.3 km of their stocking location.
- Thirteen were stocked on June 8, 2017, at Site 1 (Zone GL-A) and were caught between 2.3 and 12.0 km of their stocking location.
- Thirty-five were stocked in the Keeyask reservoir on June 6, 2019, at Sites 1 (Zone GL-C) and 2 (Zone GL-B) and were caught between 0.2 and 15.2 km of their stocking location.
- Eighteen were stocked in the Keeyask reservoir on June 2, 2022, at Sites 1 (Zone GL-B) and 2 (Zone GL-C) and were caught between 0.4 and 7.0 km of their stocking location.

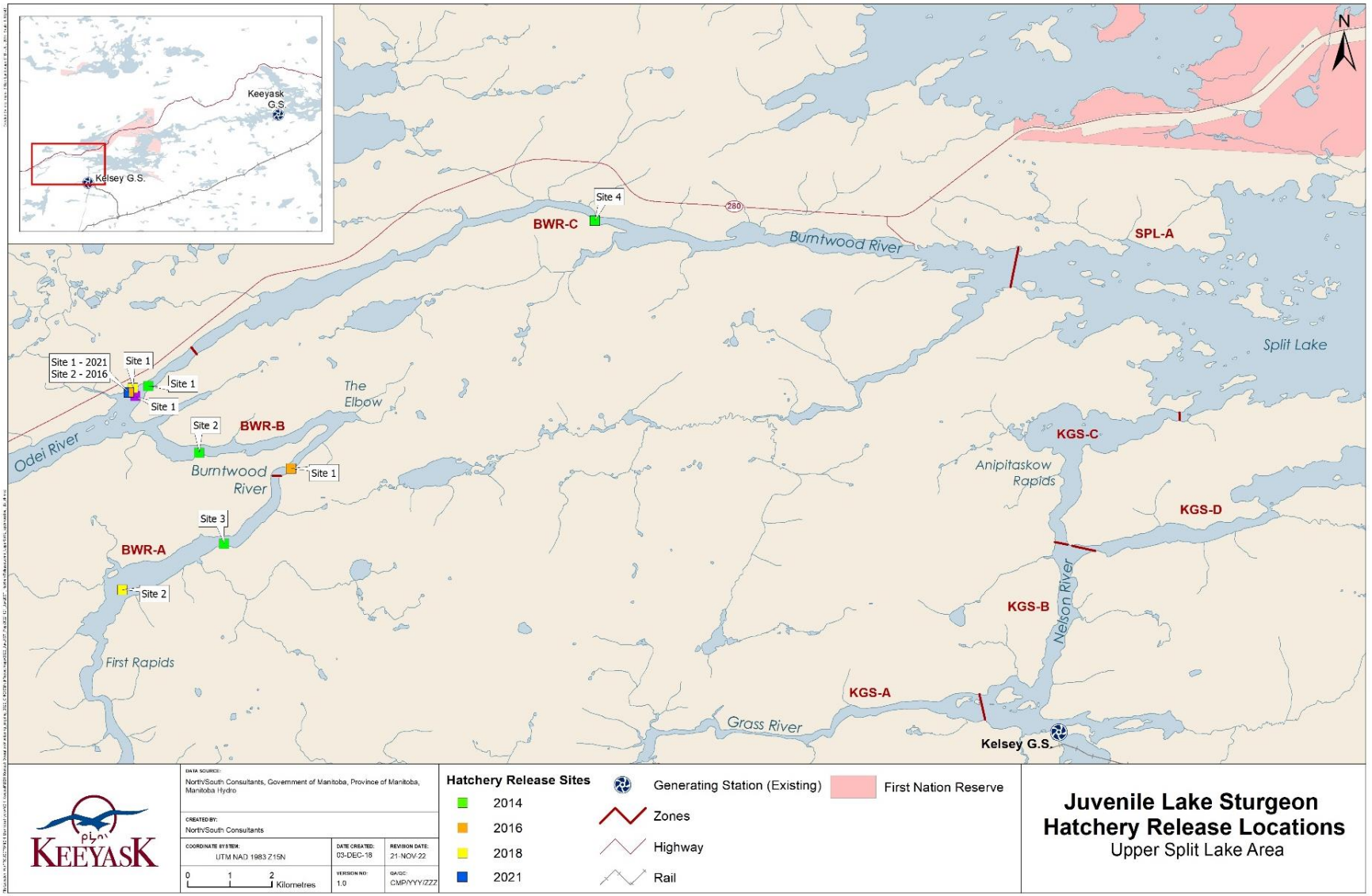
Three hatchery-reared Lake Sturgeon were stocked in the Burntwood River (Map 4) in 2014, two in May in Zone BWR-C and one in October in Zone BWR-B. In 2023, these fish were captured between 77 and 91 km downstream of their initial release location. In the nine years since release, these fish have increased in size between 287 and 360 mm FL and between 848 and 1,313 g.

Table 11: Number and ages of hatchery-reared Lake Sturgeon released as age-1/age-2 fish and captured during juvenile Lake Sturgeon studies in the Keeyask reservoir (Birthday Rapids to the Keeyask GS) since 2014.

Monitoring Year	Number of Hatchery Captures
2014	**1**
	(1 year old)
2015	**3**
	(2 were 1 year old)
	(1 was 2 years old)
2016	**7**
	(All were 2 years old)
2017	**21**
	(9 were 1 year old)
	(11 were 3 years old)
	(1 was 4 years old)
2018	**17**
	(1 was 1 year old)
	(8 were 2 years old)
	(8 were 4 years old)
2019	**57**
	(27 were 1 year old)
	(1 was 2 years old)
	(16 were 3 years old)
	(12 were 5 years old)
	(1 was 6 years old)
2020	**36**
	(17 were 2 years old)
	(12 were 4 years old)
	(6 were 6 years old)
	(1 was 7 years old)
2021	**57**
	(24 were 3 years old)
	(1 was 4 years old)
	(9 were 5 years old)
	(21 were 7 years old)
	(3 was 8 years old)
2022	**48**
	(16 were 1 year old)
	(12 were 4 years old)
	(6 were 6 years old)
	(13 was 8 years old)
	(1 was 9 years old)
2023	**84**
	(18 were 2 years old)
	(35 were 5 years old)
	(13 were 7 years old)
	(15 were 9 years old)
	(3 were 10 years old)



Map 3: Map of Lake Sturgeon yearling stocking sites in the Keeyask reservoir since 2014 (pre-impoundment shoreline shown).



Map 4: Map of Lake Sturgeon yearling stocking sites in the Burntwood River since 2014.

A total of 382 individual hatchery-reared Lake Sturgeon stocked into the Keeyask reservoir have been captured since studies began, 299 in the reservoir and 83 in Stephens Lake (Table 12). Individuals from all family groups stocked into the Keeyask reservoir have been recaptured in the same location, representing between 6 and 41% of each family stocked. Individuals stocked into the Keeyask reservoir that have been recaptured in Stephens Lake represent between 2 and 16% of each family stocked, excluding one family group that has yet to be captured downstream of the GS.

Table 12: Total number of hatchery-reared Lake Sturgeon from each family group released as age-1/age-2 fish in the Keeyask reservoir and captured during juvenile Lake Sturgeon studies since stocking began in 2015. Fish captured multiple times (either during the same study or in subsequent years) were not included in the number of captures.

Stocking Year	Family	# Stocked	Keeyask Reservoir		Stephens Lake	
			Total # Captured	% of # Stocked	Total # Captured	% of # Stocked
2015	F1xM1	195	28	14.4	6	3.1
	F1xM2	228	62	27.2	10	4.4
2017	F1xM2	308	48	15.6	11	3.6
	F2xM2	155	15	9.7	5	3.2
2019	F1xM1	70	29	41.4	5	7.1
	F1xM2	67	19	28.4	10	14.9
	F1xM3	70	22	31.4	11	15.7
	F1xM4	67	13	19.4	8	11.9
	MIX	124	29	23.4	8	6.5
2022	F1xM3	200	14	7.0	7	3.5
	F1xM6	82	5	6.1	0	0.0
	F1xM8	120	15	12.5	2	1.7
Total		1,686	299	17.7	83	4.9

4.2 STEPHENS LAKE

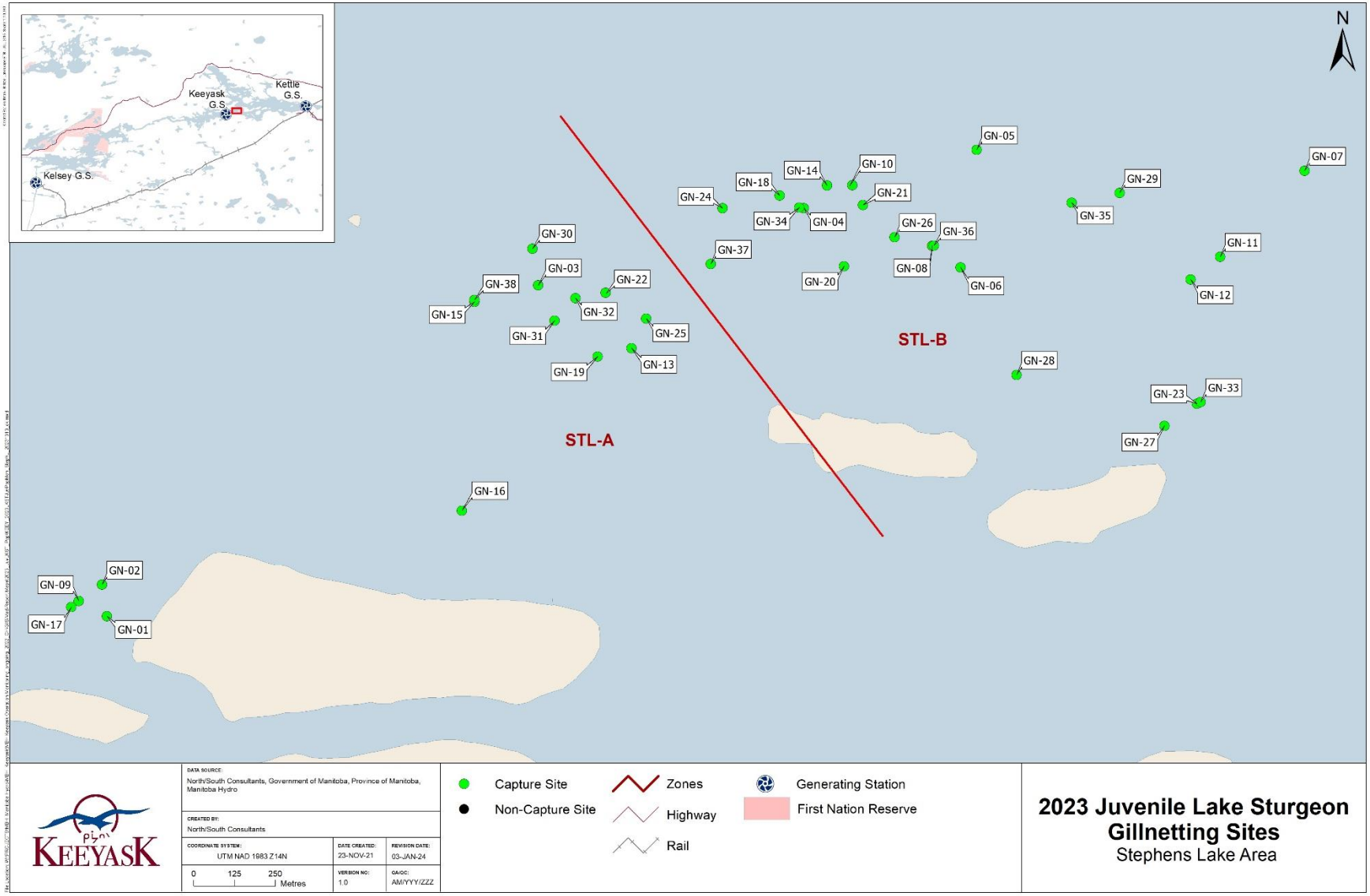
Between September 11 and 20, 2023 a total of 38 gill net sites were fished in upper Stephens Lake (Map 5). Water temperature during sampling ranged from 14.0°C to 15.0°C. A total of 1,012 fish from twelve fish species were captured with Lake Sturgeon the third most abundant (n = 173; 17.1%; Table 13). Gill net site data are presented in Table A1-2 and biological and tagging information are presented in Table A2-2.

Table 13: Number (n) and frequency of occurrence (%), by species, of fish captured during juvenile Lake Sturgeon monitoring in Stephens Lake, fall 2023.

Species	Scientific Name	n[a]	% of the Catch
Burbot	*Lota lota*	4	0.4
Freshwater Drum	*Aplodinotus grunniens*	2	0.2
Lake Sturgeon	***Acipenser fulvescens***	***173***[b]	**17.1**
Lamprey	*Petromyzontidae*	1	0.1
Longnose Sucker	*Catostomus catostomus*	382	37.7
Northern Pike	*Esox lucius*	2	0.2
Sauger	*Sander canadensis*	284	28.1
Shorthead Redhorse	*Moxostoma macrolepidotum*	14	1.4
Troutperch	*Percopsis omiscomaycus*	5	0.5
Walleye	*Sander vitreus*	132	13.0
White Sucker	*Catostomus commersonii*	12	1.2
Yellow Perch	*Perca flavescens*	1	0.1
Total		**1,012**	**100**

a. Number of fish caught.
b. Does not include Lake Sturgeon recaptured more than once in the same study.

In total, 157 juvenile and 16 adult Lake Sturgeon were captured in 1,547 gill net hours for a total CPUE of 2.68 LKST/100 m net/24 h (Table 14). Total CPUE in 2023 was higher than in 2022 and was the second highest recorded since studies began in 2007. Two juvenile and one adult mortality was recorded during sampling: two on September 16 (815 mm and 740 mm FL) and one on September 20 (489 mm FL). Gill nets were set in both zones (STL-A and STL-B; Map 5) located within the upper 10 km of Stephens Lake with effort only slightly higher in Zone STL-B (Table 15).



Map 5: Map of sites fished with gill nets in Stephens Lake, fall 2023.

Table 14: Lake Sturgeon catch-per-unit-effort (CPUE; # LKST/100 m net/24 h) for gill nets set to target juvenile Lake Sturgeon in Stephens Lake between 2007 and 2023. Grey highlighted rows indicate construction monitoring, and the blue highlighted rows indicate post-impoundment monitoring.

Year	Start Date	Completion date	Mesh Size	# Sites	Effort (gillnet hrs)[a]	# Lake Sturgeon[b]	CPUE
2007	19-Sep	23-Sep	2" - 5"	15	48[c]	0	0
2008	11-Sep	18-Sep	3.75"-8"	12	295	8	0.65
2009	14-Sep	20-Sep	1.5" - 5"	18	634[c]	23	0.87
2010	22-Sep	29-Sep	1" - 5"	18	612	32	1.25
2011	21-Sep	01-Oct	1" - 5"	30	974	37	0.91
2012	11-Sep	23-Sep	1" - 6"	19	1,195	87	1.75
2014	18-Sep	28-Sep	1" - 6"	94	921	47	1.23
2015	22-Sep	02-Oct	1" - 6"	44	1,154	54	1.12
2016	12-Sep	23-Sep	1" - 6"	37	1,384	66	1.14
2017	09-Sep	19-Sep	1" - 6"	40	1,796	148	1.98
2018	09-Sep	21-Sep	1" - 6"	49	1,599	74	1.11
2019	11-Sep	21-Sep	1" - 6"	40	1,561	229	3.52
2020	15-Sep	25-Sep	1" - 6"	54	1,605	142	2.12
2021	14-Sep	23-Sep	1" - 6"	34	1,523	158	2.49
2022	13-Sep	23-Sep	1" - 6"	34	1,545	161	2.50
2023	**11-Sep**	**20-Sep**	**1" - 6"**	**38**	**1,547**	**173**	**2.68**

a. Gill net set durations were standardized to 100 m of net and then summed to calculate the total gill net hours for each study.
b. Does not include Lake Sturgeon recaptured more than once in the same study.
c. Total effort includes nets set in Zone GR-A.

Table 15: Lake Sturgeon catch-per-unit effort (CPUE; # LKST/100 m net/24 h) by zone, for gill nets set during juvenile Lake Sturgeon monitoring in Stephens Lake between 2007 and 2023. Grey highlighted rows indicate construction monitoring, and the blue highlighted rows indicate post-impoundment monitoring.

Sample Year	STL-A			STL-B		
	Effort (gillnet hours)[a]	# of Lake Sturgeon[b]	CPUE	Effort (gillnet hours)[a]	# of Lake Sturgeon[b]	CPUE
2007	17	0	0.00	0	-	-
2008	295	8	0.65	0	-	-
2009	500	23	1.10	108	0	0.00
2010	236	0	0.00	377	32	2.04
2011	267	28	2.52	707	9	0.31
2012	650	52	2.20	545	35	1.76
2014	349	32	2.20	572	15	0.63
2015	315	13	0.99	839	41	1.17
2016	820	38	1.11	564	28	1.19
2017	878	64	1.75	918	84	2.20
2018	577	19	0.79	1,023	55	1.29
2019	321	27	2.02	1,240	202	3.91
2020	102	2	0.47	1,504	140	2.23
2021	716	68	2.28	808	90	2.67
2022	173	3	0.42	1,372	158	2.76
2023	**718**	**71**	**2.37**	**829**	**102**	**2.95**

a. Gill net set durations were standardized to 100 m of net and then summed to calculate the total gill net hours for each study.
b. Does not include Lake Sturgeon recaptured more than once in the same study.

Of the 173 Lake Sturgeon captured, 60 were known hatchery-reared fish (*i.e.*, stocked at age-1 and marked with PIT tags; discussed in further detail in Section 4.2.5). Total CPUE for wild and hatchery-reared Lake Sturgeon captured since 2014 is presented in Table 16. CPUE for wild Lake Sturgeon (1.75 LKST/100 m net/24 h) captured in Stephens Lake was the highest since stocking efforts began in 2014, while CPUE for hatchery-reared fish in 2023 (0.93 LKST/100 m net/24 h) was the lowest since 2020.

Table 16: Catch-per-unit-effort (CPUE; # LKST/100 m net/24 h) for hatchery and wild caught Lake Sturgeon in Stephens Lake between 2014 and 2023.

Year	Effort (gillnet hours)[a]	# of Lake Sturgeon[b]		Total CPUE	
		Wild	Hatchery	Wild	Hatchery
2014	921	47	0	1.22	0.00
2015	1,154	50	4	1.04	0.08
2016	1,384	61	5	1.06	0.09
2017	1,796	86	51	1.15	0.68
2018	1,599	52	17	0.78	0.26
2019	1,561	111	118	1.71	1.81
2020	1,605	93	49	1.39	0.73
2021	1,523	89	69	1.40	1.09
2022	1,545	89	72	1.38	1.12
2023	**1,547**	**113**	**60**	**1.75**	**0.93**

a. Gill net set durations were standardized to 100 m of net and then summed to calculate the total gill net hours for each study.
b. Does not include Lake Sturgeon recaptured more than once in the same study.

4.2.1 YEAR-CLASS STRENGTH

Ages were assigned to 153 of the 157 juvenile fish captured, as well as three of the sixteen adult sturgeon which were aged in a previous study year. Ageing structures were not collected from four juvenile fish that were approaching adult size (*i.e.*, nearly 800 mm FL).

Aged juvenile Lake Sturgeon (including both wild and hatchery) ranged from 0–16 years old (*i.e.*, 2007–2023 cohorts). Sturgeon in the 2018 cohort (age-5) were captured most frequently, accounting for 19% (n = 29) of aged fish (Figure 7). The 2021 (age-2) cohort was also relatively abundant, representing 13% (n = 20). Two wild YOY fish were captured in Stephens Lake in 2023.

Hatchery-reared Lake Sturgeon accounted for 42% of the 2014 cohort, 50% of the 2016 cohort, 97% of the 2018 cohort, and 90% of the 2021 cohort (Figure 7). Monitoring in 2023 marks the first year in which a wild fish from the 2018 cohort has been captured in Stephens Lake. With that, wild fish from all cohorts between 2003 and 2023 have been present in the catch since studies began (Table 17).

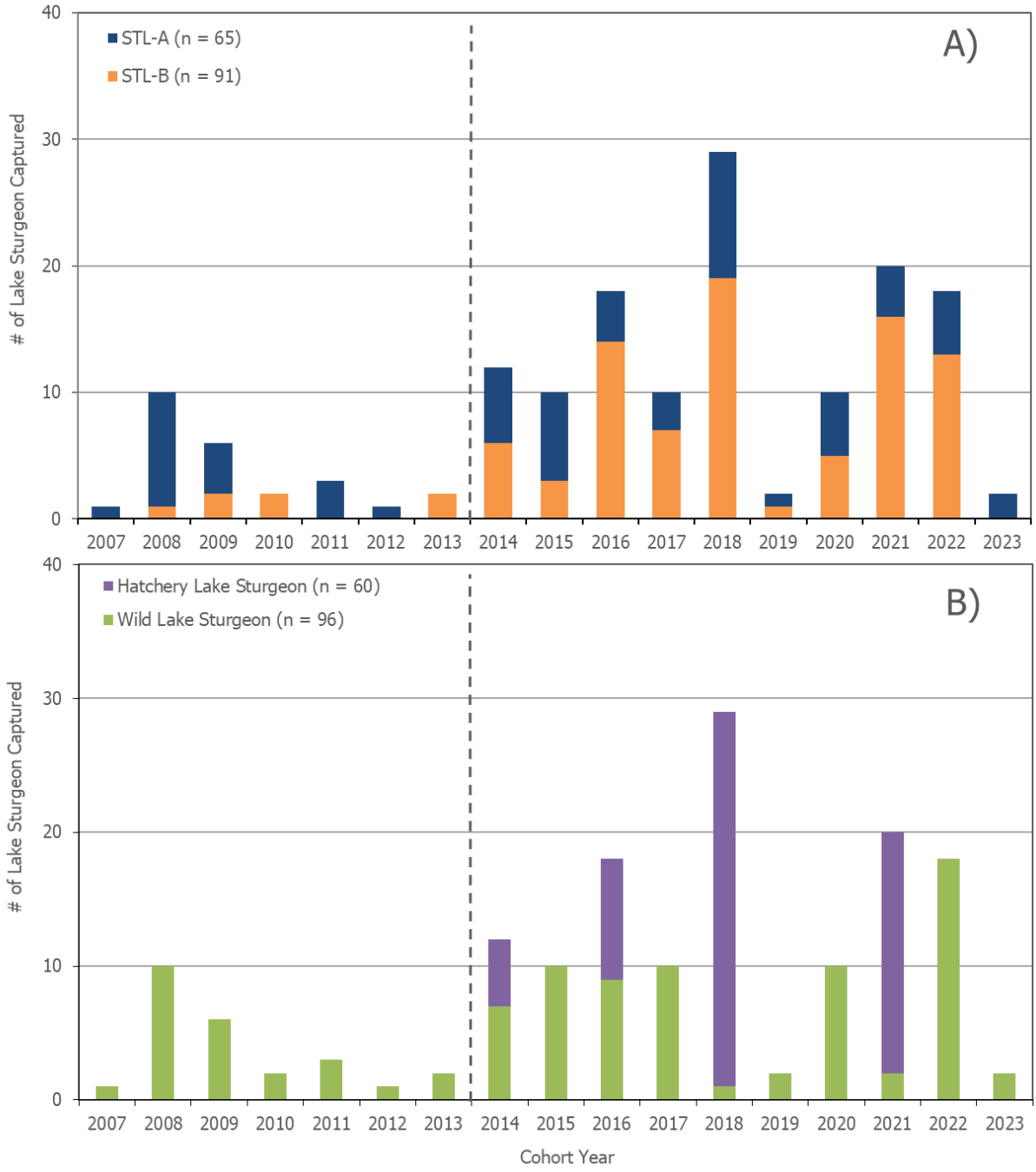


Figure 7: **Cohort frequency distributions for all aged juvenile Lake Sturgeon captured in Stephens Lake by zone (A) and by hatchery-reared and wild Lake Sturgeon (B), fall 2023. Cohorts prior to 2014 (*i.e.*, age-9 fish) are not fully represented as ageing structures are not collected from fish ≥800 mm fork length (indicated by vertical dashed line).**

Table 17: Number of wild Lake Sturgeon captured in Stephens Lake from 2009 to 2023, from which ages and cohorts were determined. Grey highlighted cells indicate cohorts spawned during Keeyask GS construction, blue highlighted cells indicate cohorts spawned after impoundment of the Keeyask reservoir, and red values indicate cohorts absent from the corresponding study year.

Location	Cohort																				
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
2009 Study Year	0	1	3	1	0	2	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2010 Study Year	3	0	1	5	7	14	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-
2011 Study Year	1	0	0	0	2	28	2	0	1	-	-	-	-	-	-	-	-	-	-	-	-
2012 Study Year	0	0	0	7	4	49	1	2	2	0	-	-	-	-	-	-	-	-	-	-	-
2014 Study Year	1	1	0	5	4	25	1	4	5	0	0	0	-	-	-	-	-	-	-	-	-
2015 Study Year	0	0	0	4	3	19	1	1	3	0	4	2	11	-	-	-	-	-	-	-	-
2016 Study Year	0	1	0	4	4	31	0	0	2	1	3	4	8	0	-	-	-	-	-	-	-
2017 Study Year	0	0	0	0	0	19	2	0	3	0	11	4	20	9	5	-	-	-	-	-	-
2018 Study Year	0	0	0	0	0	4	0	0	4	1	9	3	20	4	3	0	-	-	-	-	-
2019 Study Year	0	0	0	0	0	11	0	2	6	3	11	8	33	15	9	0	0	-	-	-	-
2020 Study Year	0	0	0	0	0	9	1	0	3	1	10	4	33	13	5	0	1	2	-	-	-
2021 Study Year	0	0	1	0	1	0	1	1	5	0	6	3	21	15	13	0	2	8	2	-	-
2022 Study Year	0	0	0	0	0	1	1	1	0	0	4	2	11	21	11	0	2	5	0	24	-
2023 Study Year	0	0	0	0	1	10	6	2	3	1	2	7	10	9	10	1	2	10	2	18	2
Total	**5**	**3**	**5**	**26**	**26**	**222**	**16**	**13**	**37**	**7**	**60**	**37**	**167**	**86**	**56**	**1**	**7**	**25**	**4**	**42**	**2**
Present in the Catch	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**

4.2.2 POPULATION ESTIMATE

The 2023 population estimate for Stephens Lake was 2,703 (95% CI: 1,660–4,400) wild juvenile Lake Sturgeon, which is higher than any other sampling year, except for 2022 (3,348 individuals; 95% CI: 2,114–5,301; Figure 8; Table A5-3). The estimated annual survival rate for wild fish was 81%.

Survival of hatchery-reared Lake Sturgeon stocked into Stephens Lake was estimated at 86% (Table A5-4). Based on this survival estimate, 121, 285, 210 and 343 hatchery-reared individuals from the 2014, 2016, 2018 and 2021 cohorts are present in Stephens Lake, contributing to a population estimate of 959 hatchery fish. Based on these numbers, it is estimated that hatchery fish currently make up 26% of the total juvenile Lake Sturgeon population in Stephens Lake.

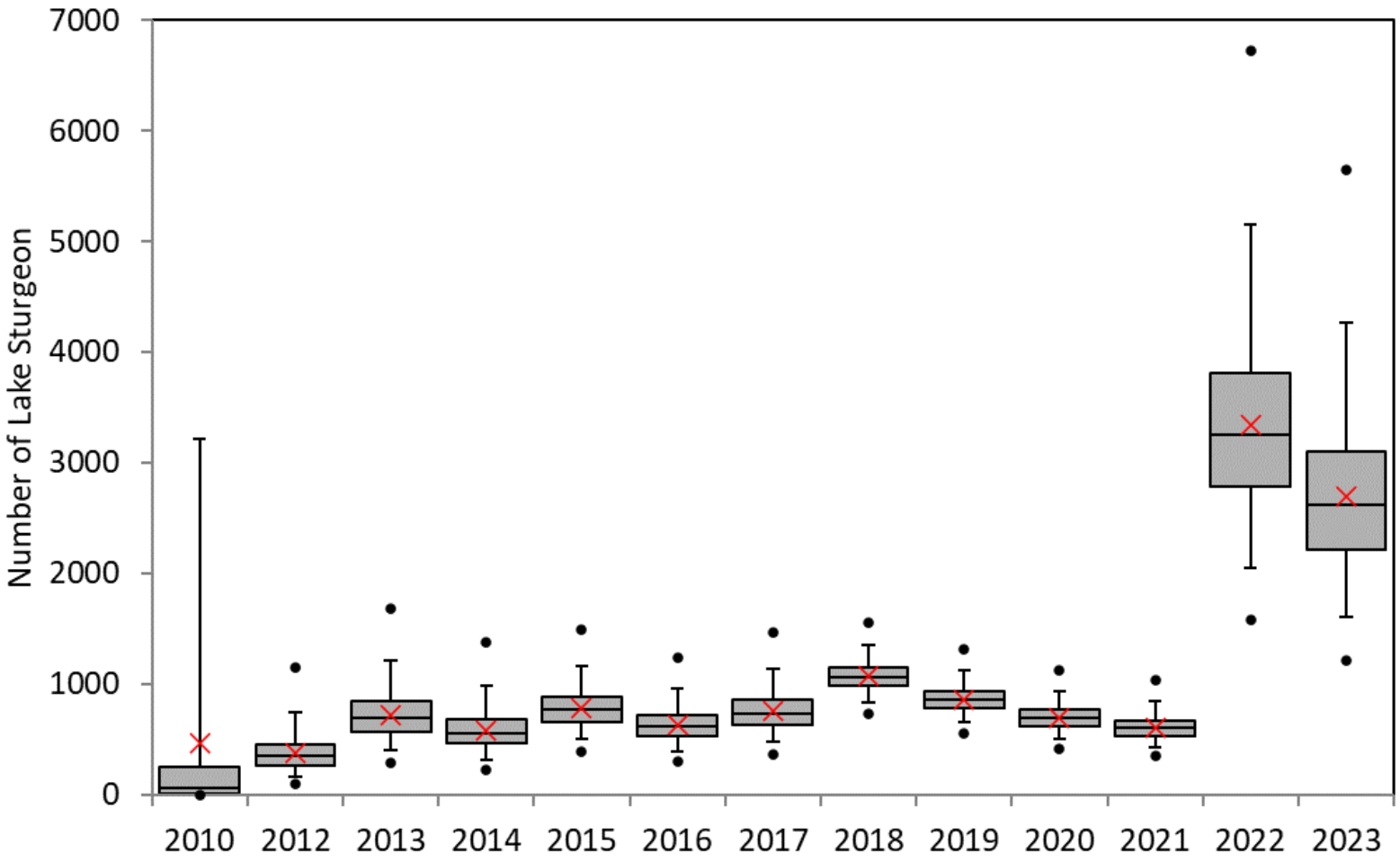


Figure 8: **Juvenile Lake Sturgeon abundance estimates based on POPAN best model for Stephens Lake (2010, 2012–2023). Results of the POPAN abundance estimate are presented in black. Each red x marks the estimated abundance for each year (*i.e.*, the number of juvenile Lake Sturgeon), the black dots represent the min and max estimates, and the vertical bar lines represent the upper and lower 95% confidence range.**

4.2.3 GROWTH AND CONDITION

Length-weight relationships for wild and hatchery-reared Lake Sturgeon are presented in Figure 9. Mean length, weight, and condition factor of wild Lake Sturgeon captured during juvenile Lake Sturgeon monitoring since 2009 is presented in Table 18.

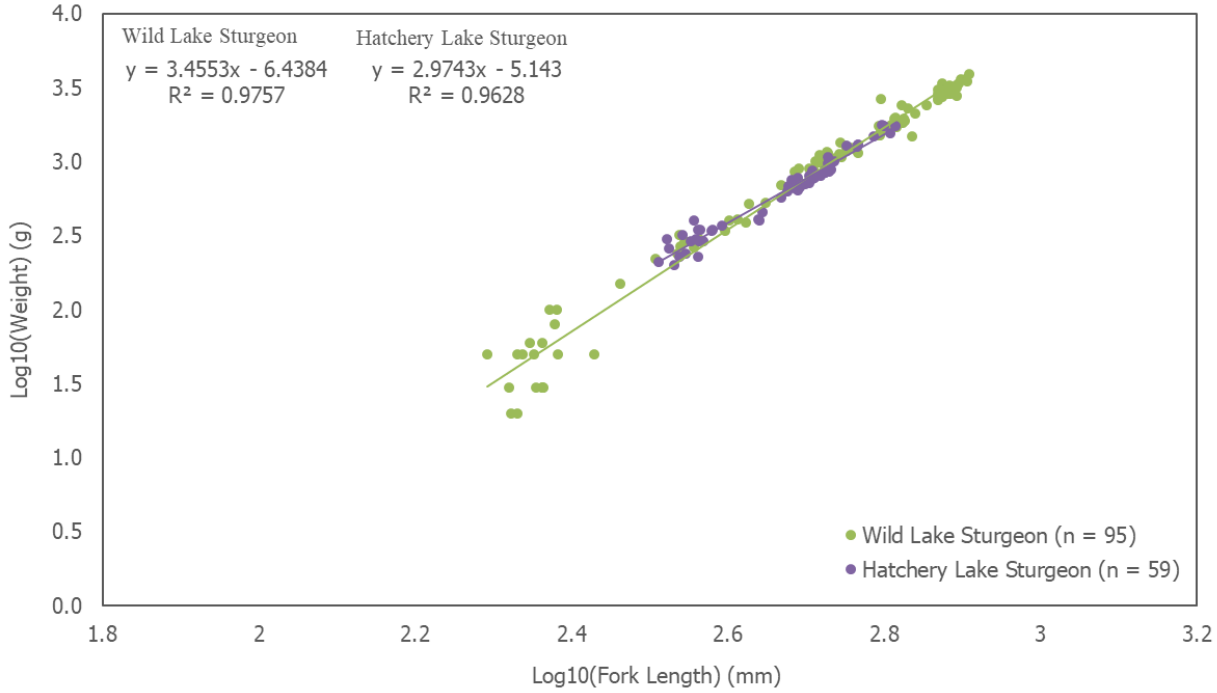


Figure 9: Comparison of weight (g) at-fork length (mm) (log transformed) for Lake Sturgeon captured in Stephens Lake, fall 2023.

Wild Lake Sturgeon captured in 2023 had a:

- Mean FL of 563 mm (n = 113; StDev = 222 mm; range 100–1000 mm);
- Mean weight of 1,347 g (n = 95; StDev = 1,135 g; range 20–3,950 g); and
- Mean condition factor of 0.63 (n = 95; range 0.20–1.10).

Wild Lake Sturgeon in the 200–249 mm interval were captured most frequently, accounting for 15% of the wild catch (n = 16) (Figure 10). Fish measuring 500–549 mm and 750–700 mm FL were also frequently captured, representing 14% (n = 15) and 13% (n = 14) of the catch, respectively. In 2023, weight (and therefore condition factor) was not obtained for 18 fish that were either too small (n = 2) or too large (n = 16) for the sampling gear.

Table 18: Mean length, weight, and condition factor of wild Lake Sturgeon captured in Stephens Lake during juvenile Lake Sturgeon monitoring, since 2009. Grey highlighted rows indicate construction monitoring and blue highlighted rows indicate post-impoundment monitoring.

Year	Fork Length (mm)				Weight (g)				K		
	n[a]	Mean	Std[b]	Range	n	Mean	Std	Range	n	Mean	Range
2009	23	344	166	110-770	7	346	167	150-525	7	0.95	0.59-1.32
2010	32	423	136	304-772	32	862	978	210-3,570	31	0.74	0.58-1.10
2011	37	450	109	168-756	36	921	894	375-4,125	36	0.81	0.58-1.03
2012	87	539	124	250-970	83	1,373	1,175	75-5,525	83	0.74	0.40-0.99
2014	51	612	121	373-971	51	2,049	1,525	350-8,700	51	0.78	0.62-1.36
2015	50	496	233	120-795	49	1,473	1,143	15-3,650	49	0.88	0.60-2.05
2016	61	607	182	233-1,000	61	2,234	1,520	80-8,400	61	0.77	0.49-1.12
2017	97	487	208	135-851	92	1,497	1,560	75-5,425	92	0.72	0.44-1.03
2018	57	481	154	222-837	57	1,113	1,215	50-4,925	57	0.72	0.46-0.90
2019	111	542	175	287-1,060	110	1,594	1,818	100-11,500	110	0.72	0.32-1.01
2020	93	552	165	97-1,050	93	1,586	1,613	4-9,000	93	0.71	0.39-0.95
2021	89	516	178	101-940	87	1,344	1,266	25-6,010	87	0.71	0.32-1.46
2022	89	421	220	95-855	65	1,232	1,002	150-4,600	65	0.67	0.50-0.93
2023	**113**	**563**	**222**	**100-1,000**	**95**	**1,347**	**1,135**	**20-3,950**	**95**	**0.63**	**0.20-1.10**

a. Number of fish measured.
b. Standard deviation.

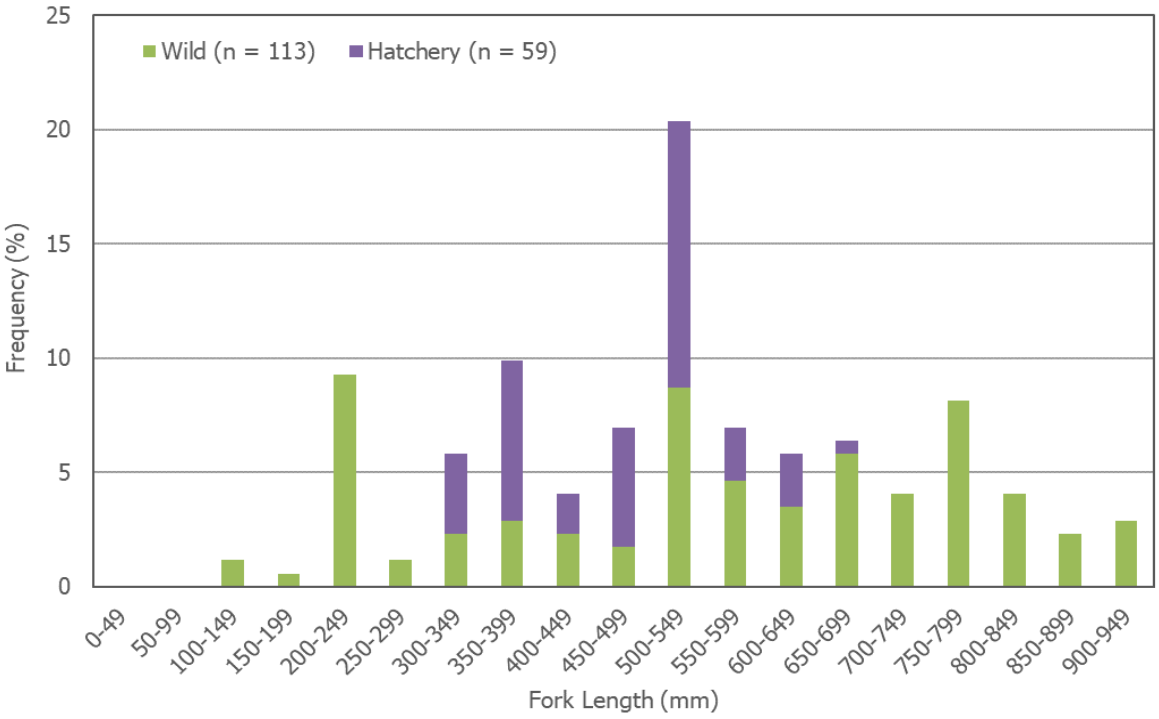


Figure 10: Fork length frequency distributions for Lake Sturgeon captured in gill nets set in Stephens Lake, fall 2023.

Hatchery-reared Lake Sturgeon captured in 2023 had a:

- Mean FL of 475 mm (n = 59; StDev = 91 mm; range 324–652 mm);
- Mean weight of 736 g (n = 59; StDev = 415 g; range 200–1,790 g); and
- Mean condition factor of 0.62 (n = 59; range 0.48–0.86) (Table 19).

Hatchery-reared Lake Sturgeon in the 500–549 mm FL interval (n = 19; 32%) were captured most frequently, followed by the 350–399 mm FL interval (n = 12; 20%). Length and weight measurements were not obtained from one hatchery-reared fish that was in poor condition at the time of capture.

Although too few juvenile Lake Sturgeon were captured during baseline studies to make comparisons to post-impoundment, a comparison of von Bertalanffy growth curves for wild fish captured during construction (2014–2020) and post-impoundment (2021–2023) shows that young fish (*i.e.*, less than age-3) captured post-impoundment are longer than those captured during construction (Figure 11). Growth curve analysis of hatchery and wild fish showed that young hatchery fish (1–4 years-old) are longer than wild fish of the same cohort. However, the lengths of wild and hatchery fish appear similar at approximately age-5, after which wild fish are longer (Figure 12).

Table 19: Mean length, weight, and condition factor of hatchery-reared Lake Sturgeon captured during juvenile Lake Sturgeon monitoring in Stephens Lake, since 2014. Grey highlighted rows indicate construction monitoring and blue highlighted rows indicate post-impoundment monitoring.

Year	Fork Length (mm)				Weight (g)				K		
	n[a]	Mean	Std[b]	Range	n	Mean	Std	Range	n	Mean	Range
2014	51	612	121	373-971	51	2049	1525	350-8,700	51	0.78	0.62-1.36
2015	50	496	233	120-795	49	1473	1143	15-3,650	49	0.88	0.60-2.05
2016	61	607	182	233-1,000	61	2234	1520	80-8,400	61	0.77	0.49-1.12
2017	97	487	208	135-851	92	1497	1560	75-5,425	92	0.72	0.44-1.03
2018	57	481	154	222-837	57	1113	1215	50-4,925	57	0.72	0.46-0.90
2019	111	542	175	287-1,060	110	1594	1818	100-11,500	110	0.72	0.32-1.01
2020	93	552	165	97-1,050	93	1586	1613	4-9,000	93	0.71	0.39-0.95
2021	89	516	178	101-940	87	1344	1266	25-6,010	87	0.71	0.32-1.46
2022	72	476	79	279-685	72	690	351	150-2,000	72	0.59	0.47-0.84
2023	**59**	**475**	**91**	**324-652**	**59**	**736**	**415**	**200-1,790**	**59**	**0.62**	**0.48-0.86**

a. Number of fish measured.
b. Standard deviation.

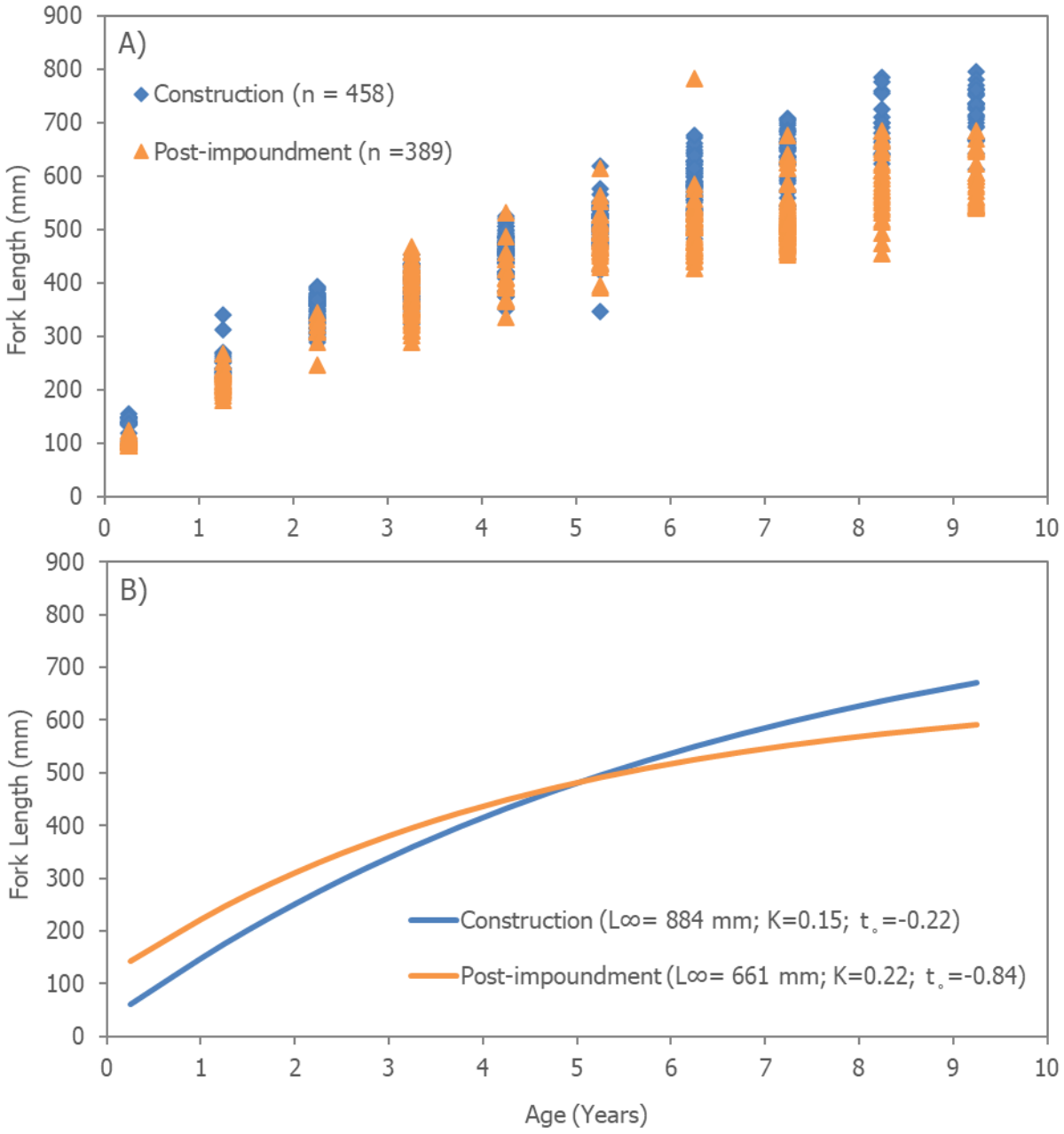


Figure 11. **Fork length-at-age (A) and von Bertalanffy growth curve analysis (B) for all wild aged Lake Sturgeon caught during construction (blue; 2014–2020), and post-impoundment (orange; 2021–2023) monitoring years in Stephens Lake. Fish older than age-9 were not included in the analysis as they are not fully represented in the catch (ageing structures are not collected from fish ≥800 mm fork length, which corresponds to fish older than age-9).**

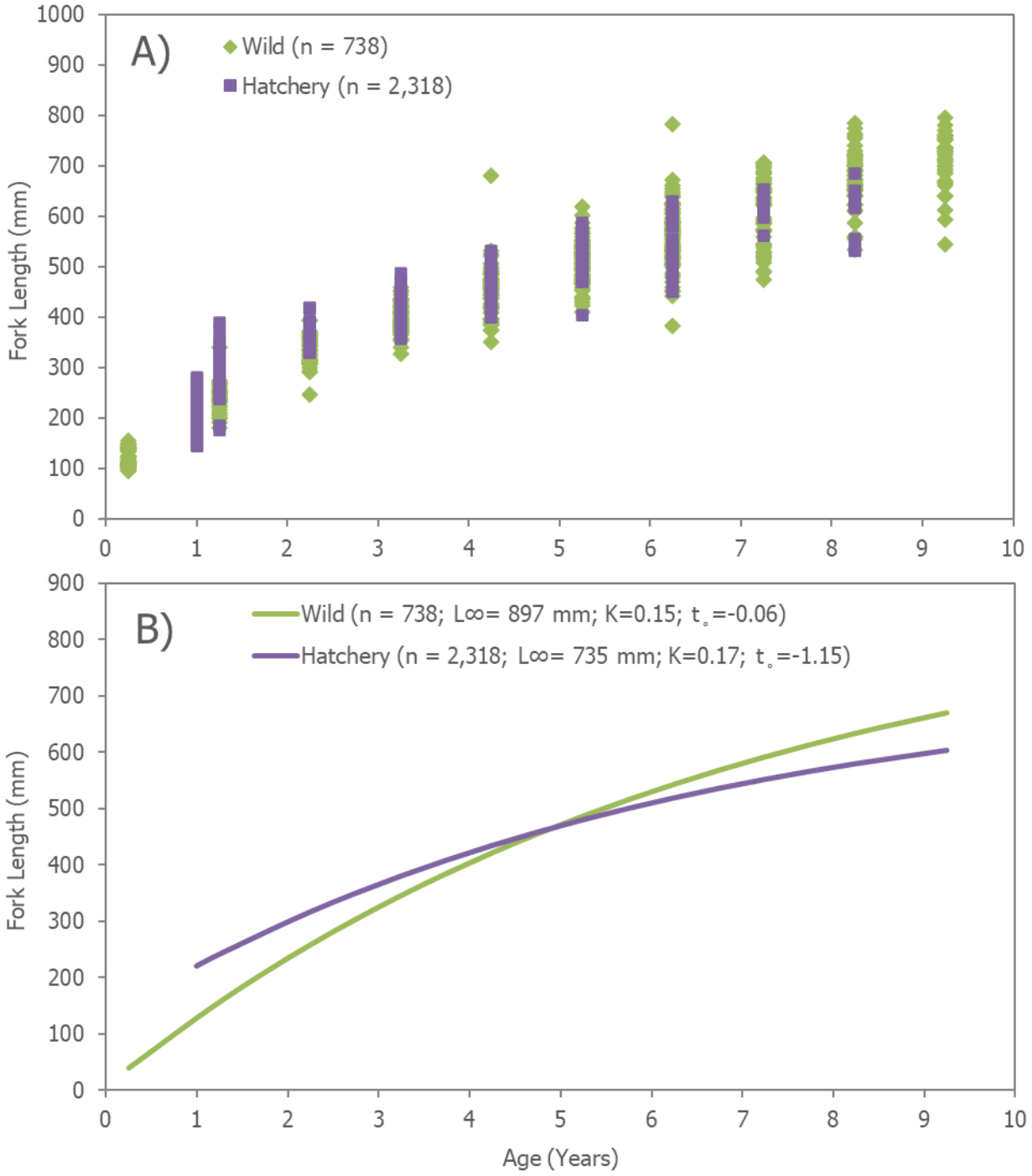


Figure 12: **Fork length-at-age (A) and von Bertalanffy growth curve analysis (B) for wild (green) and hatchery-reared (purple) Lake Sturgeon released and/or recaptured in the Stephens Lake since stocking began in 2014. Fish older than age-9 were not included in the analysis as they are not fully represented in the catch (ageing structures are not collected from fish >800 mm fork length, which corresponds to fish older than age-9).**

4.2.4 RECAPTURES

A total of 30 Lake Sturgeon tagged in a previous year were recaptured in Stephens Lake in 2023 (Table 20; Table A4-2). Recaptured fish moved varying distances from their original capture locations:

- Sixteen were originally captured in Stephens Lake. Five were recaptured less than 1.0 km from their initial capture location and eleven were recaptured between 1.0 and 5.3 km of their initial capture location.
- Fourteen were originally tagged in the Keeyask reservoir and were captured between 10.7 and 19.4 km downstream of their original tagging location. These included four adult (*i.e.*, >800 mm FL) and ten juvenile sized fish.
    - Although it is not possible to determine the exact date that these fish moved downstream, three fish definitively moved downstream after reservoir impoundment. Floy tags #121223, #117906, and #128729 were last captured in the Keeyask reservoir following impoundment in fall 2020. All three of these fish were juveniles.

Table 20: Recapture summary for wild Lake Sturgeon caught in Stephens Lake between 2009 and 2023. Grey highlighted rows indicate construction monitoring and blue highlighted rows indicate post-impoundment monitoring.

Sampling Year	Tagging Location		
	Upper Split Lake Area	Keeyask reservoir[b]	Stephens Lake
	n[a]	n	n
2009	0	0	0
2010	0	0	0
2011	0	0	0
2012	0	0	11
2014	0	0	8
2015	0	0	7
2016	0	0	14
2017	0	3	17
2018	0	1	10
2019	0	2	22
2020	1	1	38
2021	1	11	26
2022	0	4	12
2023	**0**	**14**	**16**

a. Number of fish.
b. Birthday Rapids to the Keeyask GS.

4.2.5 HATCHERY CAPTURES

A total of 60 hatchery-reared Lake Sturgeon were captured in Stephens Lake in 2023, representing 35% of the total catch (Table 21). An age breakdown of all hatchery-reared fish captured between 2014 and 2023 is presented in Table 22.

Thirty-seven were stocked in Stephens Lake (Map 6):

- Five were stocked in 2015, three on June 22 at Site 3 (Zone STL-B) and two on September 14 at Site 4 (Zone STL-B). These fish were captured within 0.7 and 3.2 km of their stocking locations.
- Seven were stocked in 2017, three on June 15 at Site 1 (Zone STL-A) and four on October 5 at Site 4 (Zone STL-B). These fish were captured within 1.4 and 5.0 km of their stocking locations.
- Fifteen were stocked on June 13, 2019, at Sites 1 (Zone STL-A) and 2 (Zone STL-B). These fish were captured between 0.1 and 3.7 km of their stocking locations.
- Ten were stocked on May 30, 2022, at Site 1 (Zone STL-A) and were recaptured between 3.3 and 5.1 km of their stocking locations.

Twenty-three were stocked in the Keeyask reservoir (Map 3):

- Two were stocked prior to spillway commissioning and may have moved downstream through Gull Rapids or the Keeyask GS spillway.
  - Both fish were stocked on June 8, 2017, at Site 1 (Zone GL-A). These fish were captured 23.3 and 24.2 km downstream of their stocking location.
- Twenty-one were stocked after spillway commissioning.
  - Thirteen were stocked on June 6, 2019, at Sites 1 (Zone GL-C) and 2 (GL-B) and were captured between 10.1 and 15.9 km downstream.
  - Eight were stocked on June 2, 2022, at Sites 1 (Zone GL-B) and 2 (GL-C) and were captured between 12.9 and 16.2 km downstream.

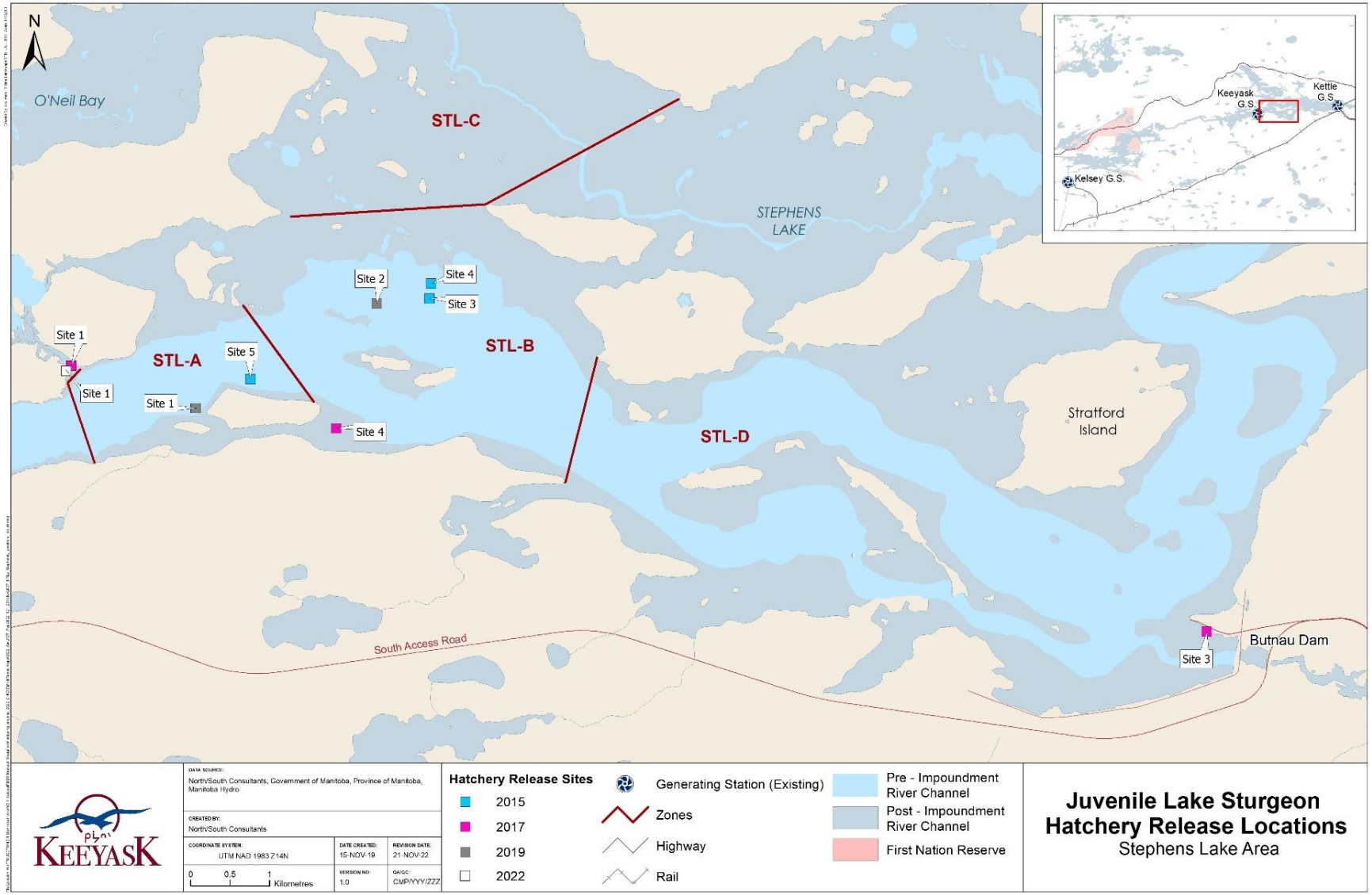
Table 21: Number (n) and percentage (%) of catch of hatchery-reared Lake Sturgeon caught in Stephens Lake between 2014 and 2023.

Sample Year	Release Location						Total	% of Total Catch
	Burntwood River		Keeyask reservoir[b]		Stephens Lake			
	n[a]	% of Catch	n	% of Catch	n	% of Catch		
2014	-	-	-	-	-	-	-	-
2015	0	0.0	0	0.0	4	7.4	4	8.5
2016	0	0.0	1	1.5	4	6.1	5	7.6
2017	0	0.0	11	7.4	40	27.0	51	34.5
2018	0	0.0	3	4.1	14	18.9	17	23.0
2019	1	0.4	11	4.8	106	46.3	118	51.5
2020	1	0.7	6	4.2	42	29.6	49	34.5
2021	0	0.0	10	6.3	59	37.3	69	43.7
2022	3	1.9	28	17.4	41	25.5	72	44.7
2023	**0**	**0.0**	**23**	**13.3**	**37**	**21.4**	**60**	**34.7**

a. Number of fish.
b. Birthday Rapids to the Keeyask GS.

Table 22: Number and ages of hatchery-reared Lake Sturgeon released as age-1/age-2 fish and captured in Stephens Lake during juvenile Lake Sturgeon studies since 2014.

Monitoring Year	Stephens Lake
2015	**4**
	(All were 1 year old)
2016	**5**
	(All were 2 years old)
2017	**51**
	(33 were 1 year old)
	(18 were 3 years old)
2018	**17**
	(7 were 2 years old)
	(10 were 4 years old)
2019	**118**
	(84 were 1 year old)
	(13 were 3 years old)
	(20 were 5 years old)
	(1 was 6 years old)
2020	**49**
	(25 were 2 years old)
	(1 was 3 years old)
	(5 were 4 years old)
	(18 were 6 years old)
2021	**69**
	(51 were 3 years old)
	(9 were 5 years old)
	(9 were 7 years old)
2022	**72**
	(6 were 1 year old)
	(1 was 3 years old)
	(42 were 4 years old)
	(2 were 5 years old)
	(12 were 6 years old)
	(9 were 8 years old)
2023	**60**
	(18 were 2 years old)
	(28 were 5 years old)
	(9 were 7 years old)
	(5 were 9 years old)



Map 6: Map of Lake Sturgeon yearling stocking sites in Stephens Lake since 2015.

A total of 307 individual hatchery-reared Lake Sturgeon stocked into Stephens Lake have been captured in the same area since stocking efforts began in 2015. Individuals from all family groups stocked into Stephens Lake have been captured, representing between 1 and 49% of each family stocked (Table 23).

Table 23: Total number of hatchery-reared Lake Sturgeon from each family group released as age-1/age-2 fish in Stephens Lake and captured during juvenile Lake Sturgeon studies since stocking began in 2015. Fish captured multiple times (either during the same study or in subsequent years) were not included in the number of recaptures.

Stocking Year	Family	# Stocked	Stephens Lake	
			Total # Captured	% of # Stocked
2015	F1xM1	191	22	11.5
	F1xM2	227	48	21.1
2017	F1xM2	290	19	6.6
	F2xM2	430	47	10.9
2019	F1xM1	68	18	26.5
	F1xM2	67	32	47.8
	F1xM3	69	25	36.2
	F1xM4	64	21	32.8
	MIX	122	60	49.2
2022	F1xM3	200	7	3.5
	F1xM6	100	7	7.0
	F1xM8	100	1	1.0
Total		1,928	307	15.9

5.0 DISCUSSION

Juvenile Lake Sturgeon population monitoring described in the Keeyask AEMP began in the fall of 2014, immediately after the start of Keeyask GS construction. The monitoring program enables comparisons to data gathered during studies conducted since 2008 that measured juvenile sturgeon abundance, habitat use, condition, growth, and factors influencing year-class strength in the Upper Split Lake Area, the Keeyask reservoir, and in Stephens Lake. Sampling is conducted biennially in the Upper Split Lake Area and annually in the Keeyask reservoir and Stephens Lake. In 2023, sampling was conducted in the Keeyask reservoir and Stephens Lake, three full years following reservoir impoundment, and 1.5 years following commissioning of the final turbine at the Keeyask GS.

5.1 MOVEMENTS

It was predicted in the EIS that juvenile Lake Sturgeon may be lost from the Keeyask reservoir due to emigration following reservoir impoundment. Prior to reservoir impoundment in 2020, relatively few wild juvenile Lake Sturgeon originally tagged upstream of the Keeyask GS were recaptured in Stephens Lake (n = 7 since 2009). This number increased in 2021, when 11 wild juvenile Lake Sturgeon tagged upstream of the Keeyask GS were recaptured in Stephens Lake. In subsequent years, four and ten wild juvenile fish tagged in the Keeyask reservoir were recaptured in Stephens Lake in 2022 and 2023, respectively. Movement monitoring using acoustic telemetry also indicates that movements of juvenile Lake Sturgeon out of the Keeyask reservoir increased following reservoir impoundment. In total, ten (25% of all tagged fish) juvenile Lake Sturgeon tracked using acoustic telemetry moved downstream through the Keeyask GS between 2021 and 2022; however, no additional acoustically tagged fish have moved downstream since June 2022 (Hrenchuk and Funk 2024).

5.2 ABUNDANCE

The abundance estimates for wild juvenile Lake Sturgeon in the Keeyask reservoir suggest the juvenile Lake Sturgeon population has remained relatively stable since 2018. In 2023, the population of wild juvenile Lake Sturgeon in the Keeyask reservoir was estimated at 3,197 individuals (95% CI: 2,224–4,594), which is similar to previous estimates. The annual survival rate was estimated at 78% which is slightly higher than those calculated in previous years. No change in abundance or survival has been observed since reservoir impoundment in 2020.

In contrast, a fivefold increase in population size for wild juvenile Lake Sturgeon in Stephens Lake was observed between 2021 (611 individuals; 95% CI: 433–862) and 2022 (3,348 individuals; 95% CI: 2,114–5,301). The abundance estimate in 2023 (2,703 individuals; 95% CI: 1,660–4,400) was slightly lower than in 2022 but remains higher than earlier estimates. The juvenile survival

estimate of 81% has remained relatively consistent, increasing only slightly from 2022. Together, these data suggest that the abundance of wild juvenile Lake Sturgeon in Stephens Lake increased following 2021 but has since stabilized.

Movement monitoring data from both acoustic telemetry and Floy-tag recaptures show that there was a short-term influx of wild juvenile Lake Sturgeon that moved into Stephens Lake following impoundment of the Keeyask reservoir beginning in June 2021 (described in Section 5.1). However, this increase in wild juvenile Lake Sturgeon emigration appears to have been a short-lived event and no downstream movements of acoustically tagged juvenile Lake Sturgeon through the Keeyask GS have been observed since June 2022 (Hrenchuk and Funk 2024). Even with this emigration, no decrease in the population in the Keeyask reservoir was observed. In contrast, adult Lake Sturgeon have continued to move downstream through the Keeyask GS since reservoir impoundment, which has led both to an increase in the population in Stephens Lake and a decrease in the adult population in the Keeyask reservoir (Dowd and Hrenchuk 2024; Hrenchuk 2024).

Although some immigrants from the Keeyask reservoir may have affected the juvenile population estimate, the main driver of the high abundance of wild juvenile Lake Sturgeon in Stephens Lake in 2022 and 2023 is likely recruitment from the large 2022 cohort. Twenty-four wild YOY Lake Sturgeon were captured in Stephens Lake in 2022, the largest number of YOY fish ever captured in a single year. The population model is sensitive to new captures and a large number can cause the population estimate to increase. Many of these fish were also captured in 2023 (n = 18), contributing to a similarly high population estimate.

5.3 RECRUITMENT

Recruitment of wild Lake Sturgeon to the Keeyask reservoir and Stephens Lake populations has occurred each year since 2003. Cohort strength has varied as both strong and weak cohorts are evident. In 2023, 66 wild fish aged between 0 and 3 (34 in the Keeyask reservoir and 32 in Stephens Lake) were captured. The presence of fish between age-0 and age-3 provides a short-term indication of spawning and recruitment success of early life stages during the post-impoundment and early operation periods.

It was predicted in the EIS that Keeyask GS operation may alter YOY rearing habitat in the Keeyask reservoir. To date, there is no evidence to suggest that YOY habitat is limiting post impoundment given that individuals from every cohort spawned since reservoir impoundment have been captured (including two from the 2021 cohort, four from the 2022 cohort, and one from the 2023 cohort). Although stocking of hatchery-reared fingerlings, which cannot be distinguished from wild fish, may lead to an overestimation of the number of wild fish present in the catch, no fingerlings have been stocked in the Keeyask reservoir since 2018. Therefore, fish captured in the 2021, 2022, and 2023 cohorts can definitively be identified as wild fish. It should be noted that the reduction of suitability of YOY habitat was anticipated to occur over time as fine sediment

deposited over existing areas of sand; therefore, effects of habitat alteration may occur in the future.

It was also predicted in the EIS that the Project may lead to a complete loss of spawning habitat for Lake Sturgeon in Stephens Lake. However, individuals from both cohorts spawned since operation of the GS began have been captured, including 42 from the 2022 cohort and two from the 2023 cohort. The large number of individuals captured from the 2022 cohort suggests that this year-class may be strong. As in the Keeyask reservoir, hatchery-reared fingerlings were not stocked in either year (last stocked in 2021), indicating that both cohorts consist only of wild fish. This indicates that successful spawning and recruitment has occurred downstream of the Keeyask GS since operation began, despite differences in flow conditions between the two years. In 2022, water was high, and both the spillway and powerhouse were in use for the duration of the spawning period (Manitoba Hydro 2023). In 2023, water levels were low, and the spillway was closed for the duration of the spawning period (Manitoba Hydro 2024).

5.4 HATCHERY FISH

Stocking in the Keeyask area began in 2015. Since that time a total of 3,614 age-1 fish from 12 families have been released, including 1,686 in the Keeyask reservoir (“Keeyask stocked fish”) and 1,928 in Stephens Lake (“Stephens stocked fish”). The proportion of Keeyask and Stephens stocked fish in the catch continues to increase as more fish are released. As of 2023, 358 individual Keeyask stocked fish (21%) have been captured, 281 in the Keeyask reservoir and 77 in Stephens Lake. Individuals from all 13 family groups have been captured in the Keeyask reservoir, representing between 6 and 37% of the total number of each family stocked. The lowest proportion of recaptures by family have been from three families stocked in 2022; this is likely because these fish are small and not yet fully recruited to the sampling gear. For hatchery fish released in Stephens Lake, a slightly lower proportion have been recaptured (n = 287; 15%); however, all 15 family groups stocked have been captured, representing between 1 and 45% of the total number of each family stocked. As in the Keeyask reservoir, the lowest proportion of recaptures by family have been from the three families stocked in 2022, with the exception of the F1xM2 family group stocked in 2017 (only 1 individual has been captured).

The proportion of stocked hatchery fish in the 2023 catch (n = 144) was the highest since stocking began. Eighty-four were captured in the Keeyask reservoir and 60 in Stephens Lake. As in previous years, a large number of fish stocked in the Keeyask reservoir were captured in Stephens Lake, accounting for 38% (n = 23) of all hatchery fish caught. This is similar to the number captured in 2022 (39%; n = 28), and higher than any previous year (1–11 fish representing 9–22% of hatchery captures between 2015 and 2020). Compared to wild fish, stocked hatchery fish appear to make downstream movements from the Keeyask reservoir into Stephens Lake more frequently. It is possible that many downstream movements occur shortly after release.

5.5 KEY QUESTIONS

Key questions identified in the AEMP relating to the operation period are addressed below.

Does recruitment of wild sturgeon occur upstream and/or downstream of the GS during operation?

In 2023, one YOY Lake Sturgeon was caught in the Keeyask reservoir and two were caught in Stephens Lake. Although no YOY Lake Sturgeon were captured in the Keeyask reservoir during sampling in 2021 or 2022, two wild fish from the 2021 cohort and four from the 2022 cohort have since been captured, suggesting that recruitment upstream of the GS has occurred every year following reservoir impoundment.

Two YOY fish were captured in Stephens Lake in 2023 while 42 wild fish from the 2022 cohort have been captured. The capture of spawning male Lake Sturgeon downstream of the Keeyask GS in both 2022 and 2023 (Hrenchuk 2023; Dowd and Hrenchuk 2024) and the large number of YOY fish captured in Stephens Lake in 2022 suggest that these fish did not drift downstream from the Keeyask reservoir but that successful spawning and recruitment has occurred in Stephens Lake in both years since GS commissioning was completed.

Does spawning habitat need to be created/modified (if recruitment of wild fish is not observed)?

Results of the 2023 monitoring program indicate the presence of the 2021, 2022, and 2023 cohorts in both the Keeyask reservoir and Stephens Lake. Additionally, spring adult Lake Sturgeon studies in 2023 captured spawning male Lake Sturgeon both upstream and downstream of the GS (Dowd and Hrenchuk 2024). Together, these suggest that successful spawning and recruitment continues to occur both upstream and downstream of the Keeyask GS during operation.

Is there a biologically meaningful (and statistically significant) change in condition factor and growth of juvenile sturgeon during operation?

Condition factor of juvenile Lake Sturgeon sampled in the Keeyask reservoir and Stephens Lake in 2023 was within the ranges observed in previous years. Comparison of growth curves of wild fish captured in the Keeyask reservoir during baseline, construction, and operation indicated that young fish (*i.e.*, age-1 and -2) captured post-impoundment are longer than those captured during baseline and construction. Although too few juveniles were collected in Stephens Lake prior to construction to support a pre-/post-construction analysis, a comparison of growth rates of wild fish between construction and operation showed a similar pattern as in the Keeyask reservoir. It is unclear why this was observed and continued monitoring will determine if this trend continues.

Where in the reservoir and in Stephens Lake will YOY rearing habitat be located, and will the distribution of YOY and juvenile Lake Sturgeon change following reservoir creation?

It was predicted in the EIS that areas used by juvenile Lake Sturgeon prior to GS construction may become unsuitable over time due to lower water velocities and silt deposition. It was predicted that juvenile Lake Sturgeon may move to alternate areas within the Keeyask reservoir.

More juvenile Lake Sturgeon have been captured within upper Gull Lake (Zone GL-A) following impoundment. The CPUE in this area ranged from 3.9–5.7 Lake Sturgeon/100 m net/24 h between 2021 and 2023, compared to 0.0–3.1 Lake Sturgeon in previous sampling years. This may be the result of increased habitat suitability related to impoundment. Large numbers of juvenile Lake Sturgeon continue to be captured in the lower portion of the middle basin of the reservoir (Zone GL-B) and in the area near Caribou Island (Zone GL-C) and CPUE in both areas tend to be similar to those observed pre-impoundment.

Degradation of pre-Project juvenile Lake Sturgeon rearing habitats in Stephens Lake was also predicted in the EIS due to increased silt deposition. However, in 2023, Lake Sturgeon were captured in every gill net site set in Stephens Lake with similar CPUE between both Zone STL-A and STL-B. In 2022, sampling in STL-A was hampered by high spillway flows and large amounts of debris (Burnett *et al*. 2023). Spillway flows were absent in 2023 and the catch of juvenile Lake Sturgeon in this area (CPUE = 2.37 Lake Sturgeon/100 m net/24 h) was within the range observed during construction (0.72–2.52 Lake Sturgeon). Overall, juvenile Lake Sturgeon in Stephens Lake have been captured in similar areas in the two years of GS operation compared to pre-operation years.

[*NTD: Will speak to habitat changes observed in juvenile rearing areas when the offshore habitat monitoring report is completed in early 2024]*.

Does additional YOY habitat need to be created in the Keeyask reservoir or in Stephens Lake?

Recruitment of wild juvenile Lake Sturgeon has occurred consistently both upstream and downstream of the Keeyask GS since construction began. As a result, it does not appear necessary to create additional YOY habitat in the Keeyask reservoir or Stephens Lake at this time.

Three questions related to the stocking program are addressed below:

- *What is the survival rate of stocked sturgeon?*;
- *What is the proportion of hatchery-reared to wild recruits within a cohort (i.e., how successful is the stocking program)?; and*
- *Do stocking rates need to be adjusted?*

In 2023, modelling results estimated the annual survival rate of stocked sturgeon at 95% in the Keeyask reservoir and 86% in Stephens Lake. The population of hatchery-reared sturgeon was estimated at 1,317 individuals (29% of the total juvenile population) in the Keeyask reservoir and 959 individuals (26% of the total juvenile population) in Stephens Lake. Since 2021, the estimated proportion of hatchery-reared fish in the Keeyask reservoir population has remained similar (25% in 2021 to 34% in 2022) but has fluctuated more in Stephens Lake (53% in 2021 to 19% in 2022). This is largely due to differences in wild juvenile population estimates, which have remained relatively stable within the Keeyask reservoir since 2018 but increased in Stephens Lake in 2022. This means that although the number of hatchery-reared fish has not changed, they make up a smaller part of the total juvenile Lake Sturgeon population. It is important to note that only sturgeon

stocked as yearlings and marked with PIT tags can be distinguished from wild fish, thus, the model only considers these fish when calculating population estimates.

As in recent study years, hatchery-reared fish continued to account for a high proportion of the catch in both the Keeyask reservoir and Stephens Lake in 2023. Within the Keeyask reservoir, hatchery-reared fish accounted for 28% of the catch in 2023, compared to 1–26% in previous years. These fish accounted for 12% of the 2013, 52% of the 2014, 17% of the 2016, 88% of the 2018 and 95% of the 2021 cohorts. Within Stephens Lake, hatchery-reared fish accounted for 35% of the catch in 2023, compared to 9–52% in previous years. These fish accounted for 42% of the 2014, 50% of the 2016, 97% of the 2018, and 90% of the 2021 cohort.

5.6 NEXT STEPS

Sampling conducted in 2023 represents the third full year following impoundment of the Keeyask GS reservoir and the second year following commissioning of the final turbine at the GS. As described in the AEMP, juvenile population monitoring is scheduled to occur annually in the Keeyask reservoir and Stephens Lake, and biennially in the Upper Split Lake Area. With that, monitoring in 2024 will be conducted in the Upper Split Lake Area, the Keeyask reservoir, and Stephens Lake.

6.0 SUMMARY AND CONCLUSIONS

- Sampling locations in the Keeyask reservoir and Stephens Lake remained similar to previous years.
- In the Keeyask reservoir, 303 (298 juvenile and five adult) Lake Sturgeon were captured in 1,410 gill net hours for a total CPUE of 5.16 LKST/100 m net/24 h. Aged Lake Sturgeon (n = 285) ranged from 0 to 17 years old, with 7-year-old fish (2016 cohort) being most abundant (n = 76; 26.7%). One wild YOY was captured in the Keeyask reservoir. A total of 47 wild Lake Sturgeon tagged in previous studies were captured in 2023, along with 84 known hatchery-reared fish. Of the hatchery-reared fish, 81 were released in the Keeyask reservoir: 15 in 2015 (2014 cohort), 13 in 2017 (2016 cohort), 35 in 2019 (2018 cohort), and 18 in 2022 (2021 cohort). The additional three fish were released in the Burntwood River in 2014 (2013 cohort) and were captured between 77 and 91 km from their initial release location.
- In Stephens Lake, 173 (157 juvenile and 16 adult) Lake Sturgeon were captured in 1,547 gill net hours for a total CPUE of 2.68 LKST/100 m net/24 h. Aged Lake Sturgeon (n = 153) ranged from 0 to 16 years old, with the 2018 cohort (age-5) captured most frequently (n = 29; 19%). Two wild YOY were captured in Stephens Lake. A total of 30 Lake Sturgeon tagged in previous studies and 60 known hatchery-reared fish were captured. Fourteen of the 30 recaptured wild Lake Sturgeon were initially tagged in the Keeyask reservoir; ten of which were juveniles. Of the 60 hatchery-reared fish captured in 2023, 35 were released in Stephens Lake: five in 2015 (2014 cohort), seven in 2017 (2016 cohort), 15 in 2019 (2018 cohort), and ten in 2022 (2021 cohort). The 23 remaining fish were stocked in the Keeyask reservoir: two in 2017 (2016 cohort), 13 in 2019 (2018 cohort), and eight in 2022 (2021 cohort).
- Abundance estimates were calculated for wild juvenile Lake Sturgeon in the Keeyask reservoir and Stephens Lake. The 2023 population estimate was 3,197 individuals (95% CI: 2,224–4,594) for the Keeyask reservoir and 2,703 individuals (95% CI: 1,660–4,400) for Stephens Lake. Survival was estimated to be 78% in the Keeyask reservoir and 81% in Stephens Lake.
- The key questions, as described in the AEMP, for juvenile Lake Sturgeon population monitoring during construction and operation of the Keeyask GS are as follows:
    - *Does recruitment of wild sturgeon occur upstream and/or downstream of the GS during construction and operation?*

        In 2023, one YOY Lake Sturgeon was caught in the Keeyask reservoir and two were caught in Stephens Lake. Although no YOY Lake Sturgeon were captured in the Keeyask reservoir during sampling in 2021 or 2022, two wild fish from the 2021 cohort and four from the 2022 cohort have since been captured, suggesting that recruitment upstream of the GS has occurred every year following reservoir impoundment. Two YOY fish were captured in Stephens Lake in 2023 while 42

wild fish from the 2022 cohort have been captured. The capture of spawning male Lake Sturgeon downstream of the Keeyask GS in both 2022 and 2023 (Hrenchuk 2023; Dowd and Hrenchuk 2024) and the large number of YOY fish captured in Stephens Lake in 2022 suggest that these fish did not drift downstream from the Keeyask reservoir but that successful spawning and recruitment has occurred in Stephens Lake in both years since GS commissioning was completed.

- *Does spawning habitat need to be created/modified (if recruitment of wild fish is not observed)?*

  Results of the 2023 monitoring program indicate the presence of the 2021, 2022, and 2023 cohorts in both the Keeyask reservoir and Stephens Lake. Additionally, spring adult Lake Sturgeon studies in 2023 captured spawning Lake Sturgeon both upstream and downstream of the GS (Hrenchuk 2023; Dowd and Hrenchuk 2024). Together, these suggest that successful spawning and recruitment continues to occur both upstream and downstream of the Keeyask GS during operation.

- *Is there a biologically meaningful (and statistically significant) change in condition factor and growth of juvenile sturgeon during construction?*

  Condition factor of juvenile Lake Sturgeon sampled in the Keeyask reservoir and Stephens Lake in 2023 was within the ranges observed in previous years. Comparison of growth curves of wild fish captured in the Keeyask reservoir during baseline, construction, and operation indicated that young fish (*i.e.*, age-1 and -2) captured post-impoundment are longer than those captured during baseline and construction. Although too few juveniles were collected in Stephens Lake prior to construction to support a pre-/post-construction analysis, a comparison of growth rates of wild fish between construction and operation showed a similar pattern as in the Keeyask reservoir.

- *Where in the Keeyask reservoir and in Stephens Lake will YOY rearing habitat be located, and will the distribution of YOY and juvenile Lake Sturgeon change following reservoir creation?*

  It was predicted in the EIS that areas used by juvenile Lake Sturgeon prior to GS construction may become unsuitable due to lower water velocities and silt deposition and that juvenile Lake Sturgeon may move to alternative areas within the Keeyask reservoir. More juvenile Lake Sturgeon have been captured within upper Gull Lake following impoundment. The CPUE in this area ranged from 3.9–5.7 Lake Sturgeon/100 m net/24 h between 2021 and 2023, compared to 0.0–3.1 Lake Sturgeon in previous sampling years. High numbers of juvenile Lake Sturgeon continue to be captured in the lower portion of the middle basin of the reservoir (Zone GL-B) and in the area near Caribou Island (Zone GL-C) and CPUE in both areas tend to be similar to those observed pre-impoundment.

  Degradation of pre-Project juvenile Lake Sturgeon rearing habitats in Stephens Lake were also predicted in the EIS due to increased silt deposition. However, in

2023, Lake Sturgeon were captured in every gill net site set in Stephens Lake with similar CPUE between both Zone STL-A and STL-B. Overall, juvenile Lake Sturgeon in Stephens Lake have been captured in similar areas in the two years since GS operation began as during pre-operation years.

- *Does additional YOY habitat need to be created in the Keeyask reservoir or in Stephens Lake?*

  Recruitment of wild juvenile Lake Sturgeon has occurred consistently both upstream and downstream of the Keeyask GS since construction began. As a result, there is no current need for the creation of additional YOY habitat in the Keeyask reservoir or Stephens Lake.

- *What is the survival rate of stocked sturgeon? What is the proportion of hatchery-reared to wild recruits within a cohort (i.e., how successful is the stocking program)? Do stocking rates need to be adjusted?*

  The survival rates of stocked sturgeon were estimated at 95% in the Keeyask reservoir and 86% in Stephens Lake. Based on these survival rates, the population of stocked fish was estimated at 1,317 (29% of the juvenile population) in the Keeyask reservoir and 959 (26% of the juvenile population) in Stephens Lake.

  As in recent study years, hatchery-reared fish continued to account for a high proportion of the catch in both the Keeyask reservoir and Stephens Lake in 2023. Within the Keeyask reservoir, hatchery-reared fish accounted for 28% of the catch in 2023, compared to 1–26% in previous years. These fish accounted for 12% of the 2013, 52% of the 2014, 17% of the 2016, 88% of the 2018, and 95% of the 2021 cohorts. Within Stephens Lake, hatchery-reared fish accounted for 35% of the catch in 2023, compared to 9–52% in previous years. These fish accounted for 42% of the 2014, 50% of the 2016, 97% of the 2018, and 90% of the 2021 cohorts.

- During the initial years of Project operation, the EIS predicted that areas used by juvenile Lake Sturgeon prior to GS construction may become unsuitable due to changes in water velocity and silt deposition, both in the Keeyask reservoir and Stephens Lake, and that juvenile Lake Sturgeon would move to other areas. In 2023, juvenile Lake Sturgeon were captured in both the Keeyask reservoir and Stephens Lake in similar locations as previous years, indicating that no large-scale shifts in habitat use have occurred. More juvenile Lake Sturgeon have been captured in upper Gull Lake following reservoir impoundment, which may reflect the increased habitat suitability of the area. It was also predicted that juvenile Lake Sturgeon may be lost from the Keeyask reservoir due to emigration following reservoir impoundment, leading to a decrease in abundance. In 2023, ten juvenile fish tagged in the Keeyask reservoir were recaptured in Stephens Lake, which is more than any other sampling year. However, movement monitoring studies using acoustic telemetry suggest that increased emigration from the Keeyask reservoir into Stephens Lake was a short-lived event, and no downstream movements have been observed since June 2022 (Hrenchuk and Funk 2024). The 2023 population estimate for the Keeyask reservoir did

not differ from previous years, suggesting that any downstream emigration has not caused a detectable change in the abundance of juvenile Lake Sturgeon in the Keeyask reservoir.

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APPENDICES

APPENDIX 1:
LOCATIONS AND SITE-SPECIFIC PHYSICAL MEASUREMENTS COLLECTED AT GILLNETTING SITES, FALL 2023.

Table A1-1: Location and site-specific physical measurements collected at gillnetting sites during juvenile Lake Sturgeon investigations conducted in the Keeyask reservoir, fall 2023. 71

Table A1-2: Location and site-specific physical measurements collected at gillnetting sites during juvenile Lake Sturgeon investigations conducted in Stephens Lake, fall 2023. 73

Table A1-1: Location and site-specific physical measurements collected at gillnetting sites during juvenile Lake Sturgeon investigations conducted in the Keeyask reservoir, fall 2023.

Site	Zone	UTM Location		Set Date	Set Water Temp (°C)	Pull Date	Pull Water Temp (°C)	Duration (dec.hrs)	Water Depth (m)	
		Easting	Northing						Start	End
GN-01	GL-C	356032	6246229	11-Sep-23	14	12-Sep-23	14	26.80	11.6	9.6
GN-02	GL-C	355492	6246528	11-Sep-23	14	12-Sep-23	14	25.53	12.9	15.2
GN-03	GL-B	354527	6244696	11-Sep-23	14	12-Sep-23	14	24.00	17.4	15.7
GN-04	GL-B	352702	6244869	11-Sep-23	14	12-Sep-23	14	22.37	9.9	10.2
GN-05	GL-A	350343	6243928	11-Sep-23	14	12-Sep-23	14	20.88	14.4	13.7
GN-05	GL-A	350343	6243928	12-Sep-23	14	13-Sep-23	14	25.37	14.4	13.7
GN-05	GL-A	350343	6243928	13-Sep-23	14	14-Sep-23	14	24.98	14.4	13.7
GN-06	GL-A	349324	6243955	11-Sep-23	14	12-Sep-23	14	19.88	16.3	16.8
GN-06	GL-A	349324	6243955	12-Sep-23	14	13-Sep-23	14	24.08	16.3	16.8
GN-07	GL-C	355524	6247532	12-Sep-23	14	13-Sep-23	14	20.98	14.9	16.2
GN-07	GL-C	355524	6247532	13-Sep-23	14	14-Sep-23	14	22.28	14.9	16.2
GN-07	GL-C	355524	6247532	14-Sep-23	14	16-Sep-23	13.5	46.47	14.9	16.2
GN-07	GL-C	355524	6247532	16-Sep-23	13.5	17-Sep-23	13.5	24.43	14.9	16.2
GN-08	GL-C	356876	6248055	12-Sep-23	14	13-Sep-23	14	21.08	12.0	16.0
GN-08	GL-C	356876	6248055	13-Sep-23	14	14-Sep-23	14	21.38	12.0	16.0
GN-09	GL-C	357207	6248075	12-Sep-23	14	13-Sep-23	14	22.68	14.2	13.0
GN-09	GL-C	357207	6248075	13-Sep-23	14	14-Sep-23	14	18.65	14.2	13.0
GN-10	GL-B	354519	6244546	13-Sep-23	14	14-Sep-23	14	28.42	14.6	15.1
GN-10	GL-B	354519	6244546	14-Sep-23	14	16-Sep-23	13.5	48.97	14.6	15.1
GN-10	GL-B	354519	6244546	16-Sep-23	13.5	17-Sep-23	13.5	19.58	14.6	15.1
GN-11	GL-A	348294	6243955	13-Sep-23	14	14-Sep-23	14	25.17	15.0	15.0
GN-11	GL-A	348294	6243955	14-Sep-23	14	16-Sep-23	13.5	48.32	15.0	15.0
GN-12	GL-C	355343	6246546	14-Sep-23	14	16-Sep-23	13.5	47.32	13.7	15.1
GN-12	GL-C	355343	6246546	16-Sep-23	13.5	17-Sep-23	13.5	23.60	13.7	15.1
GN-13	GL-C	355647	6245806	14-Sep-23	14	16-Sep-23	13.5	47.13	13.8	11.2
GN-14	GL-A	351216	6243503	14-Sep-23	14	16-Sep-23	13.5	48.17	15.0	15.0
GN-14	GL-A	351216	6243503	16-Sep-23	13.5	17-Sep-23	13.5	23.83	15.0	15.0

Table A1-1: Location and site-specific physical measurements collected at gillnetting sites during juvenile Lake Sturgeon investigations conducted in the Keeyask reservoir, fall 2023 (continued).

Site	Zone	UTM Location		Set Date	Set Water Temp (°C)	Pull Date	Pull Water Temp (°C)	Duration (dec.hrs)	Water Depth (m)	
		Easting	Northing						Start	End
GN-14	GL-A	351216	6243503	17-Sep-23	13.5	18-Sep-23	13	22.72	15.0	15.0
GN-15	GL-B	353752	6244428	16-Sep-23	13.5	17-Sep-23	13.5	23.20	14.0	16.0
GN-16	GL-A	349461	6244334	16-Sep-23	13.5	17-Sep-23	13.5	23.80	16.0	17.0
GN-17	GL-C	356693	6248179	17-Sep-23	13.5	18-Sep-23	13	27.33	15.0	16.0
GN-17	GL-C	356693	6248179	18-Sep-23	13	19-Sep-23	13	26.30	15.0	16.0
GN-17	GL-C	356693	6248179	19-Sep-23	13	20-Sep-23	13	21.62	15.0	16.0
GN-18	GL-A	347766	6243976	17-Sep-23	13.5	18-Sep-23	13	22.80	19.0	17.0
GN-18	GL-A	347766	6243976	18-Sep-23	13	19-Sep-23	13	23.68	19.0	17.0
GN-18	GL-A	347766	6243976	19-Sep-23	13	20-Sep-23	13	22.95	19.0	17.0
GN-19	BR-D	338356	6245085	17-Sep-23	13.5	18-Sep-23	13	21.32	12.0	14.0
GN-19	BR-D	338356	6245085	18-Sep-23	13	19-Sep-23	13	23.62	12.0	14.0
GN-20	BR-D	339216	6243680	17-Sep-23	13.5	18-Sep-23	13	21.33	12.0	13.0
GN-20	BR-D	339216	6243680	18-Sep-23	13	19-Sep-23	13	23.83	12.0	13.0
GN-21	GL-A	350582	6243836	17-Sep-23	13.5	18-Sep-23	13	22.00	14.0	12.9
GN-22	GL-B	352238	6243338	18-Sep-23	13	19-Sep-23	13	24.33	15.0	15.0
GN-22	GL-B	352238	6243338	19-Sep-23	13	20-Sep-23	13	21.27	15.0	15.0
GN-23	GL-C	356151	6245859	18-Sep-23	13	19-Sep-23	13	24.72	18.0	14.0
GN-23	GL-C	356151	6245859	19-Sep-23	13	20-Sep-23	13	21.73	18.0	14.0
GN-24	GL-B	352952	6243795	19-Sep-23	13	20-Sep-23	13	21.10	16.0	15.0
GN-25	GL-C	355577	6247410	19-Sep-23	13	20-Sep-23	13	21.13	12.6	17.0
GN-14	GL-A	351216	6243503	17-Sep-23	13.5	18-Sep-23	13	22.72	15.0	15.0

Table A1-2: Location and site-specific physical measurements collected at gillnetting sites during juvenile Lake Sturgeon investigations conducted in Stephens Lake, fall 2023.

Site	Zone	UTM Location		Set Date	Set Water Temp (°C)	Pull Date	Pull Water Temp (°C)	Duration (dec.hrs)	Water Depth (m)	
		Easting	Northing						Start	End
GN-01	STL-A	366645	6247310	11-Sep-23	15	13-Sep-23	15	46.30	18.6	14.6
GN-01	STL-A	366645	6247310	13-Sep-23	15	14-Sep-23	15	26.42	18.6	14.6
GN-02	STL-A	366630	6247407	11-Sep-23	15	13-Sep-23	15	46.53	17.1	15.8
GN-03	STL-A	367965	6248322	11-Sep-23	15	13-Sep-23	15	47.58	14.8	15.5
GN-03	STL-A	367965	6248322	13-Sep-23	15	14-Sep-23	15	24.07	14.8	15.5
GN-04	STL-B	368778	6248557	11-Sep-23	15	12-Sep-23	15	21.67	17.9	16.7
GN-04	STL-B	368778	6248557	12-Sep-23	15	13-Sep-23	15	25.45	17.9	16.7
GN-05	STL-B	369307	6248736	11-Sep-23	15	12-Sep-23	15	20.43	15.8	18.2
GN-06	STL-B	369258	6248376	11-Sep-23	15	12-Sep-23	15	20.60	14.2	15.7
GN-07	STL-B	370311	6248672	12-Sep-23	15	13-Sep-23	15	28.85	16.2	13.9
GN-08	STL-B	369171	6248442	12-Sep-23	15	13-Sep-23	15	28.13	15.0	16.0
GN-08	STL-B	369171	6248442	13-Sep-23	15	14-Sep-23	15	19.50	15.0	16.0
GN-09	STL-A	366559	6247357	13-Sep-23	15	14-Sep-23	15	25.90	16.7	17.6
GN-10	STL-B	368927	6248628	13-Sep-23	15	14-Sep-23	15	20.90	17.6	15.9
GN-11	STL-B	370052	6248409	13-Sep-23	15	14-Sep-23	15	18.43	18.5	18.8
GN-12	STL-B	369962	6248339	14-Sep-23	15	16-Sep-23	14.5	48.07	17.5	19.7
GN-12	STL-B	369962	6248339	16-Sep-23	14.5	17-Sep-23	14.5	24.02	17.5	19.7
GN-12	STL-B	369962	6248339	17-Sep-23	14.5	18-Sep-23	14	24.77	17.5	19.7
GN-12	STL-B	369962	6248339	18-Sep-23	14	19-Sep-23	14	22.98	17.5	19.7
GN-13	STL-A	368251	6248129	14-Sep-23	15	16-Sep-23	14.5	48.72	14.4	13.3
GN-14	STL-B	368849	6248627	14-Sep-23	15	16-Sep-23	14.5	47.85	17.5	15.9
GN-15	STL-A	367770	6248271	14-Sep-23	15	16-Sep-23	14.5	48.77	14.7	14.2
GN-16	STL-A	367731	6247633	14-Sep-23	15	16-Sep-23	14.5	49.12	16.4	14.8
GN-17	STL-A	366536	6247338	14-Sep-23	15	16-Sep-23	14.5	50.13	16.4	17.1
GN-18	STL-B	368704	6248596	16-Sep-23	14.5	17-Sep-23	14.5	23.80	15.9	16.4
GN-19	STL-A	368147	6248104	16-Sep-23	14.5	17-Sep-23	14.5	24.00	15.6	13.6
GN-20	STL-B	368901	6248380	16-Sep-23	14.5	17-Sep-23	14.5	23.60	13.2	17.3

Table A1-2: Location and site-specific physical measurements collected at gillnetting sites during juvenile Lake Sturgeon investigations conducted in Stephens Lake, fall 2023 (continued).

Site	Zone	UTM Location		Set Date	Set Water Temp (°C)	Pull Date	Pull Water Temp (°C)	Duration (dec.hrs)	Water Depth (m)	
		Easting	Northing						Start	End
GN-20	STL-B	368901	6248380	17-Sep-23	14.5	18-Sep-23	14	23.55	13.2	17.3
GN-21	STL-B	368959	6248567	16-Sep-23	14.5	17-Sep-23	14.5	19.73	17.7	16.6
GN-22	STL-A	368172	6248299	16-Sep-23	14.5	17-Sep-23	14.5	19.63	14.5	13.1
GN-22	STL-A	368172	6248299	17-Sep-23	14.5	18-Sep-23	14	26.95	14.5	13.1
GN-23	STL-B	369981	6247960	17-Sep-23	14.5	18-Sep-23	14	23.67	19.4	17.6
GN-24	STL-B	368529	6248557	17-Sep-23	14.5	18-Sep-23	14	25.60	15.4	15.5
GN-25	STL-A	368296	6248220	17-Sep-23	14.5	18-Sep-23	14	25.95	13.6	13.4
GN-26	STL-B	369056	6248469	17-Sep-23	14.5	18-Sep-23	14	22.42	15.6	17.3
GN-27	STL-B	369882	6247892	18-Sep-23	14	19-Sep-23	14	23.60	14.8	16.8
GN-28	STL-B	369429	6248048	18-Sep-23	14	19-Sep-23	14	24.22	13.6	17.5
GN-29	STL-B	369745	6248604	18-Sep-23	14	19-Sep-23	14	23.02	18.6	14.8
GN-30	STL-A	367948	6248433	18-Sep-23	14	19-Sep-23	14	23.58	14.4	14.1
GN-31	STL-A	368015	6248214	18-Sep-23	14	19-Sep-23	14	24.77	15.1	15.3
GN-32	STL-A	368079	6248282	18-Sep-23	14	19-Sep-23	14	23.55	16.2	13.6
GN-32	STL-A	368079	6248282	19-Sep-23	14	20-Sep-23	14	22.83	16.2	13.6
GN-33	STL-B	369993	6247965	19-Sep-23	14	20-Sep-23	14	24.72	15.1	16.9
GN-34	STL-B	368764	6248559	19-Sep-23	14	20-Sep-23	14	25.50	18.9	17.4
GN-35	STL-B	369598	6248574	19-Sep-23	14	20-Sep-23	14	23.17	18.9	17.9
GN-36	STL-B	369176	6248443	19-Sep-23	14	20-Sep-23	14	23.22	14.6	14.6
GN-37	STL-B	368493	6248387	19-Sep-23	14	20-Sep-23	14	23.78	9.8	13.7
GN-38	STL-A	367770	6248277	19-Sep-23	14	20-Sep-23	14	23.47	16.0	14.3

APPENDIX 2:
BIOLOGICAL AND TAG INFORMATION FOR LAKE STURGEON CAPTURED IN FALL 2023.

Table A2-1: Biological and tag information for Lake Sturgeon captured in the Keeyask reservoir, fall 2023. 76

Table A2-2: Biological and tag information for Lake Sturgeon captured in Stephens Lake, fall 2023. 87

Table A2-1: Biological and tag information for Lake Sturgeon captured in the Keeyask reservoir, fall 2023.

Waterbody	Site	Zone	Date	Fish #	Floy-tag #	Pit-tag #	Fork Length (mm)	Total Length (mm)	Weight (g)	Age
Keeyask Reservoir	GN-06	GL-A	12-Sep-23	1	129525	900 226001226318	659	745	1750	10
Keeyask Reservoir	GN-06	GL-A	12-Sep-23	2	129524	900 226001230330	550	631	1130	7
Keeyask Reservoir	GN-06	GL-A	12-Sep-23	3	129523	900 226001226274	479	550	740	5
Keeyask Reservoir	GN-06	GL-A	12-Sep-23	4	121309	900 226001224782	510	577	890	7
Keeyask Reservoir	GN-05	GL-A	12-Sep-23	5	129522	900 043000239253	336	382	290	2
Keeyask Reservoir	GN-05	GL-A	12-Sep-23	6	129521	900 226001224784	555	634	1180	9
Keeyask Reservoir	GN-05	GL-A	12-Sep-23	7	129520	900 067000055567	519	594	800	9
Keeyask Reservoir	GN-05	GL-A	12-Sep-23	8	129519	900 067000055088	534	609	880	9
Keeyask Reservoir	GN-05	GL-A	12-Sep-23	9	109563	900 226000893903	600	679	1350	9
Keeyask Reservoir	GN-03	GL-B	12-Sep-23	10	129518	900 226001226290	479	554	720	7
Keeyask Reservoir	GN-03	GL-B	12-Sep-23	11	118048	900 226001658941	905	1040	11800	-
Keeyask Reservoir	GN-03	GL-B	12-Sep-23	12	122559	900 226001227371	766	862	3550	-
Keeyask Reservoir	GN-03	GL-B	12-Sep-23	13	129517	900 226001226313	605	693	1400	9
Keeyask Reservoir	GN-03	GL-B	12-Sep-23	14	129516	900 226001226218	440	501	540	6
Keeyask Reservoir	GN-03	GL-B	12-Sep-23	15	129515	900 226001224679	458	519	650	7
Keeyask Reservoir	GN-02	GL-C	12-Sep-23	16	129514	900 226001226321	600	692	1500	9
Keeyask Reservoir	GN-02	GL-C	12-Sep-23	17	129513	900 226001224698	610	695	1550	10
Keeyask Reservoir	GN-02	GL-C	12-Sep-23	18	129512	900 226001226399	505	568	900	7
Keeyask Reservoir	GN-02	GL-C	12-Sep-23	19	129511	900 226001230368	302	338	150	3
Keeyask Reservoir	GN-02	GL-C	12-Sep-23	20	-	900 067000121195	210	236	50	1
Keeyask Reservoir	GN-06	GL-A	13-Sep-23	21	129510	900 226001226950	633	727	1640	7
Keeyask Reservoir	GN-06	GL-A	13-Sep-23	22	129509	900 226001226992	645	748	1890	10
Keeyask Reservoir	GN-06	GL-A	13-Sep-23	23	129508	900 226001226874	540	602	1000	9
Keeyask Reservoir	GN-06	GL-A	13-Sep-23	24	120507	900 226001226234	504	573	660	6
Keeyask Reservoir	GN-06	GL-A	13-Sep-23	25	116766	900 226001031213	478	562	580	6
Keeyask Reservoir	GN-06	GL-A	13-Sep-23	26	129506	900 226001226345	583	676	1180	10
Keeyask Reservoir	GN-06	GL-A	13-Sep-23	27	129505	900 226001225049	542	613	930	8
Keeyask Reservoir	GN-06	GL-A	13-Sep-23	28	129504	900 226001232300	485	547	600	-

Table A2-1: Biological and tag information for Lake Sturgeon captured in the Keeyask reservoir, fall 2023 (continued).

Waterbody	Site	Zone	Date	Fish #	Floy-tag #	Pit-tag #	Fork Length (mm)	Total Length (mm)	Weight (g)	Age
Keeyask Reservoir	GN-05	GL-A	13-Sep-23	29	129503	900 226001226907	664	748	1940	10
Keeyask Reservoir	GN-05	GL-A	13-Sep-23	30	129502	900 067000112129	450	512	510	7
Keeyask Reservoir	GN-05	GL-A	13-Sep-23	31	121290	900 226001224755	551	616	1170	8
Keeyask Reservoir	GN-05	GL-A	13-Sep-23	32	129501	900 226001226716	523	606	850	7
Keeyask Reservoir	GN-05	GL-A	13-Sep-23	33	129526	900 226001226314	580	647	1250	10
Keeyask Reservoir	GN-05	GL-A	13-Sep-23	34	129527	900 226001226999	813	929	5700	-
Keeyask Reservoir	GN-05	GL-A	13-Sep-23	35	129528	900 226001226729	529	605	970	7
Keeyask Reservoir	GN-05	GL-A	13-Sep-23	36	129529	900 067000055431	575	660	1100	9
Keeyask Reservoir	GN-07	GL-C	13-Sep-23	37	129530	900 226001226781	332	366	210	3
Keeyask Reservoir	GN-07	GL-C	13-Sep-23	38	118892	900 226001055053	507	579	770	7
Keeyask Reservoir	GN-07	GL-C	13-Sep-23	39	121172	900 226000327573	473	524	740	7
Keeyask Reservoir	GN-07	GL-C	13-Sep-23	40	129531	900 226001230600	390	434	350	5
Keeyask Reservoir	GN-07	GL-C	13-Sep-23	41	129532	900 067000113721	464	528	600	5
Keeyask Reservoir	GN-08	GL-C	13-Sep-23	42	129533	900 067000108616	472	540	570	5
Keeyask Reservoir	GN-08	GL-C	13-Sep-23	43	129534	900 226001226259	492	560	810	8
Keeyask Reservoir	GN-08	GL-C	13-Sep-23	44	117108	900 067000113768	477	545	650	5
Keeyask Reservoir	GN-08	GL-C	13-Sep-23	45	109565	900 226000893801	572	665	1340	10
Keeyask Reservoir	GN-08	GL-C	13-Sep-23	46	125157	900 226001224602	490	556	820	7
Keeyask Reservoir	GN-08	GL-C	13-Sep-23	47	116807	900 226001031270	512	593	860	7
Keeyask Reservoir	GN-08	GL-C	13-Sep-23	48	118049	900 067000059312	481	545	660	7
Keeyask Reservoir	GN-08	GL-C	13-Sep-23	49	129535	900 043000239301	317	365	240	2
Keeyask Reservoir	GN-08	GL-C	13-Sep-23	50	129536	900 067000109318	466	540	600	5
Keeyask Reservoir	GN-08	GL-C	13-Sep-23	51	129537	900 226001230664	729	823	2620	16
Keeyask Reservoir	GN-08	GL-C	13-Sep-23	52	129538	900 067000109315	431	497	470	5
Keeyask Reservoir	GN-08	GL-C	13-Sep-23	53	129539	900 226001225880	570	645	1140	-
Keeyask Reservoir	GN-08	GL-C	13-Sep-23	54	129540	900 067000108678	520	599	800	5
Keeyask Reservoir	GN-08	GL-C	13-Sep-23	55	129541	900 226001226233	560	618	1070	7
Keeyask Reservoir	GN-08	GL-C	13-Sep-23	56	129542	900 067000055177	567	646	1150	9

Table A2-1: Biological and tag information for Lake Sturgeon captured in the Keeyask reservoir, fall 2023 (continued). Red text indicates fish mortality.

Waterbody	Site	Zone	Date	Fish #	Floy-tag #	Pit-tag #	Fork Length (mm)	Total Length (mm)	Weight (g)	Age
Keeyask Reservoir	GN-08	GL-C	13-Sep-23	57	129543	900 226001226723	472	549	640	7
Keeyask Reservoir	GN-08	GL-C	13-Sep-23	58	129544	900 067000113714	469	537	540	5
Keeyask Reservoir	GN-08	GL-C	13-Sep-23	59	129545	900 043000239346	304	359	220	2
Keeyask Reservoir	GN-08	GL-C	13-Sep-23	60	129546	900 067000109319	423	489	450	5
Keeyask Reservoir	GN-08	GL-C	13-Sep-23	61	129547	900 226001226901	340	384	250	3
Keeyask Reservoir	GN-08	GL-C	13-Sep-23	62	-	900 043000238994	322	357	230	2
Keeyask Reservoir	GN-09	GL-C	13-Sep-23	63	129548	900 226001226207	540	604	1040	7
Keeyask Reservoir	GN-09	GL-C	13-Sep-23	64	129549	900 226001226938	585	672	1370	10
Keeyask Reservoir	GN-09	GL-C	13-Sep-23	65	129550	900 226001232308	604	696	1410	10
Keeyask Reservoir	GN-09	GL-C	13-Sep-23	66	125245	900 043000103752	497	546	930	7
Keeyask Reservoir	GN-09	GL-C	13-Sep-23	67	121254	900 226001224838	497	576	760	7
Keeyask Reservoir	GN-09	GL-C	13-Sep-23	68	121165	900 067000059477	500	570	720	7
Keeyask Reservoir	GN-09	GL-C	13-Sep-23	69	129551	900 067000055597	579	663	1100	9
Keeyask Reservoir	GN-09	GL-C	13-Sep-23	70	129552	900 226001224626	601	685	1350	8
Keeyask Reservoir	GN-09	GL-C	13-Sep-23	71	129553	900 226001226920	534	605	950	7
Keeyask Reservoir	GN-09	GL-C	13-Sep-23	72	129554	900 226001226996	476	534	700	6
Keeyask Reservoir	GN-09	GL-C	13-Sep-23	73	129555	900 226001226341	367	415	260	3
Keeyask Reservoir	GN-09	GL-C	13-Sep-23	74	129556	900 043000239090	322	370	220	2
Keeyask Reservoir	GN-09	GL-C	13-Sep-23	75	125318	900 226000767262	454	477	750	8
Keeyask Reservoir	GN-09	GL-C	14-Sep-23	76	107243	900 226000768498	654	740	1880	-
Keeyask Reservoir	GN-09	GL-C	14-Sep-23	77	129557	900 226001230633	647	741	1800	10
Keeyask Reservoir	GN-09	GL-C	14-Sep-23	78	129558	900 226001230699	552	645	1160	7
Keeyask Reservoir	GN-09	GL-C	14-Sep-23	79	129559	900 067000109590	491	568	690	5
Keeyask Reservoir	GN-09	GL-C	14-Sep-23	80	129560	900 226001230382	514	593	910	7
Keeyask Reservoir	GN-09	GL-C	14-Sep-23	81	129561	900 067000107918	446	509	570	5
Keeyask Reservoir	GN-09	GL-C	14-Sep-23	82	129562	900 226001230616	312	350	210	3
Keeyask Reservoir	GN-09	GL-C	14-Sep-23	83	118020	900 067000109309	503	576	750	5
Keeyask Reservoir	GN-08	GL-C	14-Sep-23	84	109637	900 226000893814	578	666	1250	11

Table A2-1: Biological and tag information for Lake Sturgeon captured in the Keeyask reservoir, fall 2023 (continued).

Waterbody	Site	Zone	Date	Fish #	Floy-tag #	Pit-tag #	Fork Length (mm)	Total Length (mm)	Weight (g)	Age
Keeyask Reservoir	GN-08	GL-C	14-Sep-23	85	118007	900 067000112891	459	532	620	5
Keeyask Reservoir	GN-08	GL-C	14-Sep-23	86	129563	900 043000239423	302	345	200	2
Keeyask Reservoir	GN-08	GL-C	14-Sep-23	87	129564	900 226001230331	493	553	790	7
Keeyask Reservoir	GN-08	GL-C	14-Sep-23	88	129565	900 067000112920	490	557	740	5
Keeyask Reservoir	GN-08	GL-C	14-Sep-23	89	129566	900 043000239151	344	387	270	2
Keeyask Reservoir	GN-08	GL-C	14-Sep-23	90	129567	900 226001230625	497	556	900	7
Keeyask Reservoir	GN-08	GL-C	14-Sep-23	91	129568	900 226001230312	514	593	810	7
Keeyask Reservoir	GN-08	GL-C	14-Sep-23	92	129569	900 067000113058	469	527	630	5
Keeyask Reservoir	GN-07	GL-C	14-Sep-23	93	116805	900 067000113723	395	454	320	5
Keeyask Reservoir	GN-07	GL-C	14-Sep-23	94	129570	900 226001230602	732	823	2800	13
Keeyask Reservoir	GN-07	GL-C	14-Sep-23	95	129571	900 043000239209	317	356	220	2
Keeyask Reservoir	GN-07	GL-C	14-Sep-23	96	129572	900 043000103664	565	650	1450	11
Keeyask Reservoir	GN-07	GL-C	14-Sep-23	97	129573	900 067000112566	483	551	690	7
Keeyask Reservoir	GN-11	GL-A	14-Sep-23	98	129574	900 226001230306	597	671	1390	10
Keeyask Reservoir	GN-11	GL-A	14-Sep-23	99	129575	900 226001225235	550	654	1300	10
Keeyask Reservoir	GN-11	GL-A	14-Sep-23	100	129576	900 226001230332	519	591	920	7
Keeyask Reservoir	GN-11	GL-A	14-Sep-23	101	129577	900 226001230352	534	597	990	7
Keeyask Reservoir	GN-11	GL-A	14-Sep-23	102	129578	900 226001224080	514	595	900	7
Keeyask Reservoir	GN-11	GL-A	14-Sep-23	103	129579	900 226001230693	555	627	1190	10
Keeyask Reservoir	GN-05	GL-A	14-Sep-23	104	118311	900 067000111917	488	560	600	7
Keeyask Reservoir	GN-05	GL-A	14-Sep-23	105	129580	900 226001230639	514	579	840	7
Keeyask Reservoir	GN-05	GL-A	14-Sep-23	106	129581	900 226001230344	506	577	820	7
Keeyask Reservoir	GN-05	GL-A	14-Sep-23	107	129582	900 226001230680	410	471	400	4
Keeyask Reservoir	GN-05	GL-A	14-Sep-23	108	129583	900 226001230323	352	393	250	3
Keeyask Reservoir	GN-10	GL-B	14-Sep-23	109	125184	900 226001226070	724	828	2570	15
Keeyask Reservoir	GN-10	GL-B	14-Sep-23	110	116787	900 226001031116	570	647	1410	10
Keeyask Reservoir	GN-10	GL-B	14-Sep-23	111	129584	900 226001230397	815	915	5100	-
Keeyask Reservoir	GN-10	GL-B	14-Sep-23	112	129585	900 226001230686	610	690	1350	8
Keeyask Reservoir	GN-10	GL-B	14-Sep-23	113	129586	900 226001230615	538	611	1080	8

Table A2-1: Biological and tag information for Lake Sturgeon captured in the Keeyask reservoir, fall 2023 (continued).

Waterbody	Site	Zone	Date	Fish #	Floy-tag #	Pit-tag #	Fork Length (mm)	Total Length (mm)	Weight (g)	Age
Keeyask Reservoir	GN-10	GL-B	14-Sep-23	114	129587	900 226001226714	380	436	320	3
Keeyask Reservoir	GN-10	GL-B	14-Sep-23	115	129588	900 226001230378	732	835	3000	13
Keeyask Reservoir	GN-10	GL-B	14-Sep-23	116	129589	900 226001230335	749	841	2510	15
Keeyask Reservoir	GN-10	GL-B	14-Sep-23	117	129590	900 226001230309	513	586	950	7
Keeyask Reservoir	GN-10	GL-B	14-Sep-23	118	129591	900 226001230690	505	573	760	6
Keeyask Reservoir	GN-07	GL-C	16-Sep-23	119	128098	900 067000113722	476	547	650	5
Keeyask Reservoir	GN-07	GL-C	16-Sep-23	120	111015	900 226000768787	613	690	1540	-
Keeyask Reservoir	GN-07	GL-C	16-Sep-23	121	129592	900 226001226993	864	973	3960	-
Keeyask Reservoir	GN-07	GL-C	16-Sep-23	122	129593	900 226001226710	793	885	3440	14
Keeyask Reservoir	GN-07	GL-C	16-Sep-23	123	129594	900 043000102944	603	674	1430	10
Keeyask Reservoir	GN-07	GL-C	16-Sep-23	124	129595	900 226001226908	678	774	2190	10
Keeyask Reservoir	GN-07	GL-C	16-Sep-23	125	129596	900 067000059316	525	597	800	7
Keeyask Reservoir	GN-07	GL-C	16-Sep-23	126	129597	900 226001227613	353	405	250	3
Keeyask Reservoir	GN-07	GL-C	16-Sep-23	127	129598	900 226001226748	500	570	820	7
Keeyask Reservoir	GN-07	GL-C	16-Sep-23	128	-	-	96	103	8	0
Keeyask Reservoir	GN-12	GL-C	16-Sep-23	130	129599	900 067000055091	619	715	1380	9
Keeyask Reservoir	GN-12	GL-C	16-Sep-23	131	129600	900 226001226904	506	577	890	7
Keeyask Reservoir	GN-12	GL-C	16-Sep-23	132	129601	900 226001226791	494	553	730	7
Keeyask Reservoir	GN-13	GL-C	16-Sep-23	133	129602	900 226001225587	760	865	2860	17
Keeyask Reservoir	GN-13	GL-C	16-Sep-23	134	129603	900 226001225045	694	789	2590	13
Keeyask Reservoir	GN-13	GL-C	16-Sep-23	135	129604	900 226001226995	647	736	1600	9
Keeyask Reservoir	GN-13	GL-C	16-Sep-23	136	129605	900 226001031208	574	654	1270	8
Keeyask Reservoir	GN-11	GL-A	16-Sep-23	137	112520	900 226000893717	645	747	1660	-
Keeyask Reservoir	GN-11	GL-A	16-Sep-23	138	111969	900 226000767031	703	790	2450	-
Keeyask Reservoir	GN-11	GL-A	16-Sep-23	139	129606	900 226001226935	721	809	2370	14
Keeyask Reservoir	GN-11	GL-A	16-Sep-23	140	129607	900 067000121566	290	334	170	3
Keeyask Reservoir	GN-11	GL-A	16-Sep-23	141	129608	900 226001227710	645	732	1900	-
Keeyask Reservoir	GN-11	GL-A	16-Sep-23	142	129609	900 226001226734	520	592	990	7

Table A2-1: Biological and tag information for Lake Sturgeon captured in the Keeyask reservoir, fall 2023 (continued).

Waterbody	Site	Zone	Date	Fish #	Floy-tag #	Pit-tag #	Fork Length (mm)	Total Length (mm)	Weight (g)	Age
Keeyask Reservoir	GN-11	GL-A	16-Sep-23	143	129610	900 067000121480	580	663	1380	-
Keeyask Reservoir	GN-11	GL-A	16-Sep-23	144	129611	900 226001226914	504	577	920	7
Keeyask Reservoir	GN-11	GL-A	16-Sep-23	145	129612	900 226001226867	519	581	860	7
Keeyask Reservoir	GN-11	GL-A	16-Sep-23	146	129613	900 067000111963	451	520	580	7
Keeyask Reservoir	GN-11	GL-A	16-Sep-23	147	129614	900 226001230393	463	520	650	6
Keeyask Reservoir	GN-14	GL-A	16-Sep-23	148	129615	900 043000119566	502	573	910	10
Keeyask Reservoir	GN-14	GL-A	16-Sep-23	149	129616	900 043000238910	337	381	250	2
Keeyask Reservoir	GN-14	GL-A	16-Sep-23	150	129617	900 226001225276	377	424	300	3
Keeyask Reservoir	GN-14	GL-A	16-Sep-23	151	129618	900 226001226945	481	548	830	7
Keeyask Reservoir	GN-14	GL-A	16-Sep-23	152	129619	900 226001226747	453	510	500	6
Keeyask Reservoir	GN-14	GL-A	16-Sep-23	153	129620	900 067000058595	550	642	1100	9
Keeyask Reservoir	GN-14	GL-A	16-Sep-23	154	129621	900 226001226973	785	897	3740	-
Keeyask Reservoir	GN-14	GL-A	16-Sep-23	155	129622	900 226001226349	730	825	2810	14
Keeyask Reservoir	GN-10	GL-B	16-Sep-23	156	129624	900 226001226789	650	720	1940	13
Keeyask Reservoir	GN-10	GL-B	16-Sep-23	157	129625	900 226001226756	525	595	970	7
Keeyask Reservoir	GN-10	GL-B	16-Sep-23	158	129626	900 226001225056	684	751	2250	13
Keeyask Reservoir	GN-10	GL-B	16-Sep-23	159	129627	900 226001225838	699	785	2440	13
Keeyask Reservoir	GN-10	GL-B	16-Sep-23	160	129628	900 226001226931	605	673	1590	9
Keeyask Reservoir	GN-10	GL-B	16-Sep-23	161	129629	900 226001230651	580	660	1450	10
Keeyask Reservoir	GN-10	GL-B	16-Sep-23	162	129630	900 226001226737	510	572	910	7
Keeyask Reservoir	GN-10	GL-B	16-Sep-23	163	118888	900 226001658018	487	552	790	7
Keeyask Reservoir	GN-10	GL-B	16-Sep-23	164	129631	900 226001031131	427	488	500	6
Keeyask Reservoir	GN-10	GL-B	16-Sep-23	165	129632	900 226001230623	542	616	1100	9
Keeyask Reservoir	GN-10	GL-B	16-Sep-23	166	129633	900 226001225146	365	417	280	3
Keeyask Reservoir	GN-10	GL-B	16-Sep-23	167	129634	900 226001226751	645	727	2020	13
Keeyask Reservoir	GN-07	GL-C	17-Sep-23	168	129635	900 067000109593	496	559	720	5
Keeyask Reservoir	GN-07	GL-C	17-Sep-23	169	129636	900 226001226994	410	475	500	4
Keeyask Reservoir	GN-07	GL-C	17-Sep-23	170	129637	900 043000239673	353	395	290	2

Table A2-1: Biological and tag information for Lake Sturgeon captured in the Keeyask reservoir, fall 2023 (continued). Red text indicates fish mortality.

Waterbody	Site	Zone	Date	Fish #	Floy-tag #	Pit-tag #	Fork Length (mm)	Total Length (mm)	Weight (g)	Age
Keeyask Reservoir	GN-07	GL-C	17-Sep-23	171	129638	900 043000239352	303	343	230	2
Keeyask Reservoir	GN-07	GL-C	17-Sep-23	172	129639	900 226001226982	340	384	260	3
Keeyask Reservoir	GN-12	GL-C	17-Sep-23	173	129640	900 043000239080	309	353	240	2
Keeyask Reservoir	GN-10	GL-B	17-Sep-23	174	116770	900 226001031179	457	520	600	7
Keeyask Reservoir	GN-10	GL-B	17-Sep-23	175	129641	900 226001226962	655	710	2080	11
Keeyask Reservoir	GN-10	GL-B	17-Sep-23	176	129642	900 226001226787	515	590	900	7
Keeyask Reservoir	GN-14	GL-A	17-Sep-23	177	129643	900 067000112893	435	493	570	5
Keeyask Reservoir	GN-14	GL-A	17-Sep-23	178	129644	900 226001226700	477	545	690	6
Keeyask Reservoir	GN-14	GL-A	17-Sep-23	179	129645	900 067000112944	490	555	710	5
Keeyask Reservoir	GN-14	GL-A	17-Sep-23	180	129646	900 226001226919	595	656	1240	8
Keeyask Reservoir	GN-14	GL-A	17-Sep-23	181	-	900 226001031254	512	573	850	7
Keeyask Reservoir	GN-19	BR-D	18-Sep-23	182	121908	900 226001227375	711	810	2140	-
Keeyask Reservoir	GN-20	BR-D	18-Sep-23	183	125149	900 226001226054	452	525	650	7
Keeyask Reservoir	GN-20	BR-D	18-Sep-23	184	129647	900 226001226989	375	424	280	3
Keeyask Reservoir	GN-20	BR-D	18-Sep-23	185	129648	900 067000113187	465	523	590	5
Keeyask Reservoir	GN-20	BR-D	18-Sep-23	186	129649	900 226001226777	477	543	700	6
Keeyask Reservoir	GN-18	GL-A	18-Sep-23	187	125138	900 226001226850	396	453	500	5
Keeyask Reservoir	GN-18	GL-A	18-Sep-23	188	129650	900 226001226961	367	414	290	3
Keeyask Reservoir	GN-18	GL-A	18-Sep-23	189	129651	900 226001226724	514	587	900	8
Keeyask Reservoir	GN-18	GL-A	18-Sep-23	190	129652	900 226001226924	544	621	1160	9
Keeyask Reservoir	GN-18	GL-A	18-Sep-23	191	129653	900 226001226906	355	400	290	3
Keeyask Reservoir	GN-18	GL-A	18-Sep-23	192	129654	900 226001226917	466	532	640	6
Keeyask Reservoir	GN-18	GL-A	18-Sep-23	193	129655	900 226001232329	460	525	610	6
Keeyask Reservoir	GN-14	GL-A	18-Sep-23	194	129656	900 226001225111	853	970	7380	-
Keeyask Reservoir	GN-14	GL-A	18-Sep-23	195	129657	900 067000059490	501	562	800	7
Keeyask Reservoir	GN-14	GL-A	18-Sep-23	196	129658	900 226001232337	558	634	1180	7
Keeyask Reservoir	GN-17	GL-C	18-Sep-23	197	129659	900 226001226941	480	547	680	6
Keeyask Reservoir	GN-17	GL-C	18-Sep-23	198	129660	900 226001225882	519	599	910	8

Table A2-1: Biological and tag information for Lake Sturgeon captured in the Keeyask reservoir, fall 2023 (continued).

Waterbody	Site	Zone	Date	Fish #	Floy-tag #	Pit-tag #	Fork Length (mm)	Total Length (mm)	Weight (g)	Age
Keeyask Reservoir	GN-17	GL-C	18-Sep-23	199	129661	900 226001226916	521	589	1030	-
Keeyask Reservoir	GN-17	GL-C	18-Sep-23	200	129662	900 067000112911	474	542	660	5
Keeyask Reservoir	GN-17	GL-C	18-Sep-23	201	129663	900 226001226932	510	583	810	7
Keeyask Reservoir	GN-17	GL-C	18-Sep-23	202	129664	900 226001226728	349	395	300	3
Keeyask Reservoir	GN-17	GL-C	18-Sep-23	203	129665	900 226001226753	450	496	600	6
Keeyask Reservoir	GN-19	BR-D	19-Sep-23	204	129666	900 226001230652	459	527	700	7
Keeyask Reservoir	GN-20	BR-D	19-Sep-23	205	129667	900 226001230678	355	409	290	3
Keeyask Reservoir	GN-20	BR-D	19-Sep-23	206	129668	900 226001232380	310	356	200	3
Keeyask Reservoir	GN-20	BR-D	19-Sep-23	207	129669	900 226001226244	330	373	220	2
Keeyask Reservoir	GN-18	GL-A	19-Sep-23	208	129670	900 226001238668	371	423	310	3
Keeyask Reservoir	GN-18	GL-A	19-Sep-23	209	117912	900 067000055127	550	629	910	9
Keeyask Reservoir	GN-18	GL-A	19-Sep-23	210	129671	900 067000055051	584	675	1160	9
Keeyask Reservoir	GN-18	GL-A	19-Sep-23	211	129672	900 067000058787	549	626	960	9
Keeyask Reservoir	GN-18	GL-A	19-Sep-23	212	129673	900 067000109360	473	546	600	5
Keeyask Reservoir	GN-18	GL-A	19-Sep-23	213	129674	900 226001224693	558	648	1010	9
Keeyask Reservoir	GN-18	GL-A	19-Sep-23	214	129675	900 226001226360	475	538	710	7
Keeyask Reservoir	GN-18	GL-A	19-Sep-23	215	129676	900 226001225808	386	435	350	3
Keeyask Reservoir	GN-18	GL-A	19-Sep-23	216	129677	900 226001226223	311	330	200	3
Keeyask Reservoir	GN-18	GL-A	19-Sep-23	217	129678	900 043000238975	301	348	200	2
Keeyask Reservoir	GN-18	GL-A	19-Sep-23	218	129679	900 226001224621	253	285	100	1
Keeyask Reservoir	GN-18	GL-A	19-Sep-23	219	129680	900 226001230601	525	589	990	7
Keeyask Reservoir	GN-18	GL-A	19-Sep-23	220	129681	900 067000109300	445	517	600	5
Keeyask Reservoir	GN-18	GL-A	19-Sep-23	221	118037	900 067000113003	430	485	450	5
Keeyask Reservoir	GN-18	GL-A	19-Sep-23	222	129682	900 226001224686	320	365	220	3
Keeyask Reservoir	GN-18	GL-A	19-Sep-23	223	129683	900 226001224683	460	540	750	7
Keeyask Reservoir	GN-18	GL-A	19-Sep-23	224	129684	900 226001226291	367	421	300	4
Keeyask Reservoir	GN-18	GL-A	19-Sep-23	225	129685	900 067000113016	445	510	500	5
Keeyask Reservoir	GN-18	GL-A	19-Sep-23	226	129686	900 226001226707	547	634	1070	9

Table A2-1: Biological and tag information for Lake Sturgeon captured in the Keeyask reservoir, fall 2023 (continued).

Waterbody	Site	Zone	Date	Fish #	Floy-tag #	Pit-tag #	Fork Length (mm)	Total Length (mm)	Weight (g)	Age
Keeyask Reservoir	GN-18	GL-A	19-Sep-23	227	129687	900 226001226252	470	531	700	7
Keeyask Reservoir	GN-18	GL-A	19-Sep-23	228	-	900 067000121208	205	222	90	1
Keeyask Reservoir	GN-22	GL-B	19-Sep-23	229	113014	900 226000327572	473	544	650	8
Keeyask Reservoir	GN-22	GL-B	19-Sep-23	230	129688	900 067000112990	477	547	660	5
Keeyask Reservoir	GN-22	GL-B	19-Sep-23	231	129689	900 067000112979	456	508	590	5
Keeyask Reservoir	GN-22	GL-B	19-Sep-23	232	129690	900 067000112109	497	574	760	7
Keeyask Reservoir	GN-22	GL-B	19-Sep-23	233	129691	900 226001226304	355	404	290	3
Keeyask Reservoir	GN-22	GL-B	19-Sep-23	234	129692	900 043000239683	315	359	200	2
Keeyask Reservoir	GN-23	GL-C	19-Sep-23	235	125186	900 226001225678	705	811	2690	14
Keeyask Reservoir	GN-23	GL-C	19-Sep-23	236	129693	900 067000108657	457	520	600	5
Keeyask Reservoir	GN-23	GL-C	19-Sep-23	237	125191	900 067000121507	487	553	650	7
Keeyask Reservoir	GN-23	GL-C	19-Sep-23	238	125241	900 226001658814	580	660	1330	8
Keeyask Reservoir	GN-23	GL-C	19-Sep-23	239	129694	900 226001226248	465	530	850	7
Keeyask Reservoir	GN-23	GL-C	19-Sep-23	240	129695	900 226001225898	365	415	340	4
Keeyask Reservoir	GN-23	GL-C	19-Sep-23	241	129696	900 226001224829	493	551	770	7
Keeyask Reservoir	GN-23	GL-C	19-Sep-23	242	129697	900 043000182258	613	698	1500	-
Keeyask Reservoir	GN-23	GL-C	19-Sep-23	243	129698	900 226001226278	510	583	990	6
Keeyask Reservoir	GN-23	GL-C	19-Sep-23	244	129699	900 226001224672	351	404	330	3
Keeyask Reservoir	GN-23	GL-C	19-Sep-23	245	129700	900 226001226702	322	369	250	3
Keeyask Reservoir	GN-23	GL-C	19-Sep-23	246	109730	900 226000152983	690	795	2160	14
Keeyask Reservoir	GN-23	GL-C	19-Sep-23	247	121244	900 226001224845	584	653	1480	10
Keeyask Reservoir	GN-23	GL-C	19-Sep-23	248	129701	900 226001232339	354	397	350	3
Keeyask Reservoir	GN-23	GL-C	19-Sep-23	249	129702	900 226001225730	489	550	830	7
Keeyask Reservoir	GN-23	GL-C	19-Sep-23	250	129703	900 067000055038	582	663	1090	9
Keeyask Reservoir	GN-23	GL-C	19-Sep-23	251	129704	900 067000055039	568	646	1070	9
Keeyask Reservoir	GN-23	GL-C	19-Sep-23	252	125136	900 226001225616	500	582	940	7
Keeyask Reservoir	GN-23	GL-C	19-Sep-23	253	129705	900 226001226959	400	457	450	4
Keeyask Reservoir	GN-23	GL-C	19-Sep-23	254	129706	900 067000112300	486	553	730	7

Table A2-1: Biological and tag information for Lake Sturgeon captured in the Keeyask reservoir, fall 2023 (continued). Red text indicates fish mortality.

Waterbody	Site	Zone	Date	Fish #	Floy-tag #	Pit-tag #	Fork Length (mm)	Total Length (mm)	Weight (g)	Age
Keeyask Reservoir	GN-23	GL-C	19-Sep-23	255	129707	900 043000238902	340	389	280	2
Keeyask Reservoir	GN-23	GL-C	19-Sep-23	256	129708	900 067000059450	483	567	800	7
Keeyask Reservoir	GN-23	GL-C	19-Sep-23	257	129709	900 226001226766	484	559	820	7
Keeyask Reservoir	GN-23	GL-C	19-Sep-23	258	129710	900 226001226828	330	360	250	3
Keeyask Reservoir	GN-23	GL-C	19-Sep-23	259	129711	900 226001232348	570	652	1200	10
Keeyask Reservoir	GN-23	GL-C	19-Sep-23	260	129712	900 226001226282	587	670	1490	10
Keeyask Reservoir	GN-23	GL-C	19-Sep-23	261	129713	900 226001224692	710	808	2440	13
Keeyask Reservoir	GN-23	GL-C	19-Sep-23	262	117113	900 226001031134	500	560	870	7
Keeyask Reservoir	GN-17	GL-C	19-Sep-23	263	129714	900 043000239023	337	382	260	2
Keeyask Reservoir	GN-17	GL-C	19-Sep-23	264	129715	900 043000239045	335	380	250	2
Keeyask Reservoir	GN-17	GL-C	19-Sep-23	265	-	900 043000192396	233	261	100	1
Keeyask Reservoir	GN-18	GL-A	20-Sep-23	266	117102	900 067000113235	428	505	520	5
Keeyask Reservoir	GN-18	GL-A	20-Sep-23	268	129716	900 067000112966	444	503	540	5
Keeyask Reservoir	GN-18	GL-A	20-Sep-23	269	129717	900 226001230662	654	723	1530	13
Keeyask Reservoir	GN-18	GL-A	20-Sep-23	270	129718	900 226001230398	673	780	2310	14
Keeyask Reservoir	GN-18	GL-A	20-Sep-23	271	129719	900 226001230654	670	765	2050	10
Keeyask Reservoir	GN-18	GL-A	20-Sep-23	272	129720	900 226001230319	517	591	950	7
Keeyask Reservoir	GN-18	GL-A	20-Sep-23	273	129721	900 226001230379	336	387	280	4
Keeyask Reservoir	GN-22	GL-B	20-Sep-23	274	129722	900 067000055086	600	690	1320	9
Keeyask Reservoir	GN-22	GL-B	20-Sep-23	275	129723	900 226001230685	745	853	3070	13
Keeyask Reservoir	GN-24	GL-B	20-Sep-23	276	129724	900 226001230364	711	809	2380	13
Keeyask Reservoir	GN-24	GL-B	20-Sep-23	277	129725	900 067000112173	467	532	600	7
Keeyask Reservoir	GN-24	GL-B	20-Sep-23	278	129726	900 226001230665	610	700	1360	8
Keeyask Reservoir	GN-24	GL-B	20-Sep-23	279	129727	900 226001230353	600	680	1540	10
Keeyask Reservoir	GN-24	GL-B	20-Sep-23	280	129728	900 226001230663	605	688	1490	10
Keeyask Reservoir	GN-24	GL-B	20-Sep-23	281	129719	900 067000112885	477	542	610	5
Keeyask Reservoir	GN-23	GL-C	20-Sep-23	282	121217	900 067000112888	445	510	580	5
Keeyask Reservoir	GN-23	GL-C	20-Sep-23	283	125349	900 226001225689	500	578	800	7

Table A2-1: Biological and tag information for Lake Sturgeon captured in the Keeyask reservoir, fall 2023 (continued).

Waterbody	Site	Zone	Date	Fish #	Floy-tag #	Pit-tag #	Fork Length (mm)	Total Length (mm)	Weight (g)	Age
Keeyask Reservoir	GN-23	GL-C	20-Sep-23	284	106461	900 226000767410	550	634	1090	9
Keeyask Reservoir	GN-23	GL-C	20-Sep-23	285	121291	900 067000055529	570	663	1120	9
Keeyask Reservoir	GN-23	GL-C	20-Sep-23	286	129730	900 226001230311	571	628	1240	9
Keeyask Reservoir	GN-23	GL-C	20-Sep-23	287	118331	900 226001658794	485	559	770	6
Keeyask Reservoir	GN-23	GL-C	20-Sep-23	288	129731	900 226001230603	370	415	340	3
Keeyask Reservoir	GN-23	GL-C	20-Sep-23	289	125152	900 226001225521	450	514	590	5
Keeyask Reservoir	GN-23	GL-C	20-Sep-23	290	129732	900 226001230638	510	576	980	7
Keeyask Reservoir	GN-23	GL-C	20-Sep-23	291	129733	900 226001230674	518	537	940	7
Keeyask Reservoir	GN-23	GL-C	20-Sep-23	292	129734	900 067000055558	545	629	1010	9
Keeyask Reservoir	GN-23	GL-C	20-Sep-23	293	129735	900 226001230659	470	525	700	7
Keeyask Reservoir	GN-23	GL-C	20-Sep-23	294	129736	900 226001230619	465	523	650	5
Keeyask Reservoir	GN-23	GL-C	20-Sep-23	295	129737	900 067000112170	446	511	580	7
Keeyask Reservoir	GN-23	GL-C	20-Sep-23	296	129738	900 226001230697	570	662	1170	10
Keeyask Reservoir	GN-23	GL-C	20-Sep-23	297	129739	900 226001230392	495	564	830	7
Keeyask Reservoir	GN-25	GL-C	20-Sep-23	298	116798	900 067000113225	395	447	390	5
Keeyask Reservoir	GN-25	GL-C	20-Sep-23	299	129740	900 043000119482	559	610	1100	10
Keeyask Reservoir	GN-25	GL-C	20-Sep-23	300	129741	900 067000112969	495	565	700	5
Keeyask Reservoir	GN-25	GL-C	20-Sep-23	301	129742	900 226001224650	560	640	1220	9
Keeyask Reservoir	GN-17	GL-C	20-Sep-23	303	129743	900 067000107968	415	473	430	5
Keeyask Reservoir	GN-17	GL-C	20-Sep-23	304	125171	900 226001224529	370	416	360	4
Keeyask Reservoir	GN-17	GL-C	20-Sep-23	305	129744	900 226001230636	733	836	2890	13
Keeyask Reservoir	GN-17	GL-C	20-Sep-23	306	129745	900 043000239606	338	383	240	2

Table A2-2: Biological and tag information for Lake Sturgeon captured in Stephens Lake, fall 2023.

Waterbody	Site	Zone	Date	Fish #	Floy-tag #	Pit-tag #	Fork Length (mm)	Total Length (mm)	Weight (g)	Age
Stephens Lake	GN-05	STL-B	12-Sep-23	1	128750	900 226001227321	535	630	1150	7
Stephens Lake	GN-06	STL-B	12-Sep-23	2	128749	900 043000239451	332	371	300	2
Stephens Lake	GN-04	STL-B	12-Sep-23	3	128748	900 226001224049	760	855	3150	14
Stephens Lake	GN-04	STL-B	12-Sep-23	4	128747	900 226001227318	521	592	1110	6
Stephens Lake	GN-04	STL-B	12-Sep-23	5	128746	900 043000239446	360	406	400	2
Stephens Lake	GN-01	STL-A	13-Sep-23	6	103624	900 226000152957	850	969	-	15
Stephens Lake	GN-01	STL-A	13-Sep-23	7	94881	900 226001227328	740	830	2640	15
Stephens Lake	GN-01	STL-A	13-Sep-23	8	113283	900 067000055210	652	749	1740	9
Stephens Lake	GN-01	STL-A	13-Sep-23	9	118878	900 067000113394	513	587	820	5
Stephens Lake	GN-01	STL-A	13-Sep-23	10	116840	900 067000109321	535	611	980	5
Stephens Lake	GN-02	STL-A	13-Sep-23	11	112904	900 067000055296	630	711	1740	9
Stephens Lake	GN-03	STL-A	13-Sep-23	12	128745	900 226001031187	862	964	-	15
Stephens Lake	GN-03	STL-A	13-Sep-23	13	128744	900 226001227566	780	879	2800	15
Stephens Lake	GN-03	STL-A	13-Sep-23	14	128743	900 067000059085	582	672	1260	7
Stephens Lake	GN-03	STL-A	13-Sep-23	15	128742	900 067000111956	565	659	1290	7
Stephens Lake	GN-03	STL-A	13-Sep-23	16	128741	900 226001227303	622	715	1520	9
Stephens Lake	GN-03	STL-A	13-Sep-23	17	128740	900 226001227559	552	629	1130	5
Stephens Lake	GN-04	STL-B	13-Sep-23	18	128739	900 226001227352	791	881	3600	-
Stephens Lake	GN-04	STL-B	13-Sep-23	19	128738	900 226001227370	360	410	265	3
Stephens Lake	GN-04	STL-B	13-Sep-23	20	128737	900 226001224090	395	455	340	3
Stephens Lake	GN-04	STL-B	13-Sep-23	21	128736	900 043000239104	391	444	370	2
Stephens Lake	GN-04	STL-B	13-Sep-23	22	128735	900 067000121642	512	590	890	7
Stephens Lake	GN-04	STL-B	13-Sep-23	23	128734	900 043000239197	324	362	210	2
Stephens Lake	GN-04	STL-B	13-Sep-23	24	125707	900 226001227362	484	563	860	7
Stephens Lake	GN-04	STL-B	13-Sep-23	25	128733	900 226001227331	345	394	320	3
Stephens Lake	GN-04	STL-B	13-Sep-23	26	128732	900 043000239562	379	439	340	2
Stephens Lake	GN-08	STL-B	13-Sep-23	27	128731	900 226001227562	940	1064	-	-
Stephens Lake	GN-08	STL-B	13-Sep-23	28	111057	900 226000154230	902	1004	-	-

Table A2-2: Biological and tag information for Lake Sturgeon captured in Stephens Lake, fall 2023 (continued).

Waterbody	Site	Zone	Date	Fish #	Floy-tag #	Pit-tag #	Fork Length (mm)	Total Length (mm)	Weight (g)	Age
Stephens Lake	GN-08	STL-B	13-Sep-23	29	128729	900 226001227308	651	749	2000	9
Stephens Lake	GN-08	STL-B	13-Sep-23	30	128726	900 226001227399	346	395	270	3
Stephens Lake	GN-08	STL-B	13-Sep-23	31	-	900 067000121222	210	239	20	1
Stephens Lake	GN-08	STL-B	13-Sep-23	32	-	900 043000182540	214	240	20	1
Stephens Lake	GN-07	STL-B	13-Sep-23	33	117288	900 226001225440	814	935	-	-
Stephens Lake	GN-07	STL-B	13-Sep-23	34	101494	000 001380348318	540	595	975	9
Stephens Lake	GN-11	STL-B	14-Sep-23	35	128725	900 067000113420	505	570	810	5
Stephens Lake	GN-11	STL-B	14-Sep-23	36	128724	900 067000113229	505	565	720	5
Stephens Lake	GN-11	STL-B	14-Sep-23	37	128723	900 067000109615	510	575	770	5
Stephens Lake	GN-11	STL-B	14-Sep-23	38	128722	900 067000108620	529	598	870	5
Stephens Lake	GN-11	STL-B	14-Sep-23	39	-	900 043000182587	230	262	30	1
Stephens Lake	GN-08	STL-B	14-Sep-23	40	128721	900 067000113028	539	616	890	5
Stephens Lake	GN-08	STL-B	14-Sep-23	41	-	900 043000128199	209	234	30	1
Stephens Lake	GN-10	STL-B	14-Sep-23	42	-	900 043000182183	268	307	50	1
Stephens Lake	GN-10	STL-B	14-Sep-23	43	-	000 001380344608	231	256	30	1
Stephens Lake	GN-10	STL-B	14-Sep-23	44	-	900 067000121266	226	257	30	1
Stephens Lake	GN-03	STL-A	14-Sep-23	45	128720	900 226001227344	780	897	3200	14
Stephens Lake	GN-03	STL-A	14-Sep-23	46	128719	900 226001227389	532	609	1160	8
Stephens Lake	GN-03	STL-A	14-Sep-23	47	128718	900 226001227390	562	635	1290	8
Stephens Lake	GN-03	STL-A	14-Sep-23	48	128715	900 067000108612	530	604	840	5
Stephens Lake	GN-03	STL-A	14-Sep-23	49	-	-	100	115	-	0
Stephens Lake	GN-09	STL-A	14-Sep-23	50	117901	900 067000113073	475	556	690	5
Stephens Lake	GN-09	STL-A	14-Sep-23	51	128714	900 226000767725	853	965	-	-
Stephens Lake	GN-09	STL-A	14-Sep-23	52	-	-	109	124	-	0
Stephens Lake	GN-12	STL-B	16-Sep-23	53	125716	900 226001227314	534	602	990	6
Stephens Lake	GN-12	STL-B	16-Sep-23	54	125739	900 067000113252	465	535	570	5
Stephens Lake	GN-12	STL-B	16-Sep-23	55	128713	900 067000059104	584	654	1310	7
Stephens Lake	GN-12	STL-B	16-Sep-23	56	128712	900 226001227312	508	574	810	6

Table A2-2: Biological and tag information for Lake Sturgeon captured in Stephens Lake, fall 2023 (continued). Red text indicates fish mortality.

Waterbody	Site	Zone	Date	Fish #	Floy-tag #	Pit-tag #	Fork Length (mm)	Total Length (mm)	Weight (g)	Age
Stephens Lake	GN-12	STL-B	16-Sep-23	57	128710	900 067000111926	612	698	1480	7
Stephens Lake	GN-12	STL-B	16-Sep-23	58	128708	900 043000238930	367	410	350	2
Stephens Lake	GN-12	STL-B	16-Sep-23	59	128707	900 067000113399	491	559	730	5
Stephens Lake	GN-12	STL-B	16-Sep-23	60	128705	900 067000113065	545	628	1010	5
Stephens Lake	GN-12	STL-B	16-Sep-23	61	128701	900 067000059147	534	606	1080	7
Stephens Lake	GN-12	STL-B	16-Sep-23	62	128706	900 067000109311	513	586	800	5
Stephens Lake	GN-14	STL-B	16-Sep-23	63	125720	900 226001227364	530	603	900	6
Stephens Lake	GN-14	STL-B	16-Sep-23	64	128703	900 067000113736	484	580	660	5
Stephens Lake	GN-14	STL-B	16-Sep-23	65	128711	900 226001227533	677	770	2310	10
Stephens Lake	GN-14	STL-B	16-Sep-23	66	128716	900 067000113265	440	490	460	5
Stephens Lake	GN-14	STL-B	16-Sep-23	67	128717	900 226000767748	365	420	300	3
Stephens Lake	GN-14	STL-B	16-Sep-23	68	-	900 067000121324	230	260	30	1
Stephens Lake	GN-13	STL-A	16-Sep-23	69	74420	900 226001227355	809	922	-	-
Stephens Lake	GN-13	STL-A	16-Sep-23	70	128704	900 226001227392	490	556	910	6
Stephens Lake	GN-13	STL-A	16-Sep-23	71	128676	900 043000239660	364	411	350	2
Stephens Lake	GN-13	STL-A	16-Sep-23	72	128677	900 226001227514	321	359	220	2
Stephens Lake	GN-13	STL-A	16-Sep-23	73	-	900 067000121473	239	272	80	1
Stephens Lake	GN-13	STL-A	16-Sep-23	74	-	900 043000182529	230	260	60	1
Stephens Lake	GN-13	STL-A	16-Sep-23	75	-	-	815	924	-	-
Stephens Lake	GN-15	STL-A	16-Sep-23	76	128678	900 226001227598	771	870	3040	15
Stephens Lake	GN-15	STL-A	16-Sep-23	77	128679	900 226001224099	650	742	1970	9
Stephens Lake	GN-15	STL-A	16-Sep-23	78	128680	900 226001224035	747	849	2750	12
Stephens Lake	GN-15	STL-A	16-Sep-23	79	128681	900 226001227391	766	899	2880	15
Stephens Lake	GN-15	STL-A	16-Sep-23	80	128683	900 226001227367	691	786	2110	14
Stephens Lake	GN-15	STL-A	16-Sep-23	81	128684	900 226001227363	620	700	1520	8
Stephens Lake	GN-15	STL-A	16-Sep-23	82	128685	900 067000108652	510	581	870	5
Stephens Lake	GN-15	STL-A	16-Sep-23	83	-	-	740	835	2690	12
Stephens Lake	GN-16	STL-A	16-Sep-23	84	88495	900 226000629336	664	762	2430	12

Table A2-2: Biological and tag information for Lake Sturgeon captured in Stephens Lake, fall 2023 (continued).

Waterbody	Site	Zone	Date	Fish #	Floy-tag #	Pit-tag #	Fork Length (mm)	Total Length (mm)	Weight (g)	Age
Stephens Lake	GN-16	STL-A	16-Sep-23	85	121223	900 226001224808	620	720	1760	11
Stephens Lake	GN-16	STL-A	16-Sep-23	86	125467	900 226001227361	580	659	1210	9
Stephens Lake	GN-16	STL-A	16-Sep-23	87	128700	900 226001227597	554	622	1350	7
Stephens Lake	GN-17	STL-A	16-Sep-23	88	128699	900 226001227335	740	846	2900	14
Stephens Lake	GN-17	STL-A	16-Sep-23	89	128697	900 067000113773	500	564	710	5
Stephens Lake	GN-12	STL-B	17-Sep-23	90	128696	-	625	716	1640	8
Stephens Lake	GN-21	STL-B	17-Sep-23	91	128695	900 067000055491	641	738	1560	9
Stephens Lake	GN-21	STL-B	17-Sep-23	92	128694	900 043000239494	345	390	230	1
Stephens Lake	GN-21	STL-B	17-Sep-23	93	128693	-	241	270	50	1
Stephens Lake	GN-18	STL-B	17-Sep-23	94	109567	900 067000112415	437	490	400	7
Stephens Lake	GN-22	STL-A	17-Sep-23	95	128691	900 067000109668	474	539	630	5
Stephens Lake	GN-22	STL-A	17-Sep-23	96	116014	900 067000109583	536	594	860	5
Stephens Lake	GN-22	STL-A	17-Sep-23	97	118859	900 226001055084	831	939	-	-
Stephens Lake	GN-22	STL-A	17-Sep-23	98	128690	-	760	860	3020	14
Stephens Lake	GN-22	STL-A	17-Sep-23	99	128689	-	399	463	400	3
Stephens Lake	GN-22	STL-A	17-Sep-23	100	128688	-	419	474	390	3
Stephens Lake	GN-19	STL-A	17-Sep-23	101	128682	-	565	648	1190	8
Stephens Lake	GN-19	STL-A	17-Sep-23	102	128692	-	214	242	50	1
Stephens Lake	GN-20	STL-B	17-Sep-23	103	125405	900 226001224021	571	670	1250	8
Stephens Lake	GN-20	STL-B	17-Sep-23	104	128675	900 067000113402	530	596	850	5
Stephens Lake	GN-20	STL-B	17-Sep-23	105	128674	900 043000239106	380	440	350	2
Stephens Lake	GN-20	STL-B	17-Sep-23	106	128673	900 043000238938	365	415	290	2
Stephens Lake	GN-20	STL-B	17-Sep-23	107	128672	900 043000239297	362	417	300	2
Stephens Lake	GN-23	STL-B	18-Sep-23	108	128671	900 067000055458	626	727	1790	9
Stephens Lake	GN-23	STL-B	18-Sep-23	109	128670	900 226001224232	781	904	-	-
Stephens Lake	GN-23	STL-B	18-Sep-23	110	128669	900 043000239208	334	389	260	2
Stephens Lake	GN-23	STL-B	18-Sep-23	111	128668	900 226001232485	505	573	910	6
Stephens Lake	GN-23	STL-B	18-Sep-23	112	128667	900 226001227332	760	875	2910	13

Table A2-2: Biological and tag information for Lake Sturgeon captured in Stephens Lake, fall 2023 (continued).

Waterbody	Site	Zone	Date	Fish #	Floy-tag #	Pit-tag #	Fork Length (mm)	Total Length (mm)	Weight (g)	Age
Stephens Lake	GN-23	STL-B	18-Sep-23	113	128666	900 226001224214	790	890	-	-
Stephens Lake	GN-12	STL-B	18-Sep-23	114	128665	900 226001224060	765	852	3310	14
Stephens Lake	GN-12	STL-B	18-Sep-23	115	128664	900 226001232401	670	773	1890	9
Stephens Lake	GN-12	STL-B	18-Sep-23	116	128662	900 226001227374	540	602	1040	7
Stephens Lake	GN-12	STL-B	18-Sep-23	117	128661	900 067000113055	514	586	780	5
Stephens Lake	GN-12	STL-B	18-Sep-23	118	128660	900 226001232466	624	694	2680	7
Stephens Lake	GN-12	STL-B	18-Sep-23	119	128659	900 067000113431	523	597	810	5
Stephens Lake	GN-12	STL-B	18-Sep-23	120	113834	900 226000767217	584	657	1150	9
Stephens Lake	GN-12	STL-B	18-Sep-23	121	128658	900 043000239628	348	393	320	2
Stephens Lake	GN-26	STL-B	18-Sep-23	122	128656	900 226001227382	444	515	530	4
Stephens Lake	GN-26	STL-B	18-Sep-23	123	128655	900 043000239335	370	425	290	2
Stephens Lake	GN-26	STL-B	18-Sep-23	124	-	900 043000182109	235	276	100	1
Stephens Lake	GN-26	STL-B	18-Sep-23	125	-	900 043000182551	240	281	100	1
Stephens Lake	GN-20	STL-B	18-Sep-23	126	116066	900 067000113464	-	-	-	5
Stephens Lake	GN-20	STL-B	18-Sep-23	127	128654	900 226001232138	908	1025	-	-
Stephens Lake	GN-24	STL-B	18-Sep-23	128	115788	900 226000152993	1000	1123	-	-
Stephens Lake	GN-24	STL-B	18-Sep-23	129	121990	900 226001226059	786	886	3390	-
Stephens Lake	GN-24	STL-B	18-Sep-23	130	128653	900 067000112924	535	607	870	5
Stephens Lake	GN-25	STL-A	18-Sep-23	131	113024	900 226000327552	760	850	3110	15
Stephens Lake	GN-25	STL-A	18-Sep-23	132	128652	900 226001225378	669	751	1960	8
Stephens Lake	GN-22	STL-A	18-Sep-23	133	125718	900 226001226927	522	591	1000	6
Stephens Lake	GN-22	STL-A	18-Sep-23	134	128651	900 226001232457	343	385	240	3
Stephens Lake	GN-22	STL-A	18-Sep-23	135	128657	900 043000239630	351	397	240	2
Stephens Lake	GN-22	STL-A	18-Sep-23	136	128663	900 043000239360	357	413	290	2
Stephens Lake	GN-22	STL-A	18-Sep-23	137	-	900 043000182544	196	221	50	1
Stephens Lake	GN-27	STL-B	19-Sep-23	138	128624	900 226001227518	643	739	1790	8
Stephens Lake	GN-27	STL-B	19-Sep-23	139	125411	900 226001227512	545	629	1020	10
Stephens Lake	GN-12	STL-B	19-Sep-23	140	117906	900 226001224731	466	524	700	6

Table A2-2: Biological and tag information for Lake Sturgeon captured in Stephens Lake, fall 2023 (continued). Red text indicates fish mortality.

Waterbody	Site	Zone	Date	Fish #	Floy-tag #	Pit-tag #	Fork Length (mm)	Total Length (mm)	Weight (g)	Age
Stephens Lake	GN-12	STL-B	19-Sep-23	141	128623	900 226001227395	515	583	1010	7
Stephens Lake	GN-29	STL-B	19-Sep-23	142	117057	900 226001031113	512	589	810	7
Stephens Lake	GN-29	STL-B	19-Sep-23	143	117672	900 067000059399	536	609	930	7
Stephens Lake	GN-29	STL-B	19-Sep-23	144	128622	900 067000109645	492	571	670	5
Stephens Lake	GN-28	STL-B	19-Sep-23	145	128621	900 226001224096	975	1094	-	-
Stephens Lake	GN-28	STL-B	19-Sep-23	146	128620	900 067000111938	584	667	1310	7
Stephens Lake	GN-30	STL-A	19-Sep-23	147	128619	900 226001227301	654	734	1720	9
Stephens Lake	GN-32	STL-A	19-Sep-23	149	94864	900 226000629142	882	991	-	-
Stephens Lake	GN-32	STL-A	19-Sep-23	150	128617	900 226001232163	748	851	3370	15
Stephens Lake	GN-32	STL-A	19-Sep-23	151	89662	900 226001226947	740	838	3080	16
Stephens Lake	GN-32	STL-A	19-Sep-23	152	128616	900 226001224056	805	904	-	-
Stephens Lake	GN-32	STL-A	19-Sep-23	153	110794	900 226000893916	665	750	1830	8
Stephens Lake	GN-32	STL-A	19-Sep-23	154	-	900 043000182586	217	245	50	1
Stephens Lake	GN-31	STL-A	19-Sep-23	155	109645	900 226000893783	714	809	2410	15
Stephens Lake	GN-33	STL-B	20-Sep-23	156	128614	900 043000239139	340	387	200	2
Stephens Lake	GN-33	STL-B	20-Sep-23	157	128613	900 067000109587	435	489	410	5
Stephens Lake	GN-35	STL-B	20-Sep-23	158	128611	900 067000059303	489	560	780	7
Stephens Lake	GN-35	STL-B	20-Sep-23	159	128609	900 226001232462	518	591	990	6
Stephens Lake	GN-36	STL-B	20-Sep-23	160	-	972 273000041190	222	253	60	1
Stephens Lake	GN-36	STL-B	20-Sep-23	161	128608	900 226001227319	290	325	150	2
Stephens Lake	GN-36	STL-B	20-Sep-23	162	128607	900 043000239636	364	422	230	2
Stephens Lake	GN-34	STL-B	20-Sep-23	163	-	900 043000182580	225	252	50	1
Stephens Lake	GN-34	STL-B	20-Sep-23	164	117572	900 067000113033	480	555	760	5
Stephens Lake	GN-37	STL-B	20-Sep-23	165	82841	900 226000629380	806	894	3510	15
Stephens Lake	GN-37	STL-B	20-Sep-23	166	103269	989 001038119579	810	914	3950	-
Stephens Lake	GN-37	STL-B	20-Sep-23	167	128606	900 226001232434	758	855	3150	13
Stephens Lake	GN-32	STL-A	20-Sep-23	168	-	900 067000109591	489	557	640	5

Table A2-2: Biological and tag information for Lake Sturgeon captured in Stephens Lake, fall 2023 (continued).

Waterbody	Site	Zone	Date	Fish #	Floy-tag #	Pit-tag #	Fork Length (mm)	Total Length (mm)	Weight (g)	Age
Stephens Lake	GN-32	STL-A	20-Sep-23	169	118345	900 226001658987	556	616	1080	6
Stephens Lake	GN-32	STL-A	20-Sep-23	170	128605	900 226001224062	409	479	410	4
Stephens Lake	GN-32	STL-A	20-Sep-23	171	128604	900 226001224012	546	634	1060	7
Stephens Lake	GN-32	STL-A	20-Sep-23	172	128603	900 226001232468	424	481	520	3
Stephens Lake	GN-32	STL-A	20-Sep-23	173	128602	900 226001227387	684	787	1490	8
Stephens Lake	GN-38	STL-A	20-Sep-23	174	128601	900 226001224000	350	400	290	3

APPENDIX 3:
AGEING STRUCTURES OF JUVENILE LAKE STURGEON CAUGHT IN THE KEEYASK STUDY AREA.

Figure A3-1: Ageing structure from a wild juvenile Lake Sturgeon (8-year-old) caught in the Keeyask reservoir. 95
Figure A3-2: Ageing structure from a hatchery-reared juvenile Lake Sturgeon caught in Stephens Lake (2-year-old).....96

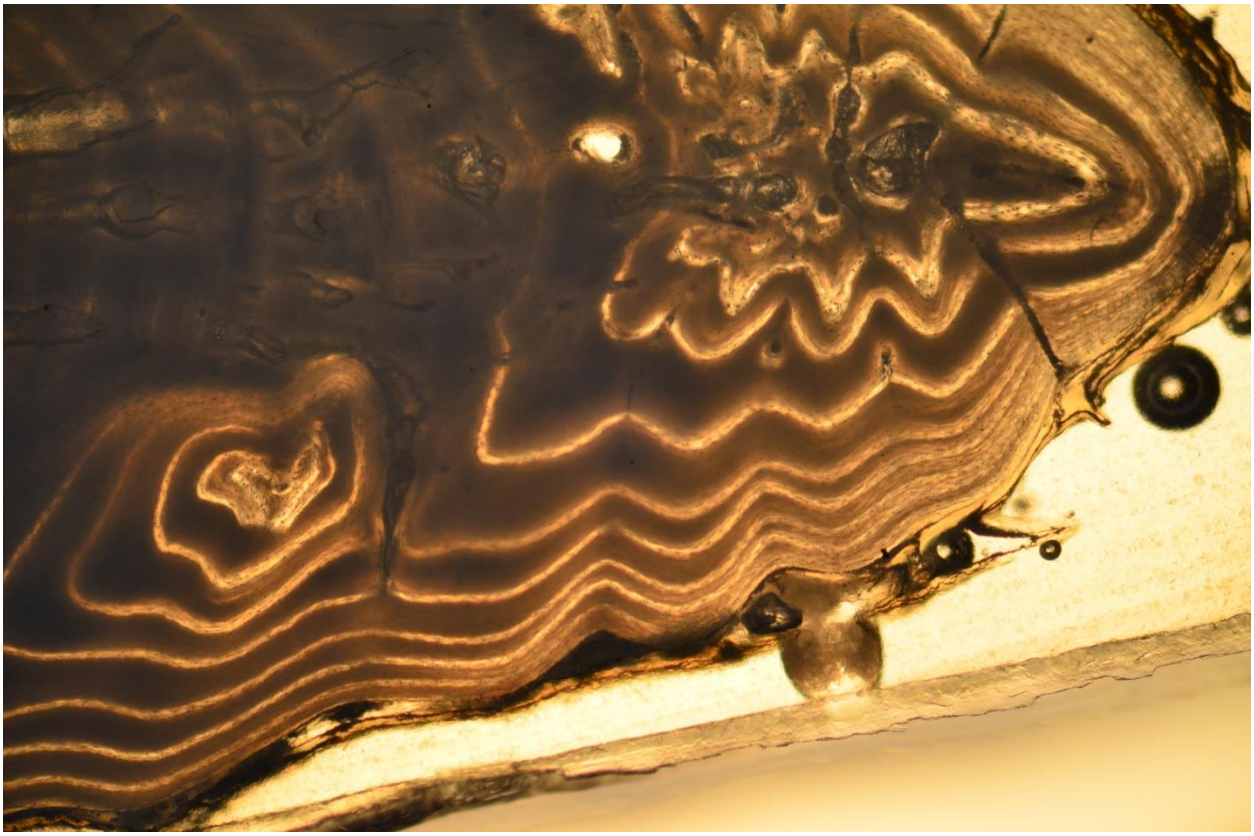

Figure A3-1: Ageing structure from a wild juvenile Lake Sturgeon (8-year-old) caught in the Keeyask reservoir.

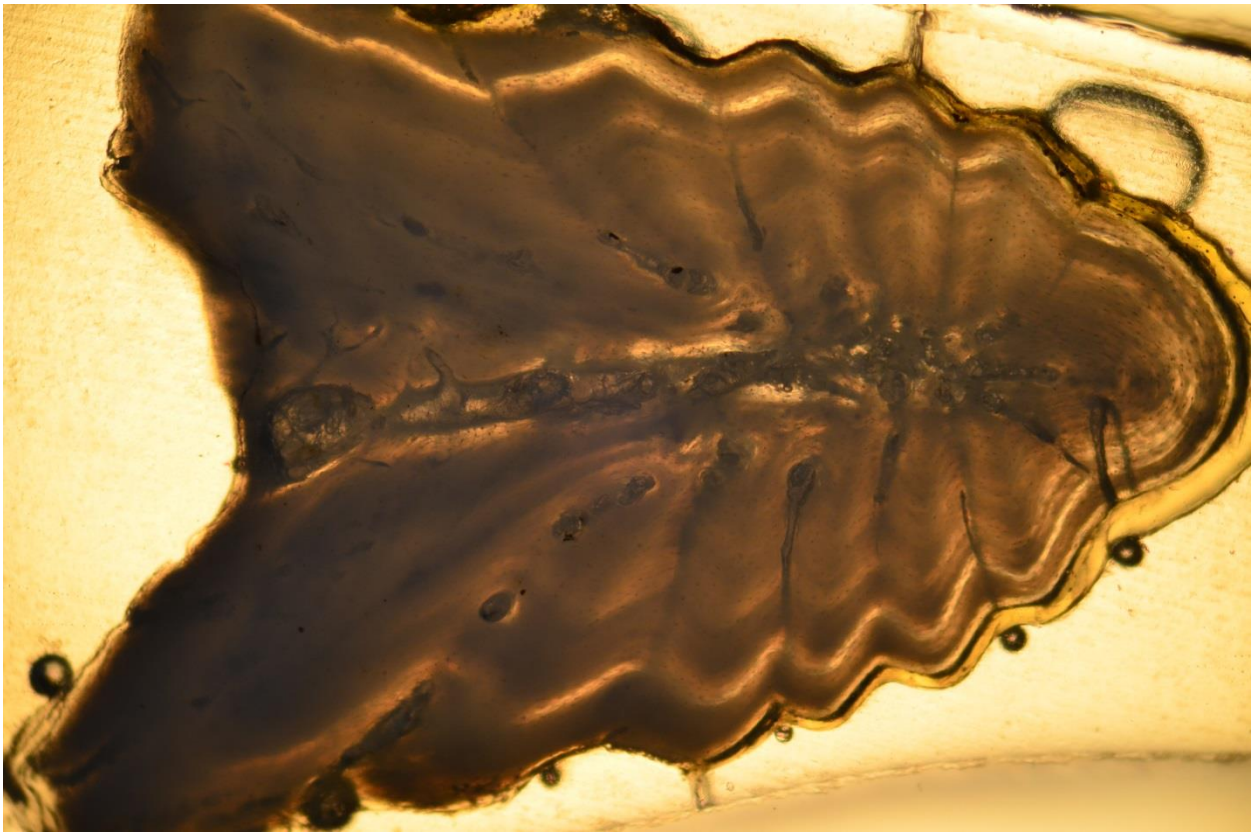

Figure A3-2: Ageing structure from a hatchery-reared juvenile Lake Sturgeon caught in Stephens Lake (2-year-old). Agers noted the presence of a weak first annulus and false annuli typically observed in hatchery-reared Lake Sturgeon.

APPENDIX 4: WILD AND HATCHERY LAKE STURGEON RECAPTURE DATA, FALL 2023.

Table A4-1: Original capture date and biological data for wild Lake Sturgeon recaptured in gill nets, fall 2023. 98

Table A4-2: Original release date and biological data for hatchery-reared Lake Sturgeon captured in gill nets set in the Keeyask reservoir, fall 2023. 108

Table A4-3: Original release date and biological data for hatchery-reared Lake Sturgeon captured in gill nets set in Stephens Lake, fall 2023. 118

Table A4-1: Original capture date and biological data for wild Lake Sturgeon recaptured in gill nets, fall 2023.

Location	Floy-tag #	Pit-tag No.	Zone	Date	Fork Length (mm)	Total Length (mm)	Weight (g)	Age	Distance (km)	Days Between Capture
Keeyask Reservoir	121309	900 226001224782	GL-A	12-Sep-23	510	577	890	7	0.95	721
Keeyask Reservoir	121309	900 226001224782	GL-A	21-Sep-21	446	506	600	5		
					64	**71**	**290**			
Keeyask Reservoir	109563	900 226000893903	GL-A	12-Sep-23	600	679	1350	9	7.41	2191
Keeyask Reservoir	109563	900 226000893903	GL-C	16-Sep-21	565	635	1275	7		
Gull Lake	109563	900 226000893903	GL-C	12-Sep-17	448	506	600	3		
					152	**173**	**750**			
Keeyask Reservoir	118048	900 226001658941	GL-B	12-Sep-23	905	1040	11800	-	1.01	1088
Gull Lake	118048	900 226001658941	GL-B	19-Sep-20	800	916	4200	-		
					105	**124**	**7600**			
Keeyask Reservoir	122559	900 226001227371	GL-B	12-Sep-23	766	862	3550	-	5.69	392
Keeyask Reservoir	122559	900 226001227371	GL-C	16-Aug-22	738	835	2840	-		
					28	**27**	**710**			
Keeyask Reservoir	116766	900 226001031213	GL-A	13-Sep-23	478	562	580	6	6.61	1462
Gull Lake	116766	900 226001031213	GL-C	12-Sep-19	311	370	175	2		
					167	**192**	**405**			
Keeyask Reservoir	121290	900 226001224755	GL-A	13-Sep-23	551	616	1170	8	8.06	723
Keeyask Reservoir	121290	900 226001224755	GL-C	20-Sep-21	514	575	1000	6		
					37	**41**	**170**			
Keeyask Reservoir	118892	900 226001055053	GL-C	13-Sep-23	507	579	770	7	0.79	1091
Gull Lake	118892	900 226001055053	GL-C	17-Sep-20	418	478	400	4		
					89	**101**	**370**			
Keeyask Reservoir	121172	900 226000327573	GL-C	13-Sep-23	473	524	740	7	3.12	1824
Keeyask Reservoir	121172	900 226000327573	GL-C	15-Sep-21	427	487	825	5		
Gull Lake	113816	900 226000327573	GL-B	15-Sep-18	325	374	200	2		
					148	**150**	**540**			
Keeyask Reservoir	109565	900 226000893801	GL-C	13-Sep-23	572	665	1340	10	0.39	2192
Gull Lake	109565	900 226000893801	GL-C	12-Sep-17	481	559	800	4		
					91	**106**	**540**			

Table A4-1: Original capture date and biological data for wild Lake Sturgeon recaptured in gill nets, fall 2023 (continued).

Location	Floy-tag #	Pit-tag No.	Zone	Date	Fork Length (mm)	Total Length (mm)	Weight (g)	Age	Distance (km)	Days Between Capture
Keeyask Reservoir	125157	900 226001224602	GL-C	13-Sep-23	490	556	820	7	0.40	355
Keeyask Reservoir	125157	900 226001224602	GL-C	23-Sep-22	469	525	600	6		
					21	**31**	**220**			
Keeyask Reservoir	116807	900 226001031270	GL-C	13-Sep-23	512	593	860	7	1.65	1459
Gull Lake	116807	900 226001031270	GL-C	15-Sep-19	355	412	300	3		
					157	**181**	**560**			
Keeyask Reservoir	129539	900 226001225880	GL-C	13-Sep-23	570	645	1140	-	0.24	75
Keeyask Reservoir	128095	900 226001225880	GL-C	30-Jun-23	580	660	1247	-		
					-10	**-15**	**-107**			
Keeyask Reservoir	125245	900 043000103752	GL-C	13-Sep-23	497	546	930	7	2.09	1827
Keeyask Reservoir	125245	900 043000103752	GL-C	21-Sep-22	480	525	775	6		
Gull Lake	-	900 043000103752	GL-C	12-Sep-18	282	309	150	2		
					215	**237**	**780**			
Keeyask Reservoir	121254	900 226001224838	GL-C	13-Sep-23	497	576	760	7	1.25	726
Keeyask Reservoir	121254	900 226001224838	GL-C	17-Sep-21	435	501	500	5		
					62	**75**	**260**			
Keeyask Reservoir	125318	900 226000767262	GL-C	13-Sep-23	454	477	750	8	4.46	1824
Keeyask Reservoir	125318	900 226000767262	GL-C	24-Sep-22	430	460	500	7		
Gull Lake	113818	900 226000767262	GL-B	15-Sep-18	351	386	250	3		
					103	**91**	**500**			
Keeyask Reservoir	107243	900 226000768498	GL-C	14-Sep-23	654	740	1880	-	21.16	2664
Gull Lake	107243	900 226000768498	BR-D	29-May-16	395	450	-	-		
					259	**290**	**-**			
Keeyask Reservoir	109637	900 226000893814	GL-C	14-Sep-23	578	666	1250	11	4.07	2191
Gull Lake	109637	900 226000893814	GL-B	14-Sep-17	470	541	600	5		
					108	**125**	**650**			
Keeyask Reservoir	129572	900 043000103664	GL-C	14-Sep-23	565	650	1450	11	0.79	3288
Gull Lake	-	900 043000103664	GL-C	13-Sep-14	292	334	175	2		
					273	**316**	**1275**			

Table A4-1: Original capture date and biological data for wild Lake Sturgeon recaptured in gill nets, fall 2023 (continued).

Location	Floy-tag #	Pit-tag No.	Zone	Date	Fork Length (mm)	Total Length (mm)	Weight (g)	Age	Distance (km)	Days Between Capture
Keeyask Reservoir	125184	900 226001226070	GL-B	14-Sep-23	724	828	2570	15	4.10	361
Keeyask Reservoir	125184	900 226001226070	GL-A	18-Sep-22	720	826	2600	14		
					4	**2**	**-30**			
Keeyask Reservoir	116787	900 226001031116	GL-C	20-Sep-23	-	-	-	10	0.02	1468
Keeyask Reservoir	116787	900 226001031116	GL-B	14-Sep-23	570	647	1410	10		
Gull Lake	116787	900 226001031116	GL-C	13-Sep-19	460	527	700	6		
					110	**120**	**710**			
Keeyask Reservoir	111015	900 226000768787	GL-C	16-Sep-23	613	690	1540	-	2.97	2550
Gull Lake	111015	900 226000768787	GL-B	22-Sep-16	418	470	580	-		
					195	**220**	**960**			
Keeyask Reservoir	129605	900 226001031208	GL-C	16-Sep-23	574	654	1270	8	2.61	1466
Keeyask Reservoir	116752	900 226001031208	GL-C	21-Sep-22	555	630	1125	7		
Gull Lake	116752	900 226001031208	GL-C	11-Sep-19	418	471	475	4		
					156	**183**	**795**			
Keeyask Reservoir	112520	900 226000893717	GL-A	16-Sep-23	645	747	1660	-	7.49	2556
Gull Lake	112520	900 226000893717	GL-C	16-Sep-16	416	484	580	-		
					229	**263**	**1080**			
Keeyask Reservoir	111969	900 226000767031	GL-A	16-Sep-23	703	790	2450	-	1.05	1926
Gull Lake	111969	900 226000767031	GL-A	08-Jun-18	628	716	1950	-		
					75	**74**	**500**			
Keeyask Reservoir	129607	900 067000121566	GL-A	16-Sep-23	290	334	170	3	0.39	364
Keeyask Reservoir	-	900 067000121566	GL-A	17-Sep-22	252	292	75	2		
					38	**42**	**95**			
Keeyask Reservoir	129610	900 067000121480	GL-A	16-Sep-23	580	663	1380	-	6.25	2557
Gull Lake	-	900 067000121480	GL-B	15-Sep-16	240	276	84	-		
					340	**387**	**1296**			
Keeyask Reservoir	118888	900 226001658018	GL-B	16-Sep-23	487	552	790	7	2.38	1094
Gull Lake	118888	900 226001658018	GL-C	17-Sep-20	407	462	450	4		
					80	**90**	**340**			

Table A4-1: Original capture date and biological data for wild Lake Sturgeon recaptured in gill nets, fall 2023 (continued). Red text indicates fish mortality.

Location	Floy-tag #	Pit-tag No.	Zone	Date	Fork Length (mm)	Total Length (mm)	Weight (g)	Age	Distance (km)	Days Between Capture
Keeyask Reservoir	129631	900 226001031131	GL-B	16-Sep-23	427	488	500	6	0.01	1459
Gull Lake	116846	900 226001031131	GL-B	18-Sep-19	295	333	100	2		
					132	**155**	**400**			
Keeyask Reservoir	116770	900 226001031179	GL-B	17-Sep-23	457	520	600	7	0.58	1466
Gull Lake	116770	900 226001031179	GL-B	21-Sep-20	389	445	450	4		
Gull Lake	116770	900 226001031179	GL-B	12-Sep-19	340	394	300	3		
					117	**126**	**300**			
Keeyask Reservoir	-	900 226001031254	GL-A	17-Sep-23	512	573	850	7	2.90	1466
Gull Lake	116779	900 226001031254	GL-B	12-Sep-19	375	475	350	3		
					137	**98**	**500**			
Keeyask Reservoir	121908	900 226001227375	BR-D	18-Sep-23	711	810	2140	-	1.31	451
Keeyask Reservoir	121908	900 226001227375	BR-D	24-Jun-22	733	827	2400			
					-22	**-17**	**-260**			
Keeyask Reservoir	125149	900 226001226054	BR-D	18-Sep-23	452	525	650	7	1.78	367
Keeyask Reservoir	125149	900 226001226054	BR-D	16-Sep-22	440	512	550	6		
					12	**13**	**100**			
Keeyask Reservoir	125138	900 226001226850	GL-A	18-Sep-23	396	453	500	5	6.75	366
Keeyask Reservoir	125138	900 226001226850	GL-B	17-Sep-22	362	415	250	4		
					34	**38**	**250**			
Keeyask Reservoir	113014	900 226000327572	GL-B	19-Sep-23	473	544	650	8	2.41	1833
Gull Lake	113014	900 226000327572	GL-B	12-Sep-18	354	413	400	3		
					119	**131**	**250**			
Keeyask Reservoir	125186	900 226001225678	GL-C	19-Sep-23	705	811	2690	14	0.63	365
Keeyask Reservoir	125186	900 226001224054	GL-C	19-Sep-22	718	814	2600	13		
					-13	**-3**	**90**			
Keeyask Reservoir	125191	900 067000121507	GL-C	19-Sep-23	487	553	650	7	1.93	1835
Keeyask Reservoir	125191	900 067000121507	GL-A	18-Sep-22	462	531	550	6		
Gull Lake	-	900 067000121507	GL-C	10-Sep-18	296	336	200	2		
					191	**217**	**450**			

Table A4-1: Original capture date and biological data for wild Lake Sturgeon recaptured in gill nets, fall 2023 (continued). Red text indicates fish mortality.

Location	Floy-tag #	Pit-tag No.	Zone	Date	Fork Length (mm)	Total Length (mm)	Weight (g)	Age	Distance (km)	Days Between Capture
Keeyask Reservoir	125241	900 226001658814	GL-C	19-Sep-23	580	660	1330	8	1.43	1095
Keeyask Reservoir	125241	900 226001658814	GL-C	21-Sep-22	551	630	1100	6		
Gull Lake	118074	900 226001658814	GL-C	19-Sep-20	496	570	975	5		
					84	**90**	**355**			
Keeyask Reservoir	129697	900 043000182258	GL-C	19-Sep-23	613	698	1500	-	2.51	810
Keeyask Reservoir	119261	900 043000182258	BR-D	1-Jul-21	531	610	1350	-		
					82	**88**	**150**			
Keeyask Reservoir	109730	900 226000152983	GL-C	19-Sep-23	690	795	2160	14	2.13	2192
Gull Lake	109730	900 226000152983	GL-B	18-Sep-17	613	714	1600	8		
					77	**81**	**560**			
Keeyask Reservoir	121244	900 226001224845	GL-C	19-Sep-23	584	653	1480	10	2.01	731
Keeyask Reservoir	121244	900 226001224845	GL-C	18-Sep-21	574	645	1250	8		
					10	**8**	**230**			
Keeyask Reservoir	125136	900 226001225616	GL-C	19-Sep-23	500	582	940	7	2.51	367
Keeyask Reservoir	125136	900 226001225616	GL-B	17-Sep-22	466	542	675	6		
					34	**40**	**265**			
Keeyask Reservoir	117113	900 226001031134	GL-C	19-Sep-23	500	560	870	7	7.00	1461
Gull Lake	117113	900 226001031134	GL-A	20-Sep-19	-	-	-	3		
Gull Lake	117113	900 226001031134	GL-A	19-Sep-19	325	370	200	3		
					175	**190**	**670**			
Keeyask Reservoir	125349	900 226001225689	GL-C	20-Sep-23	500	578	800	7	2.50	361
Keeyask Reservoir	125349	900 226001225689	GL-C	24-Sep-22	490	565	700	6		
					10	**13**	**100**			
Keeyask Reservoir	106461	900 226000767410	GL-C	20-Sep-23	550	634	1090	9	2.37	2202
Gull Lake	106461	900 226000767410	GL-B	9-Sep-17	361	411	450	3		
					189	**223**	**640**			
Keeyask Reservoir	118331	900 226001658794	GL-C	20-Sep-23	485	559	770	6	1.97	1091
Gull Lake	118331	900 226001658794	GL-B	24-Sep-20	375	428	375	3		
					110	**131**	**395**			

Table A4-1: Original capture date and biological data for wild Lake Sturgeon recaptured in gill nets, fall 2023 (continued).

Location	Floy-tag #	Pit-tag No.	Zone	Date	Fork Length (mm)	Total Length (mm)	Weight (g)	Age	Distance (km)	Days Between Capture
Keeyask Reservoir	125152	900 226001225521	GL-C	20-Sep-23	450	514	590	5	2.50	362
Keeyask Reservoir	125152	900 226001225521	GL-C	23-Sep-22	420	478	350	4		
					30	**36**	**240**			
Keeyask Reservoir	125171	900 226001224529	GL-C	20-Sep-23	370	416	360	4	1.83	364
Keeyask Reservoir	125171	900 226001224529	GL-C	21-Sep-22	320	361	150	3		
					50	**55**	**210**			
Stephens Lake	103624	900 226000152957	STL-A	13-Sep-23	850	969	-	-	0.57	1923
Stephens Lake	103624	900 226000152957	STL-A	08-Jun-18	764	870	4100	-		
					86	**99**	**-**			
Stephens Lake	94881	900 226001227328	STL-A	19-Sep-23	-	-	-	15	12.87	4378
Stephens Lake	94881	900 226001227328	STL-A	13-Sep-23	740	830	2640	15		
Gull Lake	94881	-	GL-C	24-Sep-11	414	465	400	3		
					326	**365**	**2240**			
Stephens Lake	128745	900 226001031187	STL-A	13-Sep-23	862	964	-	15	19.02	1454
Gull Lake	117143	900 226001031187	GL-A	20-Sep-19	780	878	3400	11		
					82	**86**	**-**			
Stephens Lake	128735	900 067000121642	STL-A	20-Sep-23	-	-	-	7	14.40	2198
Stephens Lake	128735	900 067000121642	STL-B	13-Sep-23	512	590	890	7		
Gull Lake	-	900 067000121642	GL-B	13-Sep-17	239	271	100	1		
					273	**319**	**790**			
Stephens Lake	125707	900 226001227362	STL-B	13-Sep-23	**484**	**563**	**860**	7	0.24	363
Stephens Lake	125707	900 226001227362	STL-B	15-Sep-22	453	522	760	6		
					31	**41**	**100**			
Stephens Lake	111057	900 226000154230	STL-B	13-Sep-23	902	1004	-	-	2.57	2192
Stephens Lake	111057	900 226000154230	STL-B	09-Jun-22	905	1000	4536	-		
Stephens Lake	111057	900 226000154230	STL-A	12-Sep-17	851	946	5425	-		
					51	**58**	**-**			
Stephens Lake	117288	900 226001225440	STL-B	13-Sep-23	814	935	-	-	5.27	820
Stephens Lake	117288	900 226001225440	STL-A	15-Jun-21	797	910	4800	-		
					17	**25**	**-**			

Table A4-1: Original capture date and biological data for wild Lake Sturgeon recaptured in gill nets, fall 2023 (continued).

Location	Floy-tag #	Pit-tag No.	Zone	Date	Fork Length (mm)	Total Length (mm)	Weight (g)	Age	Distance (km)	Days Between Capture
Stephens Lake	125716	900 226001227314	STL-B	16-Sep-23	534	602	990	6	1.45	365
Stephens Lake	125716	900 226001227314	STL-B	16-Sep-22	495	550	900	5		
					39	**52**	**90**			
Stephens Lake	125720	900 226001227364	STL-B	16-Sep-23	530	603	900	6	1.07	365
Stephens Lake	125720	900 226001227364	STL-B	16-Sep-22	480	552	750	5		
					50	**51**	**150**			
Stephens Lake	74420	900 226001227355	STL-A	16-Sep-23	809	922	-	-	0.83	4470
Stephens Lake	74420	-	STL-B	21-Jun-11	451	519	800	-		
					358	**403**	**-**			
Stephens Lake	88495	900 226000629336	STL-A	16-Sep-23	664	762	2430	12	1.19	3281
Stephens Lake	88495	900 226000629336	STL-A	01-Oct-15	409	461	725	4		
Stephens Lake	88495	900 226000629336	STL-A	22-Sep-14	374	431	375	3		
					290	**331**	**2055**			
Stephens Lake	121223	900 226001224808	STL-A	16-Sep-23	620	720	1760	11	12.22	729
Keeyask Reservoir	121223	900 226001224808	GL-C	17-Sep-21	614	698	1650	9		
					6	**22**	**110**			
Stephens Lake	125467	900 226001227361	STL-A	16-Sep-23	580	659	1210	9	1.70	358
Stephens Lake	125467	900 226001227361	STL-B	23-Sep-22	555	634	1050	8		
					25	**25**	**160**			
Stephens Lake	118859	900 226001055084	STL-A	17-Sep-23	831	939	-	15	0.89	1092
Stephens Lake	118859	900 226001055084	STL-A	6-Jun-21	817	910	4000	13		
Stephens Lake	118859	900 226001055084	STL-B	20-Sep-20	805	910	3625	12		
					26	**29**	**-**			
Stephens Lake	125405	900 226001224021	STL-B	17-Sep-23	571	670	1250	8	0.26	364
Stephens Lake	125405	900 226001224021	STL-B	18-Sep-22	529	599	1000	7		
					42	**71**	**250**			
Stephens Lake	113834	900 226000767217	STL-B	18-Sep-23	584	657	1150	9	16.05	1827
Gull Lake	113834	900 226000767217	GL-B	17-Sep-18	453	512	500	4		
					131	**145**	**650**			

Table A4-1: Original capture date and biological data for wild Lake Sturgeon recaptured in gill nets, fall 2023 (continued).

Location	Floy-tag #	Pit-tag No.	Zone	Date	Fork Length (mm)	Total Length (mm)	Weight (g)	Age	Distance (km)	Days Between Capture
Stephens Lake	115788	900 226000152993	STL-B	18-Sep-23	1000	1123	-	-	3.87	1932
Stephens Lake	115788	900 226000152993	GR-A	04-Jun-18	920	1040	6260	-		
					80	**83**	**-**			
Stephens Lake	121990	900 226001226059	STL-B	18-Sep-23	786	886	3390	-	1.52	469
Stephens Lake	121990	900 226001226059	STL-B	06-Jun-22	737	836	2268	-		
					49	**50**	**1122**			
Stephens Lake	113024	900 226000327552	STL-A	18-Sep-23	760	850	3110	15	15.20	1831
Gull Lake	113024	900 226000327552	GL-B	13-Sep-18	677	764	2400	10		
					83	**86**	**710**			
Stephens Lake	125718	900 226001226927	STL-A	18-Sep-23	522	591	1000	6	0.37	367
Stephens Lake	125718	900 226001226927	STL-B	16-Sep-22	477	540	800	5		
					45	**51**	**200**			
Stephens Lake	125411	900 226001227512	STL-B	19-Sep-23	545	629	1020	10	1.30	366
Stephens Lake	125411	900 226001227512	STL-B	18-Sep-22	544	619	1100	9		
					1	**10**	**-80**			
Stephens Lake	117906	900 226001224731	STL-B	19-Sep-23	466	524	700	6	19.42	726
Keeyask Reservoir	117906	900 226001224731	GL-A	23-Sep-21	349	400	300	4		
					117	**124**	**400**			
Stephens Lake	117057	900 226001031113	STL-B	19-Sep-23	512	589	810	7	15.56	1467
Gull Lake	117057	900 226001031113	GL-B	13-Sep-19	346	397	250	3		
					166	**192**	**560**			
Stephens Lake	128618	900 226000629142	STL-A	19-Sep-23	882	991	-	-	10.70	4380
Gull Lake	94864	900 226000629142	GL-C	14-Jun-16	780	886	4763	-		
Gull Lake	94864	900 226000629142	GL-B	03-Jul-14	724	809	3550	-		
Gull Lake	94864	-	GL-C	22-Sep-11	650	741	2000	-		
					232	**250**	**-**			
Stephens Lake	89662	900 226001226947	STL-A	19-Sep-23	740	838	3080	16	11.80	4744
Gull Lake	89662	-	GL-C	23-Sep-10	301	340	225	3		
					439	**498**	**2855**			

Table A4-1: Original capture date and biological data for wild Lake Sturgeon recaptured in gill nets, fall 2023 (continued).

Location	Floy-tag #	Pit-tag No.	Zone	Date	Fork Length (mm)	Total Length (mm)	Weight (g)	Age	Distance (km)	Days Between Capture
Stephens Lake	110794	900 226000893916	STL-A	19-Sep-23	665	750	1830	8	1.32	2194
Stephens Lake	110794	900 226000893916	STL-A	19-Sep-21	573	642	1700	6		
Stephens Lake	110794	900 226000893916	STL-A	14-Sep-19	471	531	700	6		
Stephens Lake	110794	900 226000893916	STL-B	16-Sep-17	365	414	325	2		
					300	**336**	**1505**			
Stephens Lake	109645	900 226000893783	STL-A	19-Sep-23	714	809	2410	15	15.09	2195
Gull Lake	109645	900 226000893783	GL-B	15-Sep-17	622	710	1700	9		
					92	**99**	**710**			
Stephens Lake	82841	900 226000629380	STL-B	20-Sep-23	806	894	3510	15	14.37	3294
Gull Lake	82841	900 226000629380	GL-B	16-Sep-15	594	661	1580	7		
Gull Lake	82841	900 226000629380	GL-B	13-Sep-14	548	608	1075	6		
					258	**286**	**2435**			
Stephens Lake	103269	989 001038119579	STL-B	20-Sep-23	810	914	3950	-	-	3674
Gull Lake	103269	-	-	29-Aug-13	483	555	830	-		
					327	**359**	**3120**			
Stephens Lake	118345	900 226001658987	STL-A	20-Sep-23	556	616	1080	6	11.66	1091
Gull Lake	118345	900 226001658987	GL-C	24-Sep-20	380	424	375	3		
					176	**192**	**705**			
Stephens Lake	128729	900 226001227308	STL-B	16-Sep-23	-	-	-	9	0.80	3
Stephens Lake	128729	900 226001227308	STL-B	14-Sep-23	-	-	-	9		
Stephens Lake	128729	900 226001227308	STL-B	13-Sep-23	651	749	2000	9		
					-	**-**	**-**			
Stephens Lake	-	900 067000121222	STL-B	18-Sep-23	-	-	-	1	0.94	5
Stephens Lake	-	900 067000121222	STL-B	13-Sep-23	210	239	20	1		
					-	**-**	**-**			
Stephens Lake	-	900 043000182199	STL-B	18-Sep-23	-	-	-	1	0.12	4
Stephens Lake	-	900 043000182199	STL-B	14-Sep-23	209	234	30	1		
					-	**-**	**-**			

Table A4-1: Original capture date and biological data for wild Lake Sturgeon recaptured in gill nets, fall 2023 (continued).

Location	Floy-tag #	Pit-tag No.	Zone	Date	Fork Length (mm)	Total Length (mm)	Weight (g)	Age	Distance (km)	Days Between Capture
Stephens Lake	128688	-	STL-B	18-Sep-23	-	-	-	3	0.73	1
Stephens Lake	128688	-	STL-A	17-Sep-23	419	474	390	3		
					-	-	-			
Stephens Lake	128662	-	STL-B	19-Sep-23				7	3.57	1
Stephens Lake	128662	-	STL-B	18-Sep-23	540	602	1040	7		
					-	-	-			
Stephens Lake	128656	900 226001227382	STL-A	20-Sep-23	-	-	-	4	0.99	2
Stephens Lake	128656	900 226001227382	STL-B	19-Sep-23	-	-	-	4		
Stephens Lake	128656	900 226001227382	STL-B	18-Sep-23	444	515	530	4		
					-	-	-			
Stephens Lake	128710	-	STL-B	20-Sep-23	-	-	-	7	0.38	4
Stephens Lake	128710	-	STL-B	16-Sep-23	612	698	1480	7		
					-	-	-			
Stephens Lake	128689	-	STL-B	20-Sep-23				3	0.33	3
Stephens Lake	128689	-	STL-A	17-Sep-23	399	463	400	3		
					-	-	-			

Table A4-2: Original release date and biological data for hatchery-reared Lake Sturgeon captured in gill nets set in the Keeyask reservoir, fall 2023.

Location	Floy-tag #	Pit-tag No.	Zone	Date	Fork Length (mm)	Total Length (mm)	Weight (g)	Age	Distance (km)	Days Between Capture
Keeyask Reservoir	129522	900 043000239253	GL-A	12-Sep-23	336	382	290	2	3.91	467
Gull Lake	-	900 043000239253	GL-B	2-Jun-22	223	255	64.40	1		
					113	**127**	**226**			
Keeyask Reservoir	129520	900 067000055567	GL-A	12-Sep-23	519	594	800	9	8.03	2918
Gull Lake	-	900 067000055567	GL-C	16-Sep-15	333	379	208	1.25		
					186	**215**	**592**			
Keeyask Reservoir	129519	900 067000055088	GL-A	12-Sep-23	534	609	880	9	1.90	3004
Gull Lake	-	900 067000055088	GL-B	22-Jun-15	202	234	49	1		
					332	**375**	**831**			
Keeyask Reservoir	129502	900 067000112129	GL-A	13-Sep-23	450	512	510	7	4.59	2288
Gull Lake	-	900 067000112129	GL-A	8-Jun-17	266	306	104	1		
					184	**206**	**406**			
Keeyask Reservoir	129529	900 067000055431	GL-A	13-Sep-23	575	660	1100	9	4.28	2919
Gull Lake	118309	900 067000055431	GL-B	22-Sep-20	516	594	825	6		
Gull Lake	-	900 067000055431	GL-B	16-Sep-15	318	365	170	1.25		
					257	**295**	**930**			
Keeyask Reservoir	129532	900 067000113721	GL-C	13-Sep-23	464	528	600	5	1.19	1560
Gull Lake	-	900 067000113721	GL-C	6-Jun-19	205	244	49	1		
					259	**284**	**551**			
Keeyask Reservoir	129533	900 067000108616	GL-C	13-Sep-23	472	540	570	5	0.39	1560
Keeyask Reservoir	125162	900 067000108616	GL-C	23-Sep-22	450	520	450	4		
Gull Lake	-	900 067000108616	GL-C	6-Jun-19	248	288	79.38	1		
					224	**252**	**491**			
Keeyask Reservoir	117108	900 067000113768	GL-C	13-Sep-23	477	545	650	5	0.39	1560
Keeyask Reservoir	117108	900 067000113768	GL-C	18-Sep-19	315	363	150	1		
Gull Lake	-	900 067000113768	GL-C	6-Jun-19	230	270	66	1		
					247	**275**	**584**			

Table A4-2: Original release date and biological data for hatchery-reared Lake Sturgeon captured in gill nets set in the Keeyask reservoir, fall 2023 (continued).

Location	Floy-tag #	Pit-tag No.	Zone	Date	Fork Length (mm)	Total Length (mm)	Weight (g)	Age	Distance (km)	Days Between Capture
Keeyask Reservoir	118049	900 067000059312	GL-C	16-Sep-23	-	-	-	7	9.83	2291
Keeyask Reservoir	118049	900 067000059312	GL-C	13-Sep-23	481	545	660	7		
Gull Lake	118049	900 067000059312	GL-C	19-Sep-20	423	480	500	4		
Gull Lake	-	900 067000059312	GL-A	8-Jun-17	220	256	60	1		
					261	**289**	**600**			
Keeyask Reservoir	129535	900 043000239301	GL-C	13-Sep-23	317	365	240	2	0.64	468
Gull Lake	-	900 043000239301	GL-C	2-Jun-22	186	217	40	1		
					131	**148**	**200**			
Keeyask Reservoir	129536	900 067000109318	GL-C	13-Sep-23	466	540	600	5	4.07	1560
Gull Lake	-	900 067000109318	GL-B	6-Jun-19	224	265	63	1		
					242	**275**	**537**			
Keeyask Reservoir	129538	900 067000109315	GL-C	13-Sep-23	431	497	470	5	0.39	1560
Gull Lake	-	900 067000109315	GL-C	6-Jun-19	235	275	67	1		
					196	**222**	**403**			
Keeyask Reservoir	129540	900 067000108678	GL-C	13-Sep-23	520	599	800	5	0.39	1560
Gull Lake	-	900 067000108678	GL-C	6-Jun-19	258	304	104	1		
					262	**295**	**696**			
Keeyask Reservoir	129542	900 067000055177	GL-C	13-Sep-23	567	646	1150	9	4.17	3005
Gull Lake	-	900 067000055177	GL-B	22-Jun-15	177	205	29	1		
					390	**441**	**1121**			
Keeyask Reservoir	129544	900 067000113714	GL-C	13-Sep-23	469	537	540	5	0.39	1560
Gull Lake	-	900 067000113714	GL-C	6-Jun-19	230	280	70	1		
					239	**257**	**470**			
Keeyask Reservoir	129545	900 043000239346	GL-C	13-Sep-23	304	359	220	2	4.36	468
Gull Lake	-	900 043000239346	GL-B	2-Jun-22	197	223	48	1		
					107	**136**	**172**			
Keeyask Reservoir	129546	900 067000109319	GL-C	13-Sep-23	423	489	450	5	4.07	1560
Gull Lake	-	900 067000109319	GL-B	6-Jun-19	243	290	88	1		
					180	**199**	**362**			

Table A4-2: Original release date and biological data for hatchery-reared Lake Sturgeon captured in gill nets set in the Keeyask reservoir, fall 2023 (continued). Red text indicates fish mortality.

Location	Floy-tag #	Pit-tag No.	Zone	Date	Fork Length (mm)	Total Length (mm)	Weight (g)	Age	Distance (km)	Days Between Capture
Keeyask Reservoir	-	900 043000238994	GL-C	13-Sep-23	322	357	230	2	0.64	468
Gull Lake	-	900 043000238994	GL-C	2-Jun-22	198	222	49	1		
					124	**135**	**181**			
Keeyask Reservoir	121165	900 067000059477	GL-C	13-Sep-23	500	570	720	7	12.04	2288
Keeyask Reservoir	121165	900 067000059477	GL-C	15-Sep-21	489	554	625	5		
Gull Lake	-	900 067000059477	GL-A	8-Jun-17	228	267	64	1		
					272	**303**	**656**			
Keeyask Reservoir	129551	900 067000055597	GL-C	13-Sep-23	579	663	1100	9	4.14	2919
Gull Lake	-	900 067000055597	GL-B	16-Sep-15	321	366	174	1.25		
					258	**297**	**926**			
Keeyask Reservoir	129556	900 043000239090	GL-C	13-Sep-23	322	370	220	2	0.95	468
Gull Lake	-	900 043000239090	GL-C	2-Jun-22	195	227	43	1		
					127	**143**	**177**			
Keeyask Reservoir	129559	900 067000109590	GL-C	14-Sep-23	491	568	690	5	0.71	1561
Gull Lake	-	900 067000109590	GL-C	6-Jun-19	220	258	53	1		
					271	**310**	**637**			
Keeyask Reservoir	129561	900 067000107918	GL-C	14-Sep-23	446	509	570	5	0.71	1561
Gull Lake	-	900 067000107918	GL-C	6-Jun-19	234	271	75	1		
					212	**238**	**495**			
Keeyask Reservoir	118020	900 067000109309	GL-C	14-Sep-23	503	576	750	5	4.29	1561
Gull Lake	118020	900 067000109309	GL-C	18-Sep-20	402	462	400	2		
Gull Lake	-	900 067000109309	GL-B	6-Jun-19	228	274	70	1		
					275	**302**	**680**			
Keeyask Reservoir	118007	900 067000112891	GL-C	14-Sep-23	459	532	620	5	0.39	1561
Gull Lake	118007	900 067000112891	GL-C	17-Sep-20	371	427	275	2		
Gull Lake	-	900 067000112891	GL-C	6-Jun-19	237	282	82	1		
					222	**250**	**538**			

Table A4-2: Original release date and biological data for hatchery-reared Lake Sturgeon captured in gill nets set in the Keeyask reservoir, fall 2023 (continued).

Location	Floy-tag #	Pit-tag No.	Zone	Date	Fork Length (mm)	Total Length (mm)	Weight (g)	Age	Distance (km)	Days Between Capture
Keeyask Reservoir	129563	900 043000239423	GL-C	14-Sep-23	302	345	200	2	0.64	469
Gull Lake	-	900 043000239423	GL-C	2-Jun-22	175	200	31	1		
					127	**145**	**169**			
Keeyask Reservoir	129565	900 067000112920	GL-C	14-Sep-23	490	557	740	5	4.07	1561
Gull Lake	-	900 067000112920	GL-B	6-Jun-19	260	304	109	1		
					230	**253**	**631**			
Keeyask Reservoir	129566	900 043000239151	GL-C	14-Sep-23	344	387	270	2	0.64	469
Gull Lake	-	900 043000239151	GL-C	2-Jun-22	218	250	61	1		
					126	**137**	**209**			
Keeyask Reservoir	129569	900 067000113058	GL-C	14-Sep-23	469	527	630	5	4.07	1561
Gull Lake	-	900 067000113058	GL-B	6-Jun-19	228	271	68	1		
					241	**256**	**562**			
Keeyask Reservoir	116805	900 067000113723	GL-C	14-Sep-23	395	454	320	5	1.19	1561
Keeyask Reservoir	116805	900 067000113723	GL-C	21-Sep-22	392	449	275	4		
Gull Lake	116805	900 067000113723	GL-C	15-Sep-19	300	349	100	1		
Gull Lake	-	900 067000113723	GL-C	6-Jun-19	230	270	62	1		
					165	**184**	**258**			
Keeyask Reservoir	129571	900 043000239209	GL-C	14-Sep-23	317	356	220	2	3.21	469
Gull Lake	-	900 043000239209	GL-B	2-Jun-22	180	205	33	1		
					137	**151**	**187**			
Keeyask Reservoir	129573	900 067000112566	GL-C	14-Sep-23	483	551	690	7	10.28	2289
Gull Lake	-	900 067000112566	GL-A	8-Jun-17	255	294	91	1		
					228	**257**	**599**			
Keeyask Reservoir	118311	900 067000111917	GL-A	14-Sep-23	488	560	600	7	4.59	2289
Gull Lake	118311	900 067000111917	GL-B	22-Sep-20	471	541	625	4		
Gull Lake	-	900 067000111917	GL-A	8-Jun-17	264	315	101	1		
					224	**245**	**499**			

Table A4-2: Original release date and biological data for hatchery-reared Lake Sturgeon captured in gill nets set in the Keeyask reservoir, fall 2023 (continued).

Location	Floy-tag #	Pit-tag No.	Zone	Date	Fork Length (mm)	Total Length (mm)	Weight (g)	Age	Distance (km)	Days Between Capture
Keeyask Reservoir	128098	900 067000113722	GL-C	16-Sep-23	476	547	650	5	1.19	1563
Gull Lake	-	900 067000113722	GL-C	6-Jun-19	240	284	76	1		
					236	**263**	**574**			
Keeyask Reservoir	129594	900 043000102944	GL-C	16-Sep-23	603	674	1430	10	77.07	3271
Burntwood River	-	900 043000102944	BWR-B	2-Oct-14	277	321	117	1.25		
					326	**353**	**1313**			
Keeyask Reservoir	129596	900 067000059316	GL-C	16-Sep-23	525	597	800	7	10.28	2291
Gull Lake	-	900 067000059316	GL-A	8-Jun-17	228	267	64	1		
					297	**330**	**736**			
Keeyask Reservoir	129599	900 067000055091	GL-C	16-Sep-23	619	715	1380	9	2.06	3008
Gull Lake	-	900 067000055091	GL-B	22-Jun-15	207	247	52	1		
					412	**468**	**1328**			
Keeyask Reservoir	129613	900 067000111963	GL-A	16-Sep-23	451	520	580	7	2.55	2291
Gull Lake	-	900 067000111963	GL-A	8-Jun-17	230	274	72	1		
					221	**246**	**508**			
Keeyask Reservoir	129615	900 043000119566	GL-A	16-Sep-23	502	573	910	10	90.79	3395
Burntwood River	-	900 043000119566	BWR-C	31-May-14	215	249	62	1		
					287	**324**	**848**			
Keeyask Reservoir	129616	900 043000238910	GL-A	16-Sep-23	337	381	250	2	6.98	471
Gull Lake	-	900 043000238910	GL-C	2-Jun-22	196	228	43	1		
					141	**153**	**207**			
Keeyask Reservoir	129620	900 067000058595	GL-A	16-Sep-23	550	642	1100	9	0.94	3008
Gull Lake	-	900 067000058595	GL-B	22-Jun-15	242	285	85	1		
					308	**357**	**1015**			
Keeyask Reservoir	129635	900 067000109593	GL-C	17-Sep-23	496	559	720	5	2.94	1564
Gull Lake	-	900 067000109593	GL-B	6-Jun-19	232	270	67	1		
					264	**289**	**653**			

Table A4-2: Original release date and biological data for hatchery-reared Lake Sturgeon captured in gill nets set in the Keeyask reservoir, fall 2023 (continued).

Location	Floy-tag #	Pit-tag No.	Zone	Date	Fork Length (mm)	Total Length (mm)	Weight (g)	Age	Distance (km)	Days Between Capture
Keeyask Reservoir	129637	900 043000239673	GL-C	17-Sep-23	353	395	290	2	1.08	472
Gull Lake	-	900 043000239673	GL-C	2-Jun-22	228	264	73	1		
					125	**131**	**217**			
Keeyask Reservoir	129638	900 043000239352	GL-C	17-Sep-23	303	343	230	2	1.08	472
Gull Lake	-	900 043000239352	GL-C	2-Jun-22	175	203	38	1		
					128	**140**	**192**			
Keeyask Reservoir	129640	900 043000239080	GL-C	17-Sep-23	309	353	240	2	2.25	472
Gull Lake	-	900 043000239080	GL-B	2-Jun-22	193	227	41	1		
					116	**126**	**199**			
Keeyask Reservoir	129643	900 067000112893	GL-A	17-Sep-23	435	493	570	5	3.46	1564
Gull Lake	-	900 067000112893	GL-B	6-Jun-19	244	282	76	1		
					191	**211**	**494**			
Keeyask Reservoir	129645	900 067000112944	GL-A	17-Sep-23	490	555	710	5	7.08	1564
Gull Lake	-	900 067000112944	GL-C	6-Jun-19	256	304	56	1		
					234	**251**	**654**			
Keeyask Reservoir	129648	900 067000113187	BR-D	18-Sep-23	465	523	590	5	15.24	1565
Gull Lake	-	900 067000113187	GL-B	6-Jun-19	220	259	54	1		
					245	**264**	**536**			
Keeyask Reservoir	129657	900 067000059490	GL-A	18-Sep-23	501	562	800	7	5.50	2293
Gull Lake	-	900 067000059490	GL-A	8-Jun-17	238	273	74	1		
					263	**289**	**726**			
Keeyask Reservoir	129662	900 067000112911	GL-C	18-Sep-23	474	542	660	5	4.06	1565
Gull Lake	-	900 067000112911	GL-B	6-Jun-19	260	301	96	1		
					214	**241**	**564**			
Keeyask Reservoir	117912	900 067000055127	GL-A	19-Sep-23	550	629	910	9	10.28	2925
Keeyask Reservoir	117912	900 067000055127	GL-B	23-Sep-21	536	610	800	7		
Gull Lake	-	900 067000055127	GL-C	16-Sep-15	320	366	161	1.25		
					230	**263**	**749**			

Table A4-2: Original release date and biological data for hatchery-reared Lake Sturgeon captured in gill nets set in the Keeyask reservoir, fall 2023 (continued).

Location	Floy-tag #	Pit-tag No.	Zone	Date	Fork Length (mm)	Total Length (mm)	Weight (g)	Age	Distance (km)	Days Between Capture
Keeyask Reservoir	129671	900 067000055051	GL-A	19-Sep-23	584	675	1160	9	4.42	3011
Gull Lake	-	900 067000055051	GL-B	22-Jun-15	224	268	65	1		
					360	**407**	**1095**			
Keeyask Reservoir	129672	900 067000058787	GL-A	19-Sep-23	549	626	960	9	4.42	3011
Gull Lake	-	900 067000058787	GL-B	22-Jun-15	225	267	62	1		
					324	**359**	**898**			
Keeyask Reservoir	129673	900 067000109360	GL-A	19-Sep-23	473	546	600	5	6.70	1566
Gull Lake	-	900 067000109360	GL-B	6-Jun-19	245	288	73	1		
					228	**258**	**527**			
Keeyask Reservoir	129678	900 043000238975	GL-A	19-Sep-23	301	348	200	2	6.46	474
Gull Lake	-	900 043000238975	GL-B	2-Jun-22	176	203	31	1		
					125	**145**	**169**			
Keeyask Reservoir	129681	900 067000109300	GL-A	19-Sep-23	445	517	600	5	6.70	1566
Gull Lake	-	900 067000109300	GL-B	6-Jun-19	240	287	83.9	1		
					205	**230**	**516**			
Keeyask Reservoir	118037	900 067000113003	GL-A	20-Sep-23	-	-	-	5	9.71	1567
Keeyask Reservoir	118037	900 067000113003	GL-A	19-Sep-23	430	485	450	5		
Gull Lake	118037	900 067000113003	GL-C	18-Sep-20	364	410	300	2		
Gull Lake	-	900 067000113003	GL-C	6-Jun-19	220	257	61	1		
					210	**228**	**389**			
Keeyask Reservoir	129685	900 067000113016	GL-A	19-Sep-23	445	510	500	5	6.70	1566
Gull Lake	-	900 067000113016	GL-B	6-Jun-19	220	260	58.7	1		
					225	**250**	**441**			
Keeyask Reservoir	129688	900 067000112990	GL-B	19-Sep-23	477	547	660	5	6.47	1566
Gull Lake	-	900 067000112990	GL-C	6-Jun-19	243	287	78	1		
					234	**260**	**582**			
Keeyask Reservoir	129689	900 067000112979	GL-B	19-Sep-23	456	508	590	5	2.63	1566
Gull Lake	-	900 067000112979	GL-B	6-Jun-19	230	275	71	1		
					226	**233**	**519**			

Table A4-2: Original release date and biological data for hatchery-reared Lake Sturgeon captured in gill nets set in the Keeyask reservoir, fall 2023 (continued).

Location	Floy-tag #	Pit-tag No.	Zone	Date	Fork Length (mm)	Total Length (mm)	Weight (g)	Age	Distance (km)	Days Between Capture
Keeyask Reservoir	129690	900 067000112109	GL-B	19-Sep-23	497	574	760	7	6.54	2294
Gull Lake	-	900 067000112109	GL-A	8-Jun-17	256	300	96	1		
					241	**274**	**664**			
Keeyask Reservoir	129692	900 043000239683	GL-B	19-Sep-23	315	359	200	2	2.34	474
Gull Lake	-	900 043000239683	GL-B	2-Jun-22	216	249	63	1		
					99	**110**	**137**			
Keeyask Reservoir	129693	900 067000108657	GL-C	19-Sep-23	457	520	600	5	2.37	1566
Gull Lake	-	900 067000108657	GL-C	6-Jun-19	238	273	70	1		
					219	**247**	**530**			
Keeyask Reservoir	129703	900 067000055038	GL-C	19-Sep-23	582	663	1090	9	4.80	3011
Gull Lake	-	900 067000055038	GL-B	22-Jun-15	214	252	55	1		
					368	**411**	**1035**			
Keeyask Reservoir	129704	900 067000055039	GL-C	19-Sep-23	568	646	1070	9	2.11	3011
Gull Lake	-	900 067000055039	GL-B	22-Jun-15	214	248	55	1		
					354	**398**	**1015**			
Keeyask Reservoir	129706	900 067000112300	GL-C	19-Sep-23	486	553	730	7	10.50	2294
Gull Lake	-	900 067000112300	GL-A	8-Jun-17	212	246	55	1		
					274	**307**	**675**			
Keeyask Reservoir	129707	900 043000238902	GL-C	19-Sep-23	340	389	280	2	2.45	474
Gull Lake	-	900 043000238902	GL-C	2-Jun-22	203	238	48	1		
					137	**151**	**232**			
Keeyask Reservoir	129708	900 067000059450	GL-C	19-Sep-23	483	567	800	7	10.50	2294
Gull Lake	-	900 067000059450	GL-A	8-Jun-17	213	256	58	1		
					270	**311**	**742**			
Keeyask Reservoir	129714	900 043000239023	GL-C	19-Sep-23	337	382	260	2	0.43	474
Gull Lake	-	900 043000239023	GL-C	2-Jun-22	192	223	43	1		
					145	**159**	**217**			

Table A4-2: Original release date and biological data for hatchery-reared Lake Sturgeon captured in gill nets set in the Keeyask reservoir, fall 2023 (continued).

Location	Floy-tag #	Pit-tag No.	Zone	Date	Fork Length (mm)	Total Length (mm)	Weight (g)	Age	Distance (km)	Days Between Capture
Keeyask Reservoir	129715	900 043000239045	GL-C	19-Sep-23	335	380	250	2	0.43	474
Gull Lake	-	900 043000239045	GL-C	2-Jun-22	195	226	44	1		
					140	**154**	**206**			
Keeyask Reservoir	117102	900 067000113235	GL-A	20-Sep-23	428	505	520	5	6.70	1567
Gull Lake	117102	900 067000113235	GL-C	18-Sep-19	312	370	150	1		
Gull Lake	-	900 067000113235	GL-B	6-Jun-19	231	275	71	1		
					197	**230**	**449**			
Keeyask Reservoir	129716	900 067000112966	GL-A	20-Sep-23	444	503	540	5	6.70	1567
Gull Lake	-	900 067000112966	GL-B	6-Jun-19	210	250	50	1		
					234	**253**	**490**			
Keeyask Reservoir	129722	900 067000055086	GL-B	20-Sep-23	600	690	1320	9	2.54	3012
Gull Lake	-	900 067000055086	GL-B	22-Jun-15	203	240	43	1		
					397	**450**	**1277**			
Keeyask Reservoir	129725	900 067000112173	GL-B	20-Sep-23	467	532	600	7	7.20	2295
Gull Lake	-	900 067000112173	GL-A	8-Jun-17	265	309	102	1		
					202	**223**	**498**			
Keeyask Reservoir	129719	900 067000112885	GL-B	20-Sep-23	477	542	610	5	5.66	1567
Gull Lake	-	900 067000112885	GL-C	6-Jun-19	255	296	87	1		
					222	**246**	**523**			
Keeyask Reservoir	121217	900 067000112888	GL-C	20-Sep-23	445	510	580	5	2.03	1567
Keeyask Reservoir	121217	900 067000112888	GL-C	16-Sep-21	398	450	350	3		
Gull Lake	-	900 067000112888	GL-B	6-Jun-19	239	277	73	1		
					206	**233**	**507**			
Keeyask Reservoir	121291	900 067000055529	GL-C	20-Sep-23	570	663	1120	9	1.89	2926
Keeyask Reservoir	121291	900 067000055529	GL-C	20-Sep-21	558	645	1075	7		
Gull Lake	-	900 067000055529	GL-B	16-Sep-15	320	371	185	1.25		
					250	**292**	**935**			

Table A4-2: Original release date and biological data for hatchery-reared Lake Sturgeon captured in gill nets set in the Keeyask reservoir, fall 2023 (continued).

Location	Floy-tag #	Pit-tag No.	Zone	Date	Fork Length (mm)	Total Length (mm)	Weight (g)	Age	Distance (km)	Days Between Capture
Keeyask Reservoir	129734	900 067000055558	GL-C	20-Sep-23	545	629	1010	9	1.89	2926
Gull Lake	-	900 067000055558	GL-B	16-Sep-15	350	402	270	1.25		
					195	**227**	**740**			
Keeyask Reservoir	129737	900 067000112170	GL-C	20-Sep-23	446	511	580	7	10.50	2295
Gull Lake	-	900 067000112170	GL-A	8-Jun-17	248	294	86	1		
					198	**217**	**494**			
Keeyask Reservoir	116798	900 067000113225	GL-C	20-Sep-23	395	447	390	5	2.84	1567
Gull Lake	116798	900 067000113225	GL-B	13-Sep-19	265	310	100	1		
Gull Lake	-	900 067000113225	GL-B	6-Jun-19	210	253	58	1		
					185	**194**	**332**			
Keeyask Reservoir	129740	900 043000119482	GL-C	20-Sep-23	559	610	1100	10	86.73	3399
Burntwood River	-	900 043000119482	BWR-C	31-May-14	199	222	46	1		
					360	**388**	**1055**			
Keeyask Reservoir	129741	900 067000112969	GL-C	20-Sep-23	495	565	700	5	2.84	1567
Gull Lake	-	900 067000112969	GL-B	6-Jun-19	205	240	47	1		
					290	**325**	**653**			
Keeyask Reservoir	129743	900 067000107968	GL-C	20-Sep-23	415	473	430	5	0.18	1567
Gull Lake	-	900 067000107968	GL-C	6-Jun-19	215	246	54	1		
					200	**227**	**376**			
Keeyask Reservoir	129745	900 043000239606	GL-C	20-Sep-23	338	383	240	2	4.35	475
Gull Lake	-	900 043000239606	GL-B	2-Jun-22	195	226	42	1		
					143	**157**	**198**			

Table A4-3: Original release date and biological data for hatchery-reared Lake Sturgeon captured in gill nets set in Stephens Lake, fall 2023.

Location	Floy-tag #	Pit-tag No.	Zone	Date	Fork Length (mm)	Total Length (mm)	Weight (g)	Age	Distance (km)	Days Between Capture
Stephens Lake	128749	900 043000239451	STL-B	12-Sep-23	332	371	300	2	12.98	467
Gull Lake	-	900 043000239451	GL-C	2-Jun-22	190	219	40	1		
					142	**152**	**260**			
Stephens Lake	128746	900 043000239446	STL-B	12-Sep-23	360	406	400	2	3.93	470
Stephens Lake	-	900 043000239446	STL-A	30-May-22	210	244	56	1		
					150	**162**	**344**			
Stephens Lake	113283	900 067000055210	STL-A	13-Sep-23	652	749	1740	9	0.70	2921
Stephens Lake	113283	900 067000055210	STL-B	20-Sep-18	464	532	700	4		
Stephens Lake	-	900 067000055210	STL-A	14-Sep-15	274	317	123	1		
					378	**432**	**1617**			
Stephens Lake	118878	900 067000113394	STL-A	13-Sep-23	513	587	820	5	0.08	1553
Stephens Lake	118878	900 067000113394	STL-B	19-Sep-20	-	-	-	2		
Stephens Lake	118878	900 067000113394	STL-B	17-Sep-20	377	441	300	2		
Stephens Lake	-	900 067000113394	STL-A	13-Jun-19	245	266	66	1		
					268	**321**	**754**			
Stephens Lake	116840	900 067000109321	STL-A	13-Sep-23	535	611	980	5	12.48	1560
Stephens Lake	116840	900 067000109321	STL-B	21-Sep-22	496	571	750	4		
Gull Lake	116840	900 067000109321	GL-B	19-Sep-19	-	-	-	-		
Gull Lake	116840	900 067000109321	GL-B	18-Sep-19	309	355	100	1		
Gull Lake	-	900 067000109321	GL-B	6-Jun-19	211	252	53	1		
					324	**359**	**927**			
Stephens Lake	112904	900 067000055296	STL-A	13-Sep-23	630	711	1740	9	3.16	3005
Stephens Lake	112904	900 067000055296	STL-B	15-Sep-17	457	520	725	3		
Stephens Lake	-	900 067000055296	STL-B	22-Jun-15	209	241	59	1		
					421	**470**	**1682**			
Stephens Lake	128743	900 067000059085	STL-A	13-Sep-23	582	672	1260	7	1.38	2169
Stephens Lake	-	900 067000059085	STL-B	5-Oct-17	297	347	170	1.25		
					285	**325**	**1090**			

Table A4-3: Original release date and biological data for hatchery-reared Lake Sturgeon captured in gill nets set in Stephens Lake, fall 2023 (continued).

Location	Floy-tag #	Pit-tag No.	Zone	Date	Fork Length (mm)	Total Length (mm)	Weight (g)	Age	Distance (km)	Days Between Capture
Stephens Lake	128742	900 067000111956	STL-A	13-Sep-23	565	659	1290	7	3.01	2281
Stephens Lake	-	900 067000111956	STL-A	15-Jun-17	247	294	100	1		
					318	**365**	**1190**			
Stephens Lake	128736	900 043000239104	STL-B	13-Sep-23	391	444	370	2	3.93	471
Stephens Lake	-	900 043000239104	STL-A	30-May-22	237	270	72	1		
					154	**174**	**298**			
Stephens Lake	128734	900 043000239197	STL-B	13-Sep-23	324	362	210	2	3.93	471
Stephens Lake	-	900 043000239197	STL-A	30-May-22	218	254	53	1		
					106	**108**	**157**			
Stephens Lake	128732	900 043000239562	STL-B	13-Sep-23	379	439	340	2	15.11	468
Gull Lake	-	900 043000239562	GL-B	2-Jun-22	195	226	43	1		
					184	**213**	**298**			
Stephens Lake	128725	900 067000113420	STL-B	14-Sep-23	505	570	810	5	3.66	1554
Stephens Lake	-	900 067000113420	STL-A	13-Jun-19	213	245	54	1		
					292	**325**	**756**			
Stephens Lake	128724	900 067000113229	STL-B	14-Sep-23	505	565	720	5	1.19	1554
Stephens Lake	-	900 067000113229	STL-B	13-Jun-19	190	224	36	1		
					315	**341**	**684**			
Stephens Lake	128723	900 067000109615	STL-B	14-Sep-23	510	575	770	5	13.54	1561
Gull Lake	-	900 067000109615	GL-C	6-Jun-19	232	273	63	1		
					278	**302**	**707**			
Stephens Lake	128722	900 067000108620	STL-B	14-Sep-23	529	598	870	5	3.66	1554
Stephens Lake	-	900 067000108620	STL-A	13-Jun-19	273	322	117	1		
					256	**276**	**753**			
Stephens Lake	128721	900 067000113028	STL-B	14-Sep-23	539	616	890	5	15.19	1561
Gull Lake	-	900 067000113028	GL-B	6-Jun-19	240	285	75	1		
					299	**331**	**815**			

Table A4-3: Original release date and biological data for hatchery-reared Lake Sturgeon captured in gill nets set in Stephens Lake, fall 2023 (continued).

Location	Floy-tag #	Pit-tag No.	Zone	Date	Fork Length (mm)	Total Length (mm)	Weight (g)	Age	Distance (km)	Days Between Capture
Stephens Lake	128715	900 067000108612	STL-A	14-Sep-23	530	604	840	5	1.75	1554
Stephens Lake	-	900 067000108612	STL-A	13-Jun-19	217	257	55	1		
					313	**347**	**785**			
Stephens Lake	117901	900 067000113073	STL-A	14-Sep-23	475	556	690	5	12.41	1561
Keeyask Reservoir	117901	900 067000113073	GL-A	23-Sep-21	400	470	375	3		
Gull Lake	-	900 067000113073	GL-B	6-Jun-19	248	299	91	1		
					227	**257**	**599**			
Stephens Lake	125739	900 067000113252	STL-B	16-Sep-23	465	535	570	5	0.45	360
Stephens Lake	125739	900 067000113252	STL-B	21-Sep-22	467	540	550	4		
Stephens Lake	-	900 067000113252	STL-B	13-Jun-19	-	-	-	1		
					-	**-**	**-**			
Stephens Lake	128713	900 067000059104	STL-B	16-Sep-23	584	654	1310	7	2.08	2172
Stephens Lake	-	900 067000059104	STL-B	5-Oct-17	300	340	150	1		
					284	**314**	**1160**			
Stephens Lake	128710	900 067000111926	STL-B	16-Sep-23	612	698	1480	7	4.99	2284
Stephens Lake	-	900 067000111926	STL-A	15-Jun-17	260	306	100	1		
					352	**392**	**1380**			
Stephens Lake	128708	900 043000238930	STL-B	16-Sep-23	367	410	350	2	16.20	471
Gull Lake	-	900 043000238930	GL-B	2-Jun-22	188	214	36	1		
					179	**196**	**314**			
Stephens Lake	128707	900 067000113399	STL-A	20-Sep-23	-	-	-	5	0.85	1560
Stephens Lake	128707	900 067000113399	STL-B	16-Sep-23	491	559	730	5		
Stephens Lake	-	900 067000113399	STL-B	13-Jun-19	263	310	114	1		
					228	**249**	**616**			
Stephens Lake	128705	900 067000113065	STL-B	16-Sep-23	545	628	1010	5	15.94	1563
Gull Lake	-	900 067000113065	GL-B	6-Jun-19	250	297	88	1		
					295	**331**	**922**			

Table A4-3: Original release date and biological data for hatchery-reared Lake Sturgeon captured in gill nets set in Stephens Lake, fall 2023 (continued).

Location	Floy-tag #	Pit-tag No.	Zone	Date	Fork Length (mm)	Total Length (mm)	Weight (g)	Age	Distance (km)	Days Between Capture
Stephens Lake	128701	900 067000059147	STL-B	16-Sep-23	534	606	1080	7	2.08	2172
Stephens Lake	-	900 067000059147	STL-B	5-Oct-17	270	310	135	1.25		
					264	**296**	**945**			
Stephens Lake	128706	900 067000109311	STL-B	16-Sep-23	513	586	800	5	13.45	1563
Gull Lake	-	900 067000109311	GL-C	6-Jun-19	210	250	47	1		
					303	**336**	**753**			
Stephens Lake	128703	900 067000113736	STL-B	16-Sep-23	484	580	660	5	12.35	1563
Gull Lake	-	900 067000113736	GL-C	6-Jun-19	210	260	57	1		
					274	**320**	**603**			
Stephens Lake	128716	900 067000113265	STL-B	16-Sep-23	440	490	460	5	0.05	1556
Stephens Lake	-	900 067000113265	STL-B	13-Jun-19	216	255	54	1		
					224	**235**	**406**			
Stephens Lake	128676	900 043000239660	STL-A	16-Sep-23	364	411	350	2	3.34	474
Stephens Lake	-	900 043000239660	STL-A	30-May-22	198	230	43	1		
					166	**181**	**307**			
Stephens Lake	128685	900 067000108652	STL-A	16-Sep-23	510	581	870	5	1.56	1556
Stephens Lake	-	900 067000108652	STL-A	13-Jun-19	226	264	63	1		
					284	**317**	**807**			
Stephens Lake	128697	900 067000113773	STL-A	16-Sep-23	500	564	710	5	10.06	1563
Gull Lake	-	900 067000113773	GL-C	6-Jun-19	230	271	62	1		
					270	**293**	**648**			
Stephens Lake	128695	900 067000055491	STL-B	17-Sep-23	641	738	1560	9	1.93	2925
Stephens Lake	-	900 067000055491	STL-A	14-Sep-15	270	315	100	1.25		
					371	**423**	**1460**			
Stephens Lake	128694	900 043000239494	STL-B	17-Sep-23	345	390	230	2	15.28	472
Gull Lake	-	900 043000239494	GL-B	2-Jun-22	195	223	42	1		
					150	**167**	**188**			

Table A4-3: Original release date and biological data for hatchery-reared Lake Sturgeon captured in gill nets set in Stephens Lake, fall 2023 (continued).

Location	Floy-tag #	Pit-tag No.	Zone	Date	Fork Length (mm)	Total Length (mm)	Weight (g)	Age	Distance (km)	Days Between Capture
Stephens Lake	109567	900 067000112415	STL-B	17-Sep-23	437	490	400	7	23.33	2292
Gull Lake	109567	900 067000112415	GL-B	13-Sep-17	310	355	200	1		
Gull Lake	-	900 067000112415	GL-A	8-Jun-17	232	270	70	1		
					205	**220**	**330**			
Stephens Lake	128691	900 067000109668	STL-B	20-Sep-23	-	-	-	5	12.67	1567
Stephens Lake	128691	900 067000109668	STL-A	17-Sep-23	474	539	630	5		
Gull Lake	-	900 067000109668	GL-C	6-Jun-19	219	260	59	1		
					255	**279**	**571**			
Stephens Lake	116014	900 067000109583	STL-A	17-Sep-23	536	594	860	5	14.19	1564
Stephens Lake	116014	900 067000109583	STL-B	13-Sep-19	313	356	150	1		
Gull Lake	-	900 067000109583	GL-B	6-Jun-19	235	270	66	1		
					301	**324**	**794**			
Stephens Lake	128675	900 067000113402	STL-B	17-Sep-23	530	596	850	5	0.20	1557
Stephens Lake	-	900 067000113402	STL-B	13-Jun-19	210	240	46	1		
					320	**356**	**804**			
Stephens Lake	128674	900 043000239106	STL-B	17-Sep-23	380	440	350	2	4.02	475
Stephens Lake	-	900 043000239106	STL-A	30-May-22	207	242	47	1		
					173	**198**	**303**			
Stephens Lake	128673	900 043000238938	STL-B	17-Sep-23	365	415	290	2	15.18	472
Gull Lake	-	900 043000238938	GL-B	2-Jun-22	180	207	30	1		
					185	**208**	**260**			
Stephens Lake	128672	900 043000239297	STL-B	17-Sep-23	362	417	300	2	4.02	475
Stephens Lake	-	900 043000239297	STL-A	30-May-22	220	256	56	1		
					142	**161**	**244**			
Stephens Lake	128671	900 067000055458	STL-B	18-Sep-23	626	727	1790	9	0.81	3010
Stephens Lake	-	900 067000055458	STL-B	22-Jun-15	213	250	57	1		
					413	**477**	**1733**			

Table A4-3: Original release date and biological data for hatchery-reared Lake Sturgeon captured in gill nets set in Stephens Lake, fall 2023 (continued).

Location	Floy-tag #	Pit-tag No.	Zone	Date	Fork Length (mm)	Total Length (mm)	Weight (g)	Age	Distance (km)	Days Between Capture
Stephens Lake	128669	900 043000239208	STL-B	18-Sep-23	334	389	260	2	5.05	476
Stephens Lake	-	900 043000239208	STL-A	30-May-22	218	255	60	1		
					116	**134**	**200**			
Stephens Lake	128661	900 067000113055	STL-B	18-Sep-23	514	586	780	5	15.94	1565
Gull Lake	-	900 067000113055	GL-B	6-Jun-19	209	247	54	1		
					305	**339**	**726**			
Stephens Lake	128659	900 067000113431	STL-B	18-Sep-23	523	597	810	5	3.55	1558
Stephens Lake	-	900 067000113431	STL-A	13-Jun-19	233	279	71	1		
					290	**318**	**739**			
Stephens Lake	128658	900 043000239628	STL-B	18-Sep-23	348	393	320	2	16.20	473
Gull Lake	-	900 043000239628	GL-B	2-Jun-22	196	224	50	1		
					152	**169**	**270**			
Stephens Lake	128655	900 043000239335	STL-B	18-Sep-23	370	425	290	2	4.18	476
Stephens Lake	125725	900 043000239335	STL-B	17-Sep-22	308	354	200	1		
Stephens Lake	-	900 043000239335	STL-A	30-May-22	205	237	43	1		
					165	**188**	**247**			
Stephens Lake	116066	900 067000113464	STL-B	18-Sep-23	-	-	-	5	2.58	1558
Stephens Lake	116066	900 067000113464	STL-B	18-Sep-22	435	499	600	4		
Stephens Lake	116066	900 067000113464	STL-B	13-Sep-19	285	330	100	1		
Stephens Lake	-	900 067000113464	STL-A	13-Jun-19	220	258	62	1		
					215	**241**	**538**			
Stephens Lake	128653	900 067000112924	STL-B	18-Sep-23	535	607	870	5	12.02	1565
Gull Lake	-	900 067000112924	GL-C	6-Jun-19	260	304	91	1		
					275	**303**	**779**			
Stephens Lake	128657	900 043000239630	STL-A	18-Sep-23	351	397	240	2	3.28	476
Stephens Lake	-	900 043000239630	STL-A	30-May-22	208	238	53	1		
					143	**159**	**187**			

Table A4-3: Original release date and biological data for hatchery-reared Lake Sturgeon captured in gill nets set in Stephens Lake, fall 2023 (continued).

Location	Floy-tag #	Pit-tag No.	Zone	Date	Fork Length (mm)	Total Length (mm)	Weight (g)	Age	Distance (km)	Days Between Capture
Stephens Lake	128663	900 043000239360	STL-A	18-Sep-23	357	413	290	2	14.45	473
Keeyask Reservoir	-	900 043000239360	GL-C	21-Sep-22	276	321	125	1		
Gull Lake	-	900 043000239360	GL-B	2-Jun-22	215	253	62	1		
					142	**160**	**228**			
Stephens Lake	117672	900 067000059399	STL-B	19-Sep-23	536	609	930	7	2.11	2175
Stephens Lake	117672	900 067000059399	STL-B	19-Sep-19	385	444	400	3		
Stephens Lake	-	900 067000059399	STL-B	5-Oct-17	300	354	170	1.25		
					236	**255**	**760**			
Stephens Lake	128622	900 067000109645	STL-B	19-Sep-23	492	571	670	5	0.87	1559
Stephens Lake	-	900 067000109645	STL-B	13-Jun-19	238	282	74	1		
					254	**289**	**596**			
Stephens Lake	128620	900 067000111938	STL-B	19-Sep-23	584	667	1310	7	4.43	2287
Stephens Lake	-	900 067000111938	STL-A	15-Jun-17	232	269	70	1		
					352	**398**	**1240**			
Stephens Lake	128614	900 043000239139	STL-B	20-Sep-23	340	387	200	2	5.06	478
Stephens Lake	-	900 043000239139	STL-A	44711	205	233	42	1		
					135	**154**	**158**			
Stephens Lake	128613	900 067000109587	STL-B	20-Sep-23	435	489	410	5	1.28	1560
Stephens Lake	116067	900 067000109587	STL-B	15-Sep-19	270	305	100	1		
Stephens Lake	-	900 067000109587	STL-B	13-Jun-19	225	263	68	1		
					210	**226**	**342**			
Stephens Lake	128611	900 067000059303	STL-B	20-Sep-23	489	560	780	7	24.21	2295
Gull Lake	-	900 067000059303	GL-A	8-Jun-17	218	255	60	1		
					271	**305**	**720**			
Stephens Lake	128607	900 043000239636	STL-B	20-Sep-23	364	422	230	2	12.89	475
Gull Lake	-	900 043000239636	GL-C	2-Jun-22	200	233	43	1		
					164	**189**	**187**			

Table A4-3: Original release date and biological data for hatchery-reared Lake Sturgeon captured in gill nets set in Stephens Lake, fall 2023 (continued). Red text indicates fish mortality.

Location	Floy-tag #	Pit-tag No.	Zone	Date	Fork Length (mm)	Total Length (mm)	Weight (g)	Age	Distance (km)	Days Between Capture
Stephens Lake	117572	900 067000113033	STL-B	20-Sep-23	480	555	760	5	0.11	1560
Stephens Lake	117572	900 067000113033	STL-B	18-Sep-19	280	327	125	1		
Stephens Lake	-	900 067000113033	STL-B	13-Jun-19	210	251	54	1		
					270	**304**	**706**			
Stephens Lake	-	900 067000109591	STL-A	20-Sep-23	489	557	640	5	11.57	1567
Gull Lake	-	900 067000109591	GL-C	6-Jun-19	225	254	55.67	1		
					264	**303**	**584**			

APPENDIX 5:
POPULATION ESTIMATE INFORMATION.

Table A5-1: Results of POPAN analysis of juvenile Lake Sturgeon from the Keeyask reservoir. 129
Table A5-2: Results of POPAN analysis of hatchery-reared juvenile Lake Sturgeon from the Keeyask reservoir. 130
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Table A5-4: Results of POPAN analysis of hatchery-reared juvenile Lake Sturgeon from Stephens Lake. 132

Mark-recapture population estimates were calculated for wild fish in the Keeyask reservoir and Stephens Lake during the fall of thirteen different years (2010 and 2012–2023). Only wild Lake Sturgeon classified as juveniles (*i.e.*, fork length less than 800 mm) were included in the population estimate. All data for the period 2008–2012 were collected annually as part of environmental studies related to the pre-Project environment, while data from 2014 until 2044 will be collected annually as part of monitoring studies related to the Keeyask GS Project.

Data were analysed using the program MARK (White and Burnham 1999; Kendall 2001; Arnason and Schwartz 2002), which is an industry standard for the analysis of data from marked populations. Program MARK uses binary numbers to represent the encounter history of individuals, and then uses the cumulative pattern of 0's (not-encountered) and 1's (re-encountered live capture) to generate a probability distribution of tag recaptures which form the basis of population estimation. Re-encounters can also be from dead recoveries (*e.g*., the animal is harvested) in which case the model uses a value of -1. For example, the history "10-1" indicates that an animal was captured for the first time at sampling occasion 1, not encountered at sampling occasion 2, and recovered dead at sampling occasion 3.

Several different population model variants exist, most of which can be classified as either closed or open models. Closed models assume there are no births, deaths, immigration, or emigration between sample periods, while open models assume these processes occur. The Jolly-Seber model (POPAN formulation; Arnason and Schwarz 2002), as implemented within MARK, was used to estimate the annual abundance of juvenile Lake Sturgeon. This is an open model that requires few assumptions and modeled variables, and thus likely provides a reliable estimate of abundance.

Using first-time capture and recapture information, POPAN estimates the survival (*i.e.,* the probability that a fish will survive from one capture to the next), the probability of recapture (p; *i.e.,* the probability that a fish will be recaptured given that the animal is alive and in the study area), and abundance (N; *i.e.,* the number of juvenile Lake Sturgeon in the area during each capture period) (Tables A5-1, A5-2, A5-3 and A5-4).

- Model fit for survival was calculated as 78% for the Keeyask reservoir and 21% for Stephens Lake.
- The probability of recapture varied among years:
    - Recapture rates were split into six groups based on the model for the Keeyask reservoir: i) 2010 (0.97); ii) 2012, 2017, and 2021 (0.06); iii) 2013-2016 (0.03); iv) 2018 (0.04); v) 2019, 2020, and 2022 (0.05); and vi) 2023 (0.10).
    - For Stephens Lake, recapture rates were split into nine groups: i) 2010 (0.07); ii) 2012 (0.23); iii) 2013 (0.04); iv) 2014 (0.08); v) 2015, 2018, and 2023 (0.06); vi) 2016 (0.10); vii) 2017, 2020, and 2021 (0.13); viii) 2019 (0.12); and ix) 2022 (0.02).
- Abundance estimates for the Keeyask reservoir and Stephens Lake are provided for the 2010 and 2012-2023 study years.

- As sampling continues (*i.e.*, year to year) and data is added to the model, the parameters are recalculated. Thus, although survival rates and abundance estimates are calculated for the same time periods, they may differ among reporting periods. This allows the estimates to become more refined and precise over time.

The Cormack-Jolly-Seber model was used to calculate an estimate of survival of hatchery-reared lake Sturgeon in both the Keeyask reservoir and Stephens Lake between 2015 (when stocking began) and 2023. This model calculates an estimate using the probability of recapture. For example, if 426 juveniles were stocked in a system and the estimated survival rate was 0.93 over three years then the remaining number of hatchery fish in the system would be calculated by multiplying the number of stocked fish by the survival rate over three years. The resulting number would be calculated as follows: (426 hatchery fish) x (0.93) x (0.93) x (0.93) = 342 and would represent the number of hatchery fish estimated to still be present in the system after three years.

References

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White, G.C. and Burnham, K.P. 1999. Program MARK: Survival estimation from populations of marked animals. Bird Study 46 Supplement: 120–138.

Table A5-1: Results of POPAN analysis of juvenile Lake Sturgeon from the Keeyask reservoir. Best model was constant survival and variable recapture. Confidence intervals are rounded.

Parameter	Mean	SE	95% Confidence Interval	
			Low	High
Survival (All Years)	0.78	0.03	0.72	0.83
2010 Recapture	0.97	4.47	0.00	1.00
2012 Recapture	0.06	0.03	0.03	0.14
2013 Recapture	0.03	0.01	0.01	0.06
2014 Recapture	0.03	0.02	0.01	0.10
2015 Recapture	0.03	0.01	0.02	0.05
2016 Recapture	0.03	0.01	0.02	0.04
2017 Recapture	0.06	0.01	0.04	0.09
2018 Recapture	0.04	0.01	0.02	0.07
2019 Recapture	0.05	0.01	0.03	0.09
2020 Recapture	0.05	0.01	0.03	0.08
2021 Recapture	0.06	0.01	0.04	0.09
2022 Recapture	0.05	0.01	0.03	0.07
2023 Recapture	0.10	0.02	0.06	0.14
2010 Abundance	71	329	2	2251
2012 Abundance	1254	540	559	2814
2013 Abundance	975	424	431	2206
2014 Abundance	3359	1906	1193	9462
2015 Abundance	3940	810	2644	5871
2016 Abundance	3068	621	2071	4545
2017 Abundance	2386	516	1569	3627
2018 Abundance	3481	1089	1913	6334
2019 Abundance	3276	830	2009	5341
2020 Abundance	3252	779	2046	5167
2021 Abundance	3204	688	2113	4858
2022 Abundance	2978	687	1905	4654
2023 Abundance	3197	596	2224	4594

Table A5-2: Results of POPAN analysis of hatchery-reared juvenile Lake Sturgeon from the Keeyask reservoir. Best model was constant survival and variable recapture. Confidence intervals are rounded.

Year	Parameter	Mean	SE	95% Confidence Interval	
				Low	High
All	Survival	0.95	0.08	0.47	1.00
2014	Cohort at Large	278		1	414
2016	Cohort at Large	338		5	456
2018	Cohort at Large	322		20	394
2021	Cohort at Large	379		189	399
Total	Stocked	1317		216	1663
2023	Wild	3197	596	2224	4594
2023	Percent Hatchery	29.18%			

Table A5-3: Results of POPAN analysis of juvenile Lake Sturgeon from Stephens Lake. Best model was constant survival and variable recapture. Confidence intervals are rounded.

Parameter	Mean	SE	95% Confidence Interval	
			Low	High
Survival (All Years)	0.81	0.03	0.75	0.85
2010 Recapture	0.07	0.50	0.00	1.00
2012 Recapture	0.23	0.09	0.09	0.45
2013 Recapture	0.04	0.01	0.02	0.07
2014 Recapture	0.08	0.03	0.04	0.15
2015 Recapture	0.06	0.02	0.04	0.10
2016 Recapture	0.10	0.03	0.06	0.17
2017 Recapture	0.13	0.03	0.08	0.20
2018 Recapture	0.06	0.01	0.04	0.08
2019 Recapture	0.12	0.02	0.08	0.16
2020 Recapture	0.13	0.02	0.09	0.19
2021 Recapture	0.13	0.03	0.09	0.20
2022 Recapture	0.02	0.01	0.01	0.04
2023 Recapture	0.06	0.02	0.04	0.10
2010 Abundance	471	3387	9	23333
2012 Abundance	376	151	176	803
2013 Abundance	727	212	416	1272
2014 Abundance	587	174	333	1036
2015 Abundance	785	171	514	1197
2016 Abundance	633	144	408	984
2017 Abundance	757	171	489	1174
2018 Abundance	1074	132	845	1366
2019 Abundance	867	120	662	1136
2020 Abundance	700	112	513	955
2021 Abundance	611	108	433	862
2022 Abundance	3348	796	2114	5301
2023 Abundance	2703	682	1660	4400

Table A5-4: Results of POPAN analysis of hatchery-reared juvenile Lake Sturgeon from Stephens Lake. Best model was constant survival and variable recapture. Confidence intervals are rounded.

Year	Parameter	Mean	SE	95% Confidence Interval	
				Low	High
All	Survival	0.86	0.05	0.73	0.93
2014	Cohort at Large	121		34	233
2016	Cohort at Large	285		110	464
2018	Cohort at Large	210		111	291
2021	Cohort at Large	343		292	372
Total	Stocked	959		548	1359
2023	Wild	2703	682	1660	4400
2023	Percent Hatchery	26.18%			