



Keeyask Generation Project Aquatic Effects Monitoring Plan

Walleye Movement Monitoring Report AEMP-2021-04



KEEYASK GENERATION PROJECT

AQUATIC EFFECTS MONITORING PLAN

REPORT #AEMP-2021-04

WALLEYE MOVEMENT MONITORING IN THE NELSON RIVER BETWEEN CLARK LAKE AND THE LIMESTONE GENERATING STATION, OCTOBER 2019 TO SEPTEMBER 2020: YEAR 7 CONSTRUCTION

Prepared for

Manitoba Hydro

By

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SUMMARY

Background

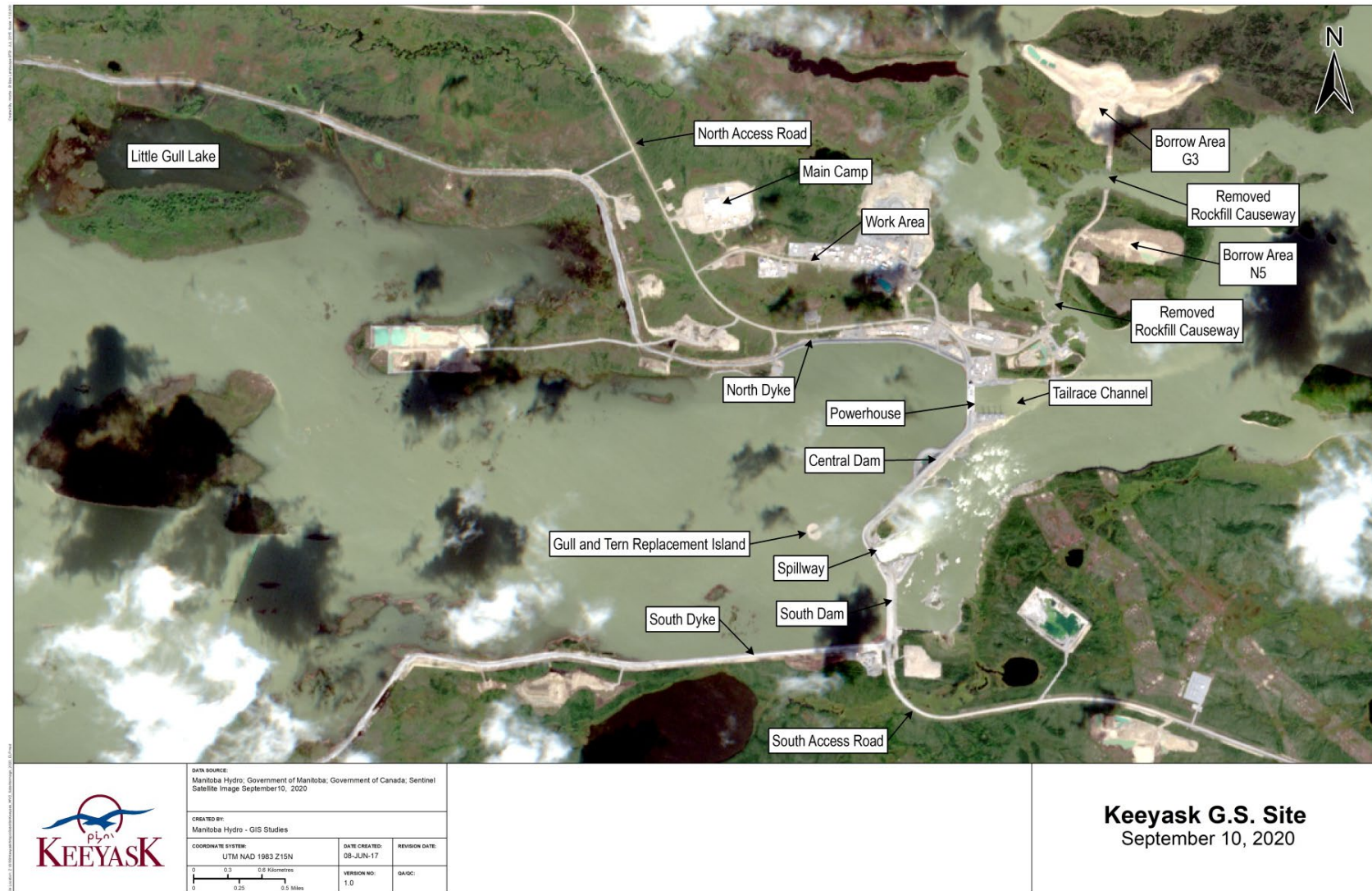
The Keeyask Hydropower Limited Partnership (KHLP) was required to prepare a plan to monitor the effects of construction and operation of the Keeyask Generating Station (GS) on the environment. Besides measuring the accuracy of the predictions made and actual effects of the GS on the environment, monitoring results will provide information on how construction and operation of the GS will affect the environment and if more needs to be done to reduce harmful effects.

Construction of the Keeyask GS began in mid-July 2014 with the construction of cofferdams in the north and central channels of Gull Rapids. These cofferdams resulted in the dewatering of the north and central channels and the diversion of all flow to the south channel. Construction of the Spillway Cofferdam (SWCD), which extends into the south channel of Gull Rapids, was completed in 2015. The rock placement for the inner and outer groins of the Tailrace Cofferdam (TRCD) started in late 2016 and the impervious fill placement was completed in fall 2017. The spillway was commissioned between August 3 and 7, 2018. Closing the south channel with the upstream South Dam Cofferdam (SDCD) commenced at the beginning of August and river closure was achieved on August 16. This closure and the work that continued to seal the cofferdam forced the entire river flow through the spillway. In 2020 water-up of the areas kept dry by cofferdams for construction occurred between the end of February and mid-April. The cofferdams upstream of Keeyask and the North Channel Rock Groin were removed and/or lowered throughout the water-up process. Excavation of the TRCD occurred from mid-April to May 14 and then resumed on July 16 and was completed in October. Impoundment of the Keeyask reservoir took place between August 31 and September 5, 2020. Commissioning of the first generator unit started on August 31, 2020 and was still underway at the end of 2020.

Movements of Walleye in relation to Birthday Rapids and Gull Rapids were monitored prior to the start of the construction monitoring program in 2013, but because different methods were used to collect data under the Aquatic Effects Monitoring Plan (AEMP), the results are not directly comparable. While earlier studies did not record detailed fish movement patterns between Clark Lake and Stephens Lake, data indicated that the majority of Walleye continued to live in the waterbody where they had been tagged and some moved over Birthday and Gull rapids. A small number of Walleye also moved downstream through the Kettle and Long Spruce generating stations.

This report presents results of Walleye movement monitoring from October 2019 to September 2020 and provides a summary of data collected since the monitoring program was initiated in June 2013. Tags were initially implanted into Walleye in 2013 and these tags expired in 2016. To continue the study, additional transmitters were applied to Walleye in 2016 (expire in 2021), 2018 (expire in 2023), and 2019 (expire in 2023). Monitoring these tags will continue through commissioning and operation of the Keeyask GS.

Monitoring fish movements is an important component of the overall plan to monitor the impacts of construction and operation of the Keeyask GS on fish. Walleye was identified as one of the key species to monitor because it is: of commercial and domestic importance; abundant in the Keeyask area; known to pass through Gull Rapids in either direction prior to the start of construction; and resilient enough to survive the acoustic tagging procedure.



Map illustrating instream structures at the Keeyask Generating Station site, September 2020.

Why is the study being done?

Monitoring during construction is being done to answer two questions:

Are there Walleye close to the construction site, particularly during spawning?

If Walleye are in the river close to the construction area, they could be harmed by high amounts of mud in the water or they could be trapped inside an area that will be drained.

How many Walleye are moving through and/or away from the Keeyask GS during construction and how far are they going?

Movement studies tell us how many Walleye are moving up or down through Gull Rapids or the Keeyask GS, how far they travel up or downstream away from the site, whether they are leaving the Keeyask area completely and when they are making these movements. The distance they travel is monitored as far upstream as the inlet to Clark Lake and downstream as far as the Limestone Reservoir.

In 2020, monitoring was also conducted for the first 19 days after the reservoir was flooded on September 5. This means an additional AEMP key question can be addressed:

How many Walleye move upstream past Birthday and/or Long rapids?

Flooding of Gull Lake will cause changes to available Walleye habitat in the area. This may cause Walleye to move out of the newly formed reservoir.

What was done?

Movements of Walleye were tracked using acoustic telemetry. This is a technique in which a tag is surgically implanted inside a fish. Each tag sends out a sound signal (called a “ping”) that is picked up by receivers that were placed along the Nelson River between Clark Lake and the Limestone Generating Station (see study area map below). Each fish is given a battery powered transmitter that sends out a unique ping, and pings can be detected up to 1 kilometre (km) away from a receiver. By looking at detections recorded by different receivers, the movement of each fish can be tracked.

Eighty Walleye were tagged in 2013, 40 upstream and 40 downstream of Gull Rapids (now called the Keeyask GS). Because the batteries in these transmitters expired in 2016, an additional 80 transmitters were applied to Walleye in June 2016: 40 upstream and 40 downstream of Gull Rapids. Because eight of the fish tagged in 2016 moved downstream through Gull Rapids shortly after being tagged, an additional eight tags were applied upstream of Gull Rapids in fall 2016. By October 2017, more fish were considered missing or had moved downstream. To replace these, 24 more tags were applied in spring 2018: 17 upstream of the Keeyask GS, and seven in Stephens Lake. The batteries in tags applied to Walleye in 2016 will expire in winter 2021, and those applied in 2018 will expire in winter 2023. In spring 2019, an additional 56 transmitters were applied to Walleye (27 upstream and 29 downstream).

Movements of these fish will continue to be monitored through commissioning and operation of the Keeyask GS.



Measuring a Walleye before surgery (left), surgery (middle), and release (right).

What was found?

Walleye tagged upstream of the Keeyask GS have consistently showed the same four general movement patterns since monitoring began in 2013. These fish either: remain in Gull Lake, move between Birthday Rapids and Gull Lake, move between Clark Lake and Gull Lake, remain in the riverine area downstream of Birthday Rapids, or move downstream through the Keeyask GS. Walleye tagged in Stephens Lake have been consistently split into two groups: those that remain exclusively within the upper portion (within 13.4 rkm of the Keeyask GS) of the lake; and those that move extensively throughout the lake.

Since tagging began in 2013, 37 fish have moved downstream through Gull Rapids or the Keeyask GS. Thirteen of these movements likely happened because of tagging stress or mortality, while 24 movements occurred for another reason. Most of these 24 movements happened in 2017 (18%) and 2019 (13%). The highest numbers of fish also moved downstream through the Kettle GS in the same years. In all other monitoring years, the percentage of fish that have moved downstream through Gull Rapids or the Keeyask GS has ranged from 0% (in 2013) to 10% (in 2015). One Walleye moved downstream through the Keeyask GS in winter 2019/2020 and one moved downstream through the Kettle GS in open-water 2020. No Walleye moved downstream through either GS after reservoir impoundment in 2020. All movements are summarized in the maps below.

No Walleye moved upstream through Gull Rapids since construction began in 2014. Only one Walleye moved upstream before the start of construction. Keeyask spillway commissioning began on August 3, 2018, after which upstream movements were no longer possible.

Flooding of the Keeyask GS reservoir to the full supply level was completed during 6 days ending on September 5, 2020, and the first turbine of the powerhouse began running. No tagged fish moved upstream out of Gull Lake during the six days of flooding. Monitoring was conducted for 19 days after the reservoir reached full supply level. During this time, one Walleye moved upstream to Birthday Rapids but returned downstream to Gull Lake after four days. No other Walleye left the newly-formed reservoir in the first 19 days after impoundment.

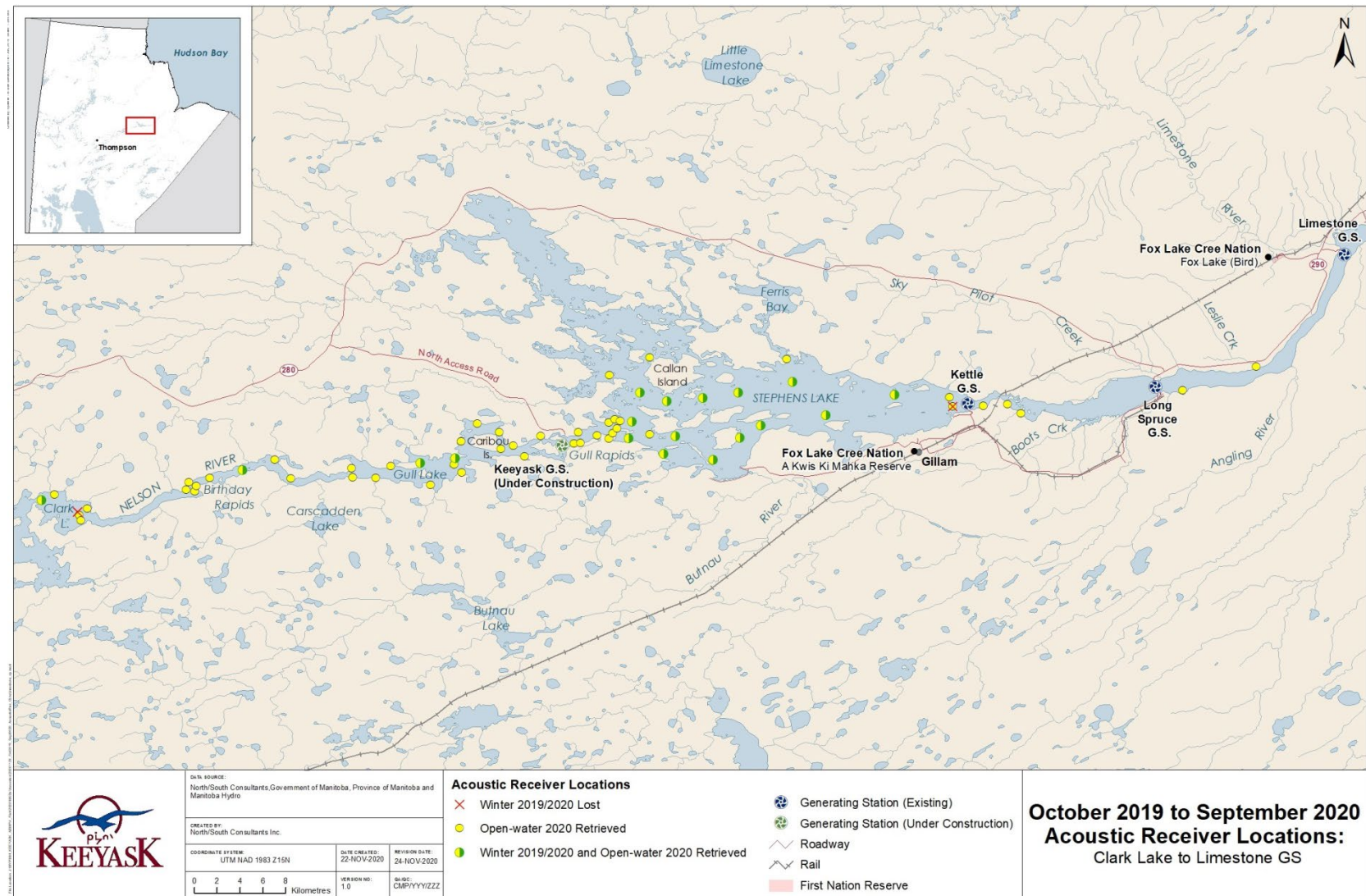
Walleye tagged in Stephens Lake, or those that have moved downstream from Gull Lake/Keeyask Reservoir, regularly use habitat directly downstream of the construction site. After the Keeyask GS reservoir was flooded, one Walleye moved farther downstream than it had in any other study year, however, this fish stayed in Stephens Lake. No Walleye left Stephens Lake in the first 19 days after GS impoundment.

What does it mean?

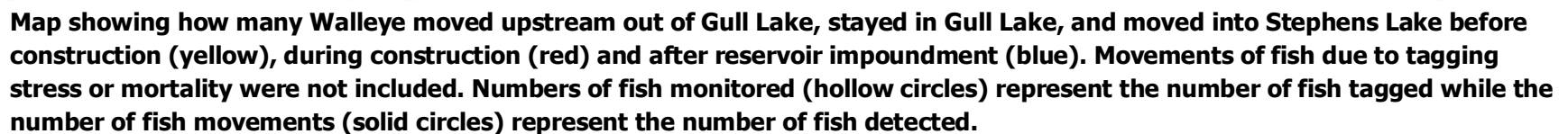
Many Walleye use habitat immediately downstream of the construction site in Stephens Lake, including during the spawning period. Fish upstream of the GS either remain in Gull Lake, move between Birthday Rapids and Gull Lake, move between Clark Lake and Gull Lake, remain in the riverine area downstream of Birthday Rapids, or move downstream through the Keeyask GS. The number of tagged Walleye moving downstream through Gull Rapids/the Keeyask GS and the Kettle GS was highest in 2017 and 2019. In 2017, movements may have been related to record-high flows. One Walleye moved downstream through the Keeyask GS in winter 2019/2020. No Walleye moved upstream through Birthday Rapids, downstream through the Keeyask GS, or downstream through the Kettle GS during the first 19 days after reservoir impoundment.

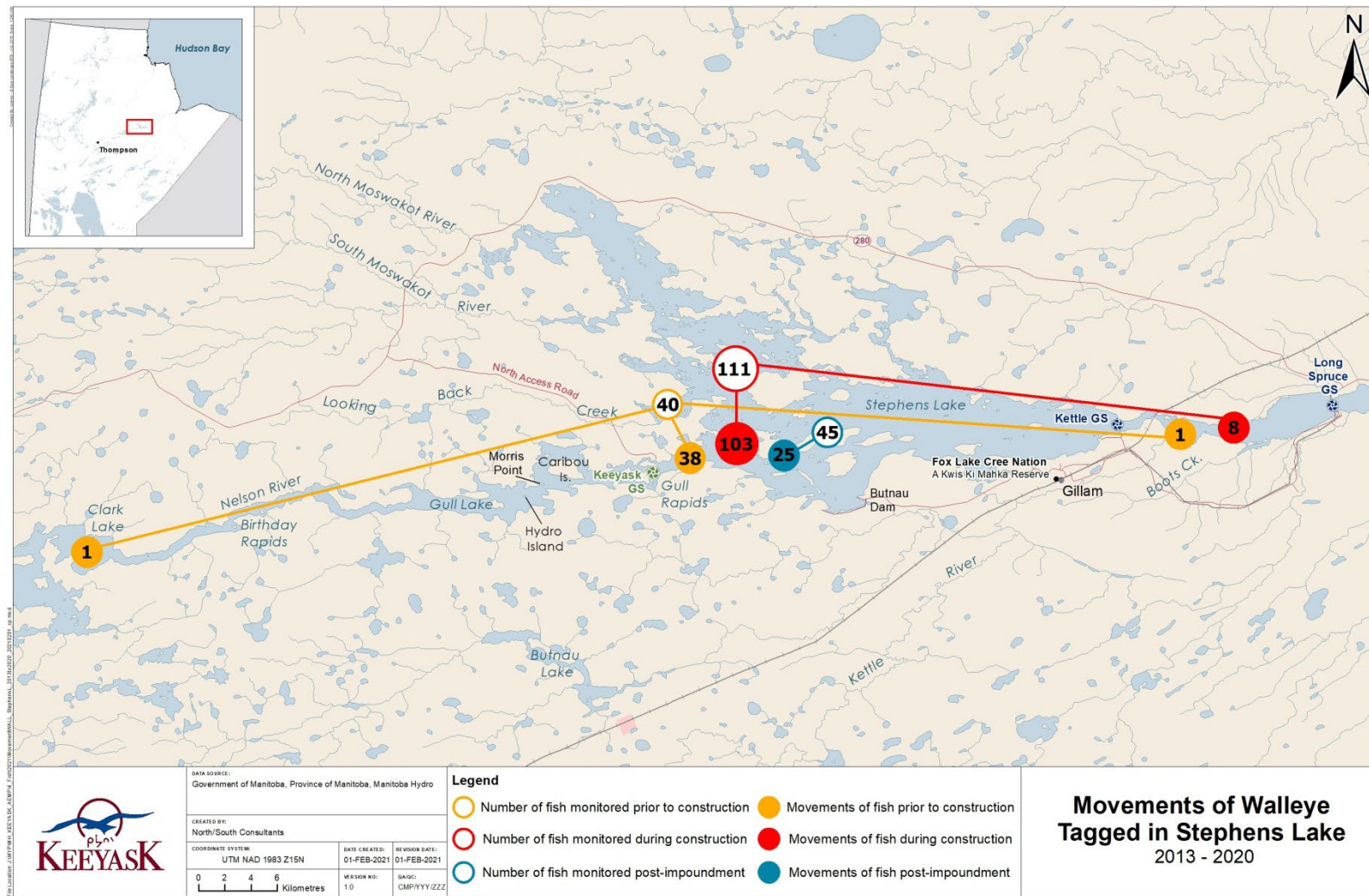
What will be done next?

Fish that were tagged in 2016 can be tracked until 2021, and fish tagged in 2018 and 2019 can be tracked until 2023. Ongoing tracking of fish through GS construction, impoundment, and operation will provide additional information about where the fish are moving, what kinds of habitats these fish need to use over several years, when and where they are spawning, and where they are feeding.



Map showing the study area (pre-flooding shoreline). The dots represent the locations of receivers in the river. The different colours represent receivers that were in the river at different times of the year.





Map showing how many Walleye moved upstream through Gull Rapids, stayed in Stephens Lake, and moved downstream through the Kettle GS before construction (yellow), during construction (red) and after reservoir impoundment (blue). Movements due to tagging stress and mortality were not included. Numbers of fish monitored (hollow circles) represent the number of fish tagged while the number of fish movements (solid circles) represent the number of fish detected.

ACKNOWLEDGEMENTS

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The collection of biological samples described in this report was authorized by Manitoba Conservation and Water Stewardship, Fisheries Branch, under terms of the Scientific Collection Permit #10-20.

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1.0 INTRODUCTION

The Keeyask Generation Project (the Project) is a 695-megawatt (MW) hydroelectric generating station at Gull (Keeyask) Rapids on the lower Nelson River in northern Manitoba. The Project is approximately 725 kilometres (km) northeast of Winnipeg, 35 km upstream of the existing Kettle Generating Station, where Gull Lake flows into Stephens Lake, 60 km east of the community of Split Lake, 180 km east-northeast of Thompson and 30 km west of Gillam (Map 1). Construction of the Project began in July 2014.

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* (AE SV). 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, Walleye (*Sander vitreus*) movement, for the construction and operation phases of the Project.

Pre-construction (baseline) movements of Walleye were monitored using radio telemetry from 2001 to 2005 (Barth *et al.* 2003; Murray *et al.* 2005; Murray and Barth 2007). Radio telemetry studies focused specifically on detecting the upstream and downstream movements of fish over rapids in the study area (Birthday Rapids and Gull Rapids). Pre-construction movement data revealed that the majority of Walleye did not move upstream or downstream over rapids into adjacent study reaches; instead, they remained within the reach where they had been tagged. Those few fish that moved over one or more sets of rapids did so in the summer or fall, suggesting that these movements were not associated with a life history event such as spawning. A small number of Walleye also moved downstream through the generating stations/spillways along the lower Nelson River. Additional information on long distance movements was obtained from mark-recapture studies. These results are not directly comparable to the movement data being collected under the AEMP.

In 2013, 80 Walleye were tagged with acoustic transmitters to assess the frequency of movement through Gull Rapids and to monitor the potential impact that construction of the Keeyask GS may have on movement (Hrenchuk and Barth 2014). Movements of these Walleye from the tagging date until October 2014 are provided in Murray *et al.* (2015); October 2014 to October 2015 are presented in Burnett *et al.* (2016); and October 2015 to October 2016 are presented in Hrenchuk and Lacho (2017).

As the transmitters applied in 2013 reached the end of their battery life in 2016, additional transmitters were applied to Walleye in 2016 to continue the movement study until 2021. Results from June to October 2016 are presented in Hrenchuk and Lacho (2017), October 2016 to October 2017 are presented in Hrenchuk and Lacho (2018), October 2017 to October 2018 are presented in Hrenchuk and Lacho (2019), and October 2018 to October 2019 are presented

in Hrenchuk (2020). This report provides results of Walleye movement monitoring from October 2019 to September 2020 and summarizes what has been observed since the program began in 2013.

Walleye movements in the main flow of the Nelson River near the construction site may be affected by the installation of cofferdams (Map 2) that block upstream and downstream movements and alter flow patterns, river diversion through the GS Spillway (in late summer 2018), and disturbances such as blasting that may increase emigration from the construction area. The broad objective of Walleye movement monitoring is to better understand movement and habitat use during generating station construction, with particular focus on movements in the vicinity of Gull Rapids.

As presented in the AEMP, the key questions to be answered about Walleye movement monitoring during construction of the Keeyask GS are:

- What is the number (or proportion) of tagged Walleye that move past the construction site?
- Are Walleye utilizing habitat in the vicinity of construction activities (particularly during spawning)?

Reservoir impoundment occurred over six days ending on September 5. Monitoring was conducted for 19 days after impoundment, which made it possible to begin to address another key question:

- What proportion of the fish population moves from the Keeyask reservoir upstream past Birthday and/or Long rapids?

This report provides results from October 2019 to September 2020, which is the fifth winter and sixth open-water period of monitoring conducted since construction of the Keeyask GS began in July 2014. This report includes data collected during the first 19 days (September 5 to September 23, 2020) after impoundment of the Keeyask reservoir.

2.0 STUDY SETTING

The study area encompasses an approximately 110 km long reach of the Nelson River from Clark Lake to the upstream end of the Limestone Reservoir (Map 1). This section of river offers a diversity of physical habitat conditions, including a variety of substrate types, and variable water depths (range 0–30 m) and velocities. Water velocities were classified as low (0.2–0.5 metres per second [m/s]), moderate (0.5–1.5 m/s), or high (greater than 1.5 m/s), as described in the Keeyask AE SV.

Clark Lake is located immediately downstream of Split Lake, and approximately 42 km upstream of the Keeyask GS (Map 1). 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.

Birthday Rapids is located approximately 10 km downstream of Clark Lake and 30 km upstream of the Keeyask GS (Maps 1 and 3). The drop in elevation from the upstream to downstream side of Birthday Rapids was approximately 2 m. The 14 km reach of the Nelson River between Birthday Rapids and Gull Lake is characterized as a large and somewhat uniform channel with medium to high water velocities. There are a few large bays with reduced water velocity and a number of small tributaries that drain into the Nelson River.

Gull Lake is a section of the Nelson River where the river widens, with moderate to low water velocity. Gull Lake is herein defined as the reach of the Nelson River beginning approximately 19.5 km upstream of the Keeyask GS and 14 km downstream of Birthday Rapids, where the river widens to the north into a bay around a large point of land (Maps 1 and 3), and extending to the downstream end of Caribou Island, approximately 3 km upstream of the Keeyask GS. Gull Lake has three distinct basins, the first extending from the upstream end of the lake downstream approximately 6 km to a large island; the second extending from the large island to Morris Point (a constriction in the river immediately upstream of Caribou Island); and the third extending from Morris Point to the downstream end of Caribou Island (Map 3).

In fall 2020, Gull Lake was impounded by the Keeyask GS and became part of the Keeyask reservoir, which will operate at a full supply level (FSL) of 159 m above sea level (ASL) on a permanent basis. The Keeyask reservoir is comprised of the mainstem of the original Nelson River from the outlet of Clark Lake as far as the Keeyask GS, plus 45 km² of adjacent, flooded terrestrial area. Reservoir impoundment formed relatively shallow bays due to flooding of terrestrial areas, which generally have low water velocities and limited mixing with the mainstem flow. Over time the total area of the reservoir will increase as the terrestrial (peat) areas erode.

Gull Rapids, now the site of the Keeyask GS, was located approximately 3 km downstream of Caribou Island on the Nelson River (Map 1). Prior to construction, the rapids were approximately 2 km in length, and the river elevation dropped approximately 11 m along the 2

km length. Two large islands and several small islands occurred within the rapids, prior to the river narrowing; these features are within the Project footprint and have now been either dewatered, incorporated into the GS or were flooded after impoundment (Map 2). A summary of construction activities is provided in Section 2.1.

Just below the Keeyask GS, the Nelson River enters Stephens Lake (Map 5). Construction has altered the flow distribution immediately downstream of Gull Rapids and all flow now passes via the Keeyask GS spillway (see Section 2.1).

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 (Map 4). 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 (Map 1). Kettle GS is located approximately 40 km downstream of the Keeyask GS.

The Long Spruce reservoir was formed in 1979 by the construction of the Long Spruce GS. It is a 16 km reach of the Nelson River extending from Long Spruce GS upstream to Kettle GS (Manitoba Hydro Public Affairs 1999). Kettle River and Boots Creek are the only major tributaries flowing into Long Spruce reservoir, with both tributaries entering the reservoir on the south shore (Maps 1 and 6).

The Limestone Reservoir was formed in 1990 by the construction of the Limestone GS. It is a 23 km reach of the Nelson River extending from Limestone GS upstream to Long Spruce GS. Four tributaries of the Nelson River enter the reservoir; Wilson Creek and Brooks Creek enter from the south, and Sky Pilot Creek and Leslie Creek enter from the north. Aquatic habitat within the reservoir ranges from a riverine environment in the upper reach, to more lacustrine conditions just upstream of the Limestone GS.

2.1 CONSTRUCTION SUMMARY

Construction of the Keeyask GS began in mid-July 2014 with the construction of cofferdams in the north and central channels of Gull Rapids. These cofferdams resulted in the dewatering of the north and central channels and the diversion of all flow to the south channel. Construction of the Spillway Cofferdam (SWCD), which extends into the south channel of Gull Rapids, was completed in 2015. The rock placement for the inner and outer groins of the Tailrace Cofferdam (TRCD) started in late 2016 and the impervious fill placement was completed in fall 2017. The spillway was commissioned between August 3 and 7, 2018. Closing the south channel with the upstream South Dam Cofferdam (SDCD) commenced at the beginning of August and river closure was achieved on August 16. This closure and the work that continued to seal the cofferdam forced the entire river flow through the spillway. In 2020, water-up of the areas kept dry by cofferdams for construction occurred between the end of February and mid-April. The cofferdams upstream of Keeyask and North Channel Rock Groin were removed and/or lowered throughout the water-up process. Excavation of the TRCD occurred from mid-April to May 14

and then resumed on July 16 and was completed in October. Impoundment of the Keeyask reservoir took place between August 31 and September 5, 2020. Commissioning of the first generator unit started on August 31, 2020 and was still underway at the end of 2020.

2.2 FLOWS AND WATER LEVELS

From October 2019 to October 2020, the calculated Split Lake outflow ranged between 2,600 m³/s in October 2019 and 5,900 m³/s in May 2020. Flows increased from about 2,600 m³/s in October 2019 to about 4,000 m³/s in December 2019 and remained fairly steady between 4,000–4,400 m³/s until the end of April 2020. In summer the flows were high and ranged between 5,000–6,000 m³/s from May through August before dropping in September through October until it reached 3,500 m³/s, slightly above the existing environment average flow.

Water levels on Gull Lake generally varied with flow and ice conditions between October 2019 and February 2020. Levels on Gull Lake rose from a low of about 153.5 m to 156 m from October to December and remained near that level until February while upstream levels varied with flow and ice conditions. From February to April, water-up activities at the construction site caused Gull Lake levels to rise about 0.3 m. After water-up, the spillway gates were used to keep levels relatively steady between about 156.3–156.8 m until the end of August prior to impoundment. The Keeyask reservoir was impounded to its operating level (158 to 159 m) from August 31 to September 5. During this period, Gull Lake was raised about 2 m to a maximum level of 158.9 m, 0.1 m below the full supply level. Upstream of Gull Lake the water level increase diminished with distance, with increases of about 0.8 m and 0.2 m immediately below and above Birthday Rapids while no increases occurred at the water level gauges immediately below and on Clark Lake. Gull Lake has since been held near 158.8 m while upstream levels vary with flow. With impoundment the Keeyask reservoir has entered its operating condition. Water levels on Gull Lake and upstream areas within the project's open water hydraulic zone of influence, which extends to about 3 km below Clark Lake, will now be permanently elevated relative to pre-project conditions.

3.0 METHODS

3.1 ACOUSTIC TELEMETRY

Acoustic telemetry involves tracking movements of fish surgically implanted with internal acoustic transmitters (tags). Each transmitter emits a unique signal, recognizable by stationary receivers. When tagged fish come into the detection range of a receiver (generally within 500 m to 1 km, depending on conditions), the transmitter code number, as well as the date and time, are stored in the receiver. Initially, the receiver array was designed to monitor adult Lake Sturgeon (Hrenchuk 2021a); however, the same array is also used to monitor movements of juvenile Lake Sturgeon (Hrenchuk 2021b), Walleye (the focus of this report), and Lake Whitefish (Hrenchuk 2021c).

3.1.1 ACOUSTIC TRANSMITTER APPLICATION

Acoustic transmitters (VEMCO V13-1x) were first applied to Walleye in 2013 (40 upstream and 40 downstream of Gull Rapids) and 2014 (nine upstream and two downstream) (Murray *et al.* 2015). These transmitters expired during the 2016 open-water period. To continue Walleye movement monitoring with a similar sample size, 80 acoustic transmitters (VEMCO V13-1x¹) were applied to Walleye between May 27 and June 7, 2016: 40 upstream, and 40 downstream of Gull Rapids (now referred to as the Keeyask GS) (Table 1). Shortly after tagging (*i.e.*, within 22 days), eight fish moved downstream into Stephens Lake. In order to return the number of tagged fish upstream of Gull Rapids to the original sample size, eight additional transmitters were applied on September 24, 2016 (Hrenchuk and Lacho 2017).

In October 2017, monitoring results indicated that several additional fish had either moved downstream out of Gull and Stephens lakes, or had gone missing (see Sections 4.1.1 and 4.1.2). Therefore, to maintain a similar sample size of tagged fish, additional transmitters (VEMCO V13-1x) were applied to Walleye upstream of the Keeyask GS and in Stephens Lake in spring 2018. Seventeen fish were tagged upstream of the Keeyask GS between May 27 and June 5, and seven fish were tagged in Stephens Lake between June 6 and 9 (Table 1).

Additional transmitters were applied to Walleye in 2019 (VEMCO V13-1x) to maintain the sample size during GS operation, while obtaining one full year of tracking prior to GS commissioning. Twenty-seven fish were tagged upstream of the Keeyask GS between May 23 and June 7, and 27 were tagged in Stephens Lake between May 30 and June 3. An additional two fish were tagged in Stephens Lake on September 16.

¹ Battery life for tags implanted in 2013 was estimated at 1,480 days; tags implanted in 2016 and 2018 had an estimated battery life of 1,735 days; and tags implanted in 2019 had an estimated battery life of 1,492 days.

3.1.2 ACOUSTIC RECEIVERS

Since 2011, stationary acoustic receivers (VEMCO model VR2W) have been used to continuously monitor tagged adult Lake Sturgeon in the Nelson River between Clark Lake and the Long Spruce GS. In spring 2016, the receiver array was extended to the upper Limestone reservoir, with the placement of two receivers downstream of the Long Spruce GS. The intent of adding these receivers was to determine whether fish that had moved into the Long Spruce reservoir had continued to move downstream.

During the six years of the construction phase of the Project (beginning in July 2014), receivers were deployed at the same sites as those established during the pre-construction phase (2011–2013). During the open-water period, receivers were deployed in calm water with a flat bottom free of large debris to maximize detection range, and spaced along the main river channel throughout the study area to maximize spatial coverage. In Stephens Lake, receivers were placed at locations within pre-flood river channels, based on the observation that sturgeon tend to stay within river channels, even in flooded environments. At constrictions within the river channel, a series of receivers were deployed to create “gates” with the intent of recording all fish that passed by the river cross-section (described in Section 3.1.2.2).

The retrieval of receivers deployed during winter has proven challenging and several were lost in previous winters, likely moved by ice (Hrenchuk and Barth 2013). Because it appears that receivers will only remain safe from ice if deployed in calm areas at depths greater than 10 m, the number of possible receiver locations during winter is limited, especially in Gull Lake.

3.1.2.1 WINTER 2019/2020

The stationary acoustic receiver array for the winter 2019/2020 (October 8, 2019, to April 30, 2020) period consisted of 21 receivers. Five were set upstream of the Keeyask GS and 16 throughout Stephens Lake (Maps 3 and 4). Low water levels prevented boat access to the river section between Kettle GS and Long Spruce GS, and therefore, an acoustic receiver could not be set downstream of the Kettle GS during winter 2019/2020. The 2019/2020 winter array differed slightly from the array used in 2018/2019. An additional receiver (#107999) was set near the outlet of Clark Lake at rkm -45.0 (Map 3). One receiver (#122776) was set immediately upstream of the Kettle GS, at rkm 40.0 (Map 4).

3.1.2.2 OPEN-WATER 2020

An array of 64 acoustic receivers was used during the 2020 open-water period (defined as May 1 to September 23, 2020). Twenty-nine were set upstream of the Keeyask GS and 30 were set in Stephens Lake (Maps 5 and 6). The 2020 open-water array differed slightly from the array used in 2019. Two additional receivers were set upstream of the GS, one close to the spillway (#127091 at rkm -3.8) and one close to the powerhouse (#127100 at rkm -2.2) (Map 6).

Water levels were higher in 2020 than in previous sampling years, and receivers were set in the Long Spruce ($n = 3$) and Limestone ($n = 2$) reservoirs (Map 7). A single receiver deployed in the Long Spruce reservoir prior to winter 2017/2018 was retrieved. The battery was no longer active, but data was recorded from October 13, 2017, to August 15, 2019.

Due to complications associated with conducting field work during the COVID-19 pandemic, the open-water receiver array was deployed later than in previous years. The open-water array was completely deployed by July 3, 2020, whereas in previous years the array was deployed in late May or early June.

Similar to previous years, receiver “gates” were established in several key areas selected by river morphology (channel restrictions) and habitat characteristics (areas with low velocity adjacent to the main flow of the river). Receiver “gates” consisted of two or more acoustic receivers set parallel to flow to provide complete (or nearly complete) signal coverage of a river cross-section. Areas between the “gates” were referred to as river zones. Receiver gates provide confidence that movements past key points are being detected, which allows for extrapolation of coarse-scale positions (*i.e.*, which zone) during periods when fish remain undetected. When analyzing data, fish detected within a zone that subsequently go undetected for a period of time without passing through a gate, are assumed to be within the zone in which they were last detected.

Four gates were established between Clark Lake and the Keeyask GS (44.0, 34.0, 19.0, and 10.0 rkms upstream of the GS), and two were established in Stephens Lake (4.5 and 40.0 rkms downstream of the GS) (Maps 5 and 6). The location of the “gates” has remained consistent since 2013.

To describe fish movements for reporting purposes, the study area was divided into nine different zones. The area upstream of the Keeyask GS was divided into five zones (Map 5; Zones 1–5), while Stephens Lake was divided into two zones (Map 6; Zones 6 and 7). The Long Spruce reservoir is referred to as Zone 8 and the Limestone reservoir as Zone 9.

Between August 31 and September 5, 2020, the Keeyask GS reservoir was impounded to full-supply level. Prior to impoundment, all acoustic receivers set within the reservoir (*i.e.*, between Birthday Rapids and the Keeyask GS) were sunk as is done prior to the winter study period. This was done to minimize the potential for losing receivers due to increased water levels and potential debris. All receivers were retrieved prior to the end of the open-water period.

By September 23, 2020, the majority of receivers were removed and a subset ($n = 26$) were redeployed to monitor movements during winter 2020/2021.

3.1.3 DATA ANALYSIS

False detections can arise on acoustic telemetry receivers due to code collisions and/or environmental noise (Pincock 2012). To filter out false detections, a fish was required to be detected at least two times within a 30-minute interval at a given stationary receiver. Single

detections were filtered and not used in most analyses; however, in instances when fish went undetected for lengthy periods, and/or rapid movements were suspected, raw data were also explored. In no instance did examination of raw data suggest that consideration of a single detection would result in a different behaviour or movement pattern compared with the result when single detections were removed.

Movements were analysed in terms of rkm distance, with the base of the Keeyask GS representing a distance of 0 rkm. The area located downstream of the Keeyask GS (*i.e.*, Stephens Lake) was given a positive (+) distance value from the GS, while the area located upstream (*i.e.*, Gull and Clark lakes) was given negative (-) distance values (Figures 1 and 2). The average rkm distance from the GS was calculated over a 4-hour interval and plotted versus time for each fish. Total detection ranges were calculated by subtracting the farthest downstream detection location from the location of the farthest upstream detection. The proportion of time that all fish spent within each river zone was calculated and plotted.

Rapid downstream movements observed within two weeks of tagging were classified as caused by tagging mortality or stress. If the fish made a rapid downstream movement within two weeks of tagging followed by upstream and downstream movements, it was classified as tagging stress. If a fish made a rapid downstream movement within two weeks of tagging and was not detected again or did not display upstream movements, it was classified as a tagging mortality. If a fish was not detected for more than one year, it was classified as missing.

4.0 RESULTS

Section 4.1 provides a movement summary for fish tagged between 2016 and 2019 prior to winter 2019/2020. Numbers of fish tagged upstream of the Keeyask GS and in Stephens Lake, by year, are provided in Table 1. Table 2 summarizes the proportional distribution of tagged fish upstream and downstream of the construction site (2013–2020). Table 3 summarizes Walleye movements through Gull Rapids (or the Keeyask GS) and the Kettle GS between 2013 and 2020. Figures 3 to 13 provide movement range, relative detection frequency, and proportional distribution of tagged fish both upstream and downstream of the construction site by season. Appendix A1 provides furthest upstream and downstream detection locations by river kilometre for each tagged fish (2016–2020) while appendices A2 to A5 provide movement summaries, by river kilometre, for each Walleye tagged between 2016 and 2019. Biological information associated with each tagged fish is provided in Appendix A4.

4.1 2016-2019 RESULTS SUMMARY

4.1.1 UPSTREAM OF THE KEEYASK GS

Forty tags were applied to Walleye upstream of Gull Rapids between May 28 and June 7, 2016, eight transmitters were applied on September 24, 2016, 17 were applied between May 27 and June 5, 2018, and an additional 27 tags were applied between May 23 and June 7, 2019, bringing the total number of fish tagged to 92.

Nine fish were only detected briefly in Gull Lake (between 0 and 18 days) after being tagged, and are considered missing due to tagging stress or mortality:

- #20168 was tagged on June 7, 2019 at the inlet of Gull Lake. It was never detected and likely represents a tag malfunction.
- #25743 was tagged on June 5, 2018. It moved downstream immediately and was last detected in lower Gull Lake on June 12, 2018 (Appendix A2-52).
- #25745 was tagged on June 5, 2018 in upper Gull Lake. It was located here until June 6, 2018 (Appendix A2-54).
- #53763 was tagged on June 5, 2016. It was located in upper Gull Lake (rkm -19.5 to -14.8) until June 18, when it moved downstream. It was last farther downstream (rkm -9.9) on June 19, 2016 (Appendix A2-4).
- #53766 was tagged on September 24, 2016 in upper Gull Lake (rkm -12.5). It remained at this location until October 4, when it moved downstream to lower Gull Lake. It was last detected on October 12, 2016 (Appendix A2-7).

- #53770 was tagged on June 5, 2016. It was located exclusively in upper Gull Lake until June 11, 2016 (Appendix A2-11).
- #53778 was tagged on June 3, 2016 in upper Gull Lake and remained here until June 16. It then moved downstream and was last detected in lower Gull Lake on June 16, 2016 (Appendix A2-19).
- #53779 was tagged on June 3, 2016 in upper Gull Lake and was located here until June 13, 2016 (Appendix A2-20).
- #53802 was tagged on June 7, 2016 in upper Gull Lake. It moved downstream immediately and was last detected in lower Gull Lake June 8, 2016 (Appendix A2-43).

An additional 20 fish are considered missing (*i.e.*, have not been detected for more than a year).

- #53765 was tagged on September 24, 2016. It was located exclusively in upper Gull Lake until July 23, 2017 (Appendix A2-6).
- #53767 was tagged on September 24, 2016. It was located exclusively in upper Gull Lake until January 8, 2017 (Appendix A2-8).
- #53768 was tagged on June 5, 2016. It was located in upper Gull during the 2017 open-water period and was last detected on November 11, 2017 (Appendix A2-9).
- #53772 was tagged on June 5, 2016. It moved between Gull Lake and the riverine area downstream of Birthday Rapids during open-water 2016. In 2017, it made a single downstream movement from Birthday Rapids to lower Gull Lake and was last detected on June 19 (Appendix A2-13).
- #53776 was tagged on May 30, 2016. It moved throughout Gull Lake and was last detected on August 22, 2017 (Appendix A2-17).
- #53780 was tagged on May 30, 2016 in upper Gull Lake. It was located here until July 13 after which it moved downstream and was last detected in lower Gull Lake on July 16, 2017 (Appendix A2-21).
- #53781 was tagged on June 2, 2016. It was last detected in lower Gull Lake on July 4, 2018 (Appendix A2-22).
- #53783 was tagged on May 31, 2016 at the inlet of Gull Lake. It remained in the upper portion of Gull Lake for the majority of both the 2016 and 2017 open-water periods, moving upstream to Clark Lake at the end of August, and returning to Gull Lake in June. It was last detected at the inlet of Clark Lake on August 23, 2017 (Appendix A2-24).
- #53784 was tagged on May 30, 2016. It was last detected in upper Gull Lake on January 12, 2019 (Appendix A2-25).
- #53785 was tagged on May 30, 2016 in upper Gull Lake. It was last detected in lower Gull Lake on July 17, 2017 (Appendix A2-26).

- #53787 was tagged on May 30, 2016. It moved throughout upper Gull Lake until August 13 after which it moved downstream and was last detected in lower Gull Lake on September 17, 2016 (Appendix A2-28).
- #53789 was tagged on May 30, 2016 immediately downstream of Birthday Rapids. It was last detected in Clark Lake on September 8, 2018, and likely moved upstream out of the study area (Appendix A2-30).
- #53792 was tagged on May 28, 2016 at the inlet of Gull Lake. It was last detected in upper Gull Lake September 27, 2018 (Appendix A2-33).
- #53795 was tagged on June 1, 2016. It remained in upper Gull Lake and was last detected on October 12, 2017 (Appendix A2-36).
- #53798 was tagged on June 7, 2016. It moved throughout upper Gull Lake during open-water 2016, but was only detected briefly in 2017. It was last detected in upper Gull Lake on May 29, 2017 (Appendix A2-39).
- #53803 was tagged on September 24, 2016. It was located exclusively in upper Gull Lake and was last detected on January 21, 2017 (Appendix A2-44).
- #53804 was tagged on September 24, 2016. It was detected briefly in lower Gull Lake during open-water 2016, and was last detected in upper Gull Lake on June 6, 2017 (Appendix A2-45).
- #53805 was tagged on June 5, 2016 in upper Gull Lake. It was last detected at the inlet of Gull Lake on October 8, 2018 (Appendix A2-46).
- #53806 was tagged on June 6, 2016. It moved between Birthday Rapids and upper Gull Lake until October 19, 2016 (Appendix A2-47).
- #53807 was tagged on June 6, 2016 in upper Gull Lake. It moved upstream and was last located at the inlet of Clark Lake on August 19, 2016 (Appendix A2-48).

The 29 fish described above were not included in data analyses and are not discussed in the remainder of the report.

Prior to winter 2019/2020, 31 tagged Walleye moved downstream through Gull Rapids or the Keeyask GS into Stephens Lake:

- Nine moved into Stephens Lake and made multiple upstream and downstream movements. Based on a lack of detections, five of these fish are now considered missing.
 - #20182 was tagged on May 25, 2019 at the inlet of Gull Lake. It moved downstream through the Keeyask GS spillway on June 13 (Appendix A4-23).
 - #20186 was tagged on May 29, 2019 in upper Gull Lake. It moved throughout Gull Lake, as far upstream as the inlet and as far downstream as lower Gull Lake

- until August 10 when it moved downstream through the Keeyask GS spillway (Appendix A4-24).
- #25739 was tagged on June 5, 2018 in lower Gull Lake and moved downstream through the Keeyask GS spillway between October and November. It was last detected in Stephens Lake (rkm 13.9) on November 20, 2018 and is now considered missing (Appendix A2-49).
 - #53758 was tagged on September 24, 2016 in upper Gull Lake and moved downstream through Gull Rapids between July 28 and August 11, 2017. This fish has not been detected since moving downstream and is now considered missing (Appendix A2-1).
 - #53759 was tagged on September 24, 2016 in upper Gull Lake and moved downstream through Gull Rapids on September 29, 2016. This fish has not been detected since open-water 2018 and is now considered missing (Appendix A2-2).
 - #53760 was tagged on September 24, 2016 in upper Gull Lake and moved downstream through Gull Rapids on October 3, 2016. It remained in Stephens Lake and was last detected on September 25, 2017 and is now considered missing (Appendix A2-3).
 - #53775 was tagged on June 5, 2016, and moved downstream through Gull Rapids on June 18, 2016 (Appendix A2-16).
 - #53788 was tagged on May 30, 2016, and moved downstream through Gull Rapids on June 21, 2016. This fish has not been detected since moving downstream and is now considered missing (Appendix A2-29).
 - #53793 was tagged on June 7, 2016, and moved downstream through Gull Rapids on June 8, 2017 (Appendix A2-34).
- Twelve moved downstream through Gull Rapids or the Keeyask GS into Stephens Lake, and then continued to move downstream into the Long Spruce Reservoir; two of these continued downstream into the Limestone Reservoir:
 - #20147 was tagged on June 5, 2019. It moved throughout upper Gull Lake until July 24, when it moved downstream through the Keeyask GS Spillway. It continued to move downstream in Stephens Lake, and was detected within the Long Spruce forebay on August 1, 2019 (Appendix A4-1).
 - #20187 was tagged on May 23, 2019 at the inlet of Gull Lake and moved downstream through the Keeyask GS spillway on June 19. It continued to move downstream through Stephens Lake and was detected within the Long Spruce forebay on July 22, 2019 (Appendix A4-25).
 - #25740 was tagged on June 5, 2018. It moved throughout lower Gull Lake until June 14 and was detected in Stephens Lake on June 15. It moved between rkm 3.8 and 7.9 until June 18, after which it continued to move downstream. It was detected within the Long Spruce forebay on July 31, 2018 (Appendix A2-50).

- #25753 was tagged on May 27, 2018 at the inlet of Gull Lake. It then moved as far upstream as Birthday Rapids. It moved downstream through Gull Rapids on July 25 and through the Kettle GS on August 12, 2018 (Appendix A2-62).
- #25755 was tagged on June 1, 2018, at the inlet of Gull Lake. It moved downstream through Gull Rapids between June 11 and 12, 2018. It was last detected in Stephens Lake on June 17, 2018 and detected in the Long Spruce forebay on August 6 (Appendix A2-64).
- #53769 was tagged on June 5, 2016 in upper Gull Lake. It moved through Gull Rapids between August 16 and September 1 and through the Kettle GS on September 11, 2016 (Appendix A2-10).
- #53771 was tagged on May 31, 2016, in upper Gull Lake. It moved downstream through Gull Rapids between July 27 and 31. It moved into the Long Spruce Reservoir on August 19 and was detected in the Limestone Reservoir on August 21, 2016 (Appendix A2-12).
- #53773 was tagged on June 5, 2016, in upper Gull Lake. It moved downstream through Gull Rapids between July 13 and 16, 2017, and through the Kettle GS on July 19, 2017 (Appendix A2-14).
- #53777 was tagged on May 29, 2016, in upper Gull Lake. It moved downstream through Gull Rapids between August 14 and 23, 2017. It moved into the Long Spruce Reservoir on August 26 and was detected in the Limestone Reservoir on August 31, 2017 (Appendix A2-18).
- #53782 was tagged on May 31, 2016, at the inlet of Gull Lake. It moved downstream through Gull Rapids between June 10 and 17, and moved through the Kettle GS between July 28 and August 8 (Appendix A2-23).
- #53791 was tagged on May 29, 2016, at the inlet of Gull Lake. It moved downstream immediately after being tagged and was detected in Stephens Lake on June 5. It moved through the Kettle GS on June 27 (Appendix A2-32).
- #53799 was tagged on June 7, 2016, in upper Gull Lake and moved downstream through Gull Rapids on October 16, 2016. It moved through the Kettle GS on June 25, 2017 (Appendix A2-40).
- Seven moved downstream through Gull Rapids immediately after tagging and were detected briefly (for one to 15 days) in Stephens Lake with no upstream movements. These fish are considered tagging mortalities or movements induced by stress resulting from the tagging procedure and are not discussed in the remainder of the report.
 - #20158 was tagged on June 6 at the inlet of Gull Lake. It moved downstream through the Keeyask GS spillway on June 16. It was last detected on June 21 (Appendix A4-11).
 - #20160 was tagged on June 7 at the inlet of Gull Lake. It remained at this location until June 13 when it began to move downstream, moving through the

- Keeyask GS Spillway on June 17. It was located in upper Stephens Lake until the end of the study period (Appendix A4-13).
- #53764 was tagged on June 5, 2016, in upper Gull Lake and moved downstream through Gull Rapids on June 12 (Appendix A2-5).
 - #53786 was tagged on May 30, 2016, in upper Gull Lake and moved downstream through Gull Rapids on June 2 (Appendix A2-27).
 - #53801 was tagged on June 7, 2016, in upper Gull Lake and moved downstream through Gull Rapids on the same day (Appendix A2-42).
 - #25748 was tagged on May 28, 2018, in the riverine area upstream of Gull Lake and moved downstream through Gull Rapids on June 12. It moved through the Kettle GS between June 14 and 18, 2018 (Appendix A2-57).
 - #25752 was tagged on May 27, 2018, at the inlet of Gull Lake and moved downstream through Gull Rapids on June 8. It moved downstream through the Kettle GS on June 23, 2018 (Appendix A2-61).
 - Three were last detected immediately upstream of the Kettle GS and likely moved downstream into the Long Spruce reservoir.
 - #20149 was tagged on June 5, 2019 in upper Gull Lake. It moved downstream through the Keeyask GS spillway on June 21 and continued to move downstream within Stephens Lake. It was last detected immediately upstream of the Kettle GS on July 2, 2019 (Appendix A4-3).
 - #20150 was tagged on June 5, 2019 in upper Gull Lake. It moved downstream within Gull Lake and was last detected at rkm -4.8 on June 21. It moved through the Keeyask GS Spillway on the same day. It was last detected immediately upstream of the Kettle GS on July 2 (Appendix A4-4).
 - #20163 was tagged on June 6, 2019 at the inlet to Gull Lake. It was located here until June 22 when it moved upstream. It was located in the riverine area of the Nelson River between Birthday Rapids and Gull Lake until July 31 when it returned to Full Lake. It moved downstream through the Keeyask GS spillway on August 9 and was last detected in lower Stephens Lake immediately upstream of the Kettle GS on August 16 (Appendix A4-16).

To summarize, 92 Walleye were tagged upstream of Gull Rapids between 2016 and 2019. Twenty-nine fish are considered missing and 31 fish moved downstream into Stephens Lake. Therefore, 32 fish were available to be detected upstream of the Keeyask GS during winter 2019/2020.

During winter 2019/2020, one fish (#20148) moved downstream through the Keeyask GS spillway. Therefore, accounting for this fish, 31 fish were available to be detected upstream of the Keeyask GS during open-water 2020.

4.1.2 STEPHENS LAKE

Forty tags were applied to Walleye in Stephens Lake between May 27 and June 1, 2016, seven were applied between June 6 and 9, 2018, and an additional 31 were applied between May and September, 2019 bringing the total number of tagged fish to 78.

Five fish were only detected briefly after being tagged, and are considered missing due to tagging stress or mortality:

- #25734 was tagged on June 7, 2018. It moved downstream and was last detected at rkm 21.6 on June 13 (Appendix A3-41).
- #53727 has never been detected since being tagged on May 28, 2016, immediately downstream of Gull Rapids.
- #53735 was tagged on May 30, 2016, immediately downstream of Gull Rapids. It moved downstream immediately after tagging and was detected at rkm 18.6 on June 16, 2016. It has been located here on every day since this date with no upstream or downstream movements, likely representing a tagging mortality (Appendix A3-12).
- #53742 was tagged on May 30, 2016, immediately downstream of Gull Rapids. It was located exclusively in upper Stephens Lake until June 11, 2016 (Appendix A3-19).
- #53743 was tagged on May 31, 2016, immediately downstream of Gull Rapids. It immediately moved downstream and was last located on June 13, 2016, at rkm 9.4 (Appendix A3-20).

Twenty-two tagged Walleye were detected for more than 14 days but have not been located for over two years and are considered missing:

- #25736 was tagged on June 7, 2018, immediately downstream of the Keeyask GS. It was detected in upper Stephens Lake (rkm 1.2 to 10.3) until June 26 (Appendix A3-43).
- #53723 was tagged on May 28, 2016, immediately downstream of Gull Rapids. It was detected regularly until the beginning of the 2018 open-water period when it was last detected at rkm 2.7 on June 21 (Appendix A3-1).
- #53725 was tagged on May 27, 2016, immediately downstream of Gull Rapids. It was detected regularly until the end of the 2018 open-water period when it was last detected in lower Stephens Lake at rkm 16.8 on September 25 (Appendix A3-3).
- #53726 was tagged on May 27, 2016, immediately downstream of Gull Rapids. It was detected in upper Stephens Lake (rkm 1.2 to 4.4) until June 5. It moved downstream and was last located in lower Stephens Lake at rkm 16.8 on June 19, 2016 (Appendix A3-4).
- #53730 was tagged on May 28, 2016 immediately downstream of Gull Rapids. It moved throughout upper Stephens Lake until November 1, 2017, when it was last detected at rkm 9.4 (Appendix A3-7).

- #53731 was tagged on May 28, 2016, immediately downstream of Gull Rapids. It was detected regularly until the beginning of the 2018 open-water period when it was last detected at rkm 9.4 on June 9 (Appendix A3-8).
- #53732 was tagged on May 28, 2016, immediately downstream of Gull Rapids. It was detected moving throughout upper Stephens Lake (rkm 1.2– 4.5) until June 2, after which it moved downstream. It was last detected in the northern portion of Stephens Lake at rkm 13.0 on June 14, 2016 (Appendix A3-9).
- #53733 was tagged on May 30, 2016, immediately downstream of Gull Rapids. It was detected regularly in both upper and lower Stephens Lake (rkms 1.2– 13.9) until August 6, 2016, when it was last detected at rkm 13.9 (Appendix A3-10).
- #53734 was tagged on May 30, 2016, immediately downstream of Gull Rapids. It was detected regularly until the middle of the 2018 open-water period when it was last detected in lower Stephens Lake on July 27 (Appendix A3-11).
- #53739 was tagged on May 31, 2016, immediately downstream of Gull Rapids. It was detected regularly in upper Stephens Lake (between rkms 1.2 and 5.8) until October 14, 2016, when it was last detected at rkm 2.6 (Appendix A3-16).
- #53740 was tagged on May 31, 2016, immediately downstream of Gull Rapids. It was detected regularly until the middle of the 2018/2019 winter period when it was last detected at rkm 9.4 on February 20, 2019 (Appendix A3-17).
- #53745 was tagged on May 31, 2016 immediately downstream of Gull Rapids. It moved between upper and lower Stephens Lake until January 20, 2018, when it was last detected at rkm 9.4 (Appendix A3-22).
- #53748 was tagged on May 31, 2016, immediately downstream of Gull Rapids. It was detected regularly until the beginning of the 2018 open-water period when it was last detected in lower Stephens Lake (at rkm 13.0) on June 7 (Appendix A3-25).
- #53749 was tagged on May 31, 2016 immediately downstream of Gull Rapids. It moved throughout Stephens Lake until July 29, 2017, when it was last detected at rkm 9.4 (Appendix A3-26).
- #53750 was tagged on May 31, 2016 at rkm 1.2. It was detected regularly moving throughout upper Stephens Lake until January 29, 2018, when it was last detected at rkm 9.4 (Appendix A3-27).
- #53752 was tagged on May 31, 2016 immediately downstream of Gull Rapids. It was detected regularly moving throughout upper Stephens Lake July 3, 2018, when it was last detected in lower Stephens Lake at rkm 18.6 (Appendix A3-29).
- #53754 was tagged on May 31, 2016, immediately downstream of Gull Rapids. It immediately moved downstream and was last located on June 28, 2016, in lower Stephens Lake at rkm 18.6 (Appendix A3-31).

- #53756 was tagged on June 1, 2016 immediately downstream of Gull Rapids. It moved throughout Stephens Lake until September 23, 2017, when it was last detected in lower Stephens Lake at rkm 13.0 (Appendix A3-33).
- #53808 was tagged on June 1, 2016 immediately downstream of Gull Rapids. It was detected regularly moving throughout Stephens Lake June 23, 2018, when it was last detected in lower Stephens Lake at rkm 18.6 (Appendix A3-35).
- #53809 was tagged on June 1, 2016 immediately downstream of Gull Rapids. It was detected regularly moving throughout Stephens Lake September 8, 2018, when it was last detected in lower Stephens Lake at rkm 18.6 (Appendix A3-36).
- #53811 was tagged on June 1, 2016 immediately downstream of Gull Rapids. It was detected regularly moving throughout upper Stephens Lake until February 18, 2018, when it was last detected in upper Stephens Lake at rkm 7.9 (Appendix A3-38).
- #53812 was tagged on June 1, 2016, immediately downstream of Gull Rapids. It moved downstream on June 20, and was last detected in lower Stephens Lake at rkm 20 on August 5, 2016 (Appendix A3-39).

These 27 fish are not discussed in the remainder of this report.

Prior to winter 2019/2020, eight Walleye moved downstream through the Kettle GS into the Long Spruce reservoir. Three continued downstream and moved into the Limestone reservoir:

- #20141 was tagged on May 31, 2019, immediately downstream of the Keeyask GS. It moved between rkm 0.6 and 9.4 in upper Stephens Lake until June 14 when it moved rapidly downstream. It moved through the Kettle GS on June 15, 2019 (Appendix A5-13).
- #25732 was tagged on June 9, 2018, immediately downstream of the Keeyask GS. It remained at this location until June 15, after which it began to move downstream. It moved through the Kettle GS on June 13, 2018 (Appendix A3-40).
- #25738 was tagged on June 7, 2018, immediately downstream of the Keeyask GS. It moved downstream and was last located in lower Stephens Lake at rkm 36.1 on July 6. It was first located in the Long Spruce forebay on June 19, 2018 (Appendix A3-45).
- #53728 was tagged on May 28, 2016, immediately downstream of Gull Rapids and moved downstream through the Kettle GS between August 10 and 12, 2017. It was detected in the Limestone Reservoir on September 16, 2017 (Appendix A3-5).
- #53737 was tagged on May 29, 2016, immediately downstream of Gull Rapids and moved downstream through the Kettle GS between July 14 and 16, 2017 (Appendix A3-14).
- #53746 was tagged on May 31, 2016, immediately downstream of Gull Rapids and moved downstream through the Kettle GS between June 13 and August 4, 2017. It was detected in the Limestone Reservoir on August 8, 2017 (Appendix A3-23).

- #53747 was tagged on May 31, 2016, immediately downstream of Gull Rapids and moved downstream through the Kettle GS between August 21 and 23, 2017 (Appendix A3-24).
- #53751 was tagged on May 31, 2016, immediately downstream of Gull Rapids and moved downstream through the Kettle GS between August 4 and 6, 2017. It was detected in the Limestone Reservoir on August 8, 2017 (Appendix A3-28).

Three additional fish likely moved downstream through the Kettle GS, however, these movements could not be confirmed.

- #20167 was tagged on September 16, 2019 at rkm 5.5 in upper Stephens Lake. It moved downstream on September 20 and was last located immediately upstream of the Kettle GS (rkm 40.9) on September 27. Due to the short amount of time between tagging and this downstream movement (four days), it likely represents a movement caused by tagging stress or by mortality (Appendix A5-20).
- #53738 was tagged on May 31, 2016 immediately downstream of Gull Rapids. It was detected throughout upper Stephens Lake until July 17, 2017. It then moved steadily downstream and was last detected immediately upstream of the Kettle GS (rkm 40.8) on July 28 (Appendix A3-15).
- #53753 was tagged on May 31, 2016 immediately downstream of Gull Rapids. It was detected throughout upper and lower Stephens Lake until July 9, 2017. It then moved steadily downstream and was last detected immediately upstream of the Kettle GS (rkm 40.9) on August 8 (Appendix A3-30).

To summarize, 78 Walleye were tagged in Stephens Lake between 2016 and 2019. Twenty-seven fish are considered missing, 11 moved downstream through the Kettle GS (eight confirmed and three suspected), and four moved downstream from Gull Lake and were available to be detected. Therefore, 44 fish were available to be detected in Stephens Lake during winter 2019/2020.

During winter 2019/2020, one Walleye (#20148) moved downstream through the Keeyask GS spillway. Therefore, 45 fish were available to be detected in Stephens Lake during open-water 2020.

4.2 WINTER 2019/2020

4.2.1 UPSTREAM OF THE KEEYASK GS

The 2019/2020 winter receiver array consisted of five receivers deployed in the Nelson River between Clark Lake and the Keeyask GS at rkms -48.2, -45.0, -29.4, -12.4, and -10.3 (Figure

1). Four of the five receivers were retrieved; the receiver located near the outlet of Clark Lake (rkm -45.0) could not be located (Map 3).

Two of the 32 fish (6%) available to be detected were located between 2,209 and 3,466 times on 46 and 83 days of the 206 day winter period (Appendix A1-1). Both fish were detected exclusively in Gull Lake. One fish moved between rkm -12.4 and -10.3, while the other was detected only at rkm -10.3 (Figure 4).

4.2.2 STEPHENS LAKE

Fifteen of the 16 receivers were deployed in Stephens Lake during the 2019/2020 winter period were retrieved. The receiver located immediately upstream of the Kettle GS (at rkm 40.0) was lost.

Positions were obtained for 14 of the 44 fish (32%) available to be detected, for a total of 256,890 detections (range: 66–57,084 detections per individual) (Appendix A1-2). Fish were detected on 4 to 183 days of the 206 day winter period (2–89% of the time). On average, fish were detected on 78 days, or 38% of the study period (StDev = 74 days). Six (43%) were located as far upstream as rkm 5.2, while one (7%) was located as far downstream as rkm 36.1 (Figure 5). The average overall movement range was 7.5 rkm (StDev = 7.1 rkm; range 0.0–23.1 rkm) (Figure 5; Appendix A1-2). Detections were logged at every receiver set during the winter period. The majority of detections were logged in the southern portion of Stephens Lake at rkms 7.9 (n = 76,191; 35%), 18.6 (n = 68,517; 32%), and 9.4 (n = 39,599; 18%) (Figure 6).

4.3 OPEN-WATER 2020

4.3.1 ACOUSTIC RECEIVER RETRIEVAL

All stationary acoustic receivers deployed upstream of the Keeyask GS (n = 29), in Stephens Lake (n = 30), and the Long Spruce (n = 3) and Limestone (n = 2) reservoirs during the 2020 open-water period were successfully retrieved (Maps 5 and 6).

4.3.2 UPSTREAM OF THE KEEYASK GS

Thirty-one Walleye were available to be detected upstream of the Keeyask GS during the 2020 open-water period (Section 4.1.1). Twenty-one (68%) were detected between 2 and 31,732 times for 1–78 days of the 146 day open-water period (1–53% of the time; Appendix A1-3). The average total movement range was 5.9 rkm (StDev = 9.9 rkm; range: 0.0–25.9 rkm) (Figure 7; Appendix A1-3). The farthest upstream detections occurred at the inlet to Clark Lake at rkm -

48.2 (by one fish; 3%). One fish was detected at the receiver closest to the Keeyask GS spillway at rkm -3.8, but no fish were detected at the receiver located closest to the powerhouse at rkm -2.2 (Figures 7, and 8; Appendix A1-3). No fish moved downstream through the Keeyask GS spillway into Stephens Lake.

Of the ten fish that were not detected:

- Three (#25750, #25756, # 53794) were last detected in Clark Lake in 2018 and likely moved upstream past the receiver array.
- Two (#20175 and #53797) were detected for the majority of the 2019 open-water period, moving throughout Gull Lake.
- Five (#20153, #20155, #20164, #20169, and #25742) were detected for less than ten days of the 2019 open-water period and may remain largely outside the receiver array.

4.3.2.1 PROPORTIONAL DISTRIBUTION

Prior to impoundment and similar to previous years, individual Walleye spent the greatest proportion of the open-water period in the upper basin of Gull Lake (Zone 4). Fish spent an average an average of 60% (StDev = 47%; range: 0–100%) of the study period in this area prior to reservoir impoundment on September 5, 2020 (Table 2; Figures 9 and 10). The remaining four zones were used less frequently:

- Zone 1 at 0.4% (StDev = 2%; range: 0–8%);
- Zone 2 at 0.2% (StDev = 1%; range: 0–4%);
- Zone 3 at 11% (StDev = 27%; range: 0–87%); and
- Zone 5 at 29% (StDev = 44%; range: 0–100%).

After reservoir impoundment, Walleye continued to spend a similar proportion of time in each river zone, using Zone 4 and 5 most often. After impoundment fish were detected in:

- Zone 1 for 5% of the time (StDev = 22%; range: 0–100%);
- Zone 2 for 0.2% of the time (StDev = 1%; range: 0–4%);
- Zone 3 for 3% of the time (StDev = 10%; range: 0–45%);
- Zone 4 for 63% of the time (StDev = 47%; range: 0–100%); and
- Zone 5 for 29% of the time (StDev = 46%; range: 0–100%).

4.3.2.2 MOVEMENT PATTERNS

During the 2020 open-water period, the majority of detections were logged at the inlet of Gull Lake at rkm -19.5 (n = 59,240; 61%) (Figure 8). General movement patterns of Walleye can be split into three groups.

- Twelve remained in Gull Lake, moving between the upper and lower portions (between rkm -19.5 and -4.8).
 - Two of these fish had not been detected for more than a year.
 - #53800 was previously considered a tagging mortality but was located at the new receiver set closest to the Keeyask spillway (rkm -3.8). It was tagged on June 7, 2016 in upper Gull Lake at rkm -14.8 and was last detected in lower Gull Lake at rkm -5.8 on September 14, 2016. It was relocated in lower Gull Lake at rkm -3.8 between August 13 and September 20, 2020 (Appendix A2-41).
 - #25746 was last located on September 23, 2018 in upper Gull Lake at rkm -12.8. It was located again at rkm -12.9 between August 16 and September 20, 2020 (Appendix A2-54).
 - Three (#20159, #20170, and #20181) were located within Gull Lake for the majority of the study period but made distinct upstream movements to the receiver set closest to Birthday Rapids (rkm -29.4) during the spring.
 - One (#25754) remained in the riverine area between Birthday Rapids and Gull Lake (Appendix A2-63).

One fish (#20188) moved upstream out of Gull Lake and was last detected in Clark Lake near the outlet of the Assean River (rkm -46.9) on September 1 (Appendix A4-26).

- This fish was first detected in Clark Lake on August 30 prior to the beginning of reservoir impoundment.

Three fish were detected following the start of impoundment after not being detected for more than a year.

- Two were previously considered tagging mortalities:
 - #53774 was tagged on June 5, 2016 in upper Gull Lake at rkm -14.8 and was last detected in lower Gull Lake at rkm -9.0 on June 16, 2016. It was located in lower Gull Lake at rkm -7.9 between September 18 and 20, 2020 (Appendix A2-15)
 - #53790 was tagged on May 29, 2016 in upper Gull Lake at rkm -17.4 and was located here until June 1, 2016. It was detected at the same location from September 3 to 21, 2020 (Appendix A2-31).
- #25744 was last located on August 6, 2018 in lower Gull Lake at rkm -9.3. It was located again in lower Gull Lake at rkm -7.4 during impoundment on September 1, 2020 (Appendix A2-53).

One fish (#25751) moved upstream out of the newly formed reservoir following impoundment. On September 7, 2020, this fish began moving upstream and was detected as far as

immediately upstream of Birthday Rapids (rkm -34.3) on September 13. It subsequently moved back downstream into Gull Lake on September 17 (Appendix A2-60).

- No fish permanently moved upstream or downstream out of Gull Lake immediately following impoundment.

4.3.3 STEPHENS LAKE

Forty-five Walleye were available to be detected in Stephens Lake during the 2020 open-water period (Section 4.1.2). Twenty-five (56%) were detected between three and 36,791 times for 2–89 days of the 146 day open-water period (1–61% of the time; Appendix A1-4). The average total movement range was 9.7 rkm (StDev = 13.4 rkm; range: 0.0–60.1 rkm) (Figure 11; Appendix A1-4). The farthest upstream detections occurred at rkm 0.6 (by one fish; 4%) while the farthest downstream occurred at rkm 40.5 (by one fish; 4%) (Figure 11; Appendix A1-4).

Of the 20 fish not detected during open-water 2020:

- One (#20137) was last detected during winter 2019/2020 (on April 4, 2020) in lower Stephens Lake at rkm 21.6.
- The remaining fish were last detected during open-water 2019.
 - Fifteen (#20129, #20133, #20134, #25741, #20145, #20152, #20171, #20178, #20186, #53724, #53729, #53744, #53755, #53775, and #53793) were last detected in upper Stephens Lake, upstream of rkm 13.9.
 - #20182 was last located in lower Stephens Lake at rkm 16.8.
 - #53810 was last located in lower Stephens Lake at rkm 18.6.
 - Two (#20136 and #20180) were last located in lower Stephens Lake at rkm 24.6.

4.3.3.1 PROPORTIONAL DISTRIBUTION

As in previous years, individual Walleye spent the greatest proportion of the open-water period in Zone 7 (farther from the Keeyask GS), spending an average of 54% (StDev = 43%, range: 0–100%) of the study period in this area. Zone 6 was used an average of 46% (StDev = 43%, range: 0–100%) of the time (Table 2; Figures 10 and 13).

After GS commissioning in early September, Walleye continued to use Zone 7 more frequently, spending an average of 65% (StDev = 47%; range: 0–100%) of the 19-day period in this area. Zone 6 was used for 35% (StDev = 47%; range: 0–100%) of this time.

4.3.3.2 MOVEMENTS

During the 2020 open-water period, the majority of detections were logged in upper Stephens Lake, upstream of rkm 10.2 ($n = 160,031$; 94%) (Figure 12). General movement patterns were as follows.

- Sixteen remained in upper Stephens Lake, moving no further downstream than rkm 13.4.
 - Seven (#25737, #20139, #20140, #20144, #20172, #20173, and #20185) were located in the northern portion of Stephens Lake for part of the study period.
 - Three (#20132, #20135, and #20174) were located exclusively at the receiver set closest to the powerhouse tailrace at rkm 1.2.
- Seven moved further downstream remaining exclusively in the southern portion of the river.
 - Four (#20131, #53736, #53741, and #53757) moved between upper and lower Stephens Lake.
 - Three (#20143, #20184, and #25735) remained exclusively in lower Stephens Lake.
- #20148 moved downstream through the Keeyask GS in winter 2019/2020 and was first located in Stephens Lake on June 20, 2020. This fish displayed some upstream and downstream movements in Stephens Lake indicating it survived passage (Appendix A4-2).
 - It continued to move downstream and was last located immediately upstream of the Kettle GS (rkm 40.5) on July 5. It is possible that this fish moved downstream through the GS.
- #20142 moved downstream through both the Kettle and Long Spruce GSs (Appendix A5-14).
 - It was detected moving between upper and lower Stephens Lake (rkm 5.2 to 18.8) until July 31, 2020, and was detected within the Limestone reservoir on August 16, 2020.

4.3.4 LONG SPRUCE RESERVOIR

Due to low water levels that prevented boat access downstream of the Kettle GS, no acoustic receivers were set in the Long Spruce reservoir between October 2017 and August 2020. Water levels were higher in 2020 than in previous sampling years, and receivers were set in the Long Spruce ($n = 3$) and Limestone ($n = 2$) reservoirs (Map 7). A single receiver deployed in the Long Spruce reservoir prior to winter 2017/2018 was retrieved. The battery was no longer active, but data were recorded from October 13, 2017, to August 15, 2019. The retrieval of this receiver

along with three additional receivers set in August 2020 confirmed the movements of ten Walleye through the Kettle GS.

Seven fish were tagged upstream of the Keeyask GS, all of which were briefly detected within Stephens Lake before moving downstream through the Kettle GS.

- Four movements likely occurred due to tagging stress or mortality.
 - #25740 moved downstream into Stephens Lake on June 15, 2018, likely due to tagging stress. It was located in the Long Spruce reservoir on July 31, 2018 (Appendix A2-50).
 - #25748 moved downstream into Stephens Lake on June 12, 2018, likely due to tagging stress. It was located in the Long Spruce reservoir on June 18 and 19, 2018 (Appendix A2-57).
 - #25752 moved downstream into Stephens Lake on June 8, 2018, likely due to tagging stress. It was located in the Long Spruce reservoir on June 24, 2018 (Appendix A2-61).
 - #25755 moved downstream into Stephens Lake on June 2, 2018, likely due to tagging stress. It was located in the Long Spruce reservoir on August 6, 2018 (Appendix A2-64).
- Three fish moved downstream independently of tagging stress or mortality.
 - #20147 moved downstream into Stephens Lake on July 24, 2019. It continued to move downstream and was detected within the Long Spruce reservoir on August 1, 2019 (Appendix A4-1).
 - #20187 moved downstream into Stephens Lake on July 19, 2019. It continued to move downstream and was detected within the Long Spruce reservoir on July 22, 2019 (Appendix A4-25).
 - #25753 moved downstream into Stephens Lake on July 25, 2018. It continued to move downstream and was detected within the Long Spruce reservoir on August 12, 2018 (Appendix A2-62).

The remaining three fish were tagged in Stephens Lake.

- #20141 moved downstream through the Kettle GS within two weeks of tagging on June 1, 2019. This movement was likely due to tagging stress or mortality (Appendix A5-13).
- #25732 was tagged on June 9, 2018. It was detected within the Long Spruce reservoir on July 14, 2018 (Appendix A3-40).
- #25738 was tagged on June 6, 2018. It was detected within the Long Spruce reservoir between July 19 and 23, 2018 (Appendix A3-45).

No fish were detected within the Long Spruce reservoir during the open-water period in 2020. A single fish (#20142; discussed in section 4.3.3.2) was detected within the Limestone reservoir during the open-water period in 2020.

5.0 DISCUSSION

Walleye movement monitoring was initiated in 2013 to describe movements during the pre-construction (2013), construction/commissioning (2014–ongoing), and operation phases of the Keeyask Project. The intent of the study was to determine if habitat changes associated with construction and operation of the GS would alter habitat use and coarse-scale movement patterns. The discussion below highlights movement patterns that have been observed and discusses the key questions (presented in the AEMP) with respect to potential impacts of construction and impoundment on Walleye and their movements.

Acoustic transmitters applied in 2013 and 2014 expired during the open-water period in 2016. Additional tags were applied both upstream and downstream of the construction site in 2016 to allow for continued monitoring during construction of the GS. The sample size of tagged Walleye was similar to 2013: 48 transmitters were applied upstream of Gull Rapids (now referred to as the Keeyask GS), and 40 were applied in Stephens Lake. An additional 24 transmitters were applied in spring 2018 (17 upstream of the Keeyask GS and seven in Stephens Lake) to account for fish that had gone missing in order to maintain the number of fish monitored at the original sample size. Although acoustic transmitters applied in 2016 and 2018 are not expected to expire until winter 2021 and 2023, respectively, additional transmitters were applied to Walleye (27 upstream and 29 downstream) in spring 2019 to provide overlap to record movements associated with reservoir impoundment.

5.1 EVALUATION OF METHODOLOGY

Fish movement monitoring, via acoustic telemetry, is a significant component of the AEMP, and is being used to assess potential impacts of Keeyask GS construction on several fish species including Lake Sturgeon (adults and juveniles), Walleye, and Lake Whitefish. Of these fish species/life stages, the methodology is most effective for monitoring movements of adult and juvenile Lake Sturgeon. Lake Sturgeon have a low natural mortality rate, occupy main channel habitats where receivers are located, and in the case of juveniles, rarely move long distances. These are all characteristics that allow for frequent detections of tagged fish. Monitoring movements of Walleye and Lake Whitefish via acoustic telemetry has been less effective relative to Lake Sturgeon. This is because: i) tagged individuals are detected less frequently due to more frequent utilization of shallow water habitats outside the detection range of receivers; ii) potential use of tributaries and off-current embayments where receivers are not located; iii) stress from the tagging procedure may cause an initial downstream movement of some individuals which complicates data interpretation; and iv) a higher natural mortality rate relative to Lake Sturgeon causes a greater proportion of tags to go missing. These characteristics reduce the frequency of detection of tagged fish and the higher proportion of missing fish further complicates data interpretation.

The proportion of detected Walleye has decreased with each study year, likely reflecting natural mortality rates or harvest. The proportion of detected fish tagged upstream of Gull Rapids in 2013/2014 decreased from 98% in 2013, 81% in 2014, 76% in 2015, and 61% in 2016. The same was true for detection of fish tagged in Stephens Lake in 2013/2014; 100% of tagged fish were detected in 2013, 85% in 2014, 68% in 2015, and 49% in 2016. Fish tagged between 2016 and 2019 continue to exhibit the same pattern. The proportion of fish detected has decreased from 100% in 2016, 75% in 2017, to 47% in both 2018 and 2019 upstream of the Keeyask GS, and from 98% in 2016, 87% in 2017, 71% in 2018, to 50% in 2019 in Stephens Lake. The proportion of fish detected increased slightly in 2020, to 68% upstream of the GS and 56% in Stephens Lake. The data collected to date provides a good understanding of Walleye movement on a coarse-scale. This has been facilitated by the extensive array of stationary acoustic receivers spread over a ~100 km length of the Nelson River between Clark Lake and the Limestone GS, and the inclusion of receiver gates which provide confidence that movements of Walleye past key points are being detected.

Two additional receivers were added to the receiver array upstream of the Keeyask GS during the 2020 open-water period. A receiver was deployed at rkm -2.2, upstream of the powerhouse, and at rkm -3.8, upstream of the spillway, in order to monitor movements in close proximity to the GS. During open-water 2020, no fish were detected at the receiver near the powerhouse, and a single fish (5%) was detected near the spillway. Both receivers will continue to be deployed as part of the array.

In 2020, three fish previously thought missing were detected upstream of the Keeyask GS following reservoir impoundment. Two fish were located in the lower portion of the reservoir (one at rkm -7.9 and -7.4) and one in the upper portion (rkm -17.4). It is likely that these three fish were located within off-current embayments or tributaries outside of the receiver array, but returned to the main portion of the river following impoundment.

5.2 MOVEMENT PATTERNS

Although different Walleye have been tagged and monitored over time, similar coarse-scale movement patterns have been observed both upstream and downstream of Gull Rapids/the Keeyask GS since the study began in 2013.

Each year, fish tagged upstream of the Keeyask GS have been split into four groups: those that remained in Gull Lake; those that moved between Birthday Rapids and Gull Lake; those that moved between Clark Lake and Gull Lake; and those that remain in the riverine area downstream of Birthday Rapids. Walleye upstream of the Keeyask GS have consistently spent little time in the vicinity of the construction site. Similarly, Walleye tagged in Stephens Lake have been consistently split into two groups: those that remain exclusively within the upper portion (within 10.3 rkm of the Keeyask GS) of the lake; and those that move extensively throughout. In contrast to those tagged upstream of the Keeyask GS, a high proportion of the Walleye tagged in Stephens Lake have continued to use habitat in the vicinity of the construction site.

5.3 MOVEMENTS THROUGH BARRIERS

Since the study began in 2013, 37 Walleye have moved downstream through Gull Rapids/Keeyask GS (Figure 14). Thirteen of these movements occurred within two weeks of tagging and are considered to be due to tagging stress or mortality. Twenty-four movements occurred after the initial two-week window, ranging annually from 0% of tagged fish (in 2013) to 18% of tagged fish (in 2017). Twenty-eight confirmed movements through the Kettle GS have occurred, nine of which were considered to be related to tagging stress. Nineteen movements occurred independently of tagging, ranging annually from 1% of tagged fish (in 2016) to 19% (in 2017) (Figure 15). Overall, the number of downstream movements through barriers has fluctuated with no clear increasing or decreasing pattern. Other than tagging stress, it is difficult to determine why these movements may have occurred. The proportion of fish entrained through Gull Rapids or the Kettle GS was the highest in 2017. Hrenchuk and Lacho (2018) hypothesized that these movements may be attributed to record high flows observed in the area.

Since the Keeyask GS spillway was commissioned in 2018, eight fish have moved downstream independent of tagging stress. One fish (3%) moved downstream in 2018, six (13%) in 2019, and one (3%) in 2020. All eight fish displayed upstream and downstream movements within Stephens Lake, indicating that they survived passage. Four of these fish continued to move downstream through the Kettle GS. It is unclear why a large proportion of fish moved downstream in 2019, however, entrainment was reduced in 2020. No fish moved downstream through either the Keeyask or Kettle GS following reservoir impoundment on September 5, 2020. It should be noted that the reported period of post-impoundment monitoring was very brief and movements associated with impoundment may be observed during 2020/2021.

5.4 KEY QUESTIONS

The AEMP identified key questions for Walleye movement monitoring, two of which are relevant to the construction period. Keeyask reservoir impoundment was completed on September 5 and monitoring was conducted for 19 days after GS impoundment. An additional key question presented in the AEMP is relevant to this period. Key questions are addressed below.

How many (or what proportion of) tagged Walleye move past the construction site?

Since tagging began in 2013, 37 fish have moved downstream through Gull Rapids or the Keeyask GS. Thirteen of these movements likely occurred due to tagging stress or mortality, while 24 movements occurred independently of tagging. By year, the highest proportion of tagged Walleye moved downstream through the Keeyask GS construction site (independent of tagging stress) in 2017 (18%) and the Keeyask GS spillway in 2019 (13%). In all other years, the rate of downstream movement has ranged from 0% (in 2013) to 10% (in 2015). A single Walleye moved downstream through the Keeyask GS in winter 2019/2020. There does not

appear to be a clear increasing or decreasing trend in the proportion of Walleye that move downstream past the Keeyask GS construction site.

No Walleye have moved upstream through Gull Rapids since construction began in 2014. Keeyask spillway commissioning began on August 3, 2018, after which upstream movements through Gull Rapids were no longer possible.

Are Walleye using habitat in the vicinity of construction activities, particularly during spawning?

Monitoring since 2013 has shown that Walleye tagged upstream of the Keeyask GS do not spend much time in the vicinity of the construction site. Since studies began, Walleye have rarely been detected at the receiver set closest to Gull Rapids or the Keeyask GS construction site (rkm -5.8 from 2013–2017, -4.8 from 2018–2019, and -2.2 in 2020). For example, no Walleye were detected by the closest receiver to the Keeyask GS in 2020, while one (5% of all detected fish) was located 3.3 rkm upstream, and two (10%) were located 4.8 rkm upstream.

In contrast, Walleye in Stephens Lake regularly use habitat directly downstream of the construction site. In all study years, Walleye have been detected near Gull Rapids or the Keeyask GS construction site (at rkm 1.2) during the spring and have likely continued to spawn in this area during the construction period. In 2020, spring movements to the base of the Keeyask GS were not recorded as receivers were not deployed until July 3. Walleye have used this area during spawning in previous construction years. For example, in 2019, 14% of detected fish were located immediately downstream of the spillway.

What proportion of the fish population moves from the Keeyask reservoir upstream past Birthday and/or Long rapids?

Before the start of construction in 2014, seven of 49 Walleye (14%) tagged upstream of Gull Rapids moved upstream into Clark Lake. Since construction began, 24 of 132 tagged Walleye (18%) have moved upstream. Following impoundment in September 2020, a single fish (5% of detected) moved upstream. However, this fish moved only as far as Birthday Rapids and returned to Gull Lake four days later. No Walleye moved upstream through Birthday or Long rapids or downstream through the Keeyask GS immediately following impoundment in 2020. These initial observations are based on a very short period of record and further monitoring will determine if movements change during the initial years post-impoundment.

6.0 SUMMARY AND CONCLUSIONS

- Acoustic transmitters were applied to Walleye upstream and downstream of the Keeyask GS construction site in 2013, 2014, 2016, 2018, and 2019. The transmitters applied in 2013/2014 have expired. Movements of Walleye tagged in 2016/2018 and 2019 are the focus of this report.
- Walleye tagged upstream of the Keeyask GS have consistently displayed four general movement patterns since monitoring began in 2013. These fish either: remain in Gull Lake, move between Birthday Rapids and Gull Lake, move between Clark Lake and Gull Lake, or remain in the riverine area downstream of Birthday Rapids.
- Walleye tagged in Stephens Lake have been consistently split into two groups: those that remain exclusively within the upper portion (within 13.4 rkm of the Keeyask GS) of the lake; and those that move extensively throughout the lake.
- The key questions, as described in the AEMP, for Walleye movement monitoring during construction and impoundment of the Keeyask GS are as follows:

- *What is the number (or the proportion) of tagged Walleye that move past the construction site?*

Since tagging began in 2013, 37 fish have moved downstream through Gull Rapids or the Keeyask GS. Thirteen of these movements likely occurred due to tagging stress or mortality, while 24 movements occurred independently of tagging. The highest proportion of tagged Walleye moved downstream through the Keeyask GS construction site (independent of tagging stress) in 2017 (18%) and the Keeyask GS spillway in 2019 (13%). In all other monitoring years, the rate of downstream entrainment has ranged from 0% (in 2013) to 10% (in 2015). There does not appear to be a clear increasing or decreasing trend in the proportion of Walleye that move downstream past the Keeyask GS construction site.

No Walleye moved upstream through Gull Rapids since construction began in 2014. Keeyask spillway commissioning began on August 3, 2018, after which upstream movements through Gull Rapids were no longer possible.

- *Are Walleye utilizing habitat in the vicinity of construction activities (particularly during spawning)?*

Monitoring since 2013 has shown that Walleye tagged upstream of the Keeyask GS that remain in Gull Lake do not spend much time in the vicinity of the construction site. In contrast, Walleye tagged in Stephens Lake, or those that have moved downstream from Gull Lake, consistently use habitat directly downstream from the construction site.

- *What proportion of the fish population move from the Keeyask reservoir upstream past Birthday and/or Long rapids?*

Before the start of construction, 14% of tagged Walleye moved upstream through Birthday and Long Rapids, while 18% moved upstream during construction. No Walleye moved upstream through Birthday or Long rapids immediately following impoundment in 2020. These initial observations are based on a very short period of record and further monitoring will determine if movements change during the initial years post-impoundment.

7.0 LITERATURE CITED

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TABLES

Table 1: Number of acoustic tags applied to Walleye in the Keeyask Study Area (upstream of Gull Rapids/the Keeyask GS and in Stephens Lake) between June 2013 and October 2020.

| Year | Upstream GR | Stephens Lake | Total |
|-------|-------------|---------------|-------|
| 2013* | 40 | 40 | 80 |
| 2014* | 9 | 2 | 11 |
| 2015* | 0 | 0 | 0 |
| 2016 | 48 | 40 | 88 |
| 2017 | 0 | 0 | 0 |
| 2018 | 17 | 7 | 24 |
| 2019 | 27 | 29 | 56 |
| 2020 | 0 | 0 | 0 |

*Tags no longer active during the current reporting period. Detailed information on movements (2013–2016) can be found in Hrenchuk and Barth (2014), Murray *et al.* (2015), Burnett *et al.* (2016), and Hrenchuk and Lacho (2017).

Table 2: Proportion of time spent in each river zone by Walleye tagged upstream of Gull Rapids/the Keeyask GS and in Stephens Lake in both 2013/2014 and 2016/2018 during a portion of the 2013 (June 4 to October 15), 2014 (June 4 to October 3), 2015 (June 4 to October 11), 2016 (June 4 to October 19), 2017 (June 7 to October 16), 2018 (June 6 to October 10), 2019 (June 2 to October 7), and 2020 (July 3 to September 23) open-water periods.

| Tagging Year | Study Year | Upstream of Gull Rapids | | | | | Stephens Lake | |
|--------------|------------|-------------------------|-----|------|------|------|---------------|------|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2013 | 2013 | 4.0 | 1.3 | 2.0 | 84.0 | 8.7 | 66.0 | 34.0 |
| | 2014 | 6.9 | 1.2 | 4.8 | 82.7 | 4.3 | 59.0 | 41.0 |
| | 2015 | 10.4 | 4.2 | 6.5 | 71.8 | 7.1 | 76.5 | 23.5 |
| | 2016 | 8.5 | 0.1 | 19.9 | 61.0 | 5.9 | 58.2 | 41.8 |
| 2016/2018 | 2016 | 3.7 | 0.6 | 6.1 | 78.6 | 8.7 | 30.0 | 70.0 |
| | 2017 | 5.9 | 1.8 | 12.3 | 63.7 | 16.3 | 33.8 | 66.2 |
| | 2018 | 9.6 | 0.9 | 9.2 | 56.5 | 23.8 | 35.5 | 64.5 |
| | 2019 | 18.7 | 1.3 | 6.9 | 53.4 | 19.8 | 56.1 | 43.9 |
| | 2020 | 0.0 | 0.1 | 1.1 | 43.3 | 55.6 | 24.8 | 75.2 |
| 2019 | 2019 | 0.1 | 0.1 | 5.3 | 83.7 | 10.8 | 50.0 | 50.0 |
| | 2020 | 2.7 | 0.3 | 15.8 | 74.3 | 7.0 | 45.7 | 50.3 |
| 2016-2019 | 2019 | 5.3 | 0.5 | 5.7 | 75.2 | 13.4 | 51.7 | 48.3 |
| | 2020 | 1.5 | 0.2 | 9.2 | 60.3 | 28.8 | 41.5 | 55.3 |

Table 3: Proportion of tagged Walleye that moved downstream through Gull Rapids (now the Keeyask GS) and the Kettle GS each year since studies began in 2013.

| Year | Gull Rapids/Keeyask GS | | | | | | | | | Kettle GS ¹ | | | | | | | | |
|------|------------------------------|------------|----|---------------------------------------|------------|----------------|---------------------------------|------------|----------------|------------------------------|---|----|---------------------------------------|---|----------------|---------------------------------|---|----------------|
| | Total Movements ² | | | Tagging Stress/Mortality ³ | | | Adjusted Movements ⁴ | | | Total Movements ² | | | Tagging Stress/mortality ³ | | | Adjusted Movements ⁴ | | |
| | Total Fish | Total Move | % | # Fish Tagged | Total Move | % ⁵ | Total Fish | Total Move | % ⁶ | Total Fish | n | % | # Fish Tagged | n | % ⁵ | Total Fish | n | % ⁶ |
| 2013 | 40 | 2 | 5 | 40 | 2 | 5 | 40 | 0 | 0 | 40 | - | - | 40 | - | - | 40 | - | - |
| 2014 | 42 | 1 | 2 | 9 | 0 | 0 | 42 | 1 | 2 | 40 | 1 | 3 | 2 | - | - | 40 | 1 | 3 |
| 2015 | 40 | 4 | 10 | 0 | - | - | 40 | 4 | 10 | 43 | 1 | 2 | 0 | - | - | 43 | 1 | 2 |
| 2016 | 79 | 11 | 14 | 48 | 5 | 10 | 79 | 6 | 8 | 88 | 4 | 5 | 40 | 3 | 8 | 88 | 1 | 1 |
| 2017 | 28 | 5 | 18 | 0 | - | - | 28 | 5 | 18 | 42 | 8 | 19 | 0 | - | - | 42 | 8 | 19 |
| 2018 | 34 | 5 | 15 | 17 | 4 | 24 | 34 | 1 | 3 | 42 | 8 | 19 | 7 | 5 | 71 | 42 | 3 | 7 |
| 2019 | 46 | 8 | 17 | 27 | 2 | 7 | 46 | 6 | 13 | 55 | 5 | 9 | 31 | 1 | 3 | 55 | 4 | 7 |
| 2020 | 31 | 1 | 3 | 0 | - | - | 31 | 1 | 3 | 45 | 1 | 2 | 0 | - | - | 45 | 1 | 2 |

1. Includes all fish tagged in Stephens Lake as well as those that moved downstream from Gull Lake.
2. Includes all downstream movements, including those that occurred due to tagging stress and mortality and those that occurred independently.
3. Includes only Walleye that moved downstream within two weeks of tagging. These movements are likely caused by tagging stress or mortality
4. Includes only Walleye that displayed downstream movements independently of tagging.
5. Proportion is calculated as a percentage of those tagged in the current year.
6. Proportion is calculated as a percentage of the total number of fish available for detection in the current year.

FIGURES

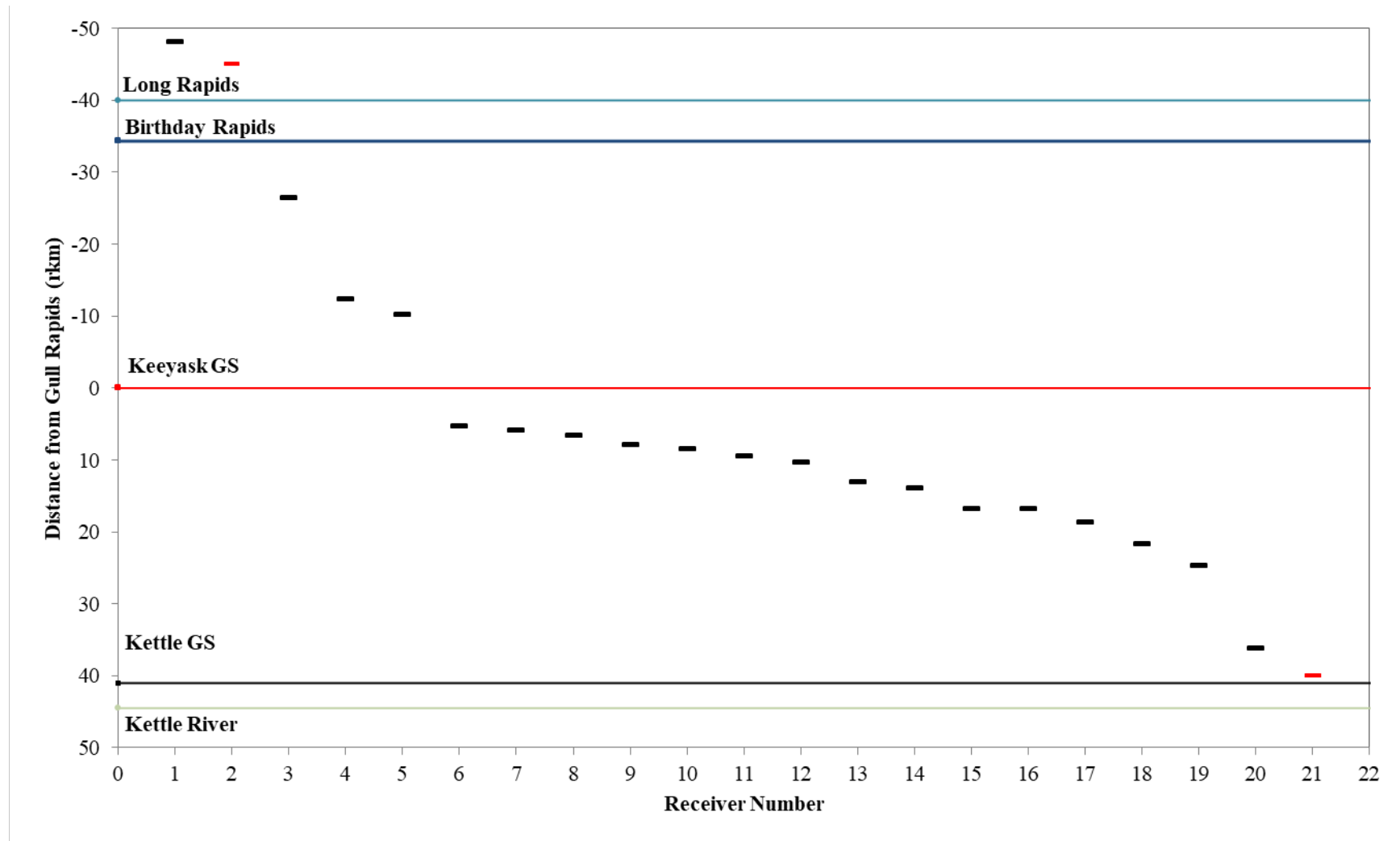


Figure 1: Locations of stationary acoustic receivers (dashes) in relation to the base of the Keeyask GS (rkm 0) and other major landmarks (lines) in the Nelson River between Clark Lake and the Limestone GS between October, 2019 and July, 2020. A red dash indicates a receiver that was lost.

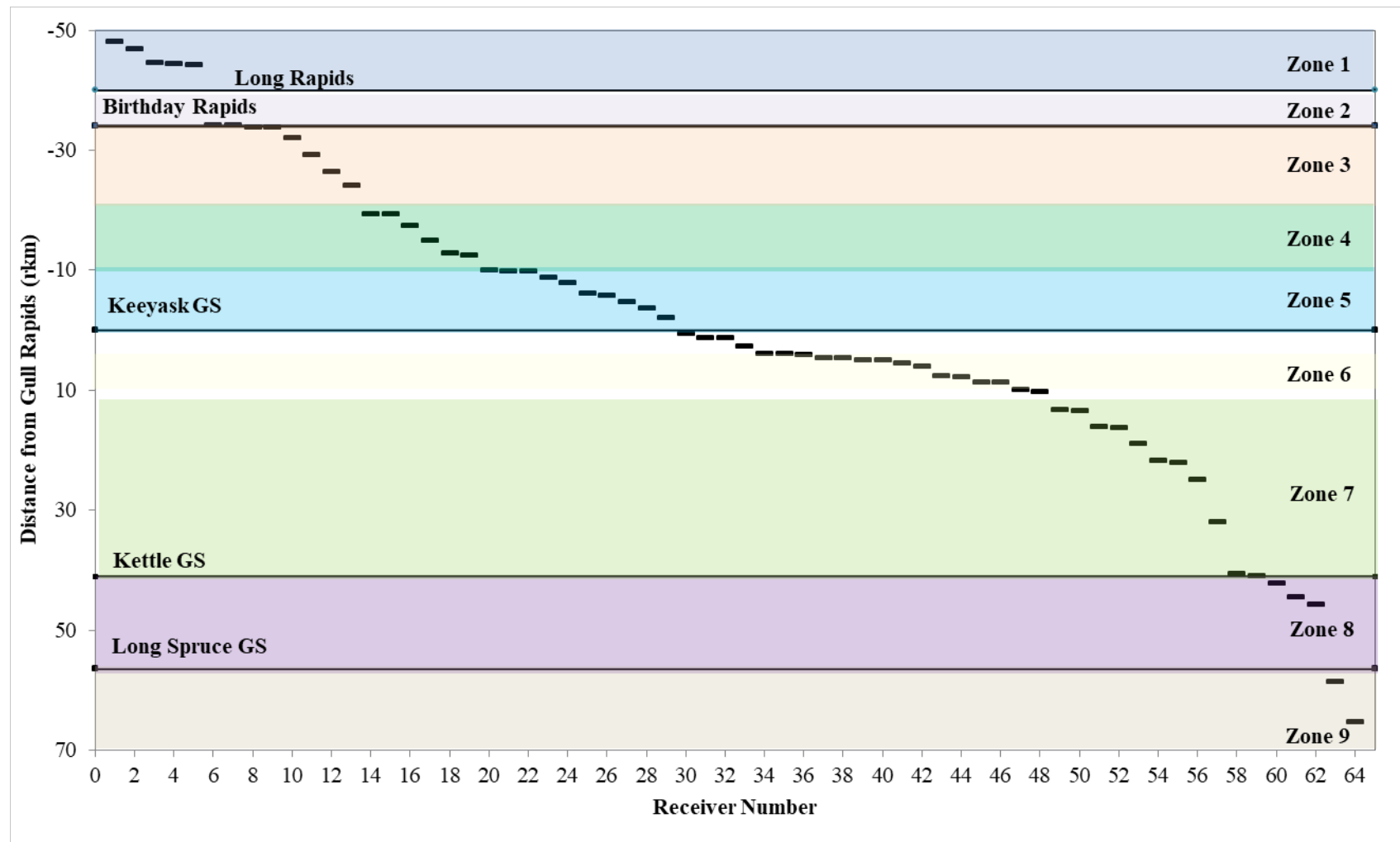


Figure 2: Locations of stationary acoustic receivers (dashes) in relation to the base of the Keeyask GS (rkm 0) and other major landmarks (lines) in the Nelson River between Clark Lake and the Limestone GS between July and October, 2020. River zones upstream and downstream of the Keeyask GS are indicated by shading.

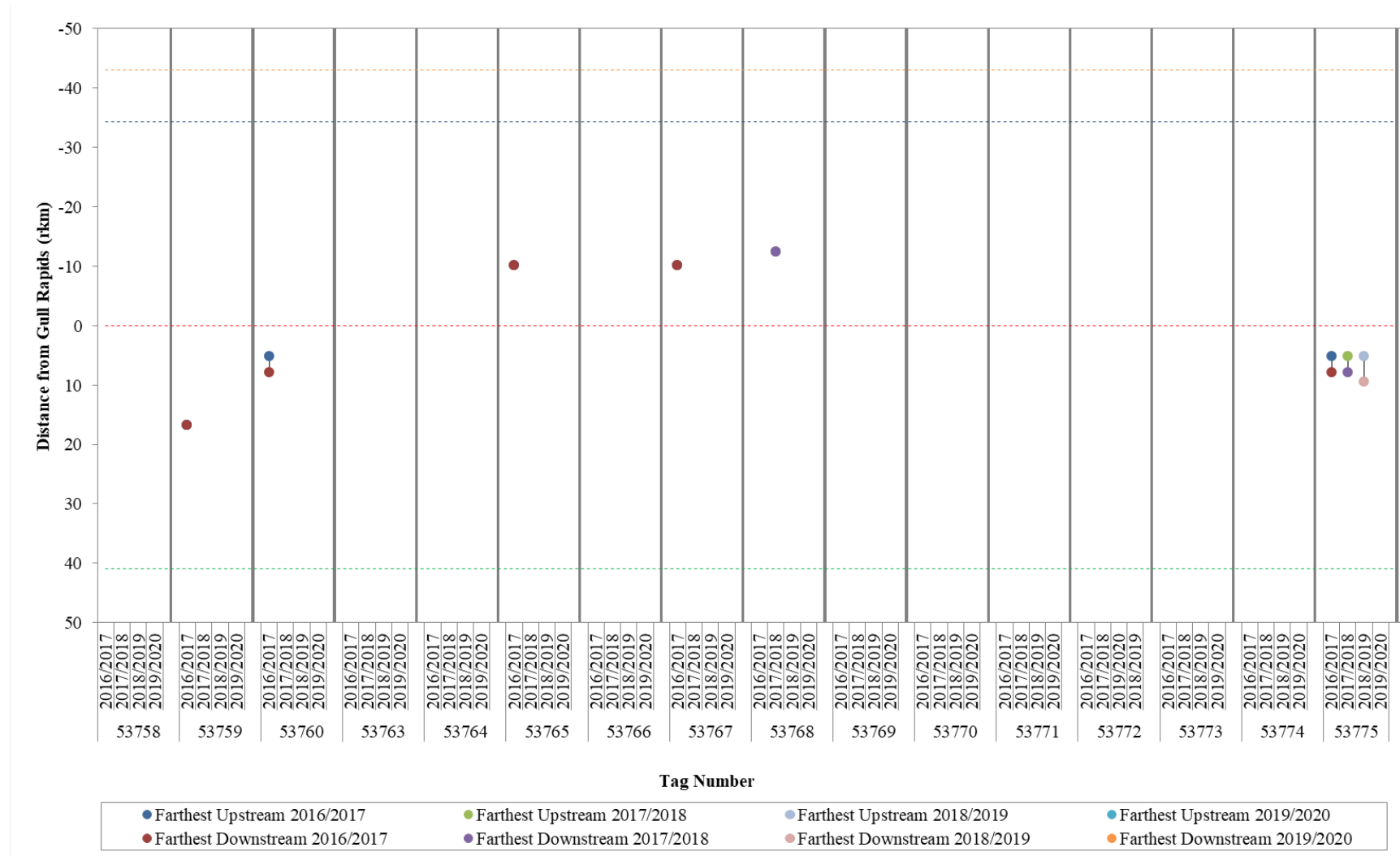


Figure 3: Detection ranges for individual Walleye tagged with acoustic transmitters upstream of the Keeyask GS during the winter period (2016–2020). Horizontal dotted lines indicate locations of landmarks (orange = Clark Lake outlet; blue = Birthday Rapids, red = the Keeyask GS; green = Kettle GS).

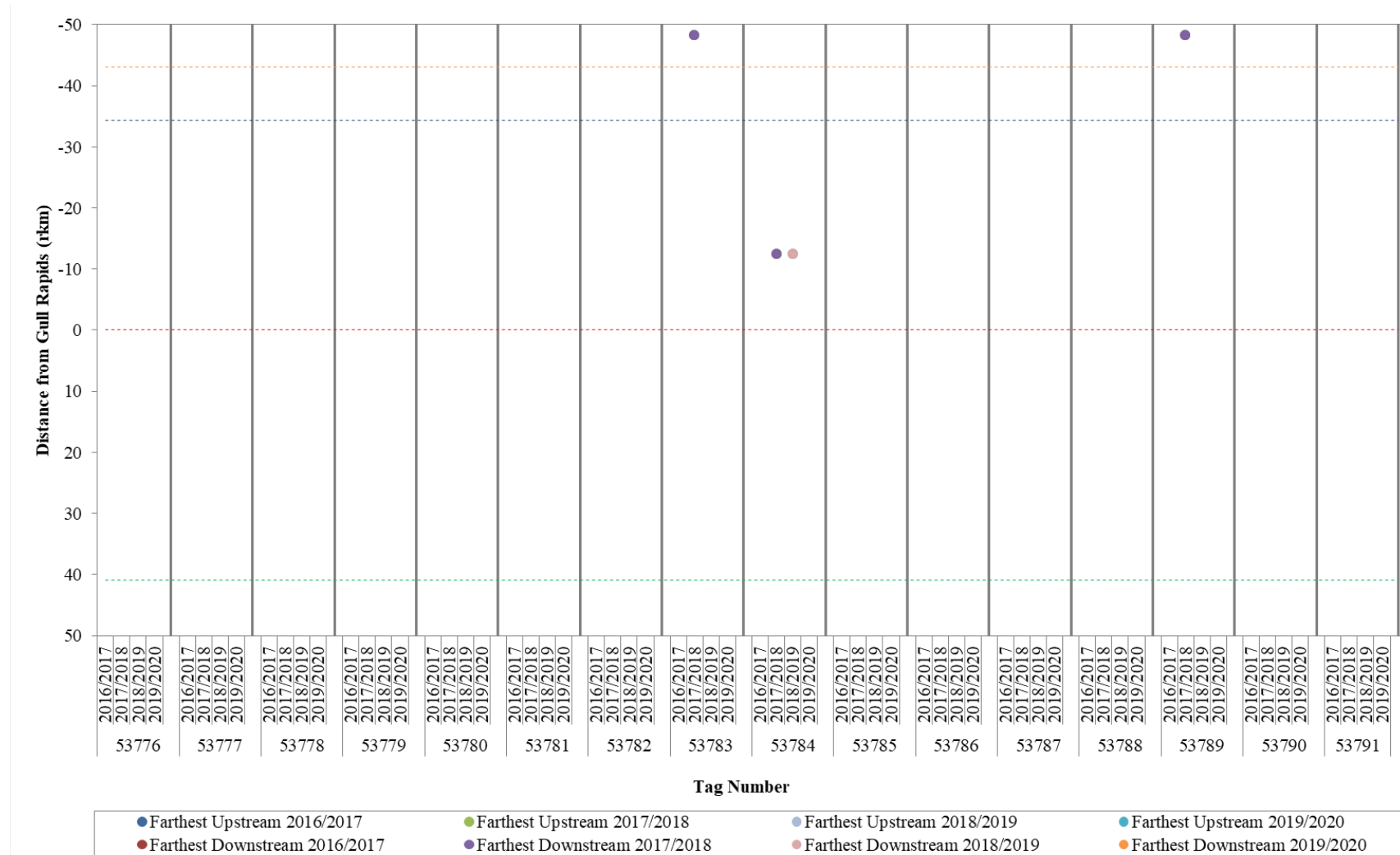


Figure 3: Detection ranges for individual Walleye tagged with acoustic transmitters upstream of the Keeyask GS during the winter period (2016–2020). Horizontal dotted lines indicate locations of landmarks (orange = Clark Lake outlet; blue = Birthday Rapids, red = the Keeyask GS; green = Kettle GS) (continued).

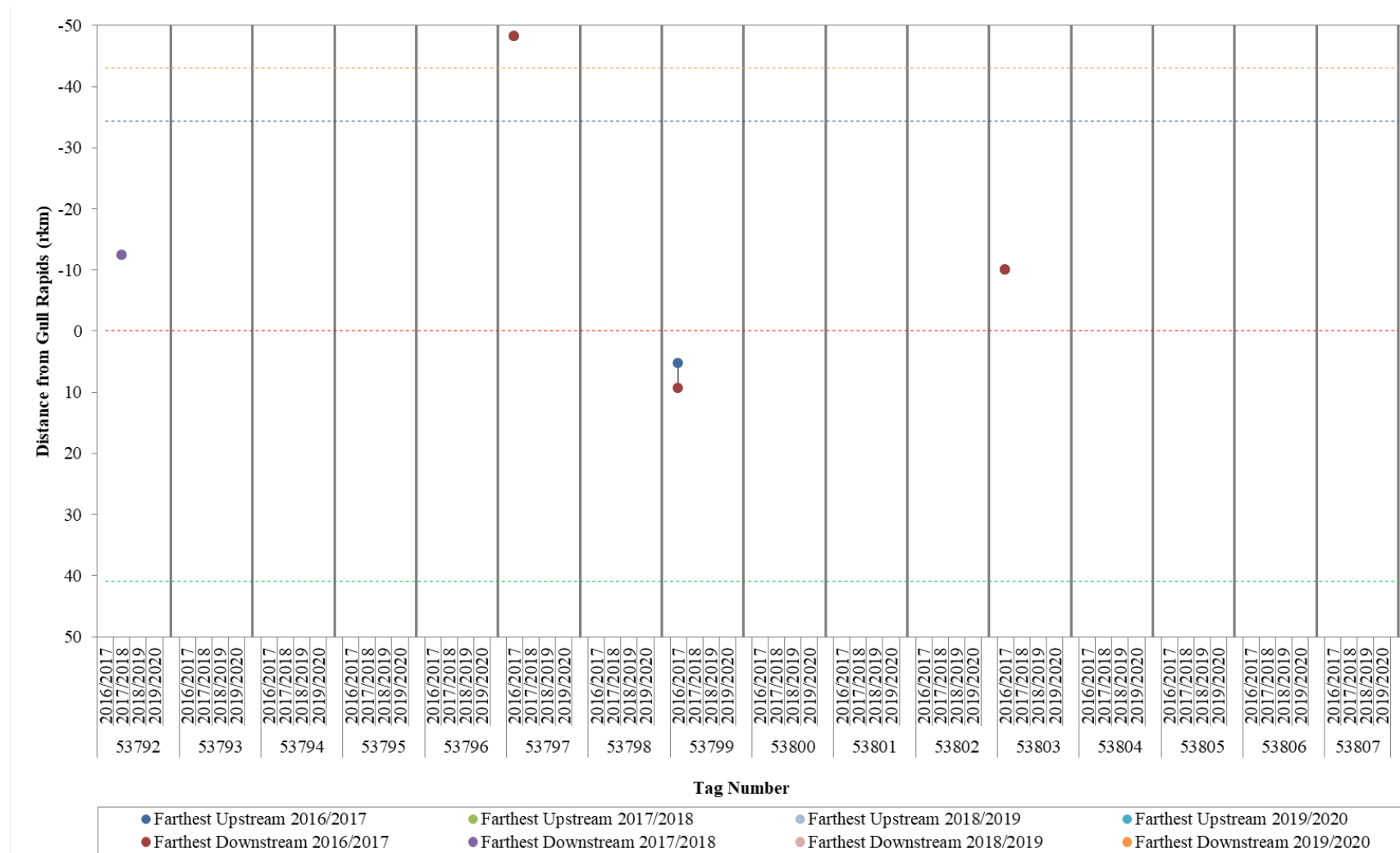


Figure 3: Detection ranges for individual Walleye tagged with acoustic transmitters upstream of the Keeyask GS during the winter period (2016–20120). Horizontal dotted lines indicate locations of landmarks (orange = Clark Lake outlet; blue = Birthday Rapids, red = the Keeyask GS; green = Kettle GS) (continued).

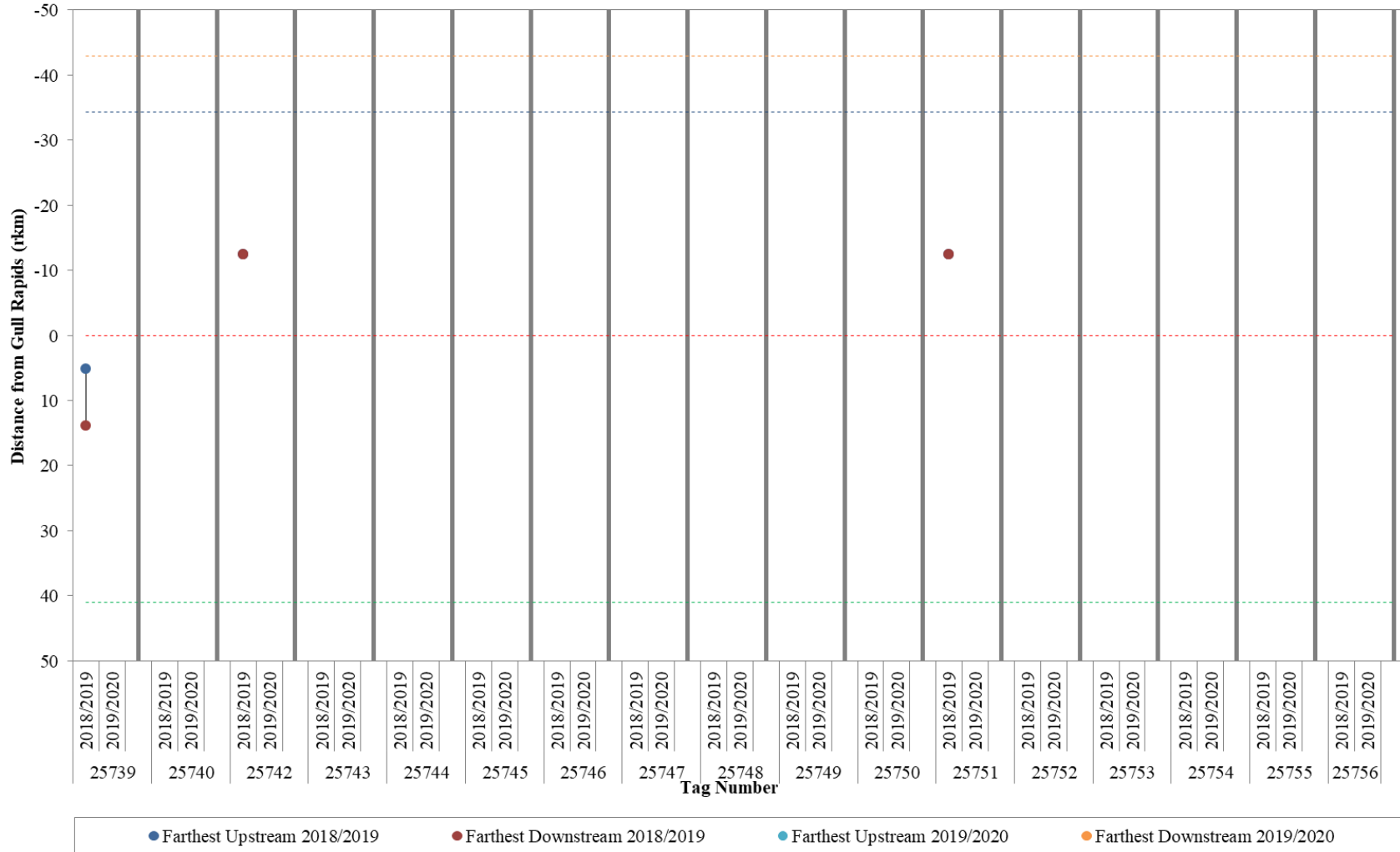


Figure 3: Detection ranges for individual Walleye tagged with acoustic transmitters upstream of the Keeyask GS during the winter period (2016–2020). Horizontal dotted lines indicate locations of landmarks (orange = Clark Lake outlet; blue = Birthday Rapids, red = the Keeyask GS; green = Kettle GS) (continued).

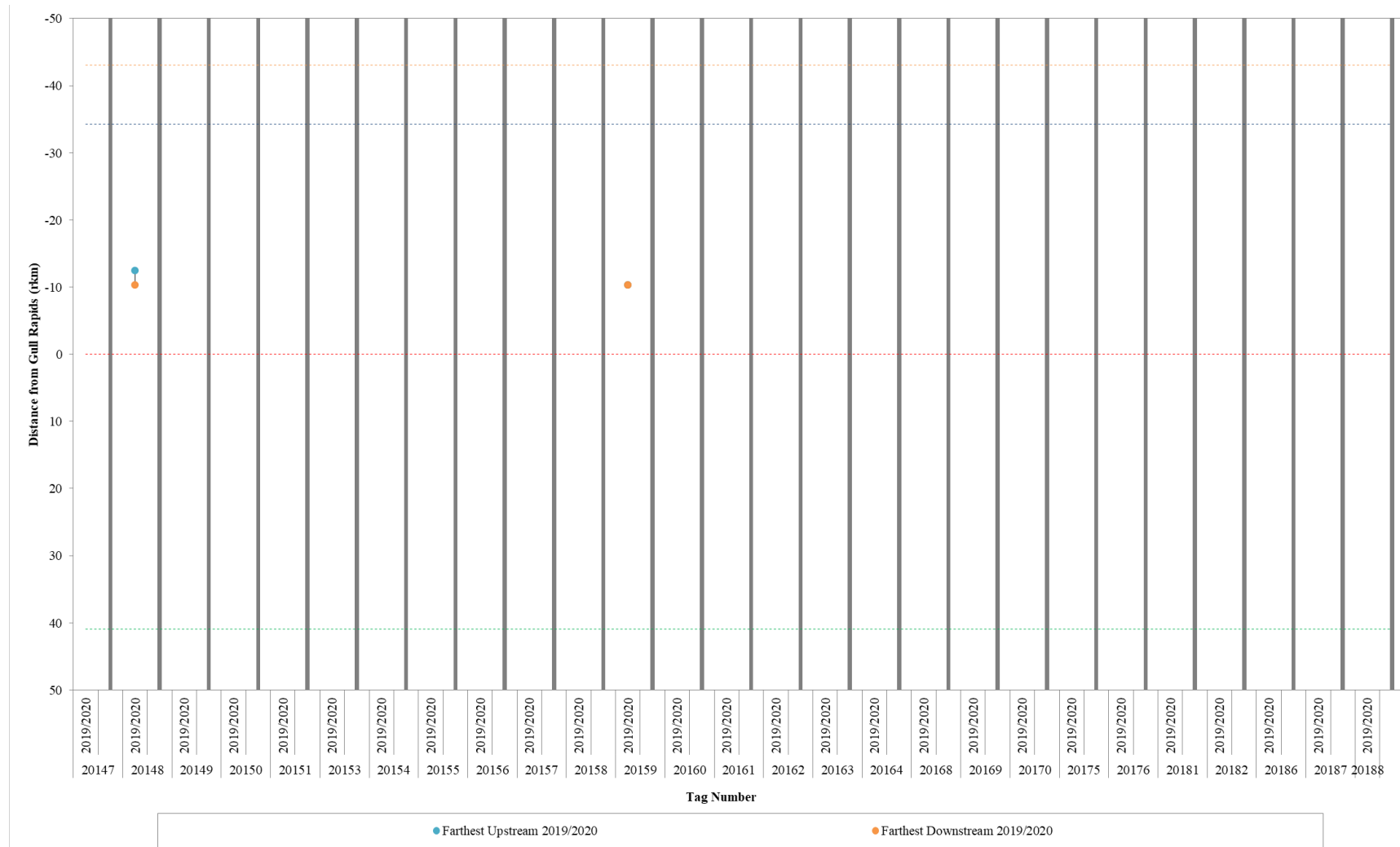


Figure 3: Detection ranges for individual Walleye tagged with acoustic transmitters upstream of the Keeyask GS during the winter period (2016–2020). Horizontal dotted lines indicate locations of landmarks (orange = Clark Lake outlet; blue = Birthday Rapids, red = the Keeyask GS; green = Kettle GS) (continued).

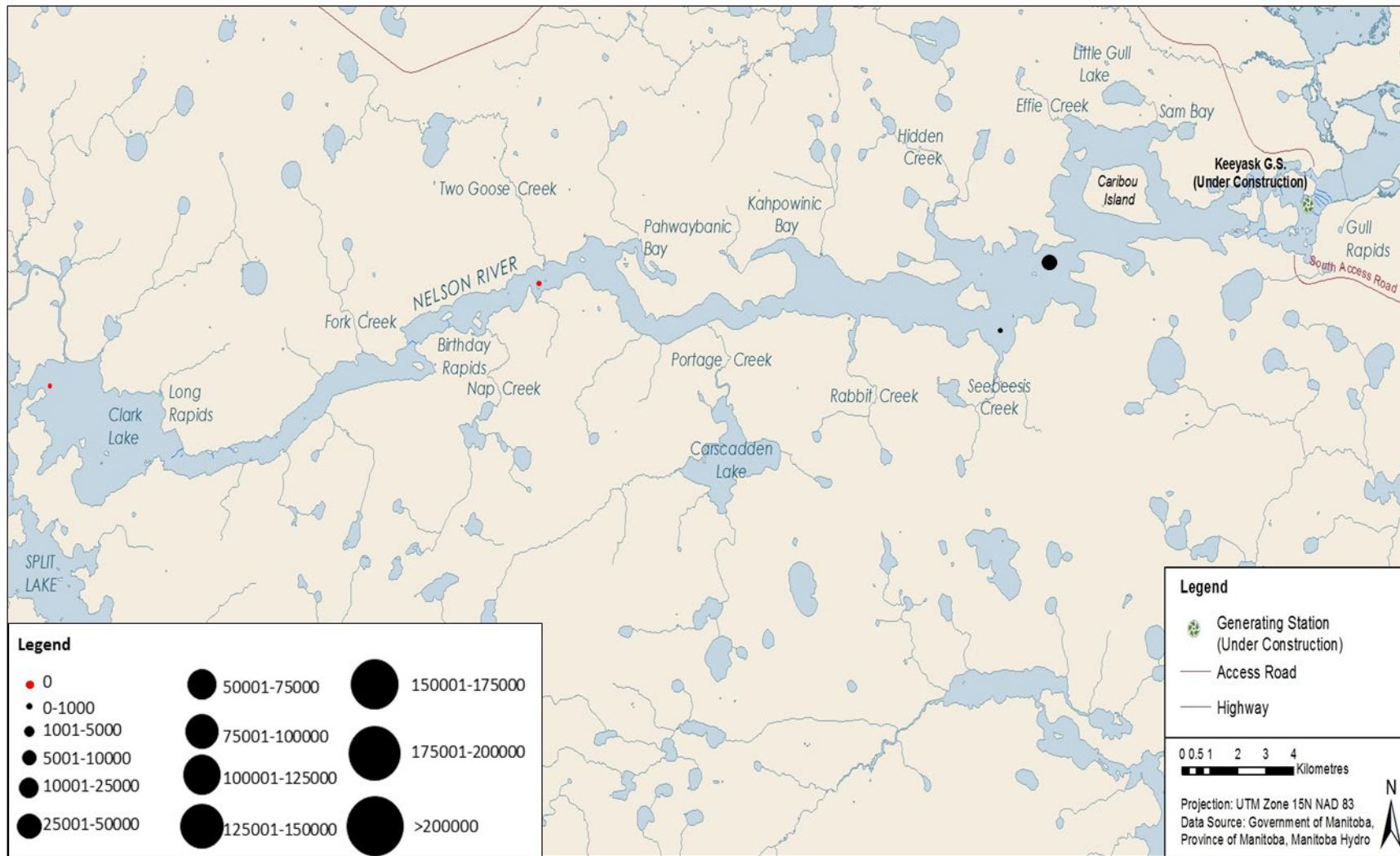


Figure 4: Relative number of detections of Walleye at each acoustic receiver set between Clark Lake and the Keeyask GS during winter 2019/2020 (October 8, 2019, to April 30, 2020). Number of detections indicated by size of bubble (defined in legend). Receivers with no detections indicated with red dot.

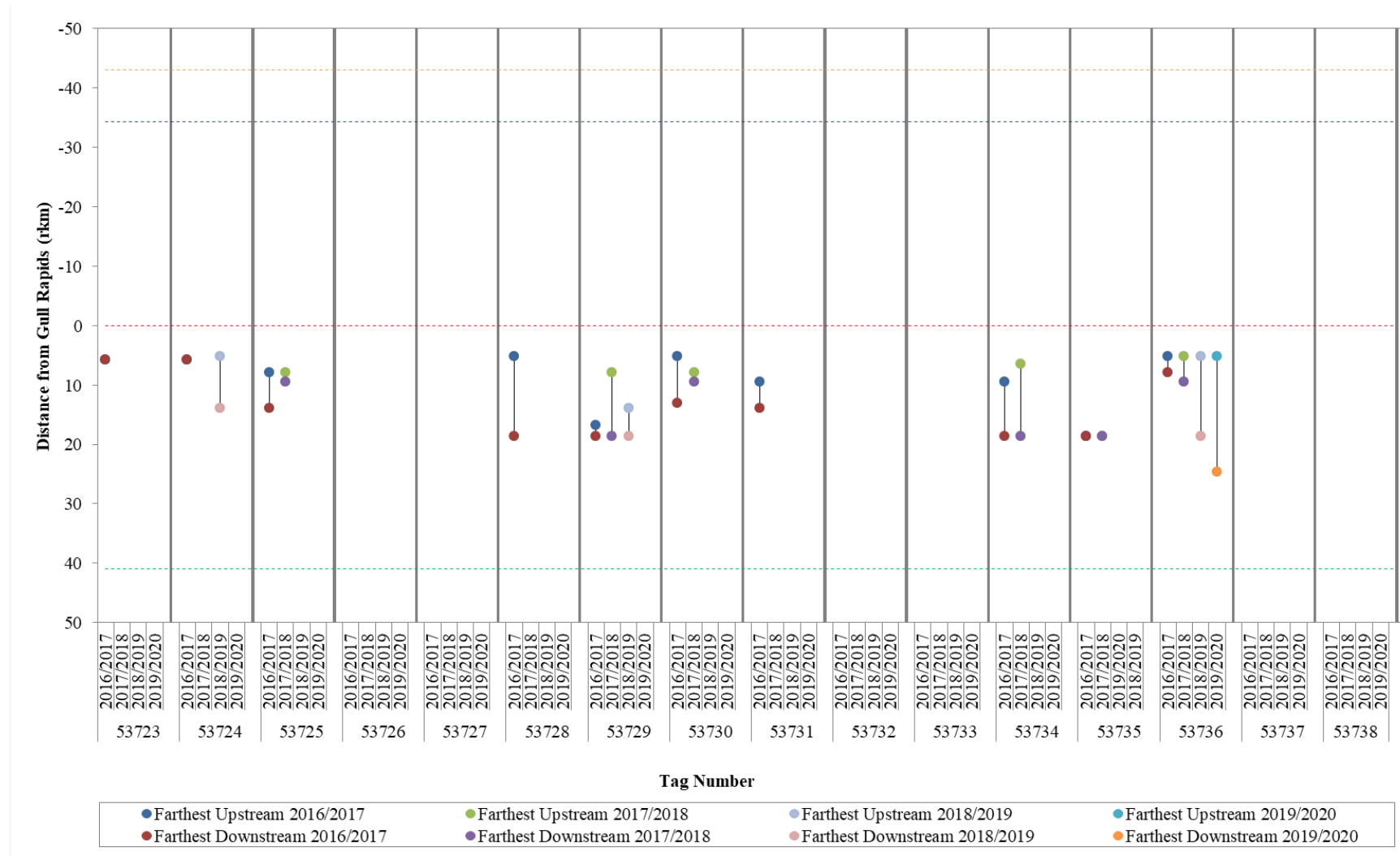


Figure 5: Detection ranges for individual Walleye tagged with acoustic transmitters in Stephens Lake during the winter period (2016–2020). Horizontal dotted lines indicate locations of landmarks (orange = Clark Lake outlet; blue = Birthday Rapids, red = the Keeyask GS; green = Kettle GS).

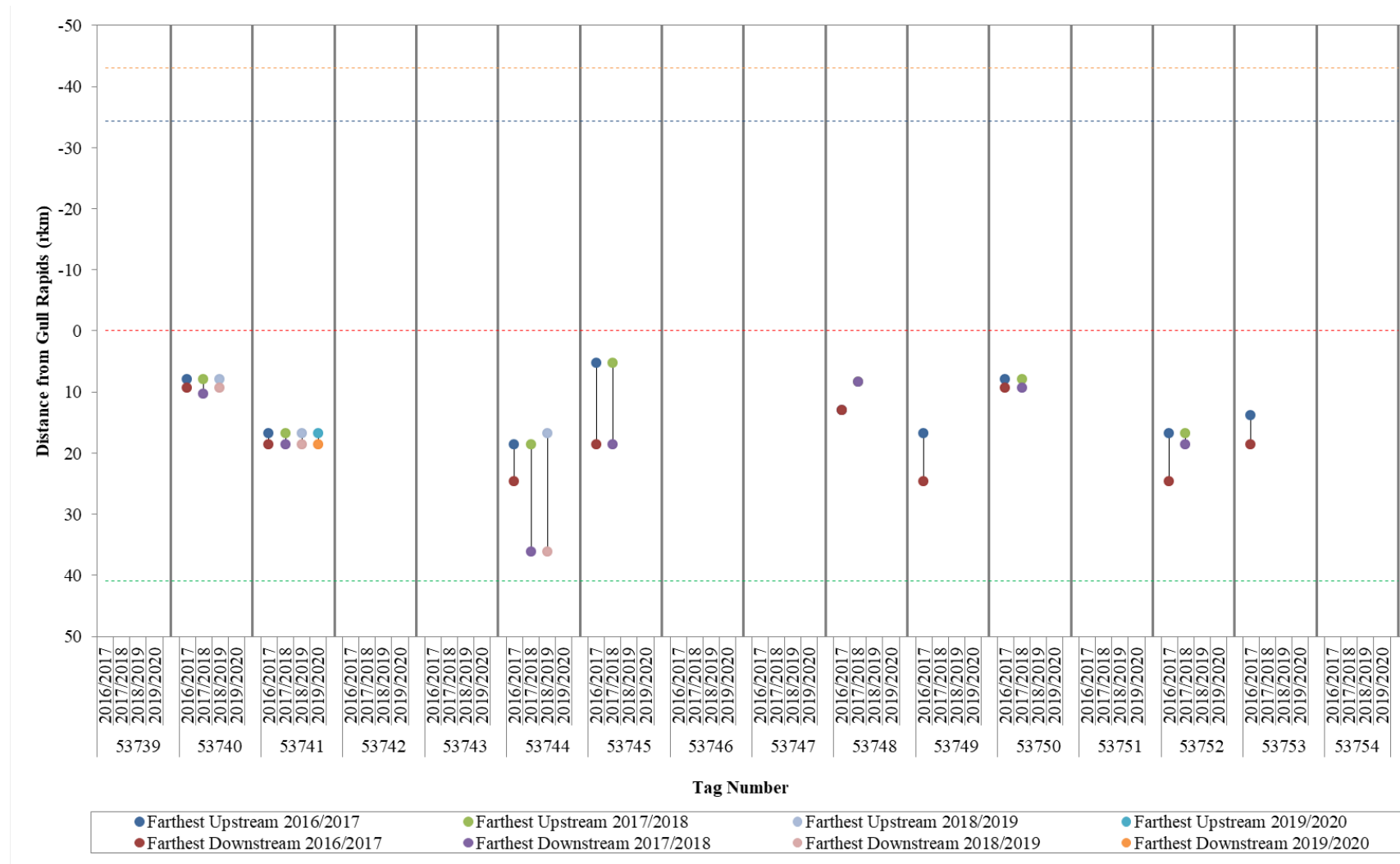


Figure 5: Detection ranges for individual Walleye tagged with acoustic transmitters in Stephens Lake during the winter period (2016–2020). Horizontal dotted lines indicate locations of landmarks (orange = Clark Lake outlet; blue = Birthday Rapids, red = the Keeyask GS; green = Kettle GS) (continued).

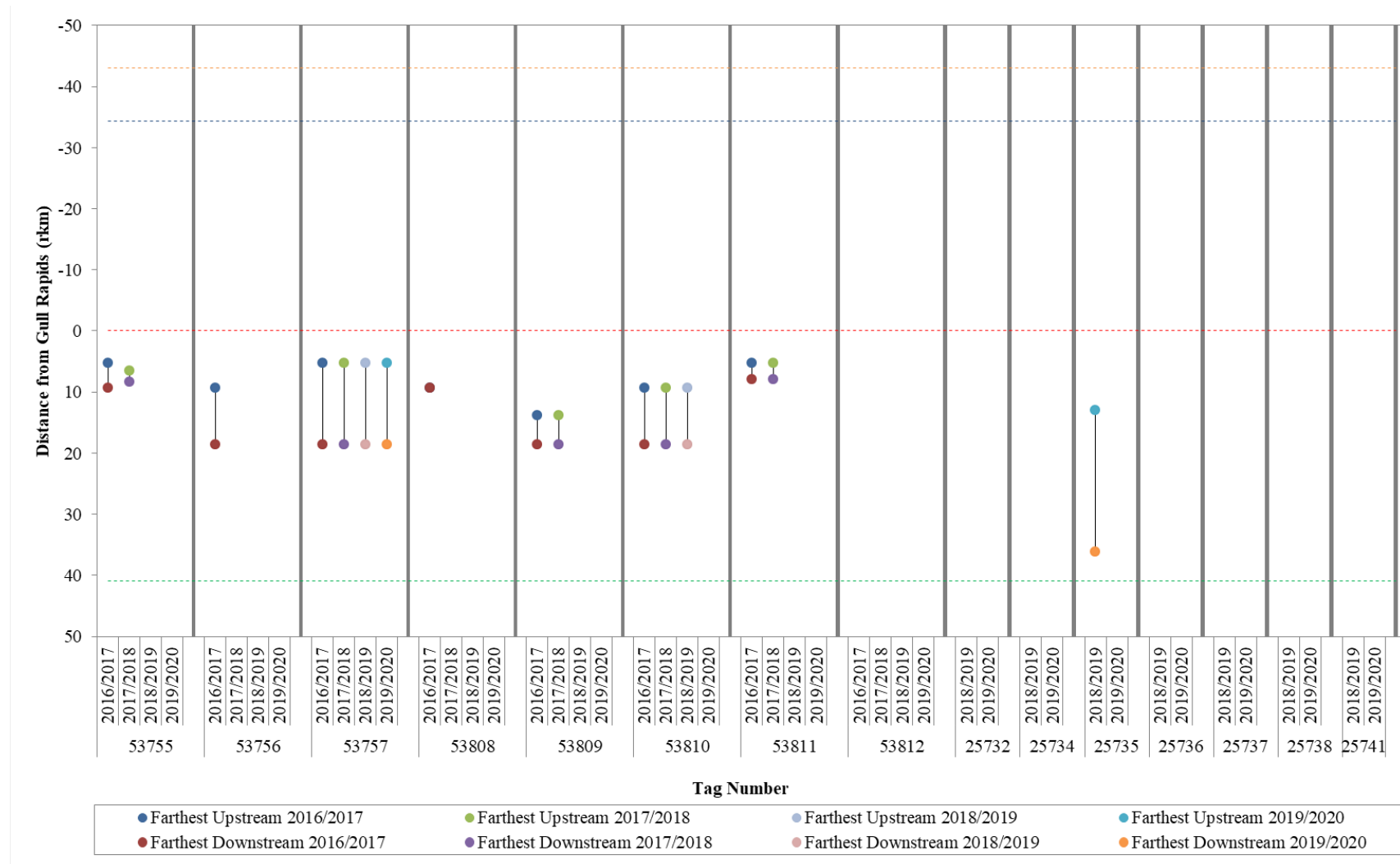


Figure 5: Detection ranges for individual Walleye tagged with acoustic transmitters in Stephens Lake during the winter period (2016–2020). Horizontal dotted lines indicate locations of landmarks (orange = Clark Lake outlet; blue = Birthday Rapids, red = the Keeyask GS; green = Kettle GS) (continued).

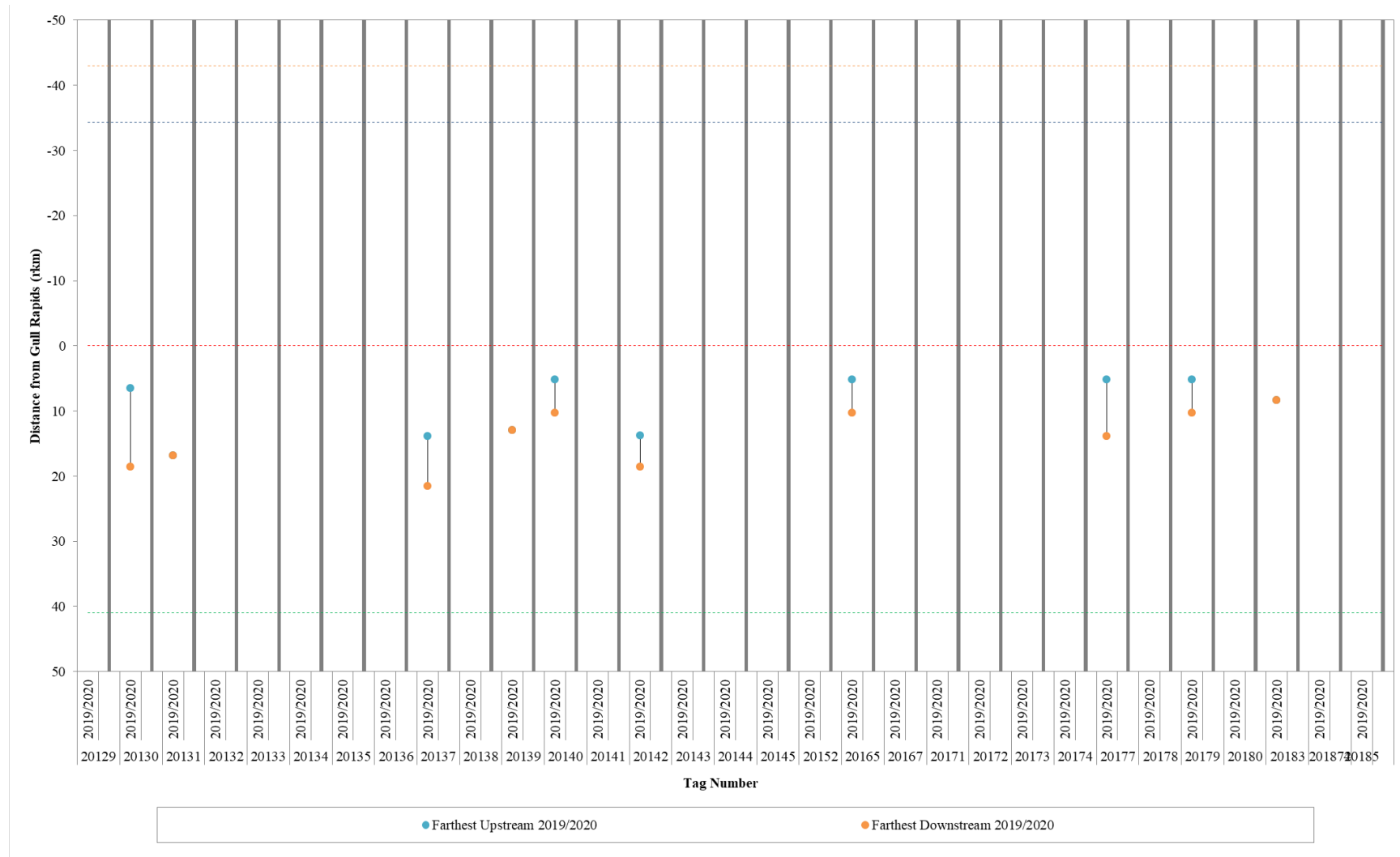


Figure 5: Detection ranges for individual Walleye tagged with acoustic transmitters in Stephens Lake during the winter period (2016–2020). Horizontal dotted lines indicate locations of landmarks (orange = Clark Lake outlet; blue = Birthday Rapids, red = the Keeyask GS; green = Kettle GS) (continued).

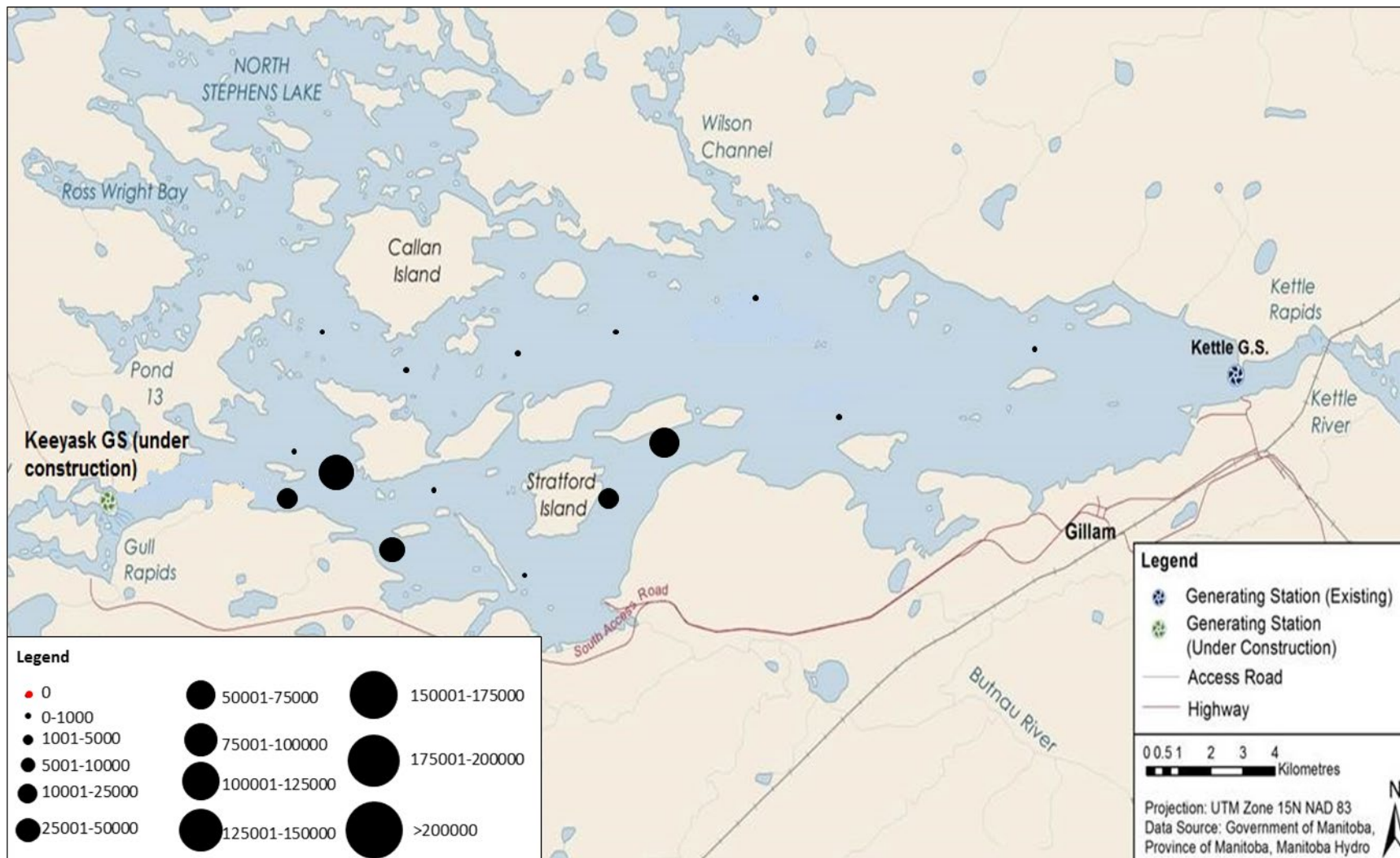


Figure 6: Relative number of detections of Walleye tagged at each acoustic receiver set in Stephens Lake during winter 2019/2020 (October 8, 2019, to April 30, 2020). Number of detections indicated by size of bubble (defined in legend). Receivers with no detections indicated with red dot.

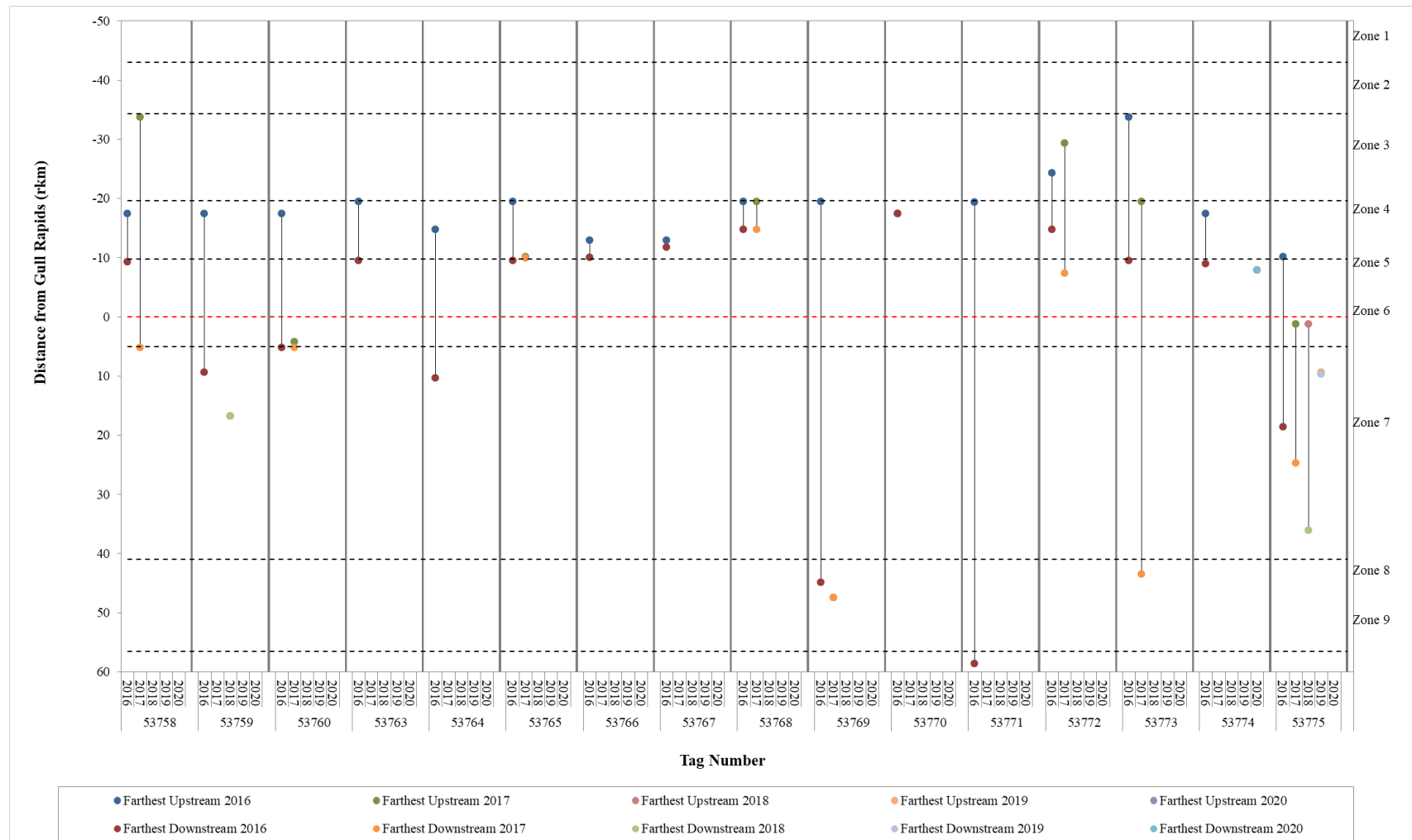


Figure 7: Detection ranges for individual Walleye tagged with acoustic transmitters upstream of the Keeyask during the open-water period (2016–2020). Horizontal dotted lines demarcate zones. Horizontal dotted lines demarcate zones. Blue represents the outlet of Clark Lake, dark pink represents Birthday Rapids, red represents the Keeyask GS, light pink represents the Kettle GS, and light green represents the Long Spruce GS.

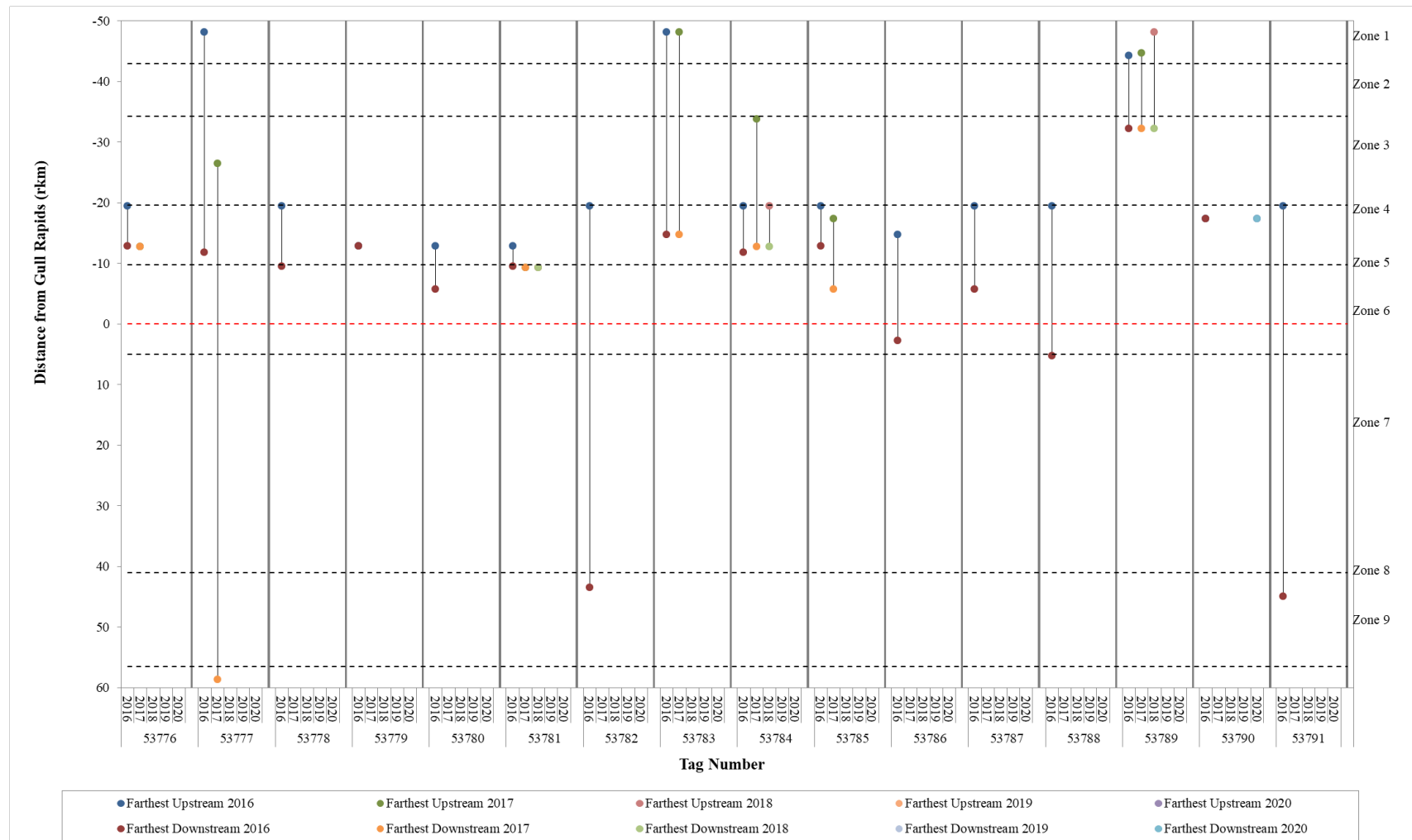


Figure 7: Detection ranges for individual Walleye tagged with acoustic transmitters upstream of the Keeyask GS during the open-water period (2016–2020). Horizontal dotted lines demarcate zones. Blue represents the outlet of Clark Lake, dark pink represents Birthday Rapids, red represents the Keeyask GS, light pink represents the Kettle GS, and light green represents the Long Spruce GS (continued).

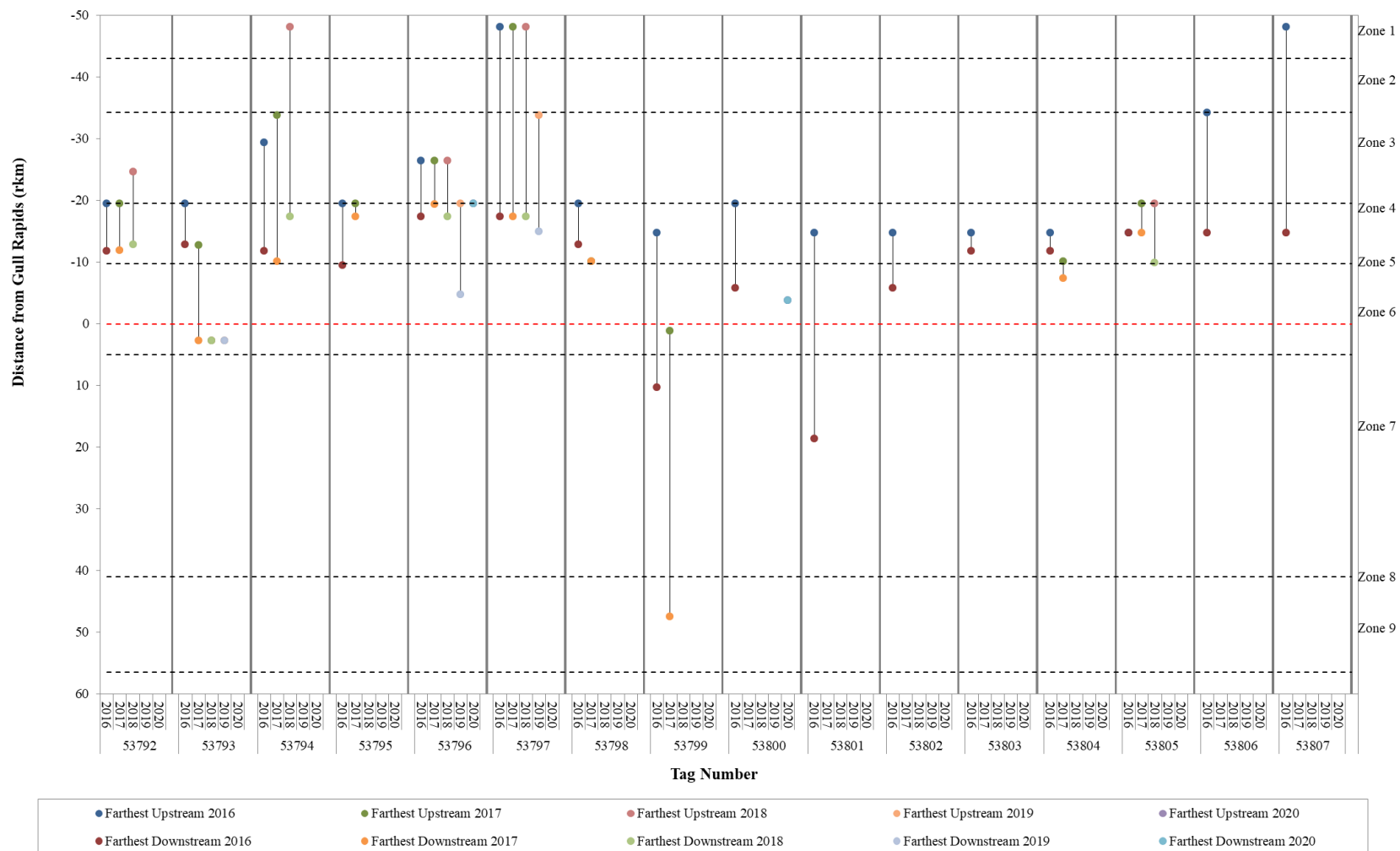


Figure 7: Detection ranges for individual Walleye tagged with acoustic transmitters upstream of the Keeyask GS during the open-water period (2016–2019). Horizontal dotted lines demarcate zones. Blue represents the outlet of Clark Lake, dark pink represents Birthday Rapids, red represents the Keeyask GS, light pink represents the Kettle GS, and light green represents the Long Spruce GS (continued).

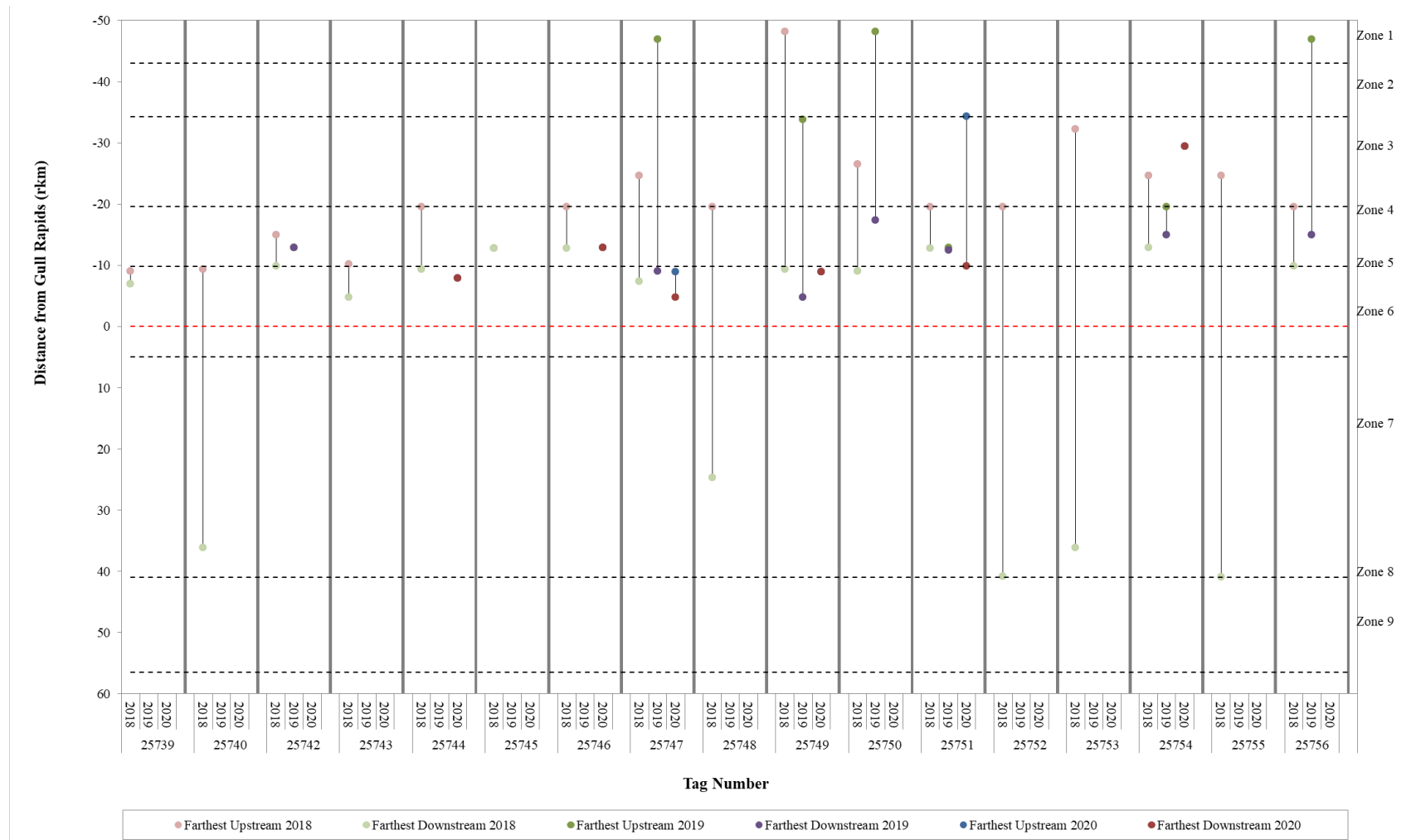


Figure 7: Detection ranges for individual Walleye tagged with acoustic transmitters upstream of the Keeyask GS during the open-water period (2016–2020). Horizontal dotted lines demarcate zones. Blue represents the outlet of Clark Lake, dark pink represents Birthday Rapids, red represents the Keeyask GS, light pink represents the Kettle GS, and light green represents the Long Spruce GS (continued).

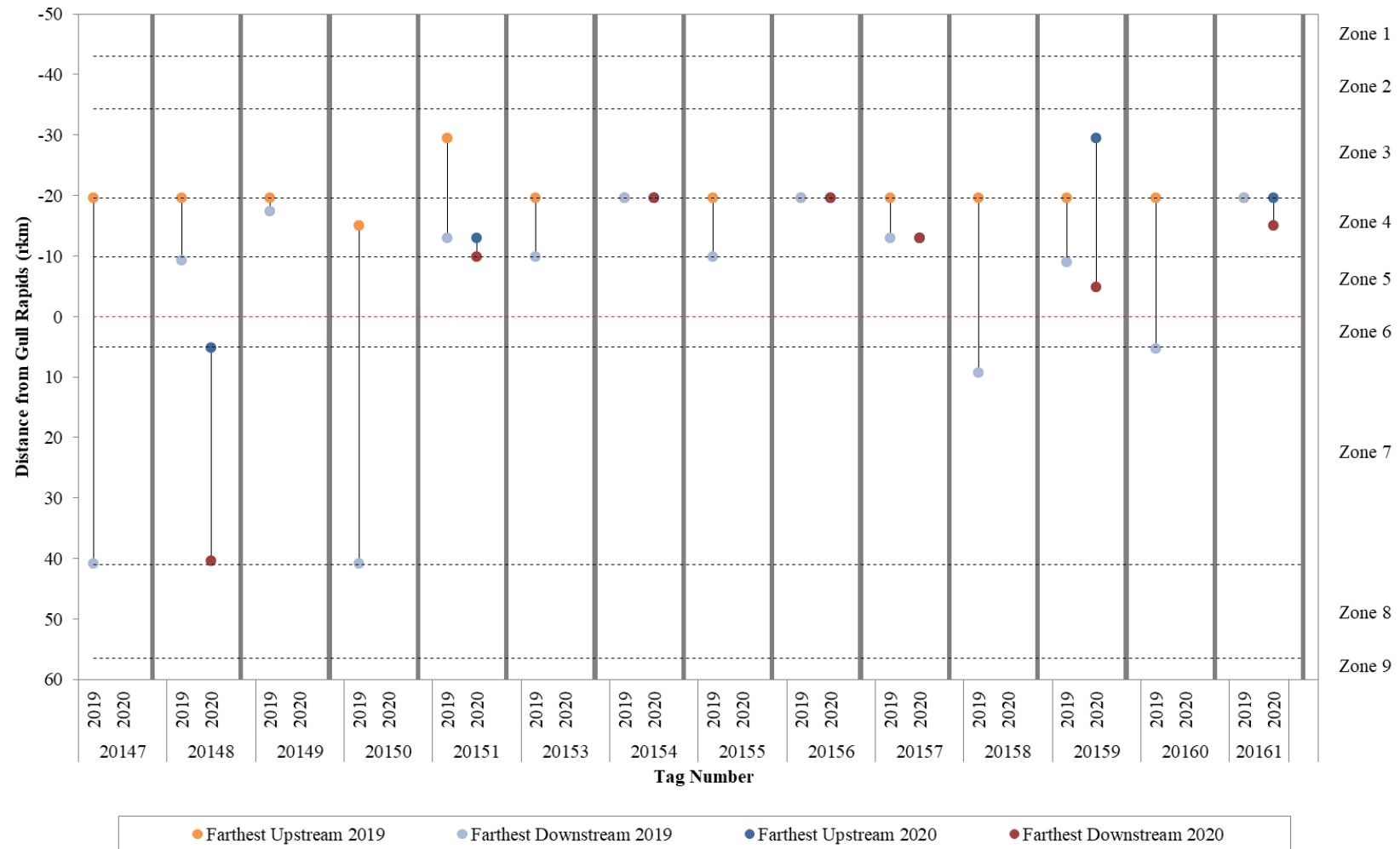
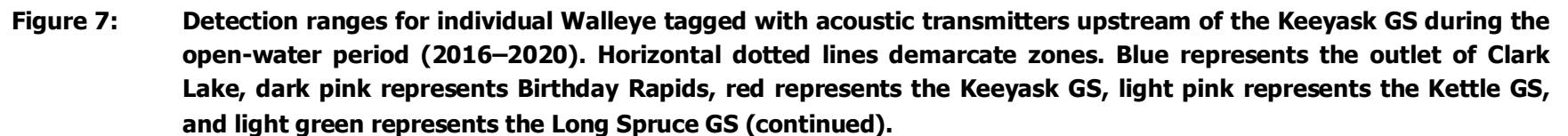


Figure 7: Detection ranges for individual Walleye tagged with acoustic transmitters upstream of the Keeyask GS during the open-water period (2016–2020). Horizontal dotted lines demarcate zones. Blue represents the outlet of Clark Lake, dark pink represents Birthday Rapids, red represents the Keeyask GS, light pink represents the Kettle GS, and light green represents the Long Spruce GS (continued).



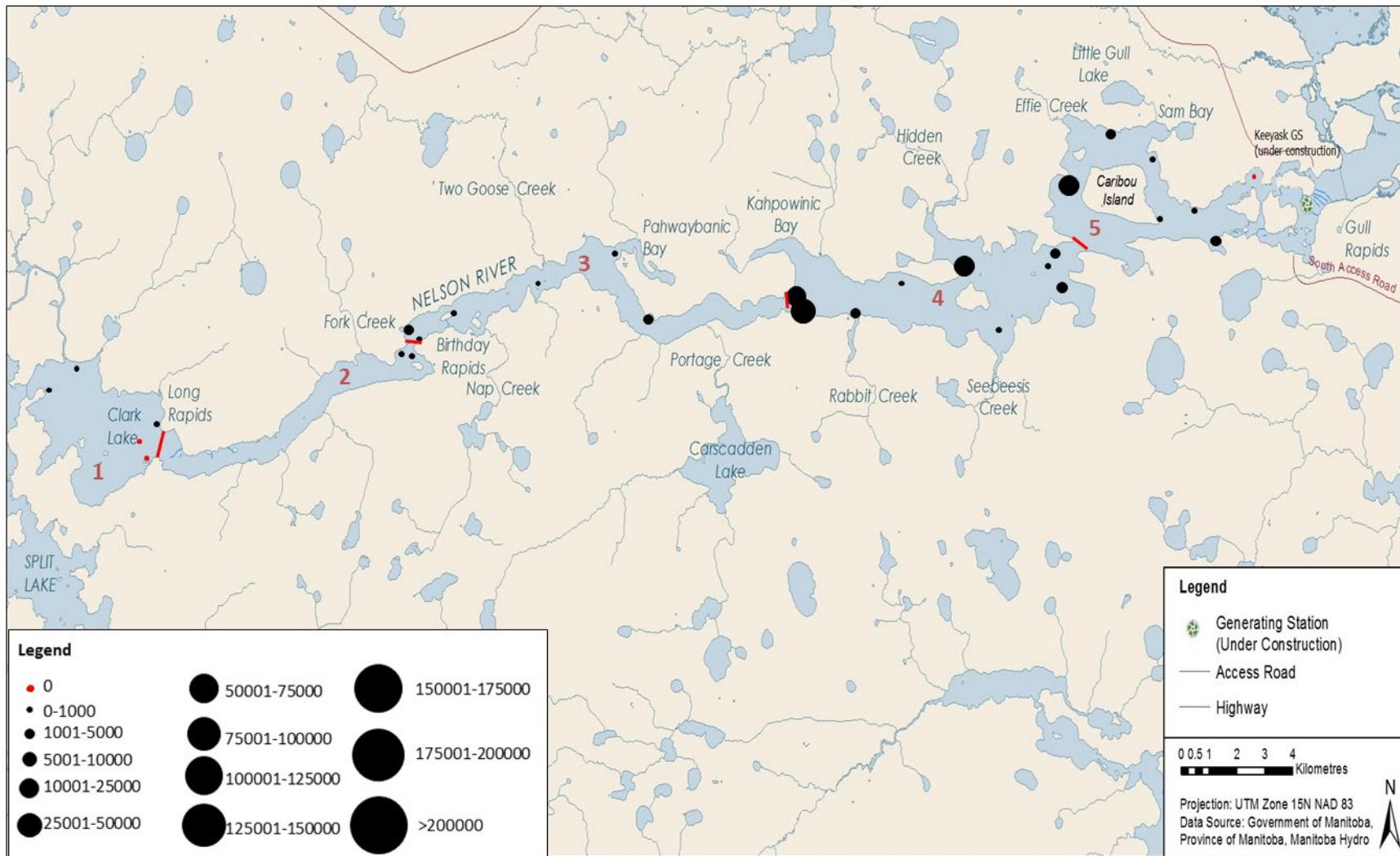


Figure 8: Relative number of detections of Walleye at each acoustic receiver set between Clark Lake and the Keeyask GS during the 2020 open-water period (May 1 to September 23). Number of detections indicated by size of bubble (defined in legend). Receivers with no detections indicated with red dot.

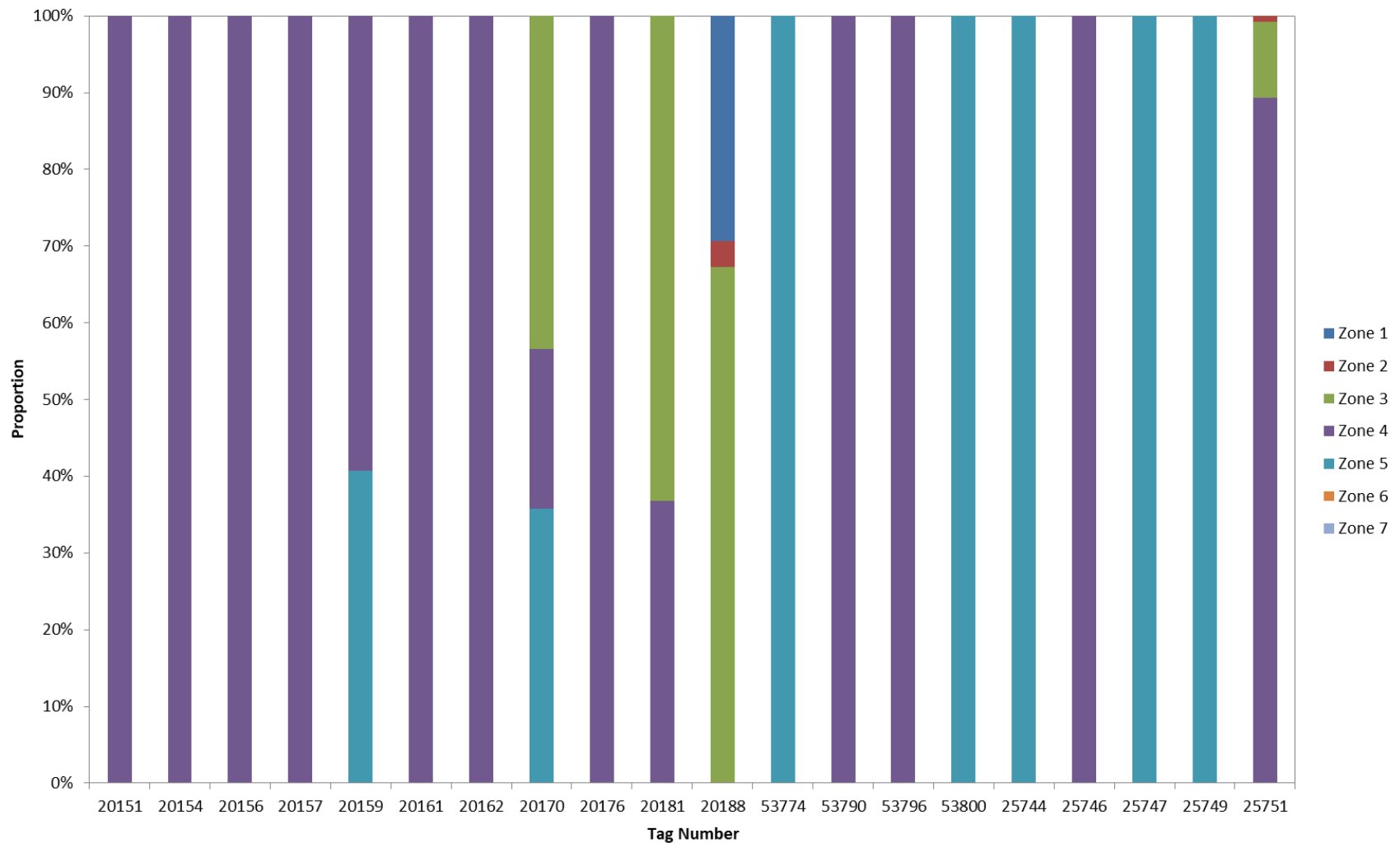


Figure 9: Proportional distributions by zone for individual Walleye tagged with acoustic transmitters upstream of Keeyask GS during a portion of the 2020 open-water period (July 3 to September 23).

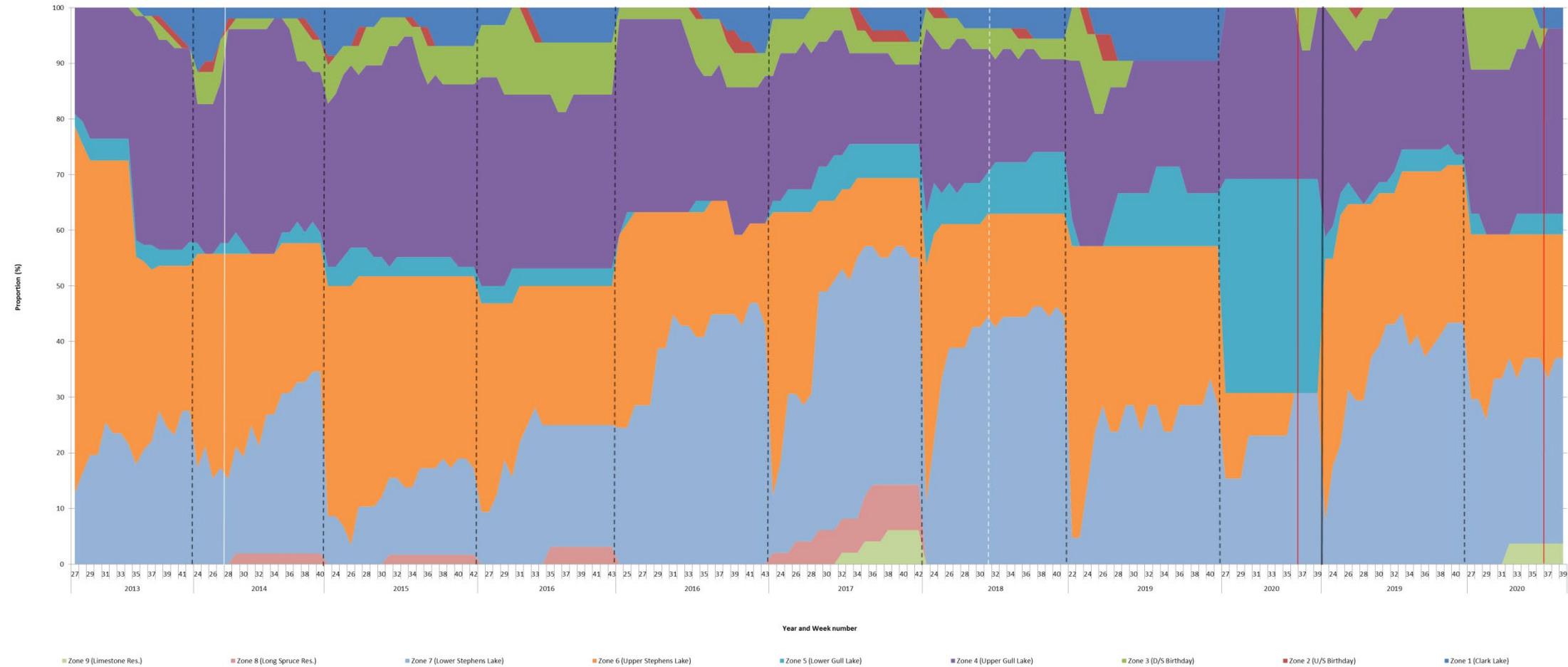


Figure 10: Proportional distribution by zone, for Walleye tagged with acoustic transmitters in the Keeyask GS Area during a portion of the 2013 (June 4 to October 15), 2014 (June 4 to October 3), 2015 (June 4 to October 11), 2016 (June 4 to October 19), 2017 (June 7 to October 16), 2018 (June 6 to October 10), 2019 (June 2 to October 7), and 2020 (July 3 to September 23) open-water periods. Black dashed lines indicate study years. Solid black line indicates new fish tagged. Solid white line indicates start of Keeyask construction. Dashed white line indicates start of Keeyask spillway commissioning. Red line indicates completion of Keeyask GS reservoir impoundment.

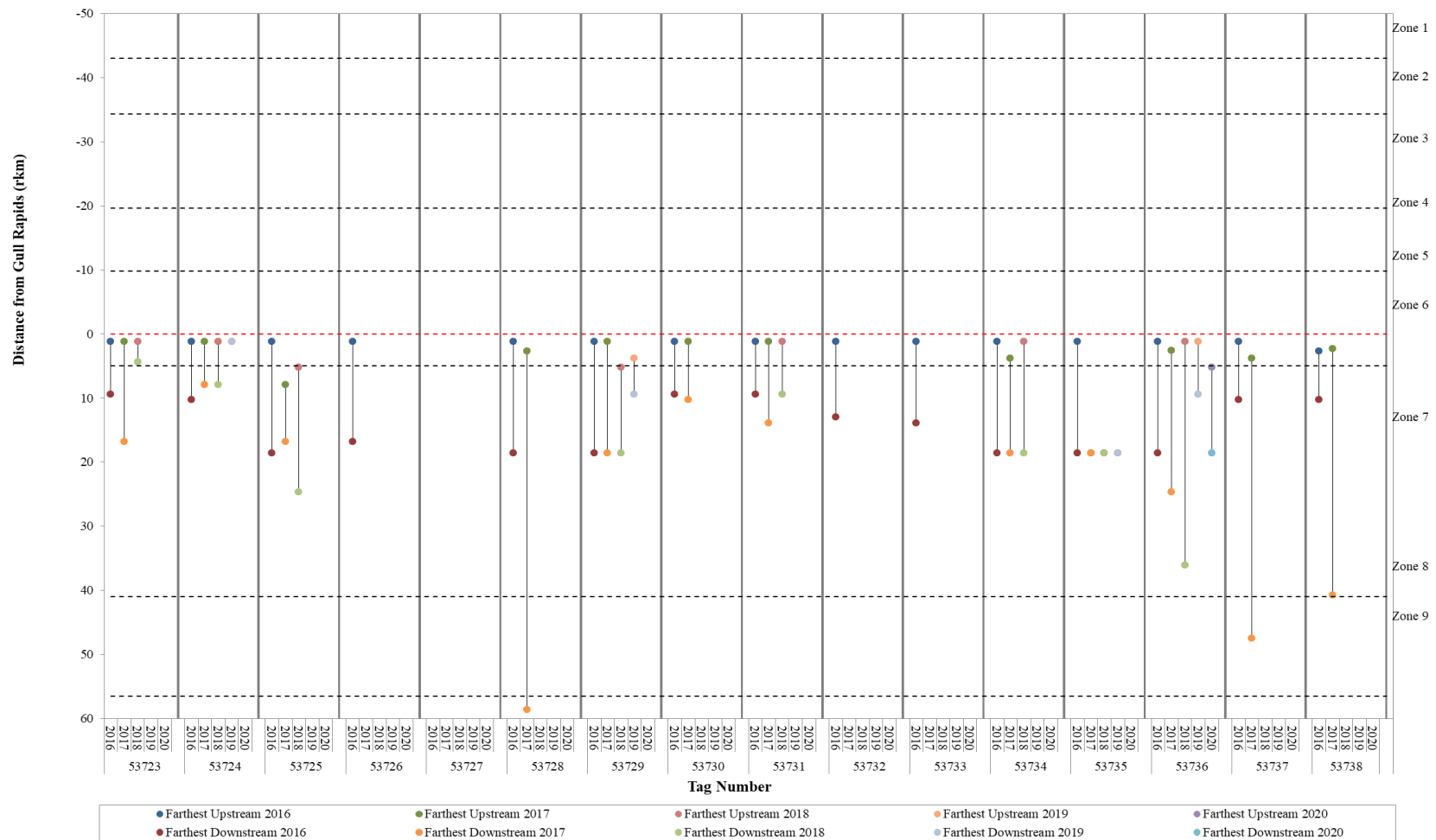


Figure 11: Detection ranges for individual Walleye tagged with acoustic transmitters in Stephens Lake during the open-water period (2016–2020). Horizontal dotted lines demarcate zones. Blue represents the outlet of Clark Lake, dark pink represents Birthday Rapids, red represents the Keeyask GS, light pink represents the Kettle GS, and light green represents the Long Spruce GS.

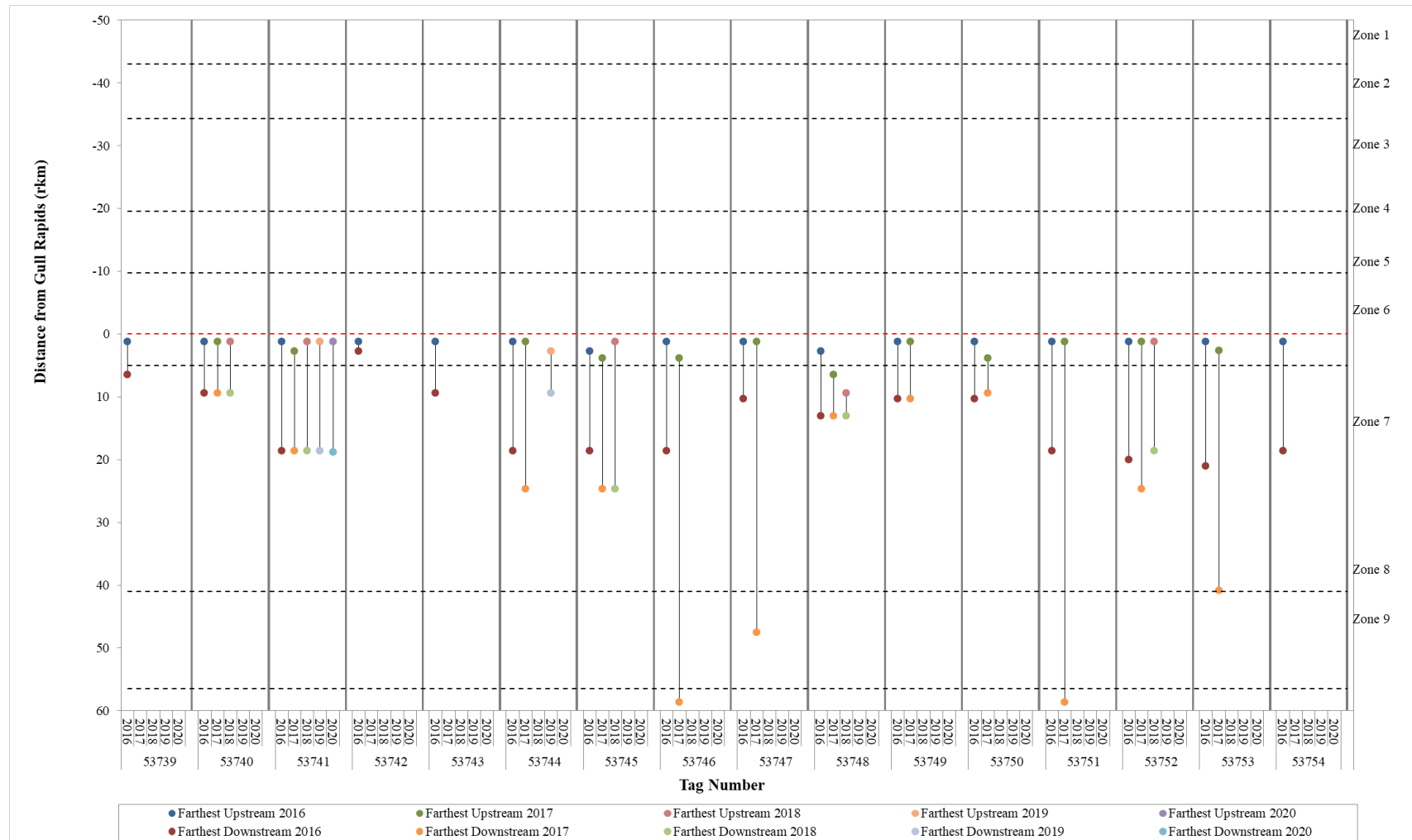


Figure 11: Detection ranges for individual Walleye tagged with acoustic transmitters in Stephens Lake during the open-water period (2016–2020). Horizontal dotted lines demarcate zones. Blue represents the outlet of Clark Lake, dark pink represents Birthday Rapids, red represents the Keeyask GS, light pink represents the Kettle GS, and light green represents the Long Spruce GS (continued).

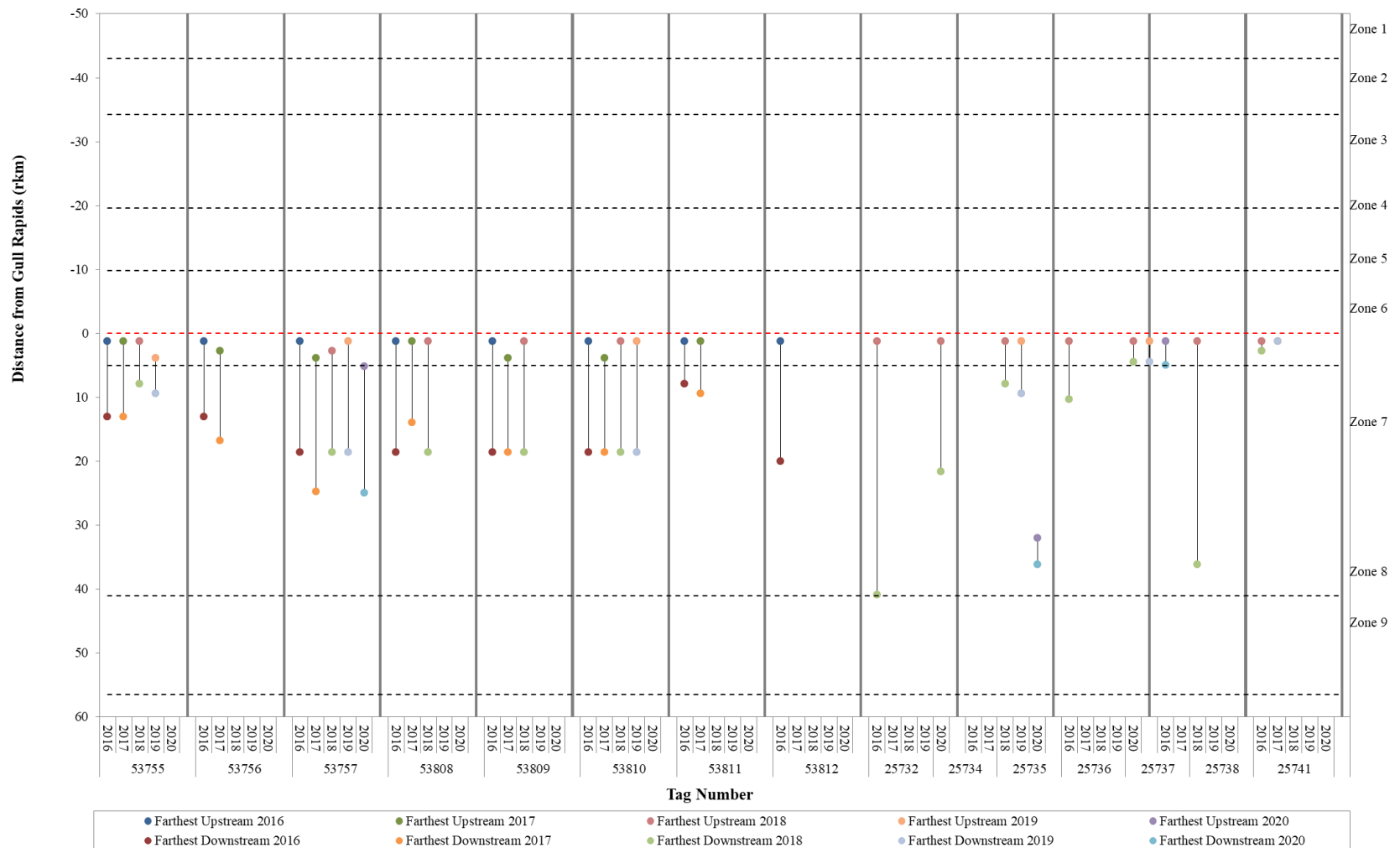


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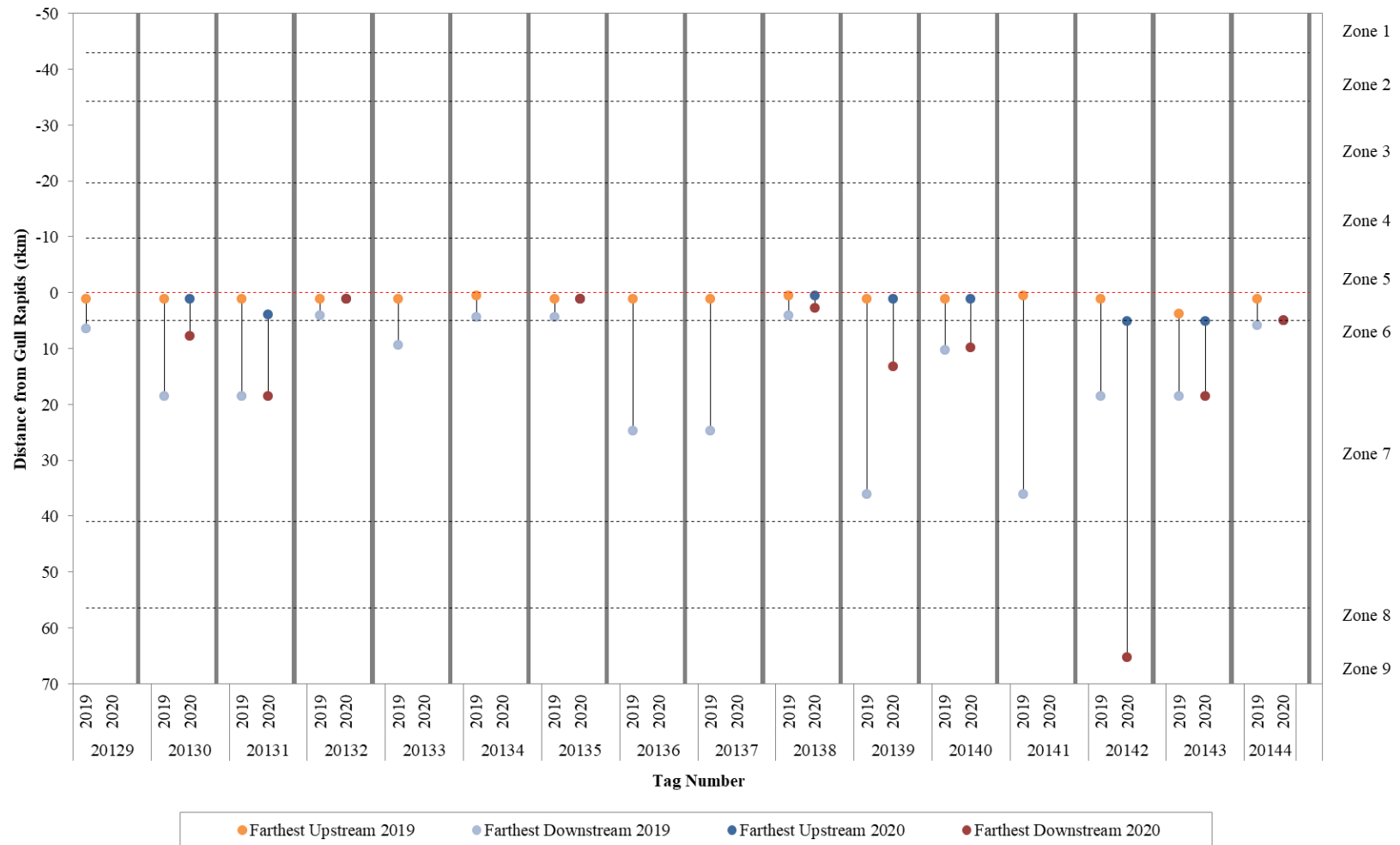


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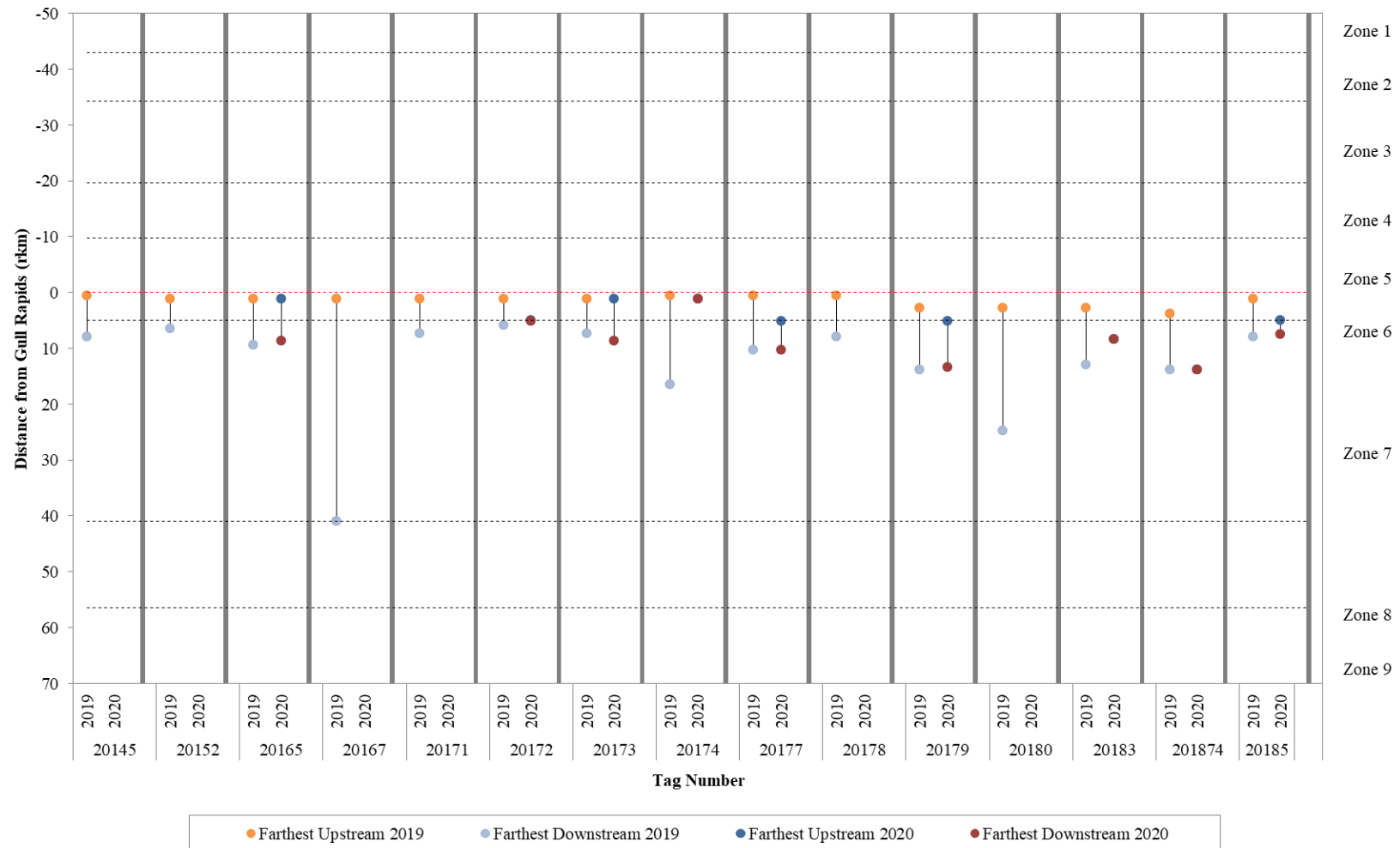


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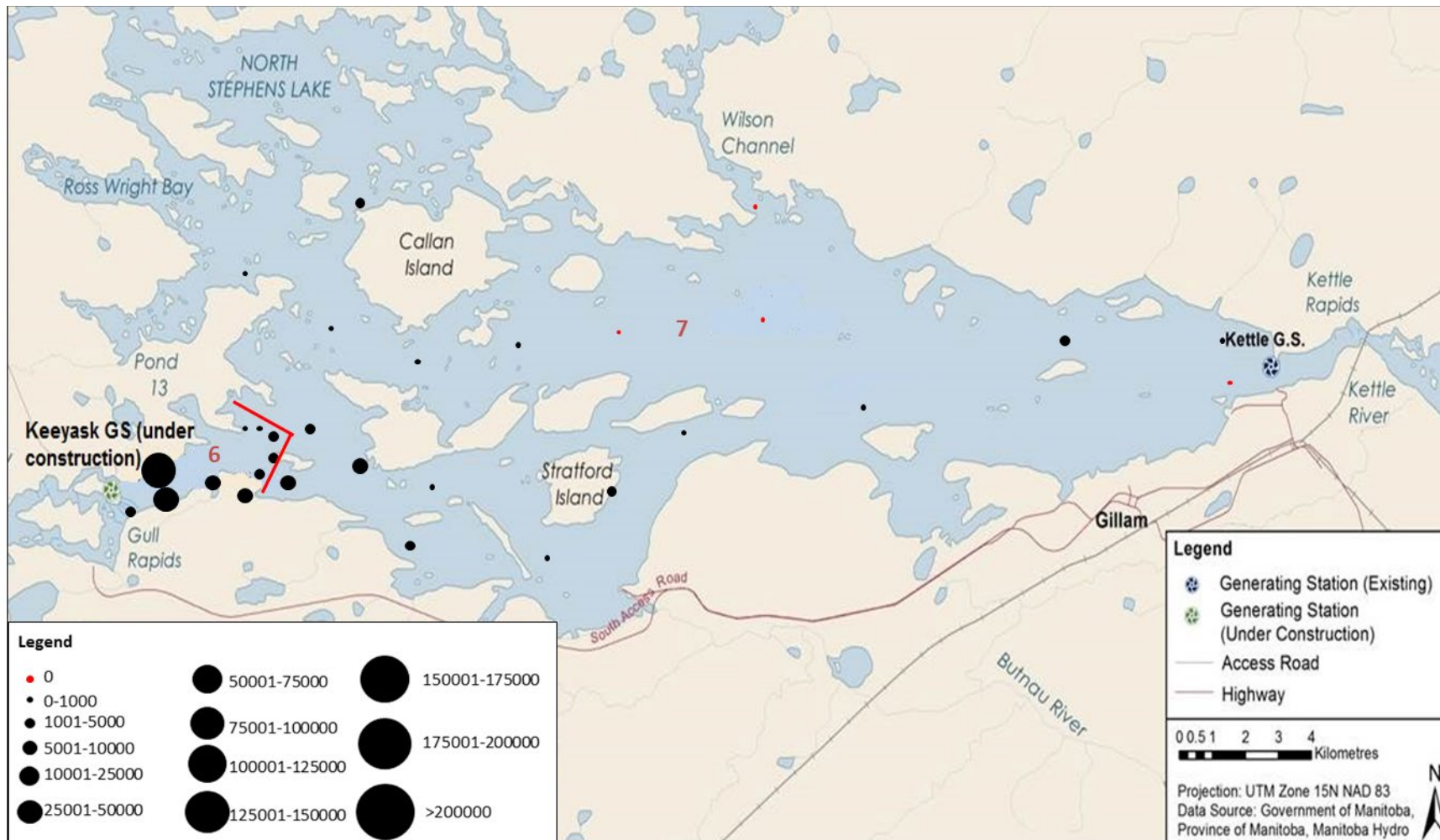


Figure 12: Relative number of detections of Walleye tagged at each acoustic receiver set in Stephens Lake during the 2020 open-water period (May 1 to September 23). Number of detections indicated by size of bubble (defined in legend). Receivers with no detections indicated with red dot.

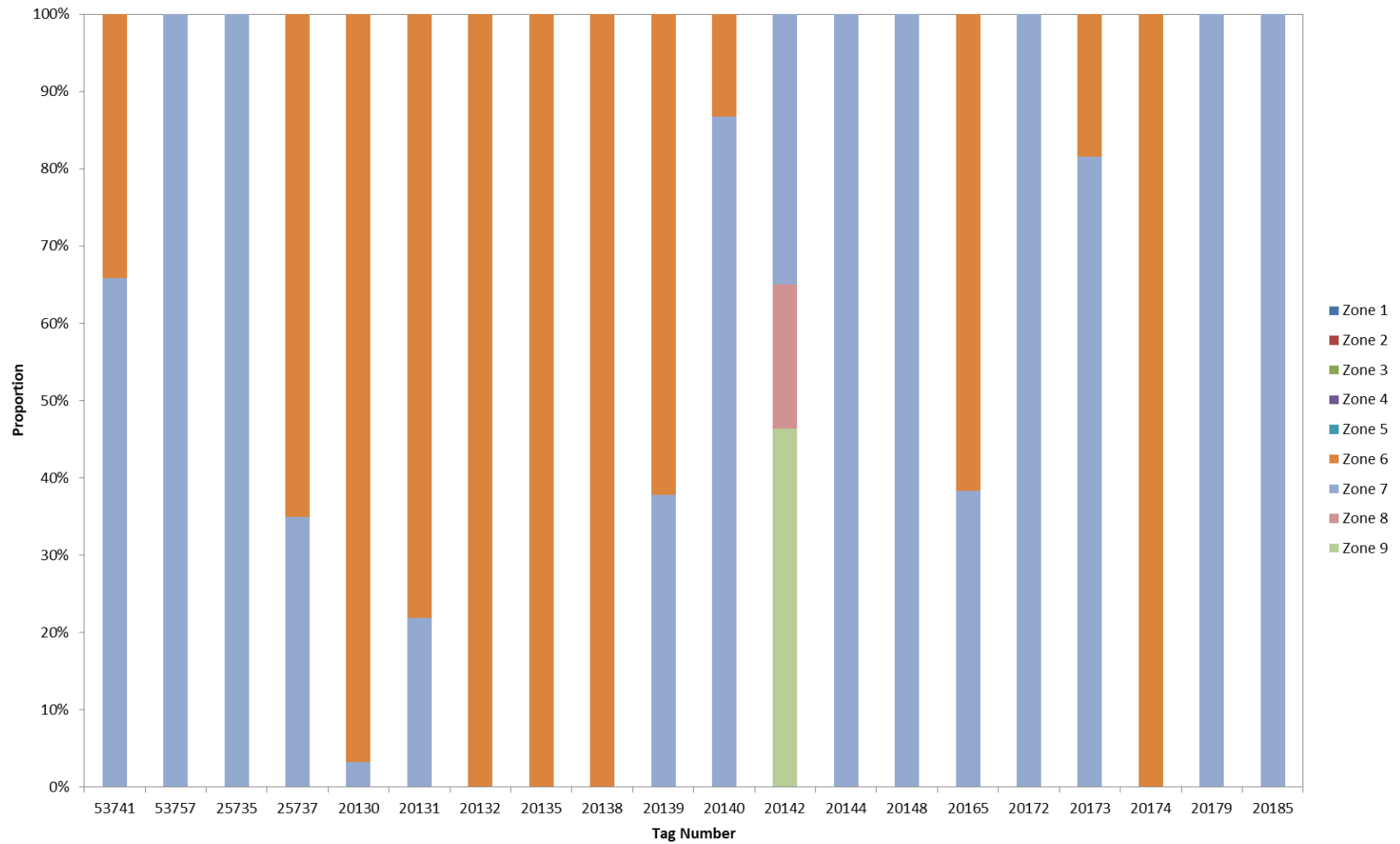


Figure 13: Proportional distributions by zone for individual Walleye tagged with acoustic transmitters in Stephens Lake during a portion of the 2020 open-water period (July 3 to September 23).

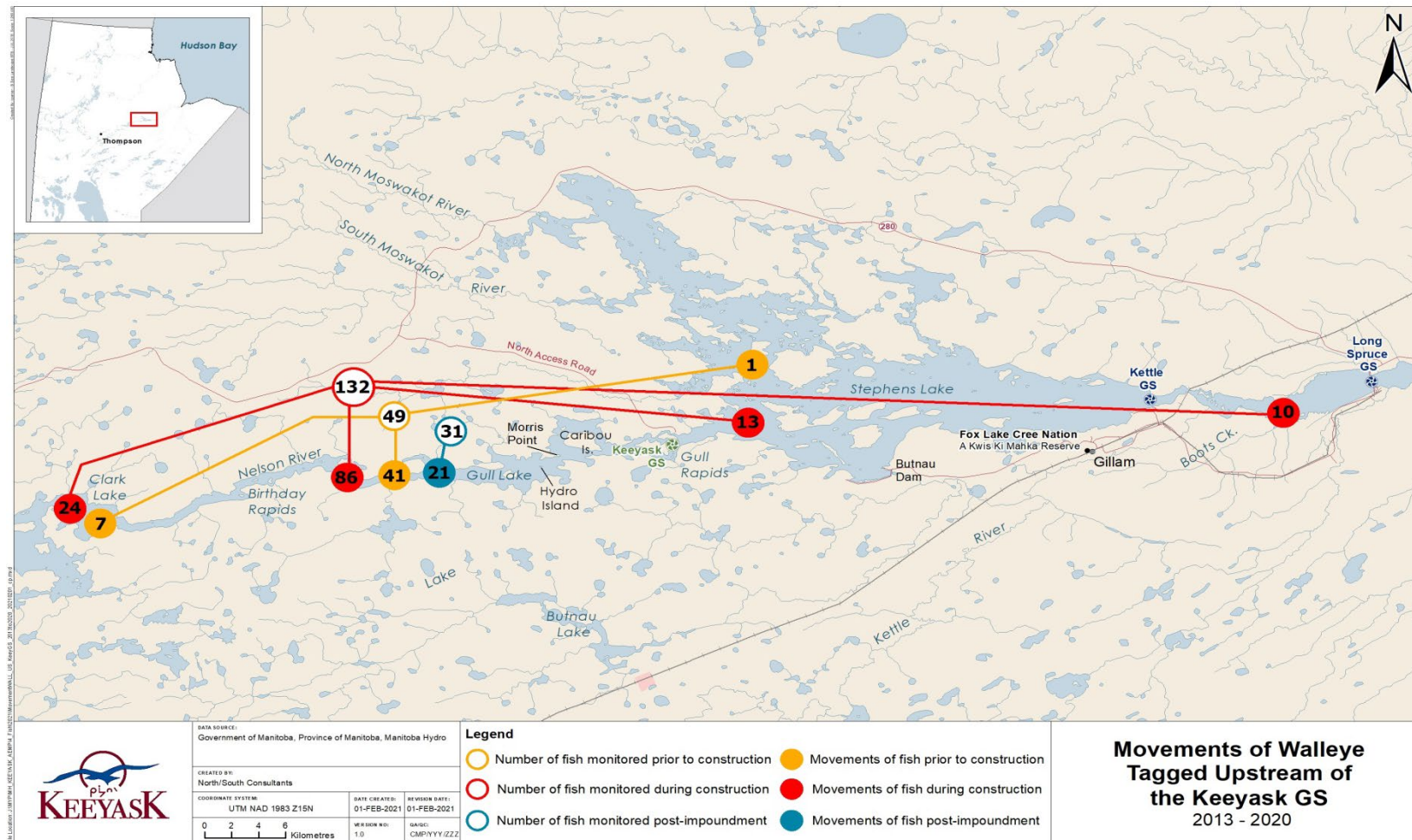


Figure 14: Map showing how many Walleye moved upstream out of Gull Lake, stayed in Gull Lake, and moved into Stephens Lake before construction (yellow), during construction (red) and after reservoir impoundment (blue). Movements of fish due to tagging stress or mortality were not included. Numbers of fish monitored (hollow circles) represent the number of fish tagged while the number of fish movements (solid circles) represent the number of fish detected.

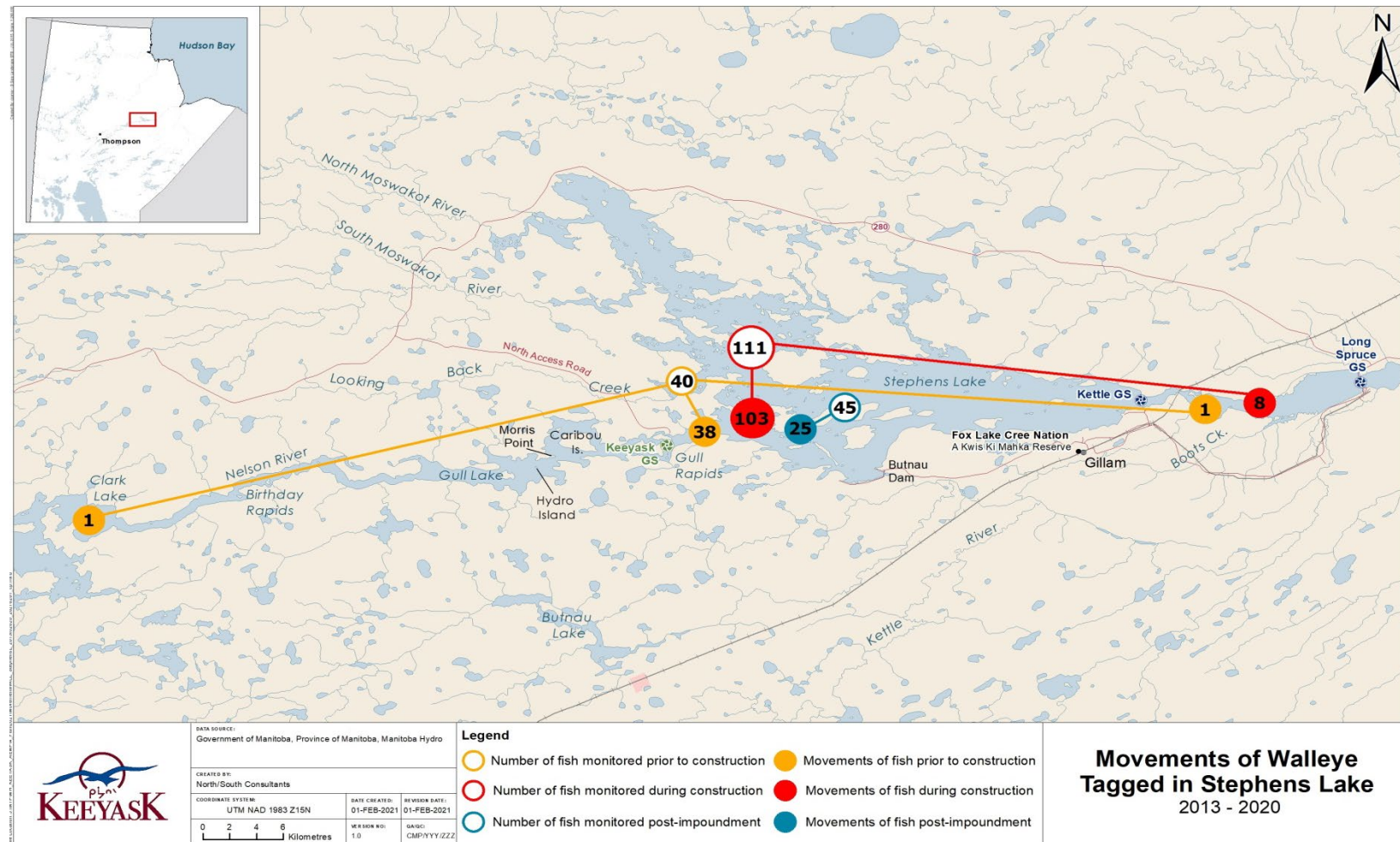
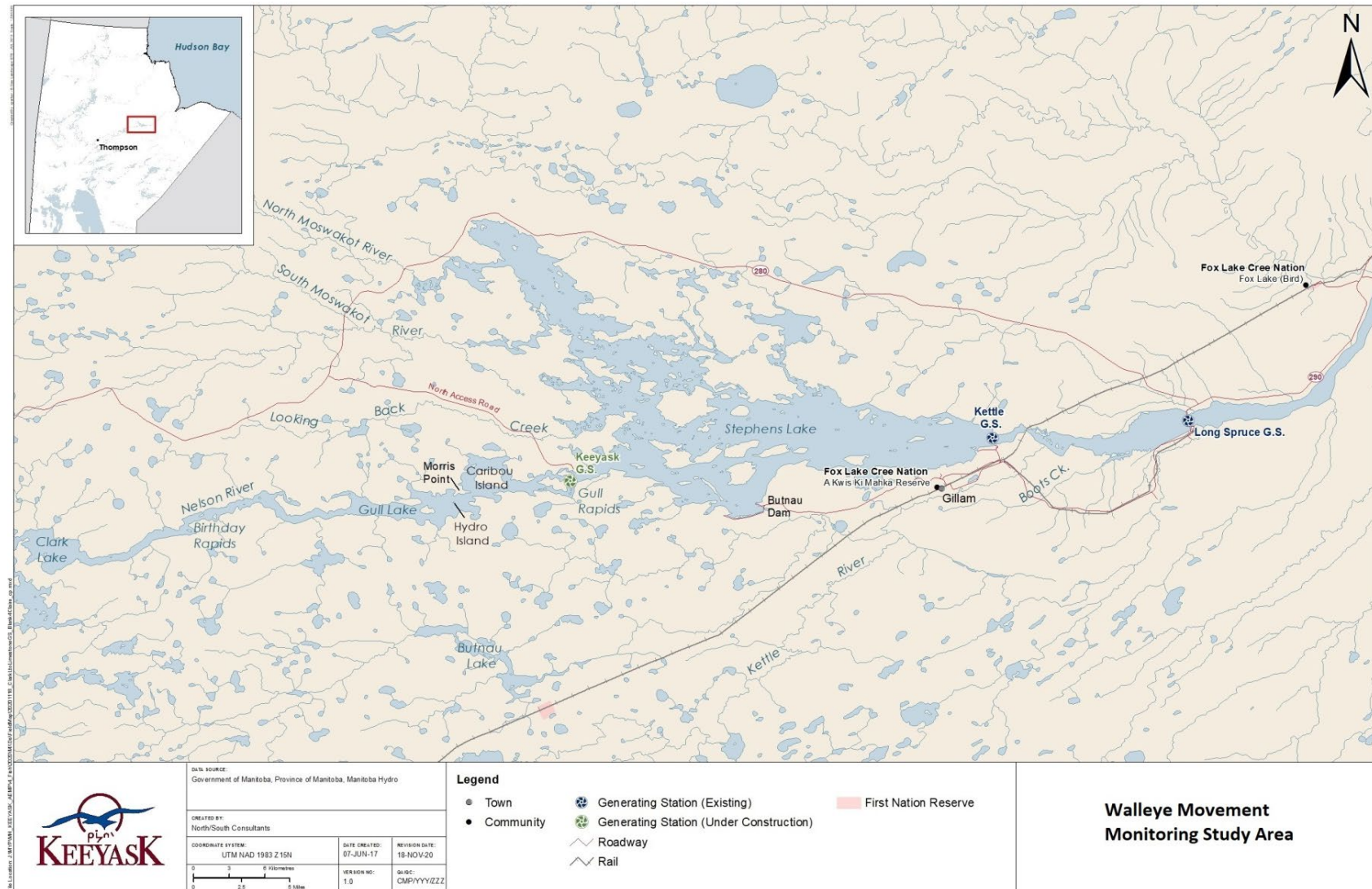
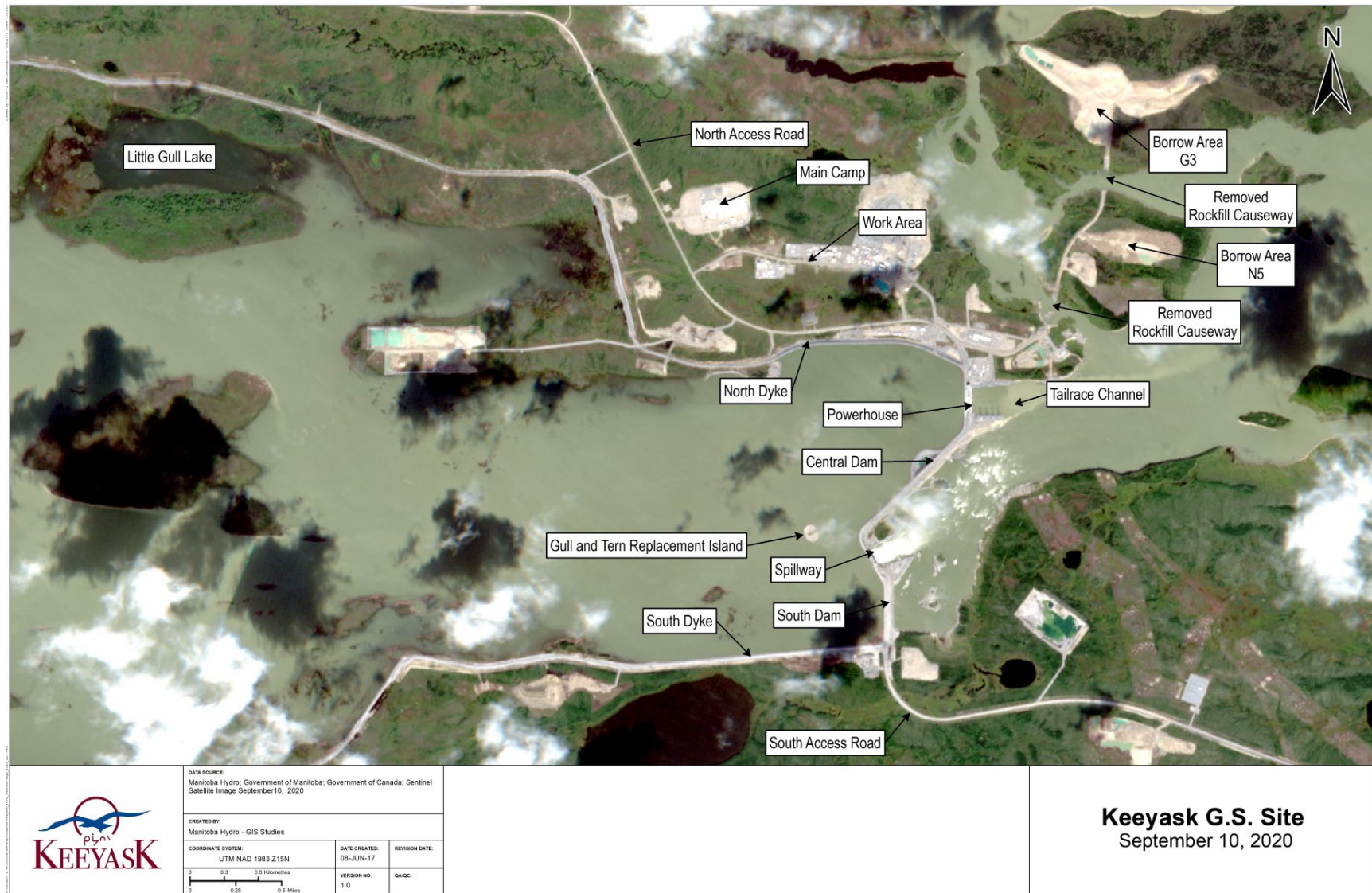


Figure 15: Map showing how many Walleye moved upstream through Gull Rapids, stayed in Stephens Lake, and moved downstream through the Kettle GS before construction (yellow), during construction (red) and after reservoir impoundment (blue). Movements due to tagging stress and mortality were not included. Numbers of fish monitored (hollow circles) represent the number of fish tagged while the number of fish movements (solid circles) represent the number of fish detected.

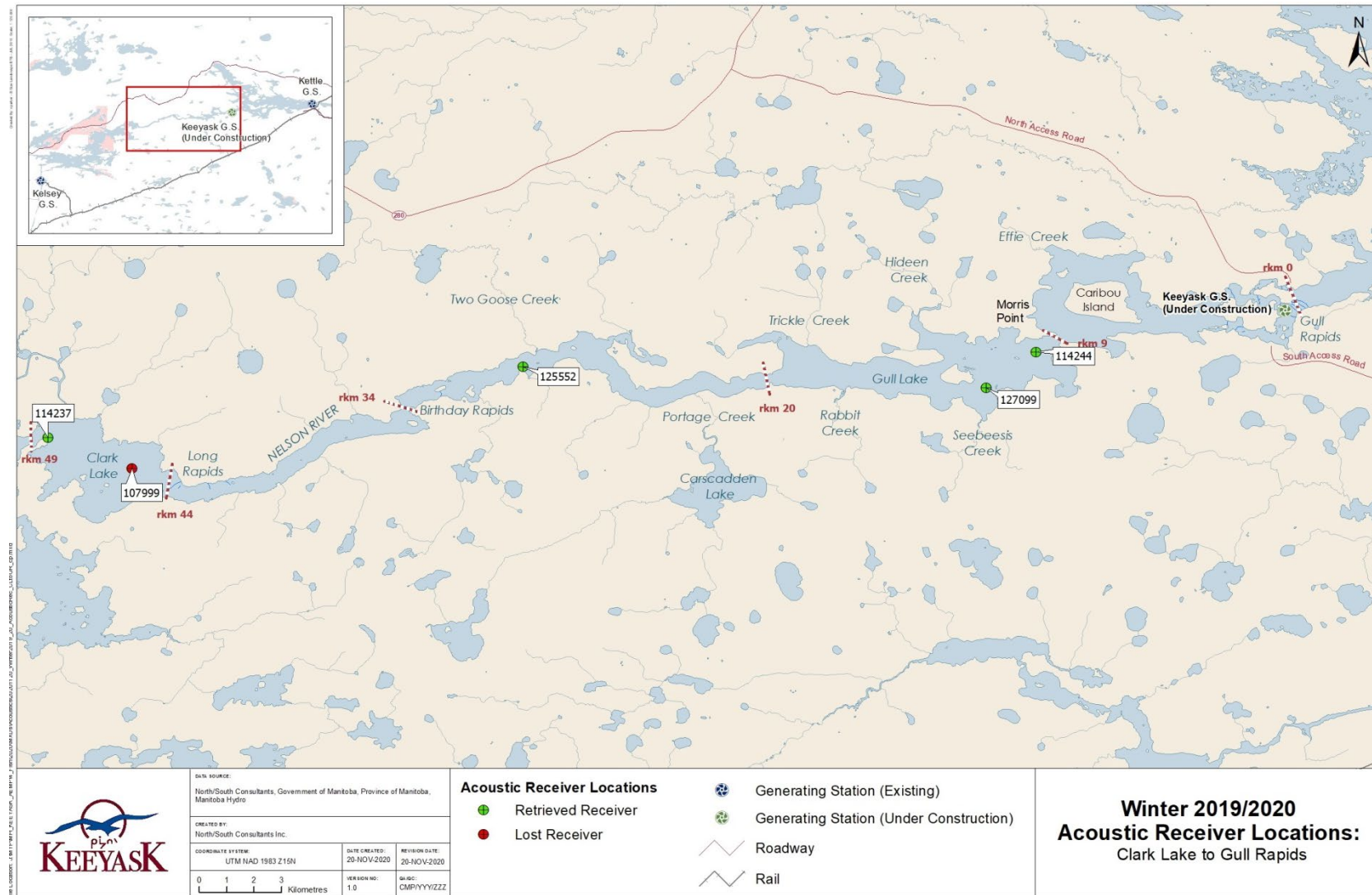
MAPS



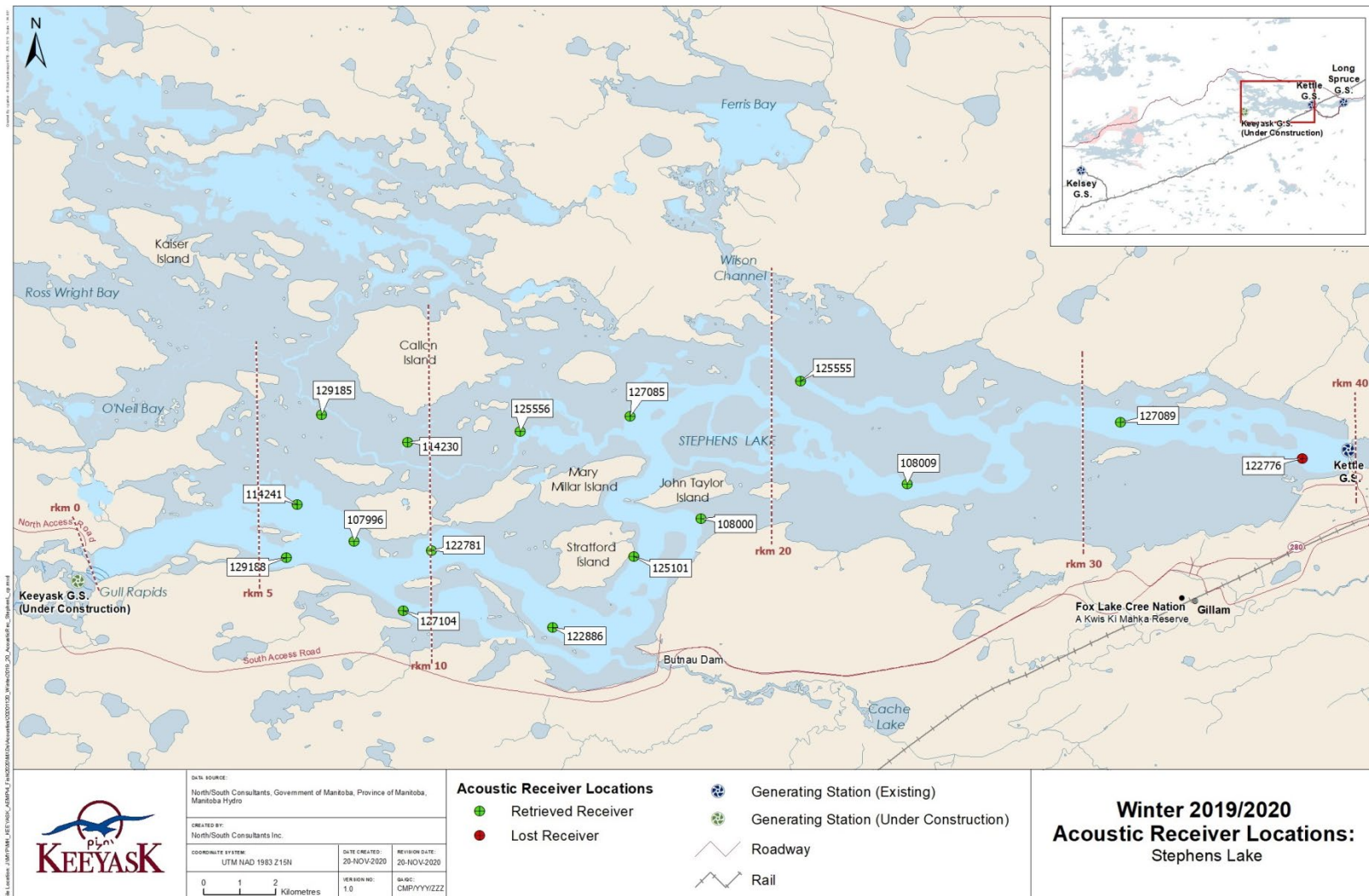
Map 1: Map of the lower Nelson River showing the site of the Keeyask Generating Station and the Walleye movement monitoring study setting.



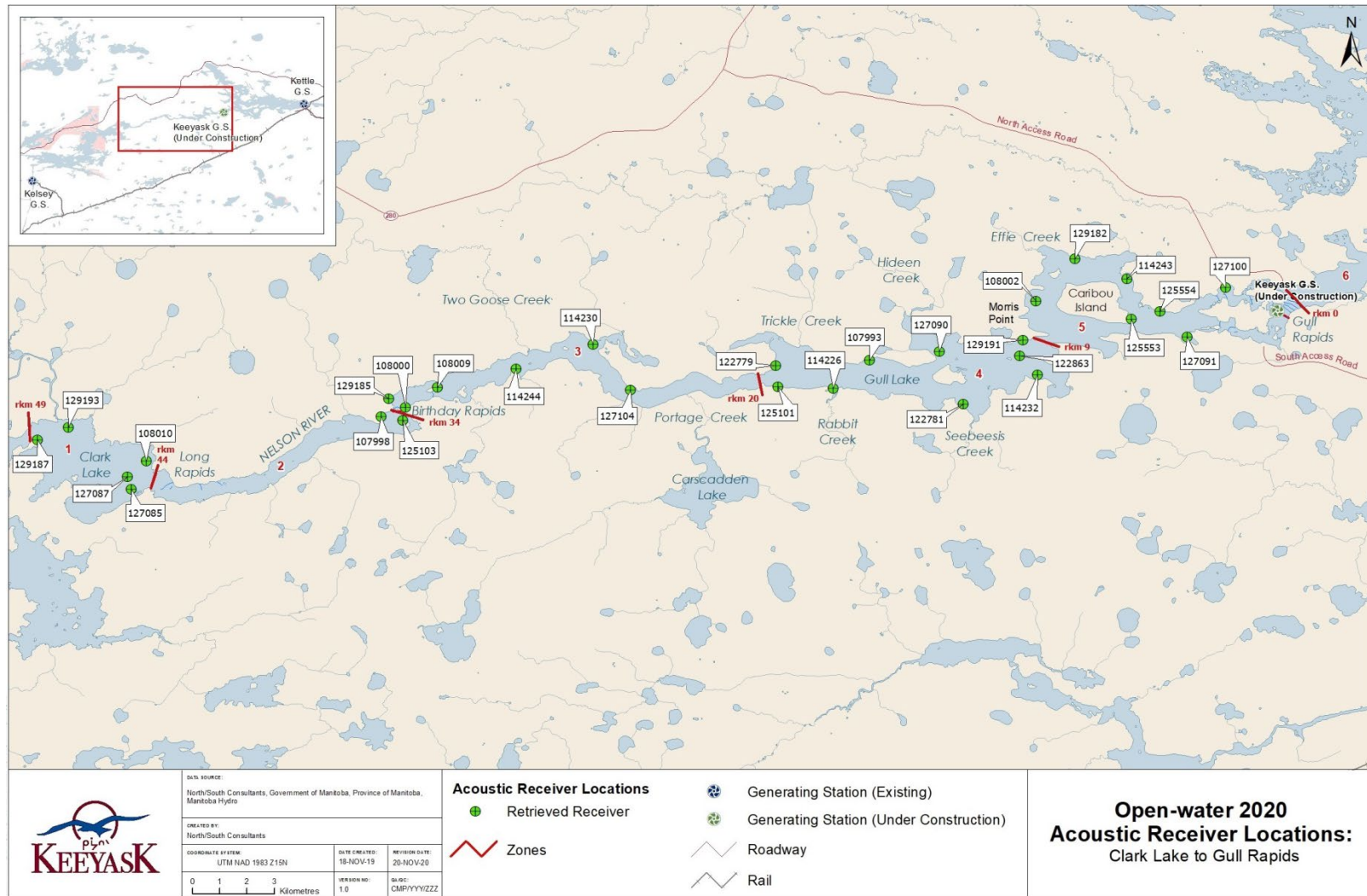
Map 2: Map of in-stream structures at the Keeyask Generating Station site, September 2020.



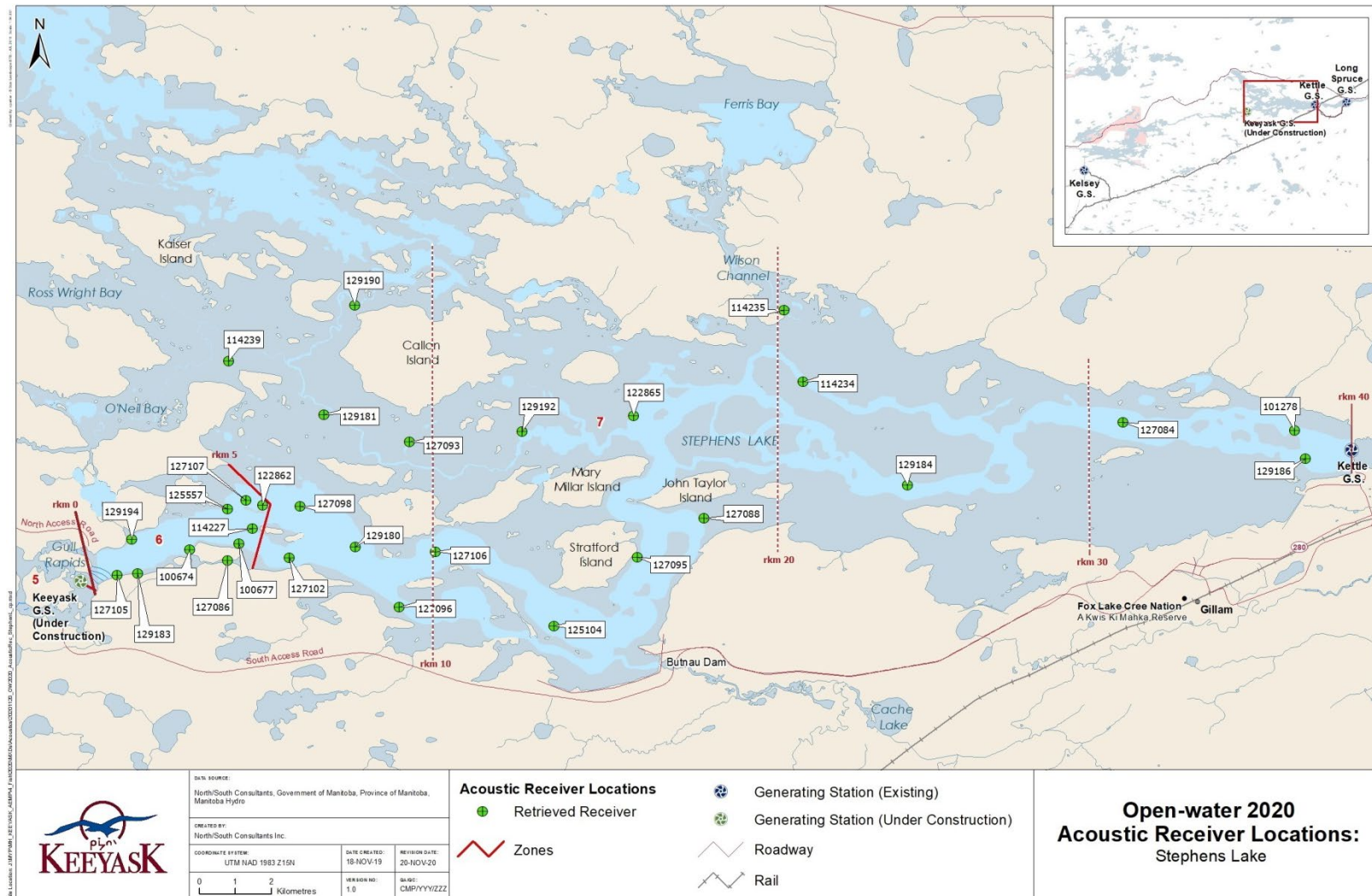
Map 3: Locations of stationary receivers set in the Nelson River from Clark Lake to the Keeyask GS between October 2019 and July 2020. River kilometer (rkm) distances are indicated with a red dotted line.



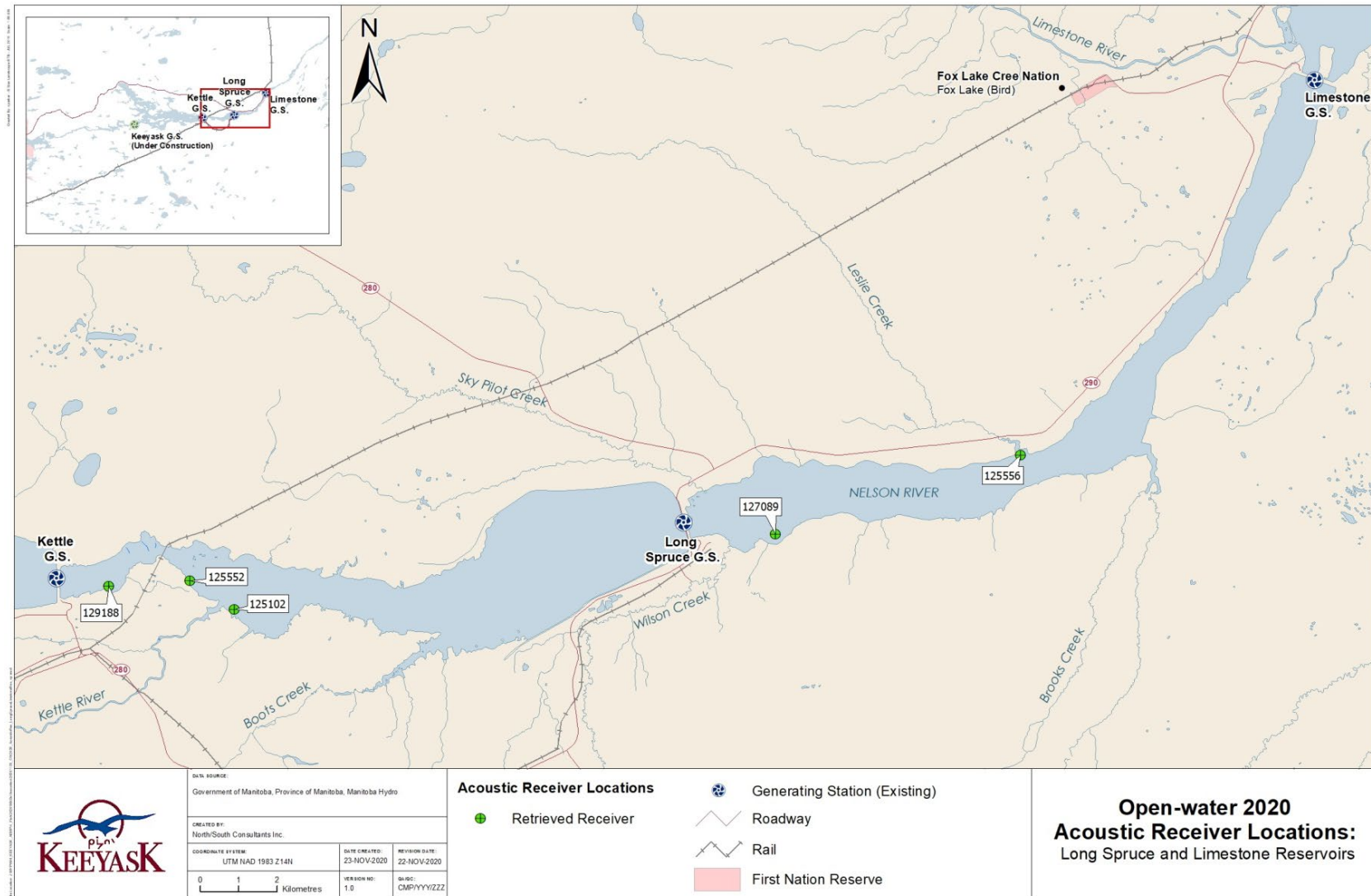
Map 4: Locations of stationary receivers set in Stephens Lake from the Keeyask GS to Kettle GS between October 2019 and July 2020. The former (pre-impoundment) river channel is shown in light blue. River kilometer (rkm) distances are indicated with a dotted red line.



Map 5: Locations of stationary receivers set in the Nelson River from Clark Lake to the Keeyask GS between July and September 2020. The river is divided into five "zones" based on placement of receiver "gates." River kilometer (rkm) distances at zone divisions are indicated in red.



Map 6: Locations of stationary receivers set in Stephens Lake between July and September 2020. The river is divided into two "zones" based on placement of receiver "gates." The pre-impoundment river channel is shown in light blue. River kilometer (rkm) distances are indicated with a dotted red line.



Map 7: Locations of stationary receivers set between the Kettle and Limestone Generating Stations, August to September 2020.

APPENDICES

APPENDIX 1:

DETECTION SUMMARIES FOR WALLEYE TAGGED AND MONITORED IN THE KEEYASK STUDY AREA BETWEEN 2016 AND 2020

| | | |
|-------------|---|----|
| Table A1-1: | Detection summary for Walleye monitored upstream of the Keeyask GS during the winter 2016/2017 (October 20, 2015 to April 30, 2017), 2017/2018 (October 17, 2017 to April 30, 2018), 2018/2019 (October 11, 2018 to April 30, 2019), and 2019/2020 (October 8, 2019 to April 30, 2020) periods..... | 80 |
| Table A1-2: | Detection summary for Walleye monitored in Stephens Lake during the winter 2016/2017 (October 20, 2015 to April 30, 2017), 2017/2018 (October 17, 2017 to April 30, 2018), 2018/2019 (October 11, 2018 to April 30, 2019), and 2019/2020 (October 8, 2019 to April 30, 2020) periods..... | 85 |
| Table A1-3: | Detection summary for Walleye and monitored upstream of the Keeyask GS during the open-water 2016 (May 1 to October 19), 2017 (May 1 to October 16), 2018 (May 1 to October 10), 2019 (May 1 to October 7), and 2020 (May 1 to September 23) periods..... | 89 |
| Table A1-4: | Detection summary for Walleye monitored in Stephens Lake during the open-water 2016 (May 1 to October 19), 2017 (May 1 to October 16), 2018 (May 1 to October 10), 2019 (May 1 to October 7), and 2020 (May 1 to September 23) periods..... | 92 |

Table A1-1: Detection summary for Walleye monitored upstream of the Keeyask GS during the winter 2016/2017 (October 20, 2015 to April 30, 2017), 2017/2018 (October 17, 2017 to April 30, 2018), 2018/2019 (October 11, 2018 to April 30, 2019), and 2019/2020 (October 8, 2019 to April 30, 2020) periods. Tag ID highlighted yellow = lost tag. Tag ID highlighted purple = moved downstream through Gull Rapids. Tag ID highlighted green = moved downstream through Kettle GS. Tag ID highlighted orange = suspected to have moved downstream through Kettle GS. Tag ID highlighted red = moved downstream through Long Spruce GS.

| Tag ID | Date tagged | 2016/2017 | | | | | 2017/2018 | | | | | 2018/2019 | | | | | 2019/2020 | | | | |
|--------|-------------|-----------|--------|--------------------|--------------------|-------------|-----------|--------|--------------------|--------------------|-------------|-----------|--------|--------------------|--------------------|-------------|-----------|--------|--------------------|--------------------|-------------|
| | | n | # Days | Farthest U/S (rkm) | Farthest D/S (rkm) | Range (rkm) | n | # Days | Farthest U/S (rkm) | Farthest D/S (rkm) | Range (rkm) | n | # Days | Farthest U/S (rkm) | Farthest D/S (rkm) | Range (rkm) | n | # Days | Farthest U/S (rkm) | Farthest D/S (rkm) | Range (rkm) |
| 53758 | 24-Sep-16 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53759 | 24-Sep-16 | 26 | 1 | 16.8 | 16.8 | 0.0 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53760 | 24-Sep-16 | 238 | 6 | 5.2 | 7.9 | 2.7 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53763 | 5-Jun-16 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53764 | 5-Jun-16 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53765 | 24-Sep-16 | 1663 | 46 | -10.1 | -10.1 | 0.0 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53766 | 24-Sep-16 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53767 | 24-Sep-16 | 19 | 1 | -10.1 | -10.1 | 0.0 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53768 | 5-Jun-16 | 0 | - | - | - | - | 126 | 10 | -12.4 | -12.4 | 0.0 | 0 | - | - | - | - | 0 | - | - | - | - |
| 53769 | 5-Jun-16 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53770 | 5-Jun-16 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53771 | 5-Jun-16 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53772 | 5-Jun-16 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53773 | 5-Jun-16 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53774 | 5-Jun-16 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53775 | 5-Jun-16 | 12123 | 75 | 5.2 | 7.9 | 2.7 | 9231 | 76 | 5.2 | 7.9 | 2.7 | 55886 | 167 | 5.2 | 9.4 | | 0 | - | - | - | - |
| 53776 | 30-May-16 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53777 | 29-May-16 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53778 | 3-Jun-16 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53779 | 3-Jun-16 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53780 | 3-Jun-16 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |

Table A1-1: Detection summary for Walleye monitored upstream of the Keeyask GS during the winter 2016/2017 (October 20, 2015 to April 30, 2017), 2017/2018 (October 17, 2017 to April 30, 2018), 2018/2019 (October 11, 2018 to April 30, 2019), and 2019/2020 (October 8, 2019 to April 30, 2020) periods. Tag ID highlighted yellow = lost tag. Tag ID highlighted purple = moved downstream through Gull Rapids. Tag ID highlighted green = moved downstream through Kettle GS. Tag ID highlighted orange = suspected to have moved downstream through Kettle GS. Tag ID highlighted red = moved downstream through Long Spruce

| Tag ID | Date tagged | 2016/2017 | | | | | 2017/2018 | | | | | 2018/2019 | | | | | 2019/2020 | | | | |
|--------|-------------|-----------|--------|--------------------|--------------------|-------------|-----------|--------|--------------------|--------------------|-------------|-----------|--------|--------------------|--------------------|-------------|-----------|--------|--------------------|--------------------|-------------|
| | | n | # Days | Farthest U/S (rkm) | Farthest D/S (rkm) | Range (rkm) | n | # Days | Farthest U/S (rkm) | Farthest D/S (rkm) | Range (rkm) | n | # Days | Farthest U/S (rkm) | Farthest D/S (rkm) | Range (rkm) | n | # Days | Farthest U/S (rkm) | Farthest D/S (rkm) | Range (rkm) |
| 53781 | 2-Jun-16 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53782 | 31-May-16 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53783 | 31-May-16 | 0 | - | - | - | - | 7 | 2 | -48.2 | -48.2 | 0.0 | 0 | - | - | - | - | 0 | - | - | - | - |
| 53784 | 30-May-16 | 0 | - | - | - | - | 41 | 6 | -12.4 | -12.4 | 0.0 | 504 | 54 | -12.4 | -12.4 | 0.0 | 0 | - | - | - | - |
| 53785 | 30-May-16 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53786 | 30-May-16 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53787 | 30-May-16 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53788 | 30-May-16 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53789 | 30-May-16 | 0 | - | - | - | - | 2 | 1 | -48.2 | -48.2 | 0.0 | 0 | - | - | - | - | 0 | - | - | - | - |
| 53790 | 29-May-16 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53791 | 29-May-16 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53792 | 28-May-16 | 0 | - | - | - | - | 5142 | 65 | -12.4 | -12.4 | 0.0 | 0 | - | - | - | - | 0 | - | - | - | - |
| 53793 | 7-Jun-16 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53794 | 7-Jun-16 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53795 | 7-Jun-16 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53796 | 7-Jun-16 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53797 | 7-Jun-16 | 15 | 1 | -48.2 | -48.2 | 0.0 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53798 | 7-Jun-16 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53799 | 7-Jun-16 | 14789 | 65 | 5.2 | 9.4 | 4.2 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53800 | 7-Jun-16 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53801 | 7-Jun-16 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |

Table A1-1: Detection summary for Walleye monitored upstream of the Keeyask GS during the winter 2016/2017 (October 20, 2015 to April 30, 2017), 2017/2018 (October 17, 2017 to April 30, 2018), 2018/2019 (October 11, 2018 to April 30, 2019), and 2019/2020 (October 8, 2019 to April 30, 2020) periods. Tag ID highlighted yellow = lost tag. Tag ID highlighted purple = moved downstream through Gull Rapids. Tag ID highlighted green = moved downstream through Kettle GS. Tag ID highlighted orange = suspected to have moved downstream through Kettle GS. Tag ID highlighted red = moved downstream through Long Spruce

| Tag ID | Date tagged | 2016/2017 | | | | | 2017/2018 | | | | | 2018/2019 | | | | | 2019/2020 | | | | |
|--------|-------------|-----------|--------|--------------------|--------------------|-------------|-----------|--------|--------------------|--------------------|-------------|-----------|--------|--------------------|--------------------|-------------|-----------|--------|--------------------|--------------------|-------------|
| | | n | # Days | Farthest U/S (rkm) | Farthest D/S (rkm) | Range (rkm) | n | # Days | Farthest U/S (rkm) | Farthest D/S (rkm) | Range (rkm) | n | # Days | Farthest U/S (rkm) | Farthest D/S (rkm) | Range (rkm) | n | # Days | Farthest U/S (rkm) | Farthest D/S (rkm) | Range (rkm) |
| 53802 | 7-Jun-16 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53803 | 24-Sep-16 | 2 | 1 | -10.1 | -10.1 | 0.0 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53804 | 24-Sep-16 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53805 | 6-Jun-16 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53806 | 6-Jun-16 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53807 | 6-Jun-16 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 25739 | 5-Jun-18 | - | - | - | - | - | - | - | - | - | - | 919 | 9 | 5.2 | 13.9 | - | 0 | - | - | - | - |
| 25740 | 5-Jun-18 | - | - | - | - | - | - | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 25742 | 5-Jun-18 | - | - | - | - | - | - | - | - | - | - | 771 | 10 | -12.4 | -12.4 | 0 | 0 | - | - | - | - |
| 25743 | 5-Jun-18 | - | - | - | - | - | - | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 25744 | 5-Jun-18 | - | - | - | - | - | - | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 25745 | 5-Jun-18 | - | - | - | - | - | - | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 25746 | 5-Jun-18 | - | - | - | - | - | - | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 25747 | 28-May-18 | - | - | - | - | - | - | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 25748 | 28-May-18 | - | - | - | - | - | - | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 25749 | 28-May-18 | - | - | - | - | - | - | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 25750 | 1-Jun-18 | - | - | - | - | - | - | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 25751 | 5-Jun-18 | - | - | - | - | - | - | - | - | - | - | 37 | 8 | -12.4 | -12.4 | 0 | 0 | - | - | - | - |
| 25752 | 27-May-18 | - | - | - | - | - | - | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 25753 | 27-May-18 | - | - | - | - | - | - | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 25754 | 27-May-18 | - | - | - | - | - | - | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |

Table A1-1: Detection summary for Walleye monitored upstream of the Keeyask GS during the winter 2016/2017 (October 20, 2015 to April 30, 2017), 2017/2018 (October 17, 2017 to April 30, 2018), 2018/2019 (October 11, 2018 to April 30, 2019), and 2019/2020 (October 8, 2019 to April 30, 2020) periods. Tag ID highlighted yellow = lost tag. Tag ID highlighted purple = moved downstream through Gull Rapids. Tag ID highlighted green = moved downstream through Kettle GS. Tag ID highlighted orange = suspected to have moved downstream through Kettle GS. Tag ID highlighted red = moved downstream through Long Spruce

| Tag ID | Date tagged | 2016/2017 | | | | | 2017/2018 | | | | | 2018/2019 | | | | | 2019/2020 | | | | |
|--------|-------------|-----------|--------|--------------------|--------------------|-------------|-----------|--------|--------------------|--------------------|-------------|-----------|--------|--------------------|--------------------|-------------|-----------|--------|--------------------|--------------------|-------------|
| | | n | # Days | Farthest U/S (rkm) | Farthest D/S (rkm) | Range (rkm) | n | # Days | Farthest U/S (rkm) | Farthest D/S (rkm) | Range (rkm) | n | # Days | Farthest U/S (rkm) | Farthest D/S (rkm) | Range (rkm) | n | # Days | Farthest U/S (rkm) | Farthest D/S (rkm) | Range (rkm) |
| 25755 | 1-Jun-18 | - | - | - | - | - | - | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 25756 | 1-Jun-18 | - | - | - | - | - | - | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 20147 | 5-Jun-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | - | - | - | - |
| 20148 | 5-Jun-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 2209 | 46 | -12.4 | -10.3 | 2.1 |
| 20149 | 6-Jun-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | - | - | - | - |
| 20150 | 5-Jun-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | - | - | - | - |
| 20151 | 5-Jun-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | - | - | - | - |
| 20153 | 6-Jun-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | - | - | - | - |
| 20154 | 6-Jun-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | - | - | - | - |
| 20155 | 6-Jun-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | - | - | - | - |
| 20156 | 6-Jun-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | - | - | - | - |
| 20157 | 6-Jun-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | - | - | - | - |
| 20158 | 6-Jun-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | - | - | - | - |
| 20159 | 7-Jun-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 3466 | 83 | -10.3 | -10.3 | 0.0 |
| 20160 | 7-Jun-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | - | - | - | - |
| 20161 | 7-Jun-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | - | - | - | - |
| 20162 | 6-Jun-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | - | - | - | - |
| 20163 | 6-Jun-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | - | - | - | - |
| 20164 | 6-Jun-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | - | - | - | - |
| 20168 | 7-Jun-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | - | - | - | - |
| 20169 | 7-Jun-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | - | - | - | - |

Table A1-1: Detection summary for Walleye monitored upstream of the Keeyask GS during the winter 2016/2017 (October 20, 2015 to April 30, 2017), 2017/2018 (October 17, 2017 to April 30, 2018), 2018/2019 (October 11, 2018 to April 30, 2019), and 2019/2020 (October 8, 2019 to April 30, 2020) periods. Tag ID highlighted yellow = lost tag. Tag ID highlighted purple = moved downstream through Gull Rapids. Tag ID highlighted green = moved downstream through Kettle GS. Tag ID highlighted orange = suspected to have moved downstream through Kettle GS. Tag ID highlighted red = moved downstream through Long Spruce

| Tag ID | Date tagged | 2016/2017 | | | | | 2017/2018 | | | | | 2018/2019 | | | | | 2019/2020 | | | | |
|--------|-------------|-----------|--------|--------------------|--------------------|-------------|-----------|--------|--------------------|--------------------|-------------|-----------|--------|--------------------|--------------------|-------------|-----------|--------|--------------------|--------------------|-------------|
| | | n | # Days | Farthest U/S (rkm) | Farthest D/S (rkm) | Range (rkm) | n | # Days | Farthest U/S (rkm) | Farthest D/S (rkm) | Range (rkm) | n | # Days | Farthest U/S (rkm) | Farthest D/S (rkm) | Range (rkm) | n | # Days | Farthest U/S (rkm) | Farthest D/S (rkm) | Range (rkm) |
| 20170 | 6-Jun-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | - | - | - | - |
| 20175 | 29-May-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | - | - | - | - |
| 20176 | 29-May-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | - | - | - | - |
| 20181 | 29-May-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | - | - | - | - |
| 20182 | 25-May-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | - | - | - | - |
| 20186 | 29-May-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | - | - | - | - |
| 20187 | 23-May-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | - | - | - | - |
| 20188 | 23-May-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | - | - | - | - |

Table A1-2: Detection summary for Walleye monitored in Stephens Lake during the winter 2016/2017 (October 20, 2015 to April 30, 2017), 2017/2018 (October 17, 2017 to April 30, 2018), 2018/2019 (October 11, 2018 to April 30, 2019), and 2019/2020 (October 8, 2019 to April 30, 2020) periods. Tag ID highlighted yellow = lost tag. Tag ID highlighted green = moved downstream through Kettle GS. Tag ID highlighted orange = suspected to have moved downstream through Kettle GS. Tag ID highlighted red = moved downstream through Long Spruce GS.

| Tag ID | Date tagged | 2016/2017 | | | | | 2017/2018 | | | | | 2018/2019 | | | | | 2019/2020 | | | | |
|--------|-------------|-----------|--------|--------------------|--------------------|-------------|-----------|--------|--------------------|--------------------|-------------|-----------|--------|--------------------|--------------------|-------------|-----------|--------|--------------------|--------------------|-------------|
| | | n | # Days | Furthest U/S (rkm) | Furthest D/S (rkm) | Range (rkm) | n | # Days | Furthest U/S (rkm) | Furthest D/S (rkm) | Range (rkm) | n | # Days | Furthest U/S (rkm) | Furthest D/S (rkm) | Range (rkm) | n | # Days | Furthest U/S (rkm) | Furthest D/S (rkm) | Range (rkm) |
| 53723 | 28-May-16 | 5 | 1 | 5.8 | 5.8 | 0 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53724 | 28-May-16 | 87 | 7 | 5.8 | 5.8 | 0 | 0 | - | - | - | - | 17 | 6 | 5.2 | 5.8 | 0.6 | 0 | - | - | - | - |
| 53725 | 27-May-16 | 18620 | 110 | 7.9 | 13.9 | 6 | 7577 | 44 | 7.9 | 9.4 | 1.5 | 0 | - | - | - | - | 0 | - | - | - | - |
| 53726 | 27-May-16 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53727 | 28-May-16 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53728 | 28-May-16 | 15806 | 111 | 5.2 | 18.6 | 13.4 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53729 | 28-May-16 | 11525 | 58 | 16.8 | 18.6 | 1.8 | 15155 | 59 | 7.9 | 18.6 | 10.7 | 13677 | 100 | 13.9 | 18.6 | 4.7 | 0 | - | - | - | - |
| 53730 | 28-May-16 | 569 | 9 | 5.2 | 13 | 7.8 | 98 | 2 | 7.9 | 9.4 | 1.5 | 0 | - | - | - | - | 0 | - | - | - | - |
| 53731 | 28-May-16 | 128 | 12 | 9.4 | 13.9 | 4.5 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53732 | 28-May-16 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53733 | 30-May-16 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53734 | 30-May-16 | 23970 | 90 | 9.4 | 18.6 | 9.2 | 30201 | 127 | 6.5 | 18.6 | 12.1 | 0 | - | - | - | - | 0 | - | - | - | - |
| 53735 | 30-May-16 | 108116 | 192 | 18.6 | 18.6 | 0 | 106681 | 196 | 18.6 | 18.6 | 0 | 0 | - | - | - | - | 0 | - | - | - | - |
| 53736 | 30-May-16 | 43994 | 159 | 5.2 | 7.9 | 2.7 | 20686 | 96 | 5.2 | 9.4 | 4.2 | 4127 | 105 | 5.2 | 18.6 | 13.4 | 22294 | 157 | 5.2 | 24.7 | 19.5 |
| 53737 | 29-May-16 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53738 | 31-May-16 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53739 | 31-May-16 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53740 | 31-May-16 | 10630 | 101 | 7.9 | 9.4 | 1.5 | 32179 | 124 | 7.9 | 10.3 | 2.4 | 14495 | 90 | 7.9 | 9.4 | 1.5 | 0 | - | - | - | - |
| 53741 | 30-May-16 | 32009 | 171 | 16.8 | 18.6 | 1.8 | 64072 | 176 | 16.8 | 18.6 | 1.8 | 29227 | 162 | 16.8 | 18.6 | 1.8 | 57084 | 181 | 16.8 | 18.6 | 1.8 |
| 53742 | 30-May-16 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53743 | 31-May-16 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53744 | 31-May-16 | 37297 | 118 | 18.6 | 24.7 | 6.1 | 45114 | 119 | 18.6 | 36.1 | 17.5 | 28697 | 112 | 16.8 | 36.1 | 19.3 | 0 | - | - | - | - |

Table A1-2: Detection summary for Walleye monitored in Stephens Lake during the winter 2016/2017 (October 20, 2015 to April 30, 2017), 2017/2018 (October 17, 2017 to April 30, 2018), 2018/2019 (October 11, 2018 to April 30, 2019), and 2019/2020 (October 8, 2019 to April 30, 2020) periods. Tag ID highlighted yellow = lost tag. Tag ID highlighted green = moved downstream through Kettle GS. Tag ID highlighted orange = suspected to have moved downstream through Long Spruce GS.

| Tag ID | Date tagged | 2016/2017 | | | | | 2017/2018 | | | | | 2018/2019 | | | | | 2019/2020 | | | | |
|--------|-------------|-----------|--------|--------------------|--------------------|-------------|-----------|--------|--------------------|--------------------|-------------|-----------|--------|--------------------|--------------------|-------------|-----------|--------|--------------------|--------------------|-------------|
| | | n | # Days | Furthest U/S (rkm) | Furthest D/S (rkm) | Range (rkm) | n | # Days | Furthest U/S (rkm) | Furthest D/S (rkm) | Range (rkm) | n | # Days | Furthest U/S (rkm) | Furthest D/S (rkm) | Range (rkm) | n | # Days | Furthest U/S (rkm) | Furthest D/S (rkm) | Range (rkm) |
| 53745 | 31-May-16 | 13041 | 108 | 5.2 | 18.6 | 13.4 | 7093 | 88 | 5.2 | 18.6 | 13.4 | 0 | - | - | - | - | 0 | - | - | - | - |
| 53746 | 31-May-16 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53747 | 31-May-16 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53748 | 31-May-16 | 23 | 5 | 13 | 13 | 0 | 15 | 2 | 8.4 | 8.4 | 0 | 0 | - | - | - | - | 0 | - | - | - | - |
| 53749 | 31-May-16 | 198 | 3 | 16.8 | 24.7 | 7.9 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53750 | 31-May-16 | 9445 | 128 | 7.9 | 9.4 | 1.5 | 3480 | 55 | 7.9 | 9.4 | 1.5 | 0 | - | - | - | - | 0 | - | - | - | - |
| 53751 | 31-May-16 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53752 | 31-May-16 | 5868 | 28 | 16.8 | 24.7 | 7.9 | 1135 | 18 | 16.8 | 18.6 | 1.8 | 0 | - | - | - | - | 0 | - | - | - | - |
| 53753 | 31-May-16 | 495 | 19 | 13.9 | 18.6 | 4.7 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53754 | 31-May-16 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53755 | 31-May-16 | 2086 | 8 | 5.2 | 9.4 | 4.2 | 253 | 15 | 6.5 | 8.4 | 1.9 | 0 | - | - | - | - | 0 | - | - | - | - |
| 53756 | 1-Jun-16 | 11795 | 77 | 9.4 | 18.6 | 9.2 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53757 | 1-Jun-16 | 13752 | 120 | 5.2 | 18.6 | 13.4 | 16216 | 156 | 5.2 | 18.6 | 13.4 | 8919 | 123 | 5.2 | 18.6 | 13.4 | 23591 | 136 | 5.2 | 18.6 | 13.4 |
| 53808 | 1-Jun-16 | 203 | 2 | 9.4 | 9.4 | 0 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53809 | 1-Jun-16 | 15097 | 148 | 13.9 | 18.6 | 4.7 | 30603 | 116 | 13.9 | 18.6 | 4.7 | 0 | - | - | - | - | 0 | - | - | - | - |
| 53810 | 1-Jun-16 | 6638 | 54 | 9.4 | 18.6 | 9.2 | 9560 | 71 | 9.4 | 18.6 | 9.2 | 8189 | 48 | 9.4 | 18.6 | 9.2 | 0 | - | - | - | - |
| 53811 | 1-Jun-16 | 20720 | 126 | 5.2 | 7.9 | 2.7 | 6122 | 78 | 5.2 | 7.9 | 2.7 | 0 | - | - | - | - | 0 | - | - | - | - |
| 53812 | 1-Jun-16 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 25732 | 9-Jun-18 | - | - | - | - | - | - | - | - | - | - | 0 | - | - | - | - | - | - | - | - | - |
| 25734 | 7-Jun-18 | - | - | - | - | - | - | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 25735 | 6-Jun-18 | - | - | - | - | - | - | - | - | - | - | 0 | - | - | - | - | 600 | 13 | 13 | 36.1 | 23.1 |
| 25736 | 7-Jun-18 | - | - | - | - | - | - | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |

Table A1-2: Detection summary for Walleye monitored in Stephens Lake during the winter 2016/2017 (October 20, 2015 to April 30, 2017), 2017/2018 (October 17, 2017 to April 30, 2018), 2018/2019 (October 11, 2018 to April 30, 2019), and 2019/2020 (October 8, 2019 to April 30, 2020) periods. Tag ID highlighted yellow = lost tag. Tag ID highlighted green = moved downstream through Kettle GS. Tag ID highlighted orange = suspected to have moved downstream through Long Spruce GS.

| Tag ID | Date tagged | 2016/2017 | | | | | 2017/2018 | | | | | 2018/2019 | | | | | 2019/2020 | | | | |
|--------|-------------|-----------|--------|--------------------|--------------------|-------------|-----------|--------|--------------------|--------------------|-------------|-----------|--------|--------------------|--------------------|-------------|-----------|--------|--------------------|--------------------|-------------|
| | | n | # Days | Furthest U/S (rkm) | Furthest D/S (rkm) | Range (rkm) | n | # Days | Furthest U/S (rkm) | Furthest D/S (rkm) | Range (rkm) | n | # Days | Furthest U/S (rkm) | Furthest D/S (rkm) | Range (rkm) | n | # Days | Furthest U/S (rkm) | Furthest D/S (rkm) | Range (rkm) |
| 25737 | 6-Jun-18 | - | - | - | - | - | - | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 25738 | 6-Jun-18 | - | - | - | - | - | - | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 25741 | 6-Jun-18 | - | - | - | - | - | - | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 20129 | 3-Jun-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | - | - | - | - |
| 20130 | 1-Jun-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1057 | 5 | 6.5 | 16.8 | 10.3 |
| 20131 | 31-May-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 66 | 5 | 16.8 | 16.8 | 0.0 |
| 20132 | 1-Jun-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | - | - | - | - |
| 20133 | 31-May-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | - | - | - | - |
| 20134 | 31-May-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | - | - | - | - |
| 20135 | 1-Jun-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | - | - | - | - |
| 20136 | 1-Jun-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | - | - | - | - |
| 20137 | 31-May-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 8548 | 48 | 13.9 | 21.6 | 7.7 |
| 20138 | 31-May-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | - | - | - | - |
| 20139 | 31-May-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 20139 | 4 | 13 | 13 | 0.0 |
| 20140 | 31-May-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 20140 | 14 | 5.2 | 10.3 | 5.1 |
| 20141 | 31-May-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | - | - | - | - |
| 20142 | 31-May-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 7989 | 75 | 13.9 | 18.6 | 4.7 |
| 20143 | 1-Jun-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | - | - | - | - |
| 20144 | 1-Jun-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | - | - | - | - |
| 20145 | 1-Jun-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | - | - | - | - |
| 20152 | 31-May-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | - | - | - | - |
| 20165 | 16-Sep-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 39683 | 174 | 5.2 | 10.3 | 5.1 |

Table A1-2: Detection summary for Walleye monitored in Stephens Lake during the winter 2016/2017 (October 20, 2015 to April 30, 2017), 2017/2018 (October 17, 2017 to April 30, 2018), 2018/2019 (October 11, 2018 to April 30, 2019), and 2019/2020 (October 8, 2019 to April 30, 2020) periods. Tag ID highlighted yellow = lost tag. Tag ID highlighted green = moved downstream through Kettle GS. Tag ID highlighted orange = suspected to have moved downstream through Long Spruce GS.

| Tag ID | Date tagged | 2016/2017 | | | | | 2017/2018 | | | | | 2018/2019 | | | | | 2019/2020 | | | | |
|--------|-------------|-----------|--------|--------------------|--------------------|-------------|-----------|--------|--------------------|--------------------|-------------|-----------|--------|--------------------|--------------------|-------------|-----------|--------|--------------------|--------------------|-------------|
| | | n | # Days | Furthest U/S (rkm) | Furthest D/S (rkm) | Range (rkm) | n | # Days | Furthest U/S (rkm) | Furthest D/S (rkm) | Range (rkm) | n | # Days | Furthest U/S (rkm) | Furthest D/S (rkm) | Range (rkm) | n | # Days | Furthest U/S (rkm) | Furthest D/S (rkm) | Range (rkm) |
| 20167 | 16-Sep-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | - | - | - | - |
| 20171 | 27-May-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | - | - | - | - |
| 20172 | 30-May-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | - | - | - | - |
| 20173 | 30-May-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | - | - | - | - |
| 20174 | 30-May-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | - | - | - | - |
| 20177 | 30-May-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 10513 | 89 | 5.2 | 13.9 | 8.7 |
| 20178 | 30-May-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | - | - | - | - |
| 20179 | 30-May-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 45009 | 183 | 5.2 | 10.3 | 5.1 |
| 20180 | 30-May-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | - | - | - | - |
| 20183 | 30-May-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 177 | 6 | 8.4 | 8.4 | 0.0 |
| 20184 | 30-May-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | - | - | - | - |
| 20185 | 30-May-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | - | - | - | - |

Table A1-3: Detection summary for Walleye and monitored upstream of the Keeyask GS during the open-water 2016 (May 1 to October 19), 2017 (May 1 to October 16), 2018 (May 1 to October 10), 2019 (May 1 to October 7), and 2020 (May 1 to September 23) periods. Tag ID highlighted yellow = lost tag. Tag ID highlighted purple = moved downstream through Gull Rapids. Tag ID highlighted green = moved downstream through Kettle GS. Tag ID highlighted orange = suspected to have moved downstream through Kettle GS. Tag ID highlighted red = moved downstream through Long Spruce GS.

| Tag ID | Date tagged | 2016 | | | | | 2017 | | | | | 2018 | | | | | 2019 | | | | | 2020 | | | | |
|--------|-------------|-------|--------|-----------|-----------|-------------|-------|--------|-----------|-----------|-------------|-------|--------|-----------|-----------|-------------|-------|--------|-----------|-----------|-------------|------|--------|-----------|-----------|-------------|
| | | n | # Days | U/S (rkm) | D/S (rkm) | Range (rkm) | n | # Days | U/S (rkm) | D/S (rkm) | Range (rkm) | n | # Days | U/S (rkm) | D/S (rkm) | Range (rkm) | n | # Days | U/S (rkm) | D/S (rkm) | Range (rkm) | n | # Days | U/S (rkm) | D/S (rkm) | Range (rkm) |
| 53758 | 24-Sep-16 | 409 | 10 | -17.4 | -9.3 | 8.1 | 6376 | 46 | -33.8 | 5.2 | 39.0 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53759 | 24-Sep-16 | 2725 | 18 | -17.4 | 9.4 | 26.8 | 0 | - | - | - | - | 2 | 1 | 16.8 | 16.8 | 0.0 | 0 | - | - | - | - | 0 | - | - | - | - |
| 53760 | 24-Sep-16 | 360 | 10 | -17.4 | 5.2 | 22.6 | 35 | 8 | 4.2 | 5.2 | 1.0 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53763 | 5-Jun-16 | 369 | 11 | -19.5 | -9.5 | 10 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53764 | 5-Jun-16 | 717 | 6 | -14.8 | 10.3 | 25.1 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53765 | 24-Sep-16 | 5790 | 20 | -19.5 | -9.5 | 10 | 1122 | 36 | -10.1 | -9.9 | 0.2 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53766 | 24-Sep-16 | 1164 | 11 | -12.9 | -10 | 3.4 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53767 | 24-Sep-16 | 1490 | 16 | -12.9 | -11.8 | 1.1 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53768 | 5-Jun-16 | 5426 | 127 | -19.5 | -14.8 | 4.7 | 9240 | 117 | -19.5 | -14.8 | 4.7 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53769 | 5-Jun-16 | 16254 | 94 | -19.5 | 44.9 | 64.4 | 410 | 4 | 47.5 | 47.5 | 0.0 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53770 | 5-Jun-16 | 299 | 3 | -17.4 | -17.4 | 0 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53771 | 5-Jun-16 | 1919 | 26 | -19.4 | 58.6 | 78 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53772 | 5-Jun-16 | 2950 | 19 | -24.3 | -14.8 | 9.5 | 656 | 8 | -29.4 | -7.4 | 22.0 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53773 | 5-Jun-16 | 7239 | 74 | -33.8 | -9.5 | 24.3 | 2895 | 36 | -19.5 | 43.5 | 63.0 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53774 | 5-Jun-16 | 1403 | 7 | -17.4 | -9 | 8.4 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 17 | 3 | -7.9 | -7.9 | 0.0 |
| 53775 | 5-Jun-16 | 9686 | 68 | -10.1 | 18.6 | 28.7 | 7764 | 67 | 1.2 | 24.7 | 23.5 | 5945 | 46 | 1.2 | 36.1 | 34.9 | 30676 | 83 | 9.4 | 9.7 | 0.0 | 0 | - | - | - | - |
| 53776 | 30-May-16 | 10606 | 110 | -19.5 | -12.9 | 6.6 | 4044 | 33 | -12.8 | -12.8 | 0.0 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53777 | 29-May-16 | 8877 | 99 | -48.2 | -11.8 | 36.4 | 5624 | 55 | -26.5 | 58.6 | 85.1 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53778 | 3-Jun-16 | 6979 | 15 | -19.5 | -9.5 | 10 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53779 | 3-Jun-16 | 389 | 7 | -12.9 | -12.9 | 0 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53780 | 3-Jun-16 | 3585 | 28 | -12.9 | -5.8 | 7.1 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53781 | 2-Jun-16 | 344 | 10 | -12.9 | -9.5 | 3.4 | 21 | 2 | -9.3 | -9.3 | 0.0 | 13 | 4 | -9.3 | -9.3 | 0.0 | 0 | - | - | - | - | 0 | - | - | - | - |
| 53782 | 31-May-16 | 11144 | 48 | -19.5 | 43.5 | 63 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53783 | 31-May-16 | 18635 | 92 | -48.2 | -14.8 | 33.4 | 7435 | 44 | -48.2 | -14.8 | 33.4 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53784 | 30-May-16 | 3309 | 85 | -19.5 | -11.8 | 7.7 | 6111 | 41 | -33.8 | -12.8 | 21.0 | 1669 | 38 | -19.5 | -12.8 | 6.7 | 0 | - | - | - | - | 0 | - | - | - | - |
| 53785 | 30-May-16 | 30891 | 132 | -19.5 | -12.9 | 6.6 | 4227 | 42 | -17.4 | -5.8 | 11.6 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53786 | 30-May-16 | 266 | 4 | -14.8 | 2.7 | 17.5 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53787 | 30-May-16 | 6972 | 92 | -19.5 | -5.8 | 13.7 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53788 | 30-May-16 | 2521 | 24 | -19.5 | 5.2 | 24.7 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53789 | 30-May-16 | 17373 | 84 | -44.3 | -32.3 | 12 | 7018 | 51 | -44.7 | -32.3 | 12.4 | 4078 | 47 | -48.2 | -32.3 | 15.9 | 0 | - | - | - | - | 0 | - | - | - | - |
| 53790 | 29-May-16 | 1177 | 4 | -17.4 | -17.4 | 0 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 1361 | 17 | -17.4 | -17.4 | 0.0 |
| 53791 | 29-May-16 | 1265 | 17 | -19.5 | 44.9 | 64.4 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53792 | 28-May-16 | 18568 | 130 | -19.5 | -11.8 | 7.7 | 19717 | 122 | -19.5 | -11.9 | 7.6 | 18260 | 114 | -24.7 | -12.9 | 11.8 | 0 | - | - | - | - | 0 | - | - | - | - |
| 53793 | 7-Jun-16 | 40350 | 133 | -19.5 | -12.9 | 6.6 | 56 | 3 | -12.8 | 2.7 | 15.5 | 290 | 12 | 2.7 | 2.7 | 0.0 | 2 | 1 | 2.7 | 2.7 | 0.0 | 0 | - | - | - | - |

Table A1-3: Detection summary for Walleye and monitored upstream of the Keeyask GS during the open-water 2016 (May 1 to October 19), 2017 (May 1 to October 16), 2018 (May 1 to October 10), 2019 (May 1 to October 7), and 2020 (May 1 to September 23) periods. Tag ID highlighted yellow = lost tag. Tag ID highlighted purple = moved downstream through Gull Rapids. Tag ID highlighted green = moved downstream through Kettle GS. Tag ID highlighted orange = suspected to have moved downstream through Kettle GS. Tag ID highlighted red = moved downstream through Long Spruce GS (Cont.).

| Tag ID | Date tagged | 2016 | | | | | 2017 | | | | | 2018 | | | | | 2019 | | | | | 2020 | | | | |
|--------|-------------|-------|--------|-----------|-----------|-------------|-------|--------|-----------|-----------|-------------|-------|--------|-----------|-----------|-------------|-------|--------|-----------|-----------|-------------|------|--------|-----------|-----------|-------------|
| | | n | # Days | U/S (rkm) | D/S (rkm) | Range (rkm) | n | # Days | U/S (rkm) | D/S (rkm) | Range (rkm) | n | # Days | U/S (rkm) | D/S (rkm) | Range (rkm) | n | # Days | U/S (rkm) | D/S (rkm) | Range (rkm) | n | # Days | U/S (rkm) | D/S (rkm) | Range (rkm) |
| 53794 | 7-Jun-16 | 14606 | 97 | -29.4 | -11.8 | 17.6 | 4327 | 63 | -33.8 | -10.1 | 23.7 | 466 | 7 | -48.2 | -17.4 | 30.8 | 0 | - | - | - | - | 0 | - | - | - | - |
| 53795 | 7-Jun-16 | 7864 | 105 | -19.5 | -9.5 | 10 | 24523 | 122 | -19.5 | -17.4 | 2.1 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53796 | 7-Jun-16 | 4385 | 62 | -26.5 | -17.4 | 9.1 | 1926 | 44 | -26.5 | -19.4 | 7.1 | 1529 | 31 | -26.5 | -17.4 | 9.1 | 2776 | 39 | -19.5 | -4.8 | 14.7 | 615 | 19 | -19.5 | -19.5 | 0.0 |
| 53797 | 7-Jun-16 | 17953 | 86 | -48.2 | -17.4 | 30.8 | 12338 | 93 | -48.2 | -17.4 | 30.8 | 34552 | 129 | -48.2 | -17.4 | 30.8 | 9637 | 55 | -33.8 | -15 | 18.8 | 0 | - | - | - | - |
| 53798 | 7-Jun-16 | 11017 | 85 | -19.5 | -12.9 | 6.6 | 3 | 1 | -10.1 | -10.1 | 0.0 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53799 | 7-Jun-16 | 7477 | 59 | -14.8 | 10.3 | 25.1 | 312 | 12 | 1.2 | 47.5 | 46.3 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53800 | 7-Jun-16 | 22181 | 94 | -19.5 | -5.8 | 13.7 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 1121 | 23 | -3.8 | -3.8 | 0.0 |
| 53801 | 7-Jun-16 | 1488 | 8 | -14.8 | 18.6 | 33.4 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53802 | 7-Jun-16 | 118 | 2 | -14.8 | -5.8 | 9 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53803 | 24-Sep-16 | 1530 | 21 | -14.8 | -11.8 | 3 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53804 | 24-Sep-16 | 1829 | 17 | -14.8 | -11.8 | 3 | 160 | 4 | -10.1 | -7.4 | 2.7 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53805 | 6-Jun-16 | 17640 | 129 | -14.8 | -14.8 | 0 | 8346 | 100 | -19.5 | -14.8 | 4.7 | 6114 | 74 | -19.5 | -9.9 | 9.6 | 0 | - | - | - | - | 0 | - | - | - | - |
| 53806 | 6-Jun-16 | 24853 | 125 | -34.3 | -14.8 | 19.5 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53807 | 6-Jun-16 | 7475 | 63 | -48.2 | -14.8 | 33.4 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 25739 | 5-Jun-18 | - | - | - | - | - | - | - | - | - | - | 996 | 30 | -9.3 | -7.4 | 1.9 | 0 | - | - | - | - | 0 | - | - | - | - |
| 25740 | 5-Jun-18 | - | - | - | - | - | - | - | - | - | - | 3587 | 29 | -9.3 | 36.1 | 45.4 | 0 | - | - | - | - | 0 | - | - | - | - |
| 25742 | 5-Jun-18 | - | - | - | - | - | - | - | - | - | - | 14026 | 101 | -15.0 | -9.9 | 5.1 | 586 | 8 | -12.9 | -12.9 | 0.0 | 0 | - | - | - | - |
| 25743 | 5-Jun-18 | - | - | - | - | - | - | - | - | - | - | 597 | 7 | -10.2 | -4.8 | 5.4 | 0 | - | - | - | - | 0 | - | - | - | - |
| 25744 | 5-Jun-18 | - | - | - | - | - | - | - | - | - | - | 5128 | 44 | -19.5 | -9.3 | 10.2 | 0 | - | - | - | - | 2 | 1 | -8 | -7.9 | 0.0 |
| 25745 | 5-Jun-18 | - | - | - | - | - | - | - | - | - | - | 225 | 2 | -12.8 | -12.8 | 0.0 | 0 | - | - | - | - | 0 | - | - | - | - |
| 25746 | 5-Jun-18 | - | - | - | - | - | - | - | - | - | - | 1946 | 28 | -19.5 | -12.8 | 6.7 | 0 | - | - | - | - | 423 | 21 | -13 | -12.9 | 0.0 |
| 25747 | 28-May-18 | - | - | - | - | - | - | - | - | - | - | 12012 | 100 | -24.7 | -7.4 | 17.3 | 4724 | 53 | -46.9 | -9 | 37.9 | 963 | 34 | -8.9 | -4.8 | 4.1 |
| 25748 | 28-May-18 | - | - | - | - | - | - | - | - | - | - | 625 | 6 | -19.5 | 24.7 | 44.2 | 0 | - | - | - | - | 0 | - | - | - | - |
| 25749 | 28-May-18 | - | - | - | - | - | - | - | - | - | - | 9675 | 75 | -48.2 | -9.3 | 38.9 | 2504 | 64 | -33.8 | -4.8 | 29.0 | 8435 | 39 | -8.9 | -8.9 | 0.0 |
| 25750 | 1-Jun-18 | - | - | - | - | - | - | - | - | - | - | 3401 | 49 | -26.5 | -9.0 | 17.5 | 6437 | 35 | -48.2 | -17.4 | 30.8 | 0 | - | - | - | - |
| 25751 | 5-Jun-18 | - | - | - | - | - | - | - | - | - | - | 3274 | 72 | -19.5 | -12.8 | 6.7 | 3532 | 83 | -12.9 | -12.5 | 0.4 | 6091 | 60 | -34.3 | -9.9 | 24.4 |
| 25752 | 27-May-18 | - | - | - | - | - | - | - | - | - | - | 2272 | 21 | -19.5 | 40.8 | 60.3 | 0 | - | - | - | - | 0 | - | - | - | - |
| 25753 | 27-May-18 | - | - | - | - | - | - | - | - | - | - | 11695 | 58 | -32.3 | 36.1 | 68.4 | 0 | - | - | - | - | 0 | - | - | - | - |
| 25754 | 27-May-18 | - | - | - | - | - | - | - | - | - | - | 5119 | 60 | -24.7 | -12.9 | 11.8 | 4147 | 58 | -19.5 | -15 | 4.5 | 10 | 1 | -29.4 | -29.4 | 0.0 |
| 25755 | 1-Jun-18 | - | - | - | - | - | - | - | - | - | - | 564 | 11 | -24.7 | 40.9 | 65.6 | 0 | - | - | - | - | 0 | - | - | - | - |
| 25756 | 1-Jun-18 | - | - | - | - | - | - | - | - | - | - | 5983 | 54 | -19.5 | -9.9 | 9.6 | 3332 | 22 | -46.9 | -15 | 31.9 | 0 | - | - | - | - |
| 20147 | 5-Jun-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 11721 | 46 | -19.5 | 40.9 | 60.4 | 0 | - | - | - | - |
| 20148 | 5-Jun-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 25306 | 116 | -19.5 | -9.3 | 10.2 | 998 | 8 | 5.2 | 40.5 | 35.3 |
| 20149 | 6-Jun-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 7 | 1 | -19.5 | -17.4 | 2.1 | 0 | - | - | - | - |

Table A1-3: Detection summary for Walleye and monitored upstream of the Keeyask GS during the open-water 2016 (May 1 to October 19), 2017 (May 1 to October 16), 2018 (May 1 to October 10), 2019 (May 1 to October 7), and 2020 (May 1 to September 23) periods. Tag ID highlighted yellow = lost tag. Tag ID highlighted purple = moved downstream through Gull Rapids. Tag ID highlighted green = moved downstream through Kettle GS. Tag ID highlighted orange = suspected to have moved downstream through Kettle GS. Tag ID highlighted red = moved downstream through Long Spruce GS (Cont.).

| Tag ID | Date tagged | 2016 | | | | | 2017 | | | | | 2018 | | | | | 2019 | | | | | 2020 | | | | |
|--------|-------------|------|--------|-----------|-----------|-------------|------|--------|-----------|-----------|-------------|------|--------|-----------|-----------|-------------|-------|--------|-----------|-----------|-------------|-------|--------|-----------|-----------|-------------|
| | | n | # Days | U/S (rkm) | D/S (rkm) | Range (rkm) | n | # Days | U/S (rkm) | D/S (rkm) | Range (rkm) | n | # Days | U/S (rkm) | D/S (rkm) | Range (rkm) | n | # Days | U/S (rkm) | D/S (rkm) | Range (rkm) | n | # Days | U/S (rkm) | D/S (rkm) | Range (rkm) |
| 20150 | 5-Jun-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1783 | 8 | -15.0 | 40.9 | 55.9 | 0 | - | - | - | - |
| 20151 | 5-Jun-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 7125 | 97 | -29.4 | -12.9 | 16.5 | 7166 | 72 | -12.9 | -9.9 | 3.0 |
| 20153 | 6-Jun-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1607 | 9 | -19.5 | -9.9 | 9.6 | 0 | - | - | - | - |
| 20154 | 6-Jun-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 66867 | 115 | -19.5 | -19.5 | 0.0 | 31732 | 78 | -19.5 | -19.5 | 0.0 |
| 20155 | 6-Jun-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 621 | 5 | -19.5 | -9.9 | 9.6 | 0 | - | - | - | - |
| 20156 | 6-Jun-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 62130 | 121 | -19.5 | -19.5 | 0.0 | 22726 | 56 | -19.5 | -19.5 | 0.0 |
| 20157 | 6-Jun-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1174 | 9 | -19.5 | -12.9 | 6.6 | 131 | 12 | -12.9 | -12.9 | 0.0 |
| 20158 | 6-Jun-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1697 | 6 | -19.5 | 9.4 | 28.9 | 0 | - | - | - | - |
| 20159 | 7-Jun-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 10988 | 82 | -19.5 | -9.0 | 10.5 | 6662 | 71 | -29.4 | -4.8 | 24.6 |
| 20160 | 7-Jun-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 9846 | 10 | -19.5 | 5.4 | 24.9 | 0 | - | - | - | - |
| 20161 | 7-Jun-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 4014 | 81 | -19.5 | -19.5 | 0.0 | 1817 | 37 | -19.5 | -15.0 | 4.5 |
| 20162 | 6-Jun-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 537 | 13 | -19.5 | -15.0 | 4.5 | 76 | 8 | -15.0 | -15.0 | 0.0 |
| 20163 | 6-Jun-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 6084 | 53 | -33.8 | 36.1 | 69.9 | 0 | - | - | - | - |
| 20164 | 6-Jun-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 106 | 1 | -19.5 | -15.0 | 4.5 | 0 | - | - | - | - |
| 20168 | 7-Jun-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 20169 | 7-Jun-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 27 | 4 | -19.5 | -15.0 | 4.5 | 0 | - | - | - | - |
| 20170 | 6-Jun-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 6259 | 89 | -46.9 | -9.3 | 37.6 | 2464 | 42 | -33.8 | -7.9 | 25.9 |
| 20175 | 29-May-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 6127 | 65 | -48.2 | -4.8 | 43.4 | 0 | - | - | - | - |
| 20176 | 29-May-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 42406 | 118 | -19.5 | -17.4 | 2.1 | 1390 | 17 | -19.5 | -19.5 | 0.0 |
| 20181 | 29-May-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 6572 | 93 | -19.5 | -17.4 | 2.1 | 1604 | 24 | -29.4 | -15.0 | 14.4 |
| 20182 | 25-May-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 10080 | 22 | -19.5 | 10.3 | 29.8 | 0 | - | - | - | - |
| 20186 | 29-May-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 10480 | 74 | -17.4 | 5.4 | 22.8 | 0 | - | - | - | - |
| 20187 | 23-May-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 4991 | 35 | -19.5 | 24.7 | 44.2 | 0 | - | - | - | - |
| 20188 | 23-May-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 31081 | 102 | -24.7 | -19.5 | 5.2 | 2715 | 27 | -48.2 | -24.2 | 24.0 |

Table A1-4: Detection summary for Walleye monitored in Stephens Lake during the open-water 2016 (May 1 to October 19), 2017 (May 1 to October 16), 2018 (May 1 to October 10), 2019 (May 1 to October 7), and 2020 (May 1 to September 23) periods. Tag ID highlighted yellow = lost tag. Tag ID highlighted green = moved downstream through Kettle GS. Tag ID highlighted orange = suspected to have moved downstream through Kettle GS. Tag ID highlighted red = moved downstream through Long Spruce GS.

| Tag ID | Date tagged | 2016 | | | | | 2017 | | | | | 2018 | | | | | 2019 | | | | | 2020 | | | | |
|--------|-------------|-------|--------|-----------|-----------|-------------|-------|--------|-----------|-----------|-------------|-------|--------|-----------|-----------|-------------|-------|--------|-----------|-----------|-------------|------|--------|-----------|-----------|-------------|
| | | n | # Days | U/S (rkm) | D/S (rkm) | Range (rkm) | n | # Days | U/S (rkm) | D/S (rkm) | Range (rkm) | n | # Days | U/S (rkm) | D/S (rkm) | Range (rkm) | n | # Days | U/S (rkm) | D/S (rkm) | Range (rkm) | n | # Days | U/S (rkm) | D/S (rkm) | Range (rkm) |
| 53723 | 28-May-16 | 6822 | 52 | 1.2 | 9.4 | 8.2 | 11415 | 64 | 1.2 | 16.8 | 15.6 | 1096 | 15 | 1.2 | 4.4 | 3.2 | 0 | - | - | - | - | 0 | - | - | - | - |
| 53724 | 28-May-16 | 16473 | 97 | 1.2 | 10.3 | 9.1 | 2937 | 36 | 1.2 | 7.9 | 6.7 | 492 | 11 | 1.2 | 7.9 | 6.7 | 20 | 1 | 1.2 | 1.2 | 0.0 | 0 | - | - | - | - |
| 53725 | 27-May-16 | 1918 | 22 | 1.2 | 18.6 | 17.4 | 5934 | 35 | 7.9 | 16.8 | 8.9 | 594 | 13 | 5.2 | 24.7 | 19.5 | 0 | - | - | - | - | 0 | - | - | - | - |
| 53726 | 27-May-16 | 1862 | 17 | 1.2 | 16.8 | 15.6 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53727 | 28-May-16 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53728 | 28-May-16 | 13006 | 102 | 1.2 | 18.6 | 17.4 | 4712 | 42 | 2.7 | 58.6 | 55.9 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53729 | 28-May-16 | 3470 | 41 | 1.2 | 18.6 | 17.4 | 2432 | 46 | 1.2 | 18.6 | 17.4 | 571 | 23 | 5.2 | 18.6 | 13.4 | 234 | 6 | 3.8 | 9.4 | 5.6 | 0 | - | - | - | - |
| 53730 | 28-May-16 | 1907 | 15 | 1.2 | 9.4 | 8.2 | 4610 | 43 | 1.2 | 10.3 | 9.1 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53731 | 28-May-16 | 4702 | 19 | 1.2 | 9.4 | 8.2 | 1757 | 26 | 1.2 | 13.9 | 12.7 | 924 | 14 | 1.2 | 9.4 | 8.2 | 0 | - | - | - | - | 0 | - | - | - | - |
| 53732 | 28-May-16 | 380 | 7 | 1.2 | 13.0 | 11.8 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53733 | 30-May-16 | 2770 | 34 | 1.2 | 13.9 | 12.7 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53734 | 30-May-16 | 2165 | 13 | 1.2 | 18.6 | 17.4 | 2137 | 28 | 3.8 | 18.6 | 14.8 | 736 | 19 | 1.2 | 18.6 | 17.4 | 0 | - | - | - | - | 0 | - | - | - | - |
| 53735 | 30-May-16 | 71469 | 135 | 1.2 | 18.6 | 17.4 | 98904 | 168 | 18.6 | 18.6 | 0.0 | 93804 | 160 | 18.6 | 18.6 | 0.0 | 90394 | 158 | 18.6 | 18.6 | 0.0 | 0 | - | - | - | - |
| 53736 | 30-May-16 | 5122 | 42 | 1.2 | 18.6 | 17.4 | 5996 | 48 | 2.6 | 24.7 | 22.1 | 713 | 19 | 1.2 | 36.1 | 34.9 | 284 | 7 | 1.2 | 9.4 | 8.2 | 1739 | 21 | 5.2 | 18.6 | 13.4 |
| 53737 | 29-May-16 | 2237 | 64 | 1.2 | 10.3 | 9.1 | 1772 | 21 | 3.8 | 47.5 | 43.7 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53738 | 31-May-16 | 7820 | 75 | 2.7 | 10.3 | 7.6 | 692 | 20 | 2.6 | 40.8 | 38.2 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53739 | 31-May-16 | 9452 | 111 | 1.2 | 6.5 | 5.3 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53740 | 31-May-16 | 12989 | 77 | 1.2 | 9.4 | 8.2 | 6334 | 60 | 1.2 | 9.4 | 8.2 | 6514 | 84 | 1.2 | 9.4 | 8.2 | 0 | - | - | - | - | | | | | |
| 53741 | 30-May-16 | 4836 | 76 | 1.2 | 18.6 | 17.4 | 11129 | 90 | 2.7 | 18.6 | 15.9 | 15069 | 122 | 1.2 | 18.6 | 17.4 | 6450 | 102 | 1.2 | 18.6 | 17.4 | 5987 | 61 | 1.2 | 18.8 | 17.6 |
| 53742 | 30-May-16 | 1118 | 12 | 1.2 | 2.7 | 1.5 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53743 | 31-May-16 | 466 | 9 | 1.2 | 9.4 | 8.2 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53744 | 31-May-16 | 5132 | 56 | 1.2 | 18.6 | 17.4 | 6665 | 69 | 1.2 | 24.7 | 23.5 | 3812 | 48 | 1.2 | 24.7 | 23.5 | 1442 | 33 | 2.7 | 9.4 | 6.7 | 0 | - | - | - | - |
| 53745 | 31-May-16 | 249 | 4 | 2.7 | 18.6 | 15.9 | 2884 | 25 | 3.8 | 24.7 | 20.9 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53746 | 31-May-16 | 310 | 4 | 1.2 | 18.6 | 17.4 | 1449 | 19 | 3.8 | 58.6 | 54.8 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53747 | 31-May-16 | 19408 | 65 | 1.2 | 10.3 | 9.1 | 6715 | 47 | 1.2 | 47.5 | 46.3 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53748 | 31-May-16 | 4332 | 57 | 2.7 | 13.0 | 10.3 | 558 | 20 | 6.5 | 13 | 6.5 | 23 | 2 | 9.4 | 13 | 3.6 | 0 | - | - | - | - | 0 | - | - | - | - |
| 53749 | 31-May-16 | 34767 | 132 | 1.2 | 10.3 | 9.1 | 2531 | 12 | 1.2 | 10.3 | 9.1 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53750 | 31-May-16 | 4459 | 52 | 1.2 | 10.3 | 9.1 | 15866 | 72 | 3.8 | 9.4 | 5.6 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53751 | 31-May-16 | 8287 | 56 | 1.2 | 18.6 | 17.4 | 633 | 25 | 1.2 | 58.6 | 57.4 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53752 | 31-May-16 | 12710 | 51 | 1.2 | 20.0 | 18.8 | 7479 | 67 | 1.2 | 24.7 | 23.5 | 2768 | 26 | 1.2 | 18.6 | 17.4 | 0 | - | - | - | - | 0 | - | - | - | - |
| 53753 | 31-May-16 | 23679 | 89 | 1.2 | 21.0 | 19.8 | 3253 | 39 | 2.6 | 40.9 | 38.3 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53754 | 31-May-16 | 1653 | 11 | 1.2 | 18.6 | 17.4 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53755 | 31-May-16 | 12782 | 65 | 1.2 | 13.0 | 11.8 | 13253 | 100 | 1.2 | 13 | 11.8 | 10782 | 66 | 1.2 | 7.9 | 6.7 | 7520 | 29 | 3.8 | 9.4 | 5.6 | 0 | - | - | - | - |
| 53756 | 1-Jun-16 | 2800 | 39 | 1.2 | 13.0 | 11.8 | 7437 | 91 | 2.7 | 16.8 | 14.1 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |

Table A1-4: Detection summary for Walleye monitored in Stephens Lake during the open-water 2016 (May 1 to October 19), 2017 (May 1 to October 16), 2018 (May 1 to October 10), 2019 (May 1 to October 7), and 2020 (May 1 to September 23) periods. Tag ID highlighted yellow = lost tag. Tag ID highlighted green = moved downstream through Kettle GS. Tag ID highlighted orange = suspected to have moved downstream through Long Spruce GS (Continued).

| Tag ID | Date tagged | 2016 | | | | | 2017 | | | | | 2018 | | | | | 2019 | | | | | 2020 | | | | |
|--------|-------------|-------|--------|-----------|-----------|-------------|-------|--------|-----------|-----------|-------------|-------|--------|-----------|-----------|-------------|-------|--------|-----------|-----------|-------------|-------|--------|-----------|-----------|-------------|
| | | n | # Days | U/S (rkm) | D/S (rkm) | Range (rkm) | n | # Days | U/S (rkm) | D/S (rkm) | Range (rkm) | n | # Days | U/S (rkm) | D/S (rkm) | Range (rkm) | n | # Days | U/S (rkm) | D/S (rkm) | Range (rkm) | n | # Days | U/S (rkm) | D/S (rkm) | Range (rkm) |
| 53757 | 1-Jun-16 | 714 | 5 | 1.2 | 18.6 | 17.4 | 1466 | 20 | 3.8 | 24.7 | 20.9 | 3292 | 28 | 2.7 | 18.6 | 15.9 | 5133 | 28 | 1.2 | 18.6 | 17.4 | 3212 | 29 | 5.2 | 24.9 | 19.7 |
| 53808 | 1-Jun-16 | 5683 | 43 | 1.2 | 18.6 | 17.4 | 7513 | 63 | 1.2 | 13.9 | 12.7 | 5168 | 32 | 1.2 | 18.6 | 17.4 | 0 | - | - | - | - | 0 | - | - | - | - |
| 53809 | 1-Jun-16 | 3821 | 62 | 1.2 | 18.6 | 17.4 | 4659 | 58 | 3.8 | 18.6 | 14.8 | 1654 | 32 | 1.2 | 18.6 | 17.4 | 0 | - | - | - | - | 0 | - | - | - | - |
| 53810 | 1-Jun-16 | 1340 | 43 | 1.2 | 18.6 | 17.4 | 2374 | 68 | 3.8 | 18.6 | 14.8 | 1625 | 75 | 1.2 | 18.6 | 17.4 | 4054 | 42 | 1.2 | 18.6 | 17.4 | 0 | - | - | - | - |
| 53811 | 1-Jun-16 | 62445 | 123 | 1.2 | 7.9 | 6.7 | 61299 | 156 | 1.2 | 9.4 | 8.2 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 53812 | 1-Jun-16 | 5047 | 27 | 1.2 | 20.0 | 18.8 | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - |
| 25732 | 9-Jun-18 | - | - | - | - | - | - | - | - | - | - | 2502 | 19 | 1.2 | 40.9 | 39.7 | 0 | - | - | - | - | 0 | - | - | - | - |
| 25734 | 7-Jun-18 | - | - | - | - | - | - | - | - | - | - | 1429 | 7 | 1.2 | 21.6 | 20.4 | 0 | - | - | - | - | 0 | - | - | - | - |
| 25735 | 6-Jun-18 | - | - | - | - | - | - | - | - | - | - | 1572 | 34 | 1.2 | 7.9 | 6.7 | 2081 | 33 | 1.2 | 9.4 | 8.2 | 4117 | 75 | 32.0 | 36.1 | 4.1 |
| 25736 | 7-Jun-18 | - | - | - | - | - | - | - | - | - | - | 4814 | 18 | 1.2 | 10.3 | 9.1 | 0 | - | - | - | - | 0 | - | - | - | - |
| 25737 | 6-Jun-18 | - | - | - | - | - | - | - | - | - | - | 13243 | 78 | 1.2 | 4.4 | 3.2 | 11124 | 78 | 1.2 | 4.4 | 3.2 | 15411 | 64 | 1.2 | 5.0 | 3.8 |
| 25738 | 6-Jun-18 | - | - | - | - | - | - | - | - | - | - | 2300 | 20 | 1.2 | 36.1 | 34.9 | 0 | - | - | - | - | 0 | - | - | - | - |
| 25741 | 6-Jun-18 | - | - | - | - | - | - | - | - | - | - | 45733 | 120 | 1.2 | 2.7 | 1.5 | 156 | 21 | 1.2 | 1.2 | 0.0 | 0 | - | - | - | - |
| 20129 | 3-Jun-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 2257 | 23 | 1.2 | 6.5 | 5.3 | 0 | - | - | - | - |
| 20130 | 1-Jun-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 3708 | 25 | 1.2 | 18.6 | 17.4 | 1753 | 15 | 1.2 | 7.8 | 6.6 |
| 20131 | 31-May-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 11481 | 79 | 1.2 | 18.6 | 17.4 | 4020 | 63 | 3.9 | 18.6 | 14.7 |
| 20132 | 1-Jun-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 20473 | 103 | 1.2 | 4.1 | 2.9 | 23801 | 82 | 1.2 | 1.2 | 0.0 |
| 20133 | 31-May-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 6795 | 44 | 1.2 | 9.4 | 8.2 | 0 | - | - | - | - |
| 20134 | 31-May-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 771 | 11 | 0.6 | 4.4 | 3.8 | 0 | - | - | - | - |
| 20135 | 1-Jun-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 55200 | 124 | 1.2 | 4.4 | 3.2 | 36772 | 82 | 1.2 | 1.2 | 0.0 |
| 20136 | 1-Jun-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 673 | 18 | 1.2 | 24.7 | 23.5 | 0 | - | - | - | - |
| 20137 | 31-May-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 2094 | 29 | 1.2 | 24.7 | 23.5 | 0 | - | - | - | - |
| 20138 | 31-May-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 22235 | 95 | 0.6 | 4.1 | 3.5 | 20138 | 37 | 0.6 | 2.7 | 2.1 |
| 20139 | 31-May-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 2457 | 39 | 1.2 | 36.1 | 34.9 | 20139 | 22 | 1.2 | 13.2 | 12.0 |
| 20140 | 31-May-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1190 | 50 | 1.2 | 10.3 | 9.1 | 20140 | 37 | 1.2 | 9.9 | 8.7 |
| 20141 | 31-May-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 2202 | 15 | 0.6 | 36.1 | 35.5 | 0 | - | - | - | - |
| 20142 | 31-May-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 9295 | 91 | 1.2 | 18.6 | 17.4 | 20142 | 30 | 5.2 | 65.3 | 60.1 |
| 20143 | 1-Jun-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 181 | 6 | 3.8 | 18.6 | 14.8 | 20143 | 7 | 5.2 | 18.6 | 13.4 |
| 20144 | 1-Jun-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 5023 | 31 | 1.2 | 5.8 | 4.6 | 20144 | 3 | 5.0 | 5.0 | 0.0 |
| 20145 | 1-Jun-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 883 | 20 | 0.6 | 7.9 | 7.3 | 0 | - | - | - | - |
| 20152 | 31-May-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 11491 | 41 | 1.2 | 6.5 | 5.3 | 0 | - | - | - | - |
| 20165 | 16-Sep-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 5391 | 11 | 1.2 | 9.4 | 8.2 | 23771 | 89 | 1.2 | 8.7 | 7.5 |
| 20167 | 16-Sep-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1661 | 9 | 1.2 | 40.9 | 39.7 | 0 | - | - | - | - |
| 20171 | 27-May-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1870 | 14 | 1.2 | 7.4 | 6.2 | 0 | - | - | - | - |

Table A1-4: Detection summary for Walleye monitored in Stephens Lake during the open-water 2016 (May 1 to October 19), 2017 (May 1 to October 16), 2018 (May 1 to October 10), 2019 (May 1 to October 7), and 2020 (May 1 to September 23) periods. Tag ID highlighted yellow = lost tag. Tag ID highlighted green = moved downstream through Kettle GS. Tag ID highlighted orange = suspected to have moved downstream through Long Spruce GS (Continued).

| Tag ID | Date tagged | 2016 | | | | | 2017 | | | | | 2018 | | | | | 2019 | | | | | 2020 | | | | |
|--------|-------------|------|--------|-----------|-----------|-------------|------|--------|-----------|-----------|-------------|------|--------|-----------|-----------|-------------|-------|--------|-----------|-----------|-------------|-------|--------|-----------|-----------|-------------|
| | | n | # Days | U/S (rkm) | D/S (rkm) | Range (rkm) | n | # Days | U/S (rkm) | D/S (rkm) | Range (rkm) | n | # Days | U/S (rkm) | D/S (rkm) | Range (rkm) | n | # Days | U/S (rkm) | D/S (rkm) | Range (rkm) | n | # Days | U/S (rkm) | D/S (rkm) | Range (rkm) |
| 20172 | 30-May-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 5131 | 43 | 1.2 | 5.8 | 4.6 | 11 | 2 | 5.0 | 5.2 | 0.2 |
| 20173 | 30-May-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 2377 | 45 | 1.2 | 7.4 | 6.2 | 2394 | 27 | 1.2 | 8.7 | 7.5 |
| 20174 | 30-May-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 20228 | 60 | 1.0 | 16.5 | 15.5 | 36791 | 82 | 1.2 | 1.2 | 0.0 |
| 20177 | 30-May-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 11339 | 100 | 0.6 | 10.3 | 9.7 | 670 | 19 | 5.2 | 10.3 | 5.1 |
| 20178 | 30-May-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 4293 | 26 | 0.6 | 7.9 | 7.3 | 0 | - | - | - | - |
| 20179 | 30-May-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 2746 | 35 | 2.7 | 13.9 | 11.2 | 394 | 25 | 5.2 | 13.4 | 8.2 |
| 20180 | 30-May-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1874 | 37 | 2.7 | 24.7 | 22.0 | 0 | - | - | - | - |
| 20183 | 30-May-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1338 | 12 | 2.7 | 13.0 | 10.3 | 11 | 3 | 8.4 | 8.4 | 0.0 |
| 20184 | 30-May-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 2823 | 16 | 3.8 | 13.9 | 10.1 | 3 | 2 | 13.9 | 13.9 | 0.0 |
| 20185 | 30-May-19 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 5527 | 63 | 1.2 | 7.9 | 6.7 | 177 | 8 | 5.0 | 7.5 | 2.5 |

APPENDIX 2:

LOCATION SUMMARY FOR INDIVIDUAL ACOUSTIC TAGGED WALLEYE UPSTREAM OF THE KEEYASK GS JUNE 2016 TO SEPTEMBER 2020

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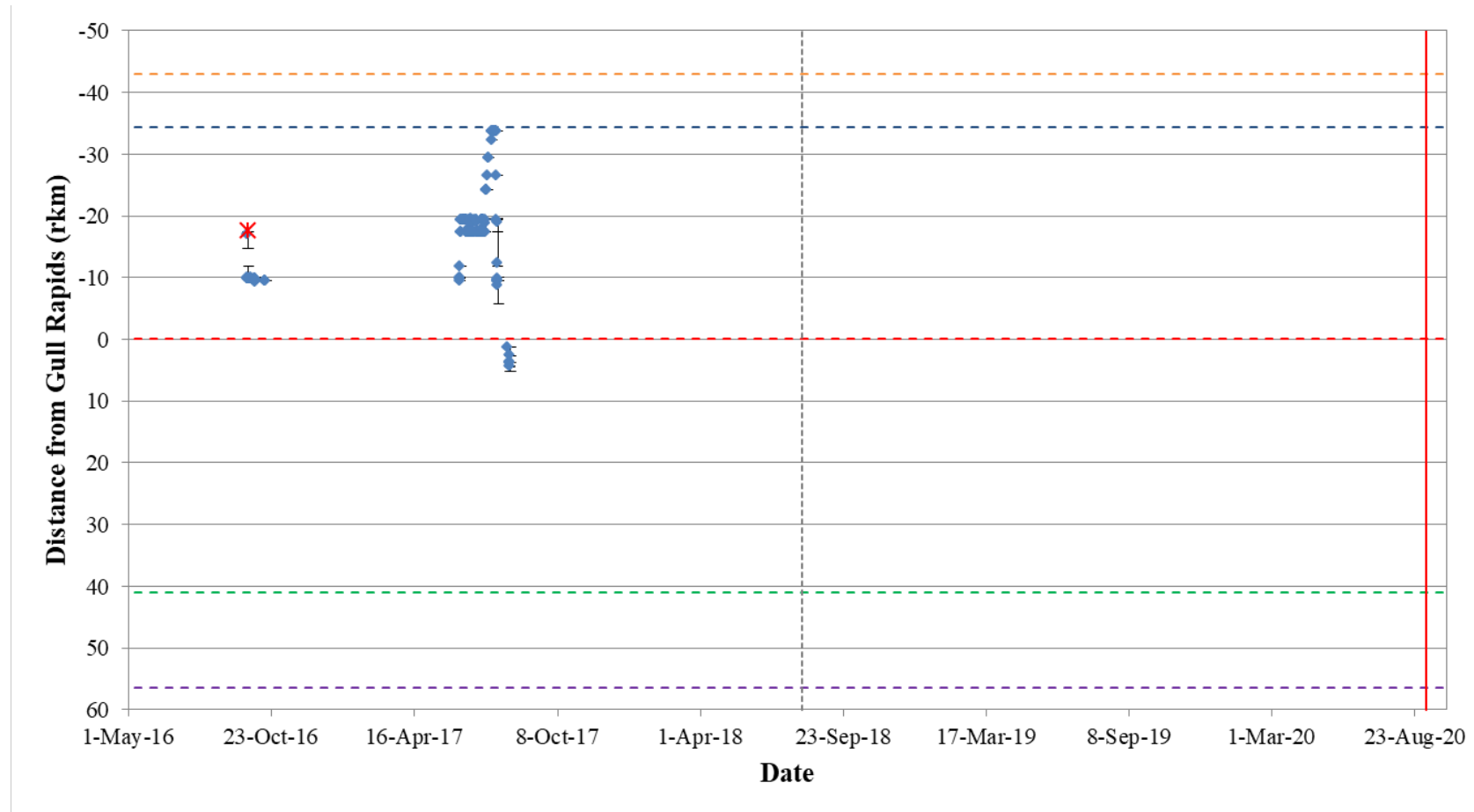


Figure A2-1: Position of a Walleye tagged with an acoustic transmitter (code #53758) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

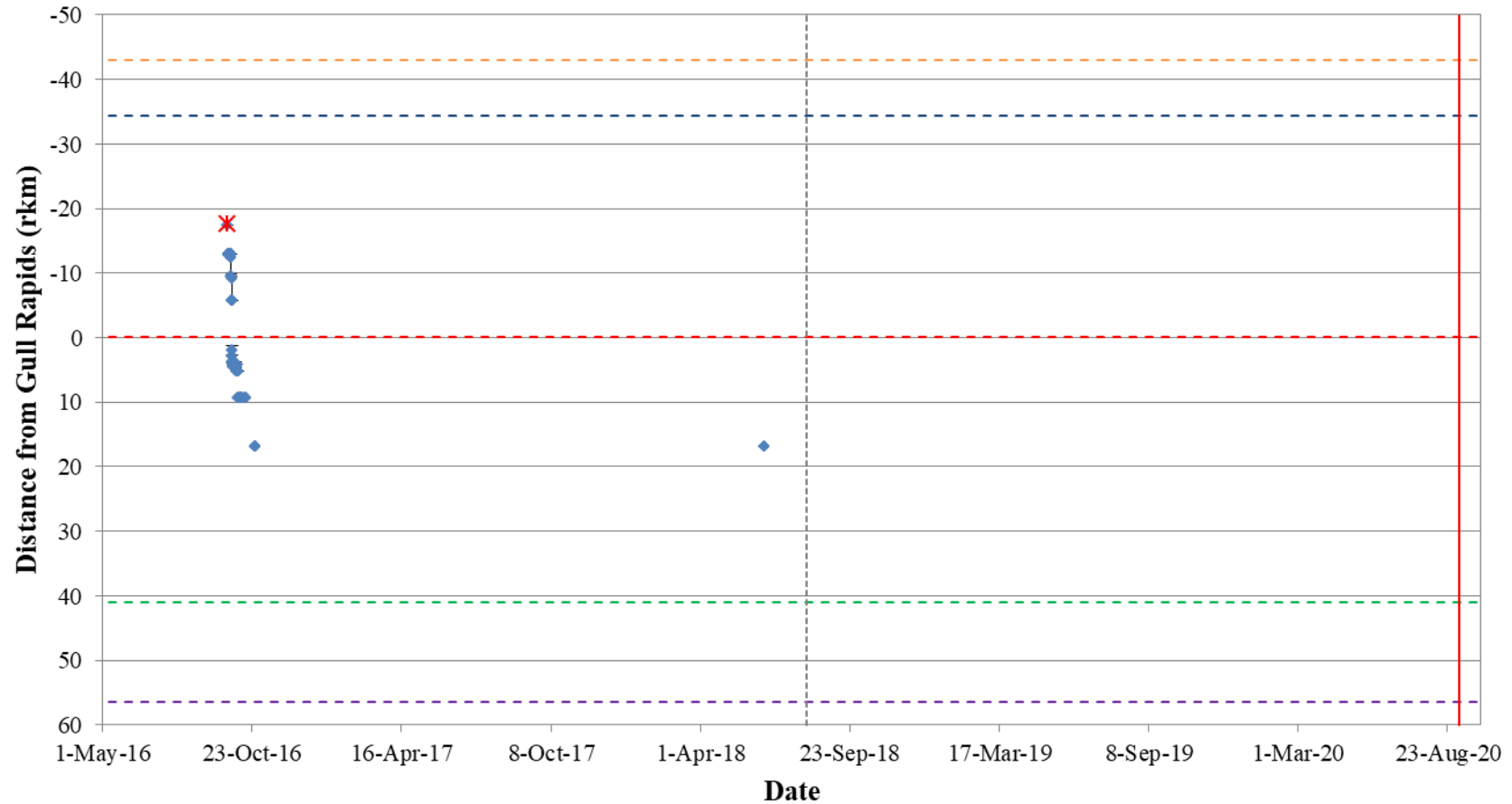


Figure A2-2: Position of a Walleye tagged with an acoustic transmitter (code #53759) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

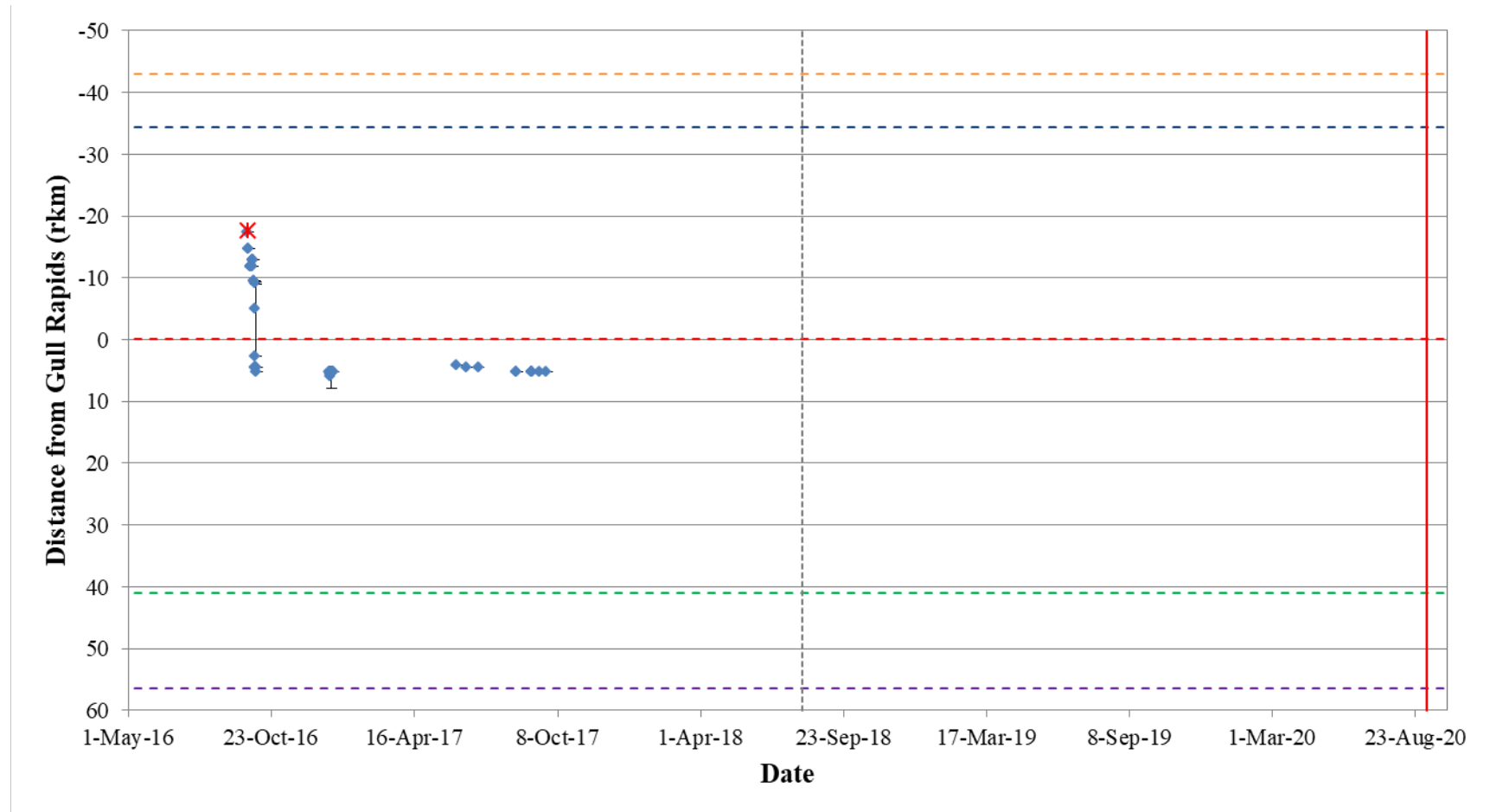


Figure A2-3: Position of a Walleye tagged with an acoustic transmitter (code #53760) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

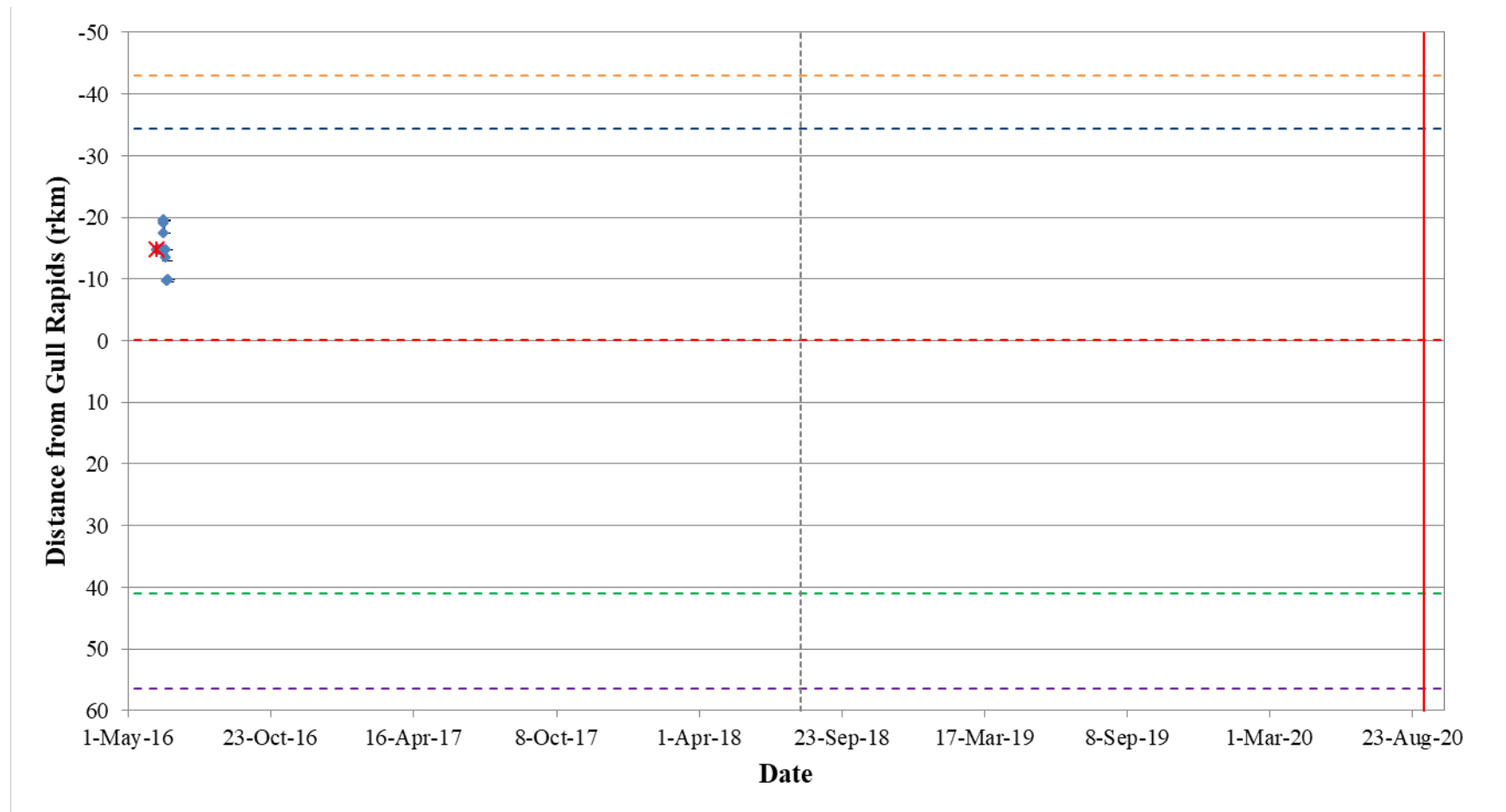


Figure A2-4: Position of a Walleye tagged with an acoustic transmitter (code #53763) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

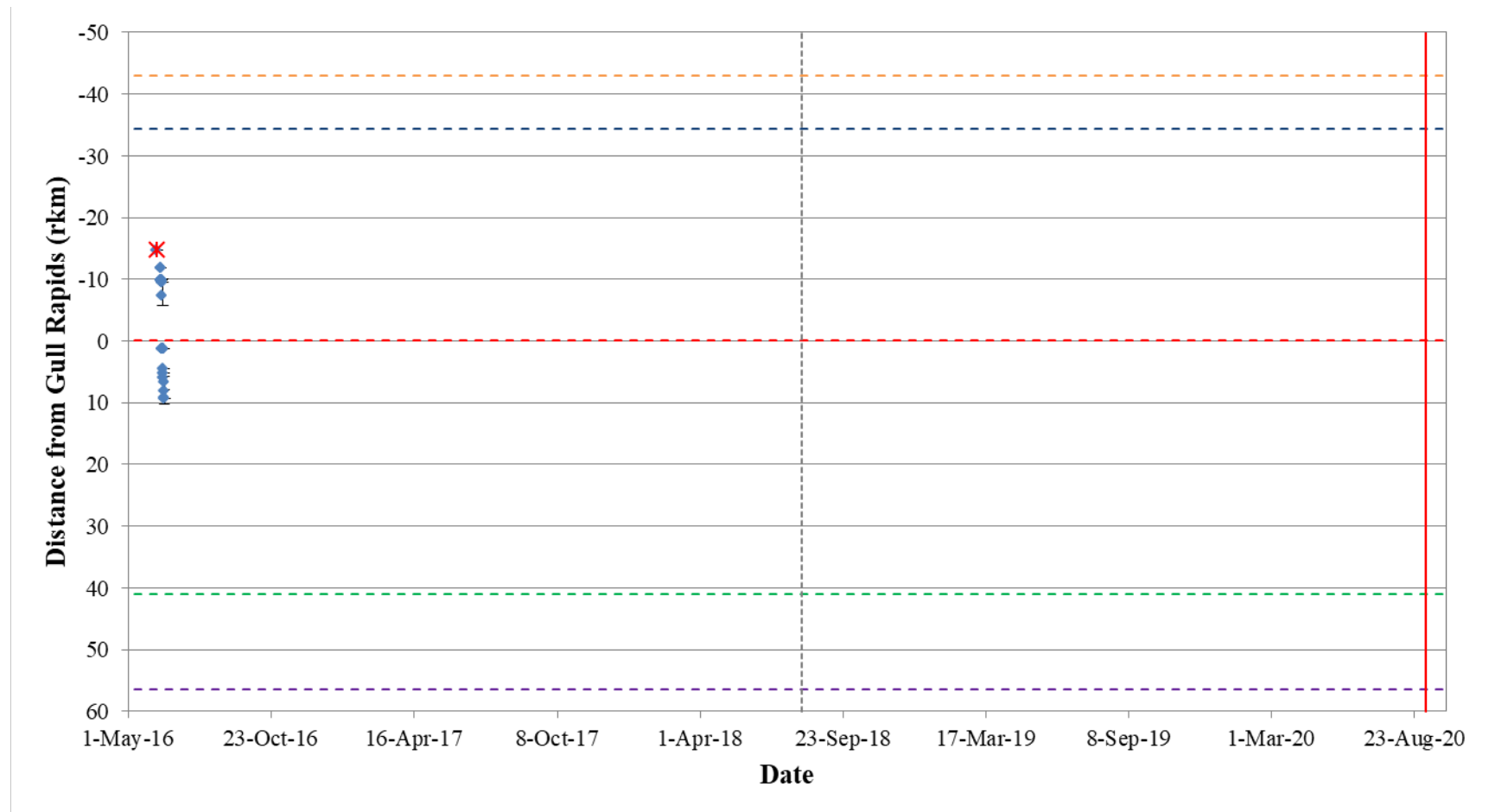


Figure A2-5: Position of a Walleye tagged with an acoustic transmitter (code #53764) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

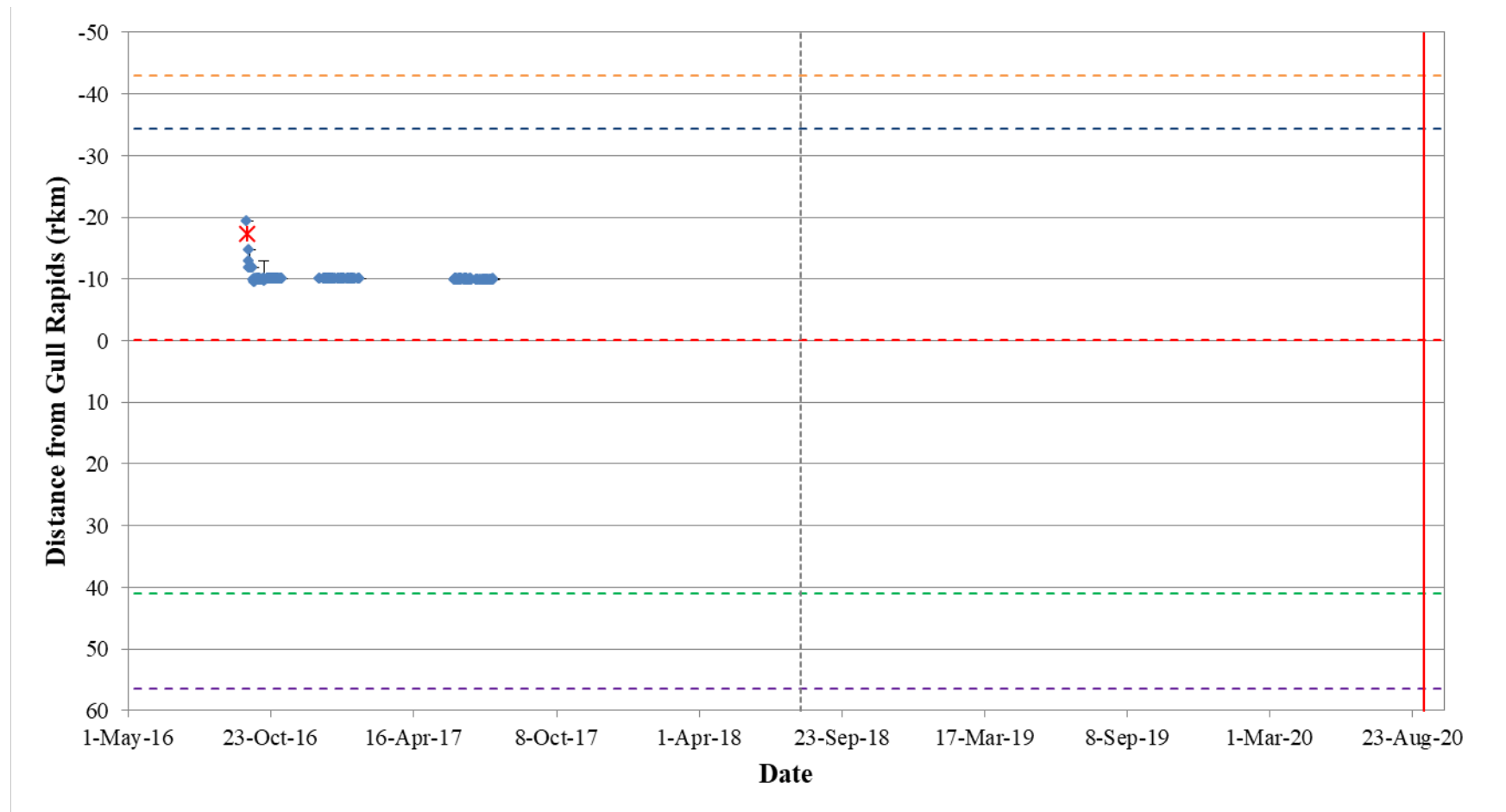


Figure A2-6: Position of a Walleye tagged with an acoustic transmitter (code #53765) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

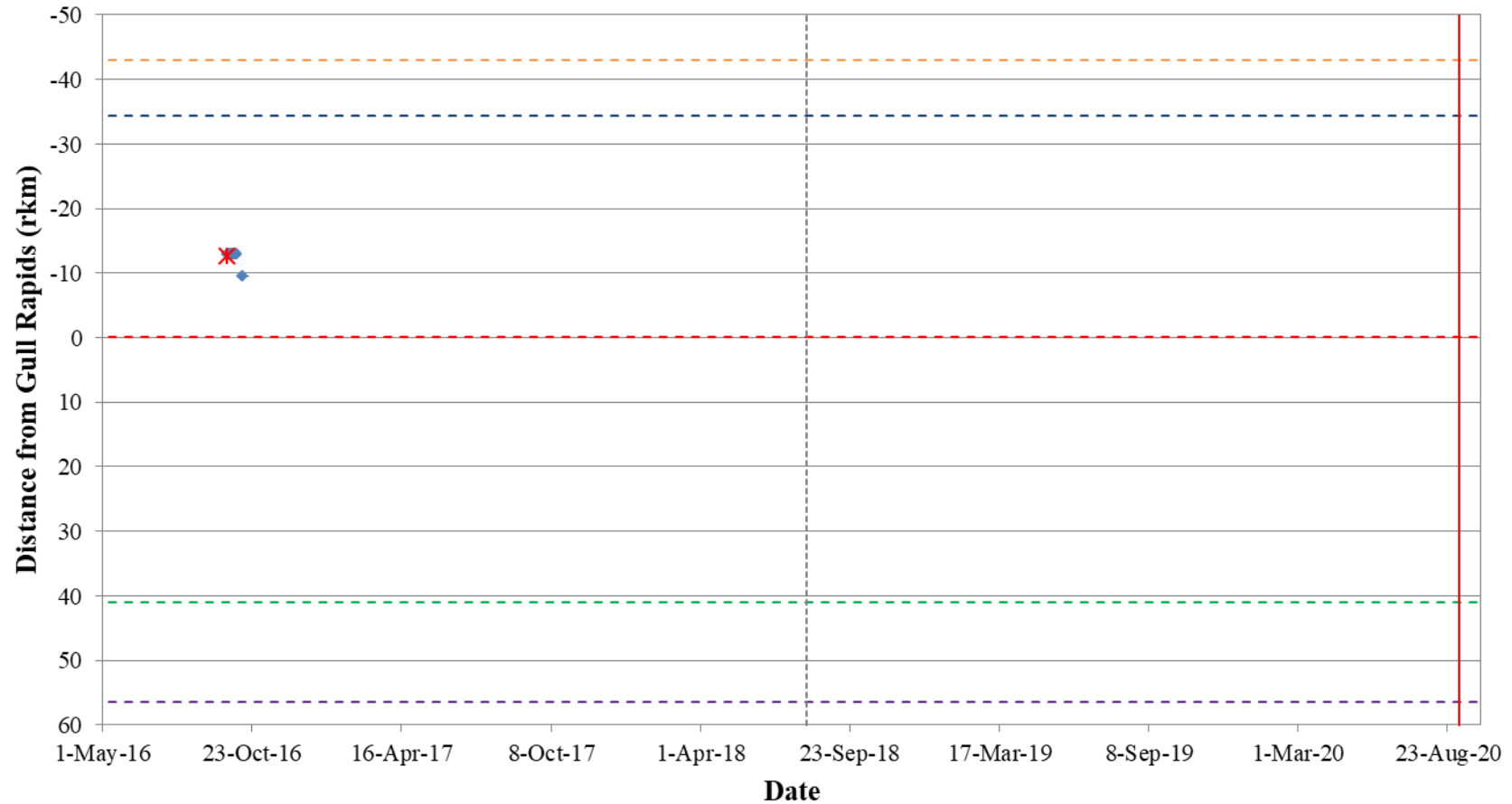


Figure A2-7: Position of a Walleye tagged with an acoustic transmitter (code #53766) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

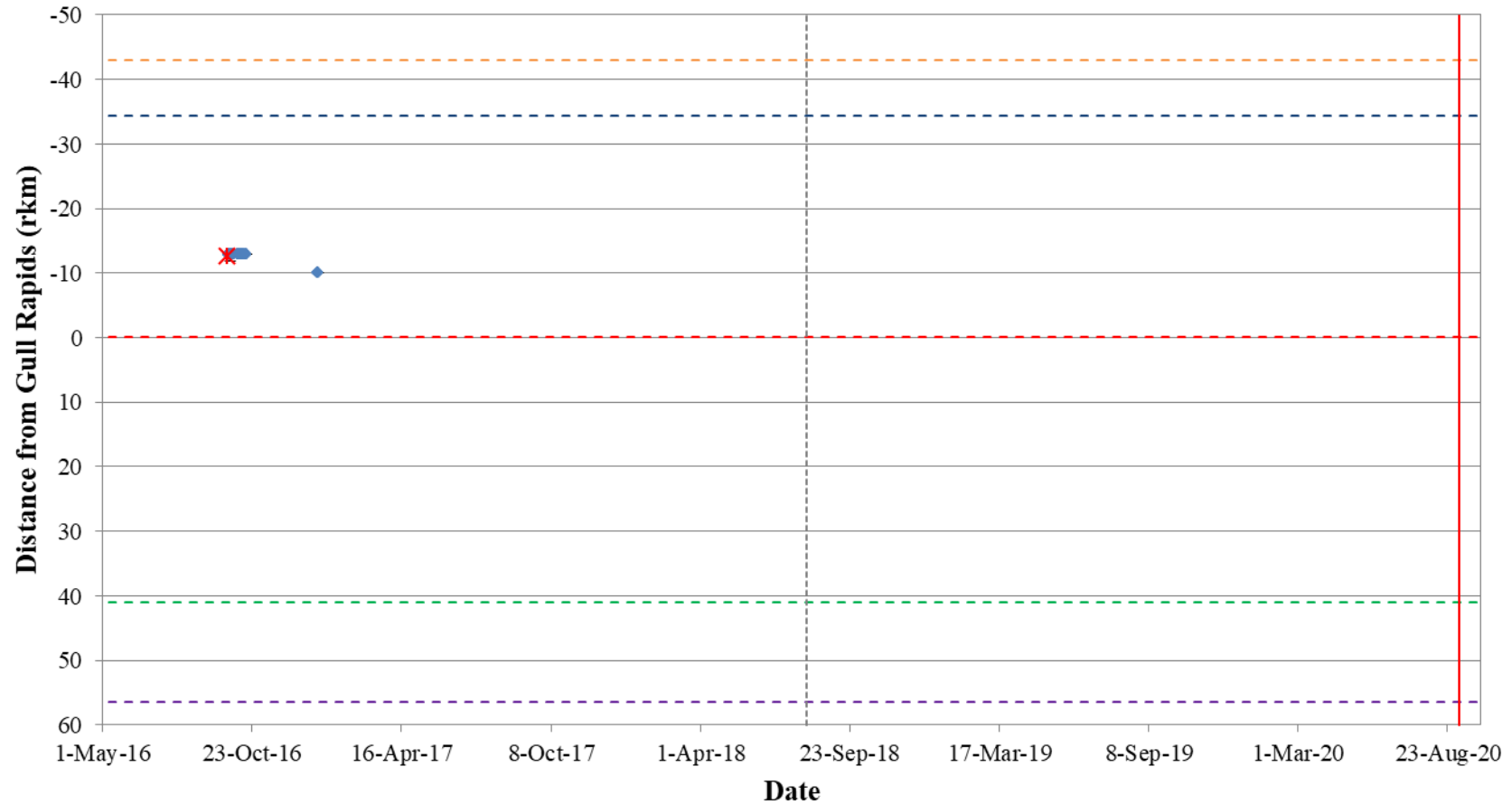


Figure A2-8: Position of a Walleye tagged with an acoustic transmitter (code #53767) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

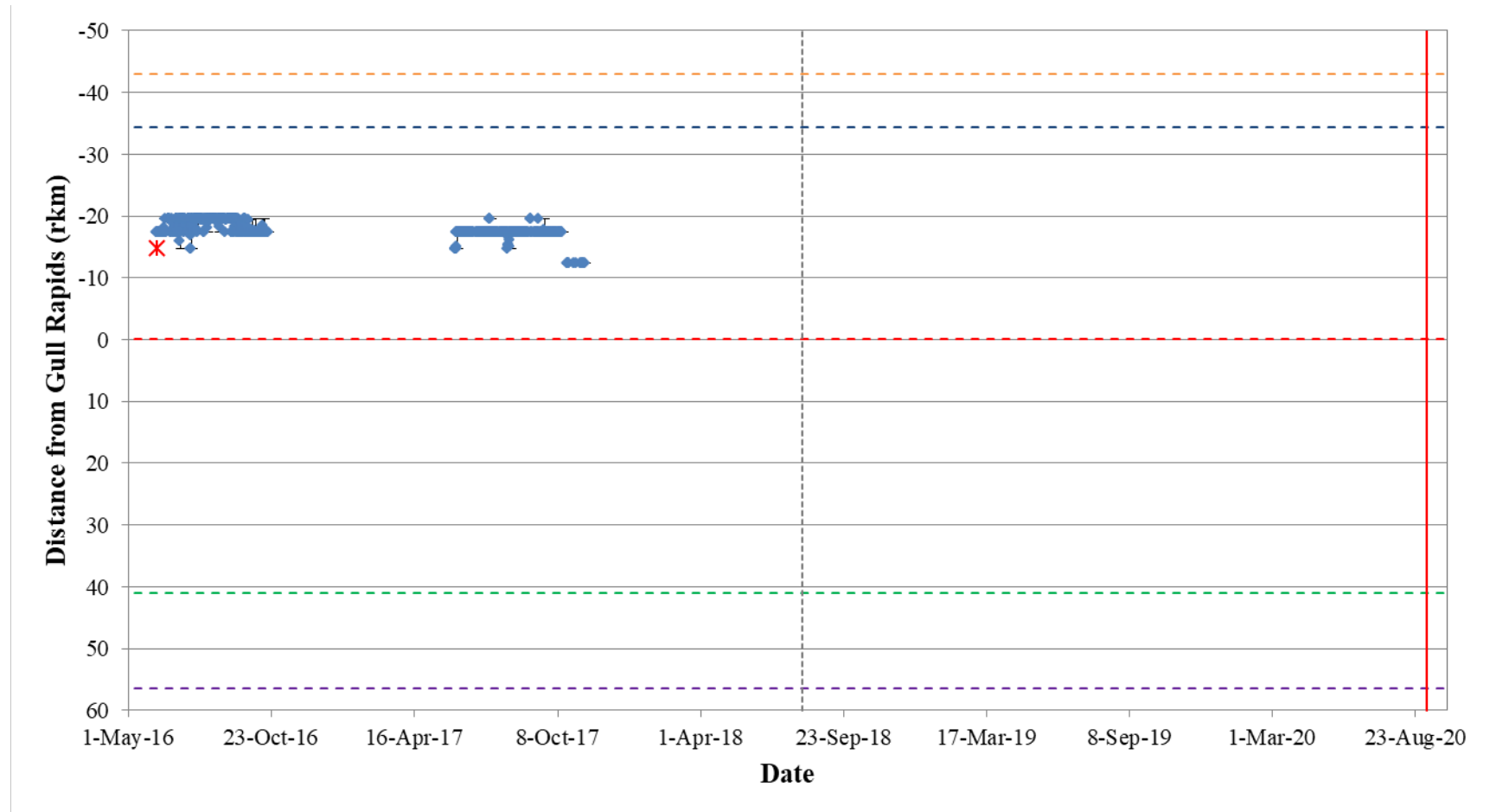


Figure A2-9: Position of a Walleye tagged with an acoustic transmitter (code #53768) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

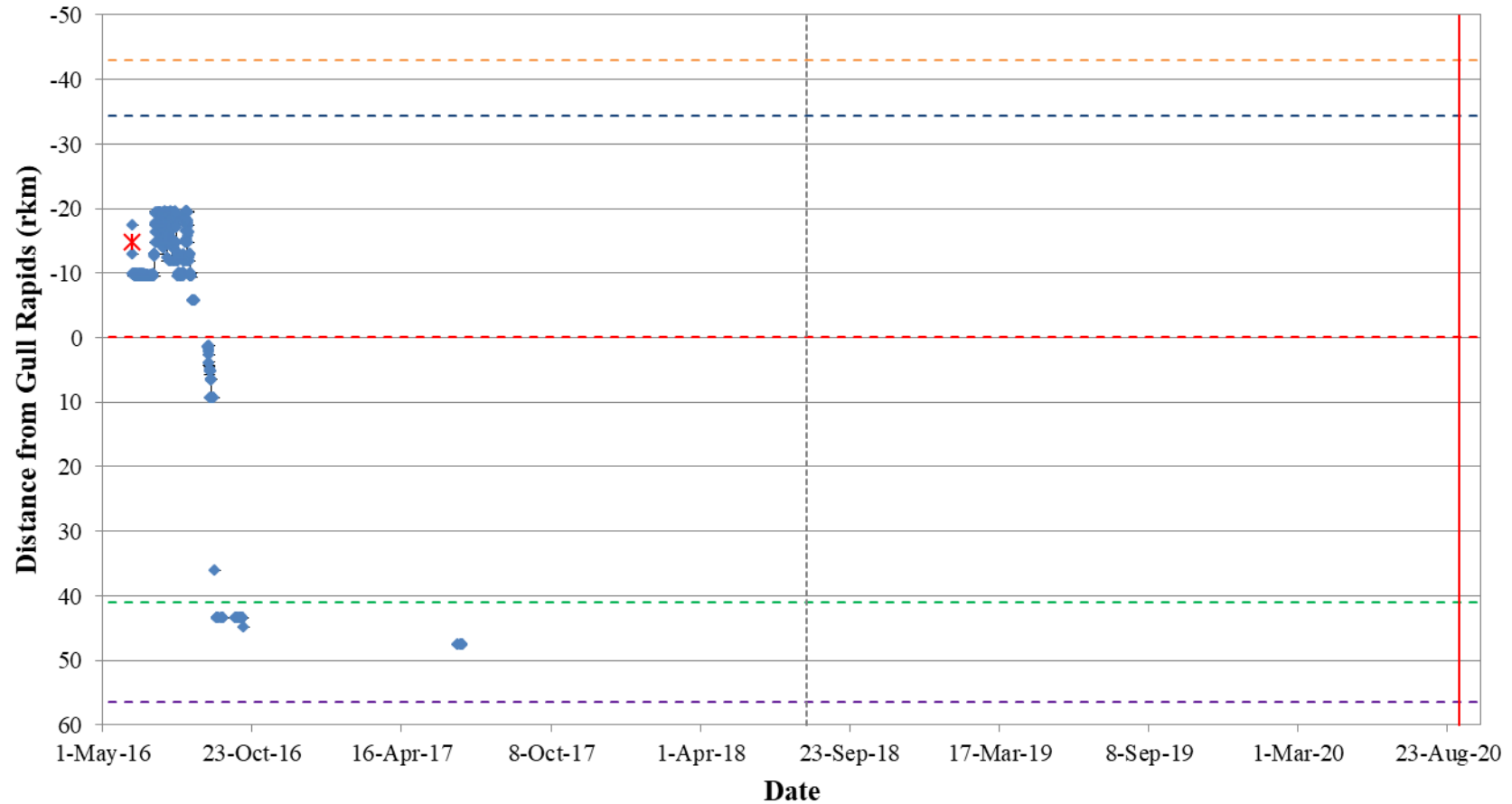


Figure A2-10: Position of a Walleye tagged with an acoustic transmitter (code #53769) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

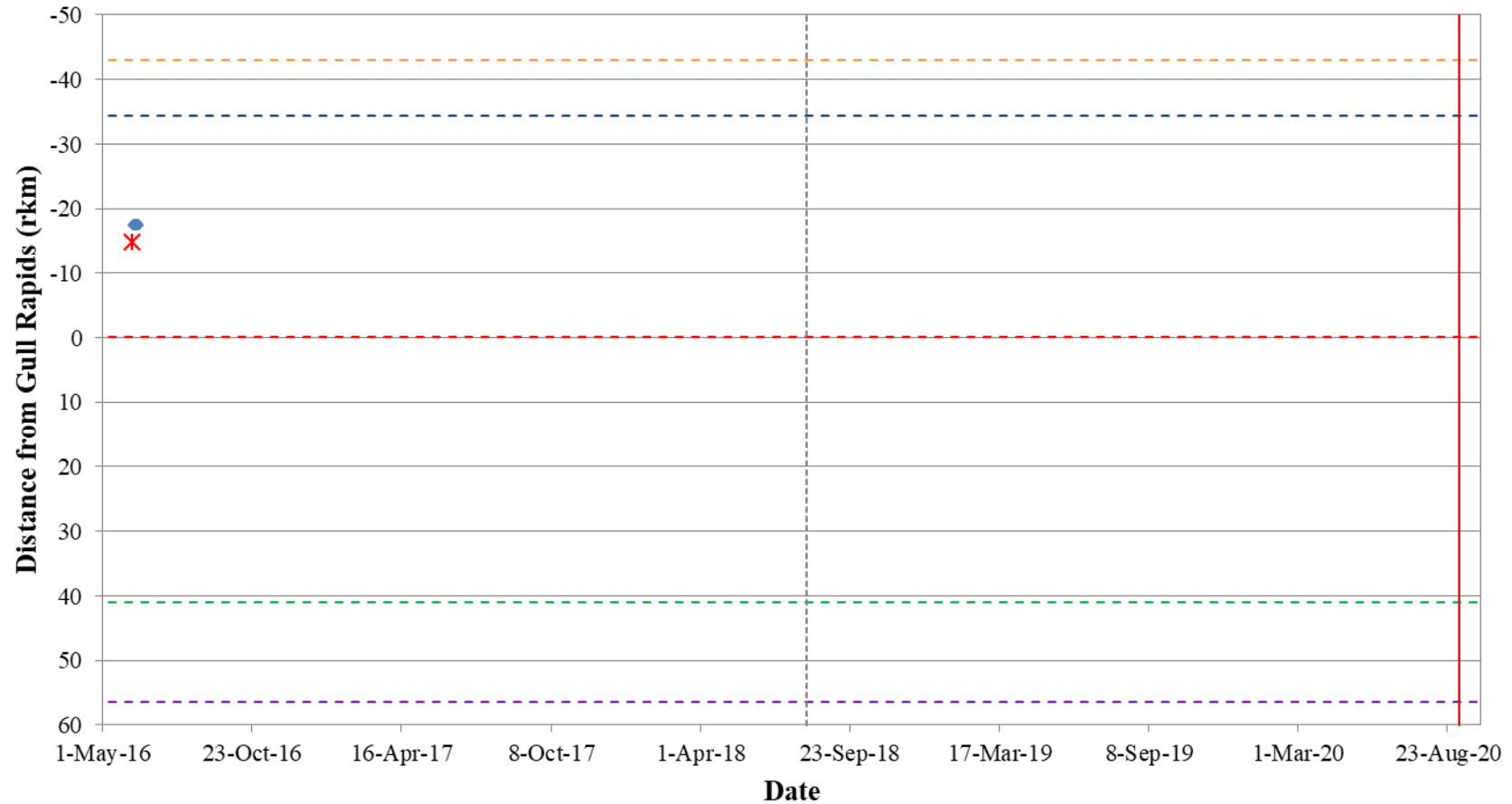


Figure A2-11: Position of a Walleye tagged with an acoustic transmitter (code #53770) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

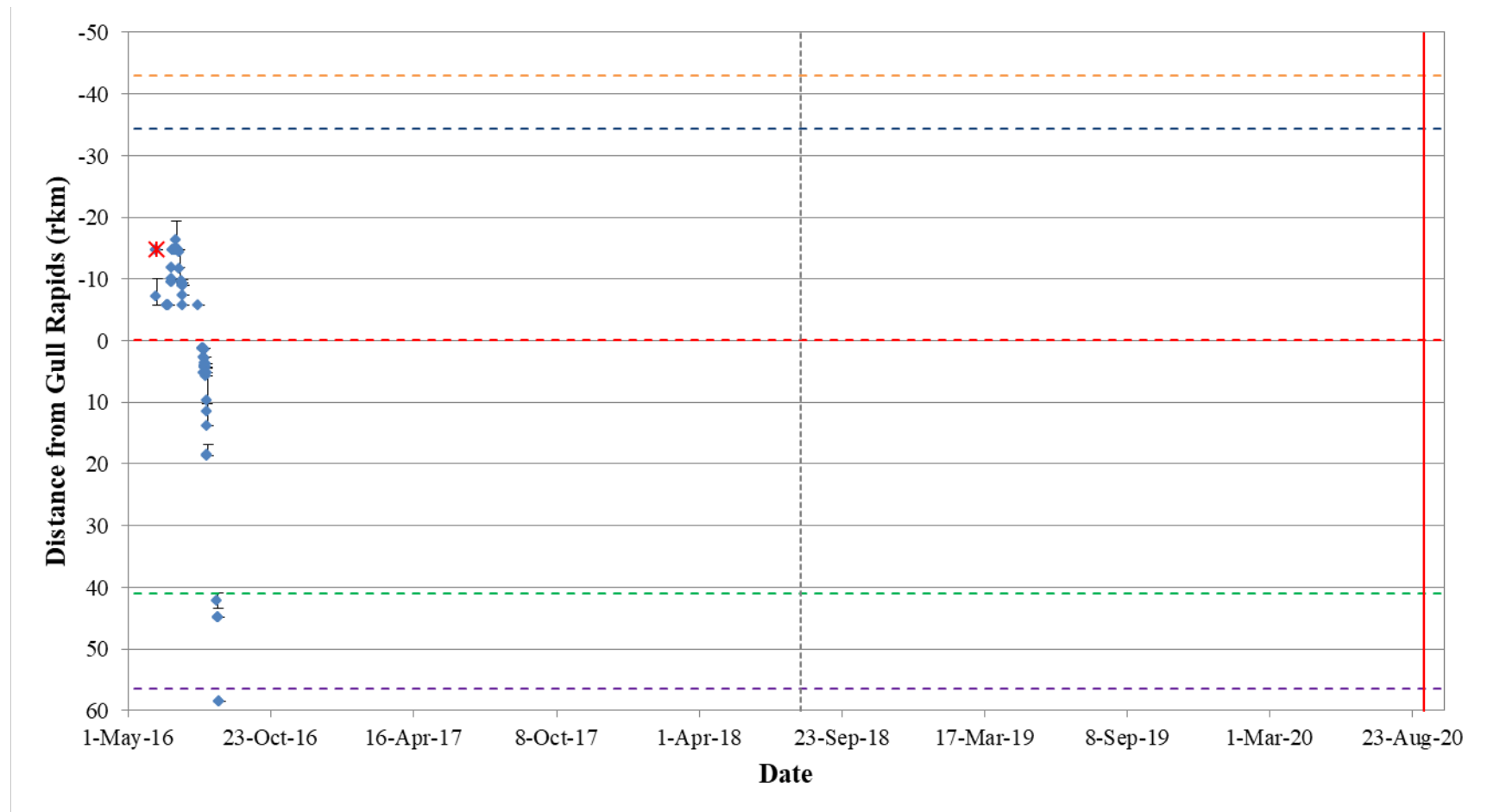


Figure A2-12: Position of a Walleye tagged with an acoustic transmitter (code #53771) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

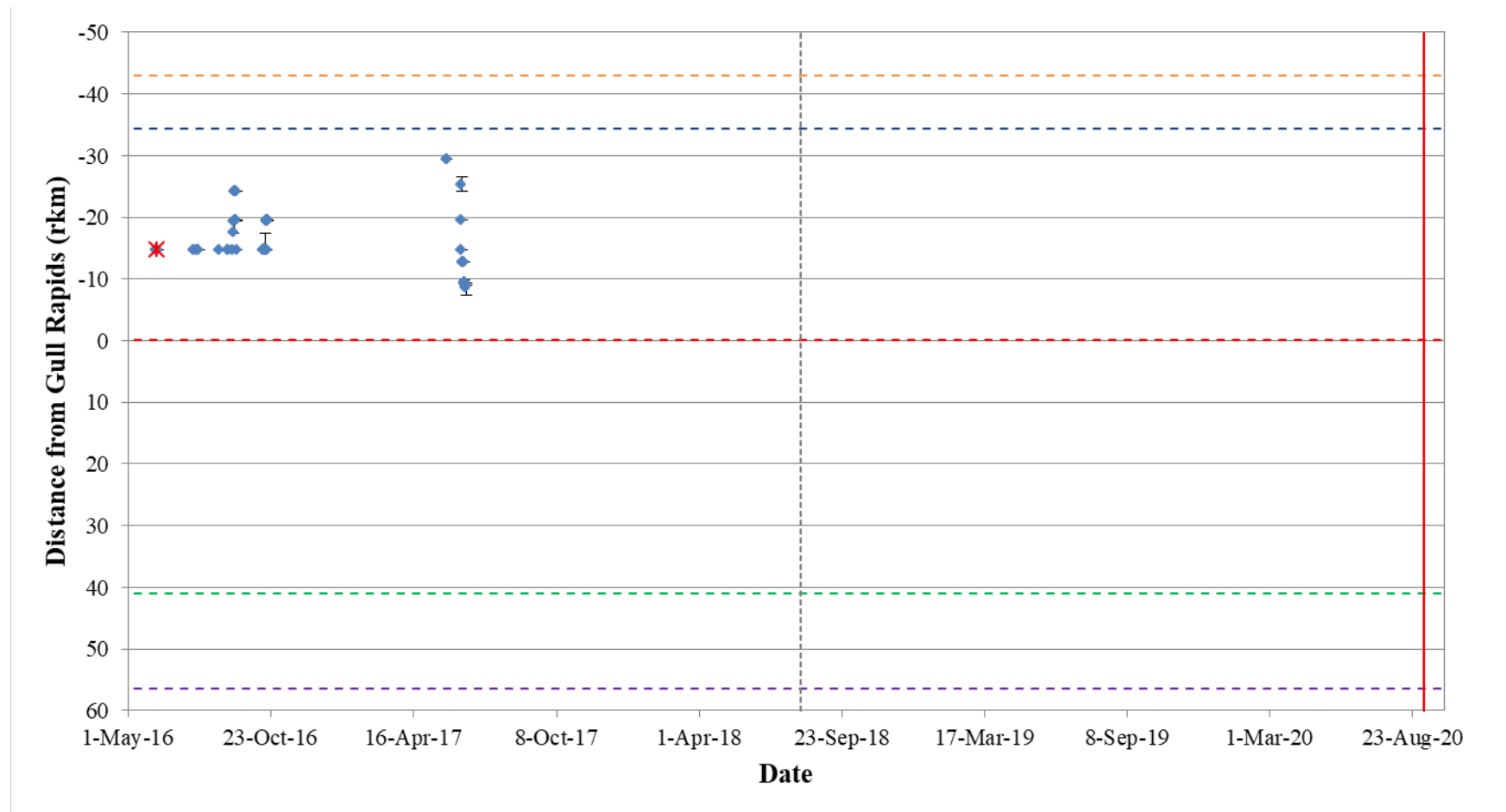


Figure A2-13: Position of a Walleye tagged with an acoustic transmitter (code #53772) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

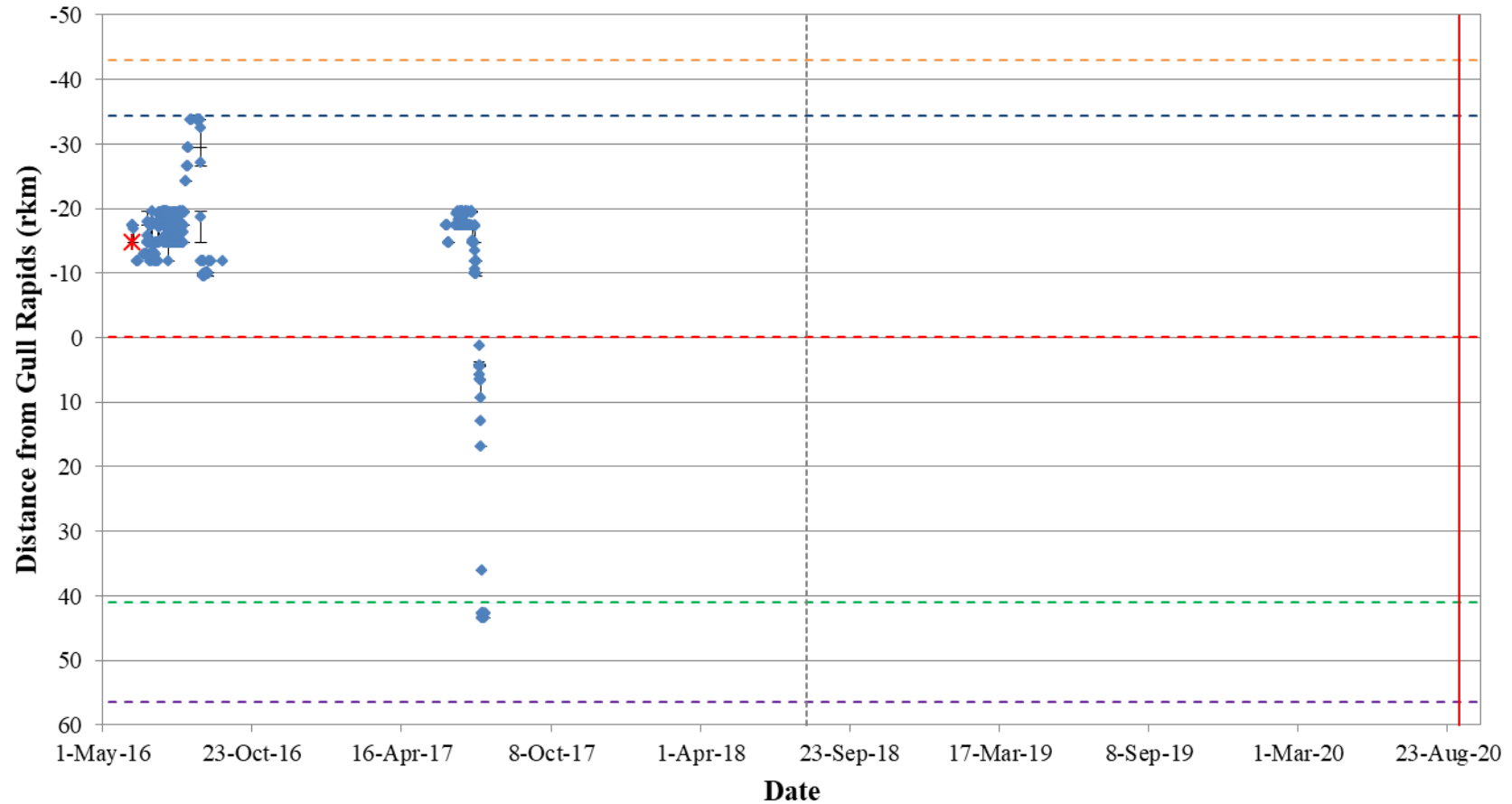


Figure A2-14: Position of a Walleye tagged with an acoustic transmitter (code #53773) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

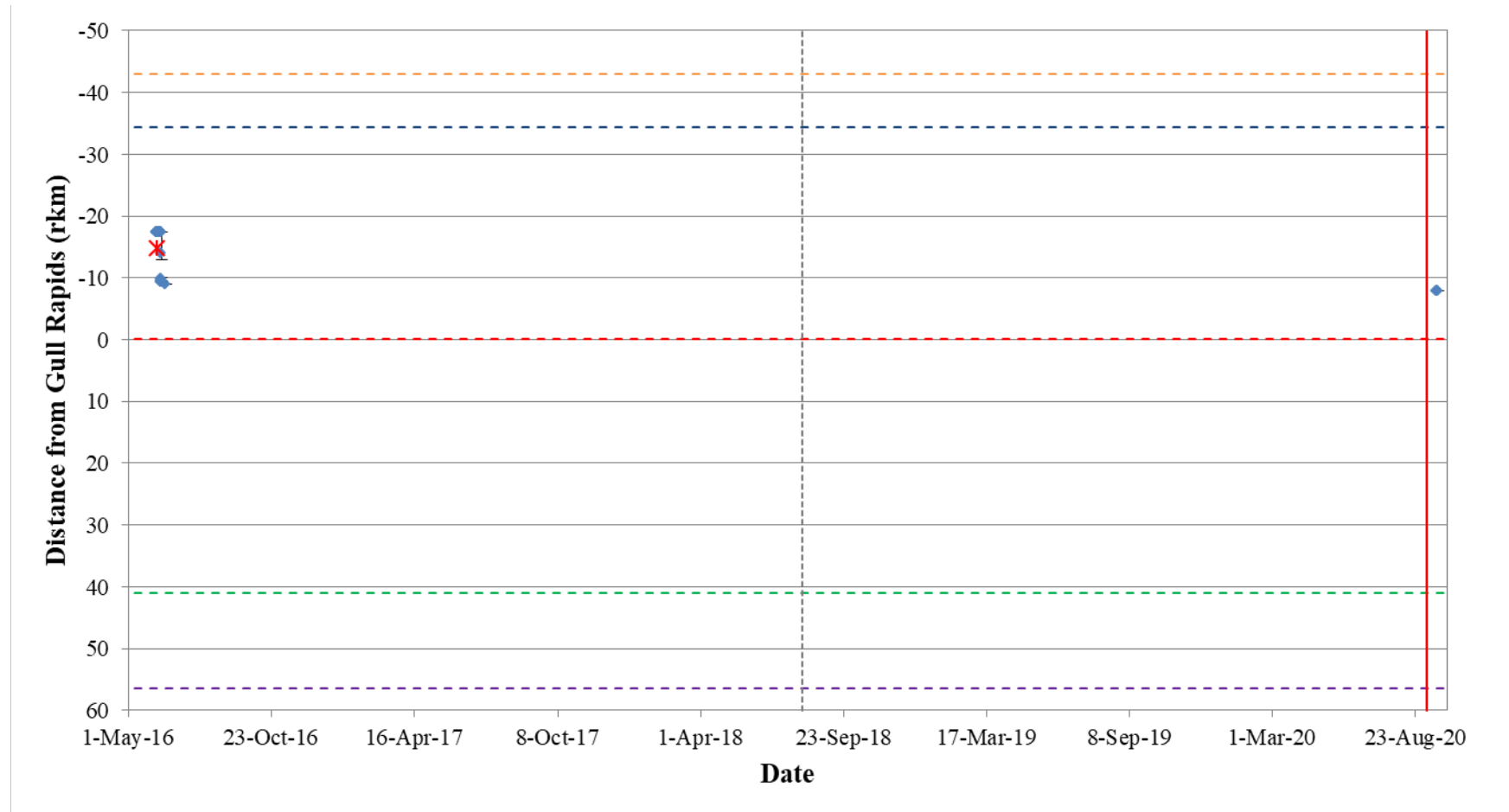


Figure A2-15: Position of a Walleye tagged with an acoustic transmitter (code #53774) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

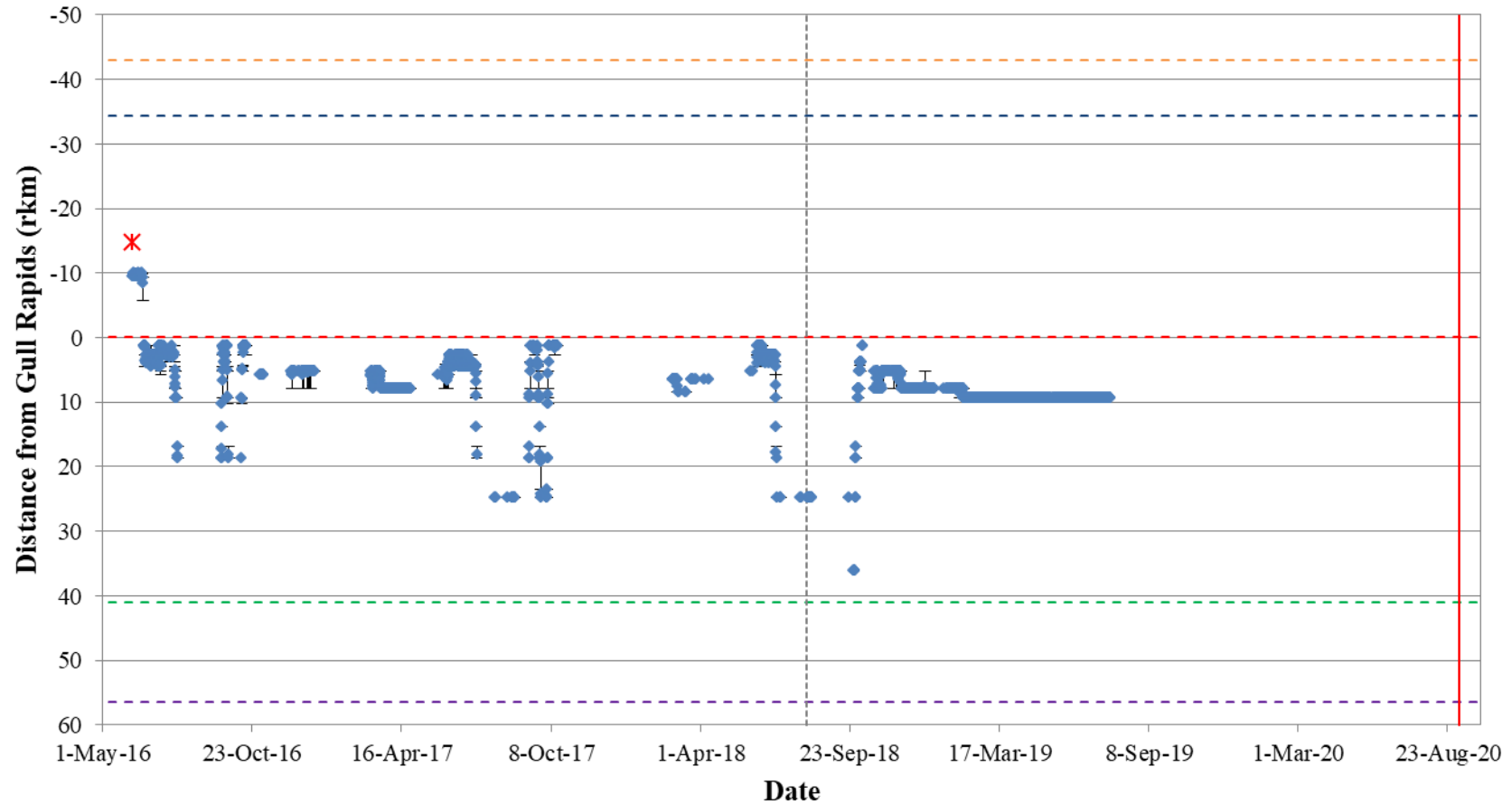


Figure A2-16: Position of a Walleye tagged with an acoustic transmitter (code #53775) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

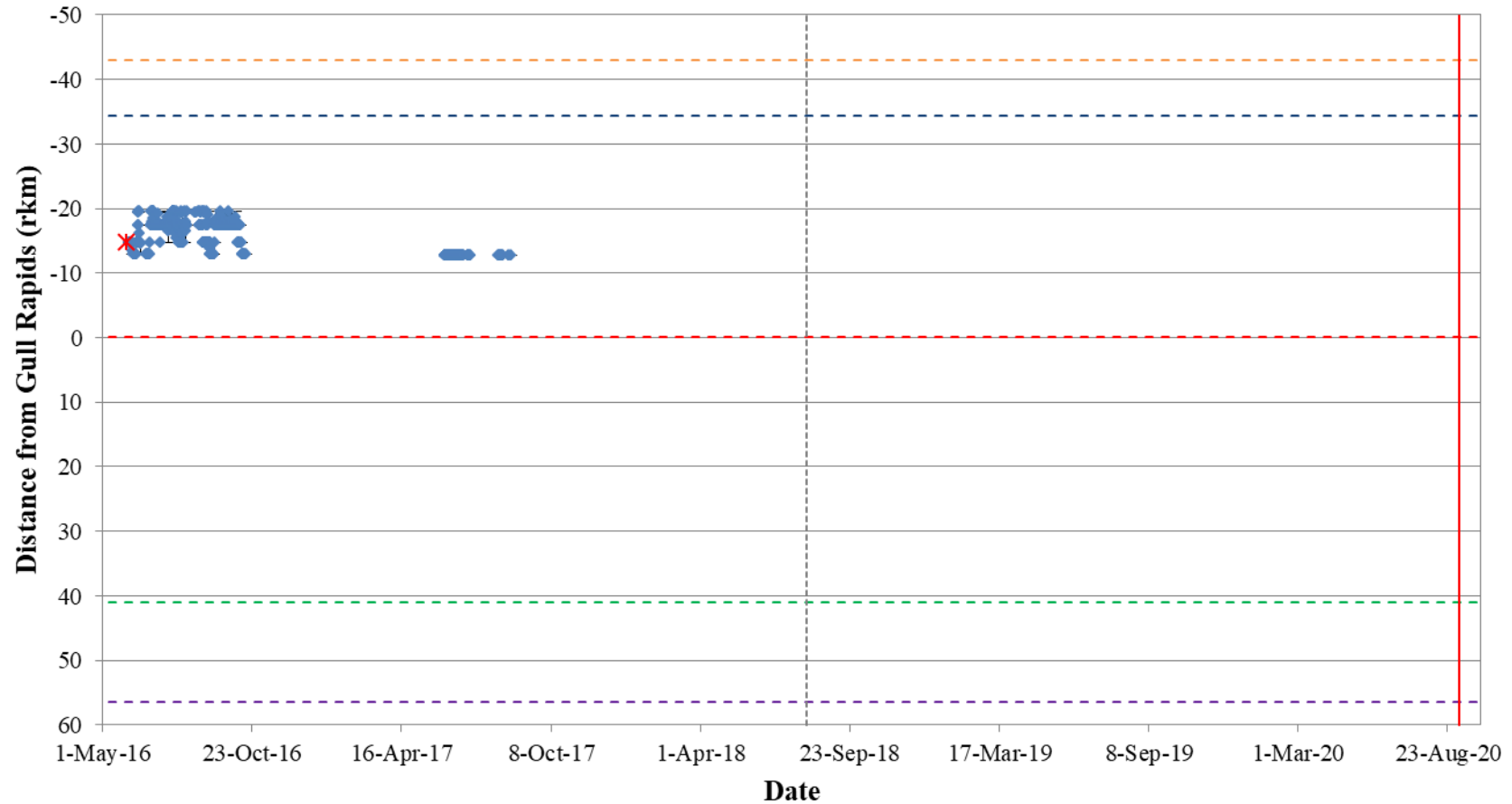


Figure A2-17: Position of a Walleye tagged with an acoustic transmitter (code #53776) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

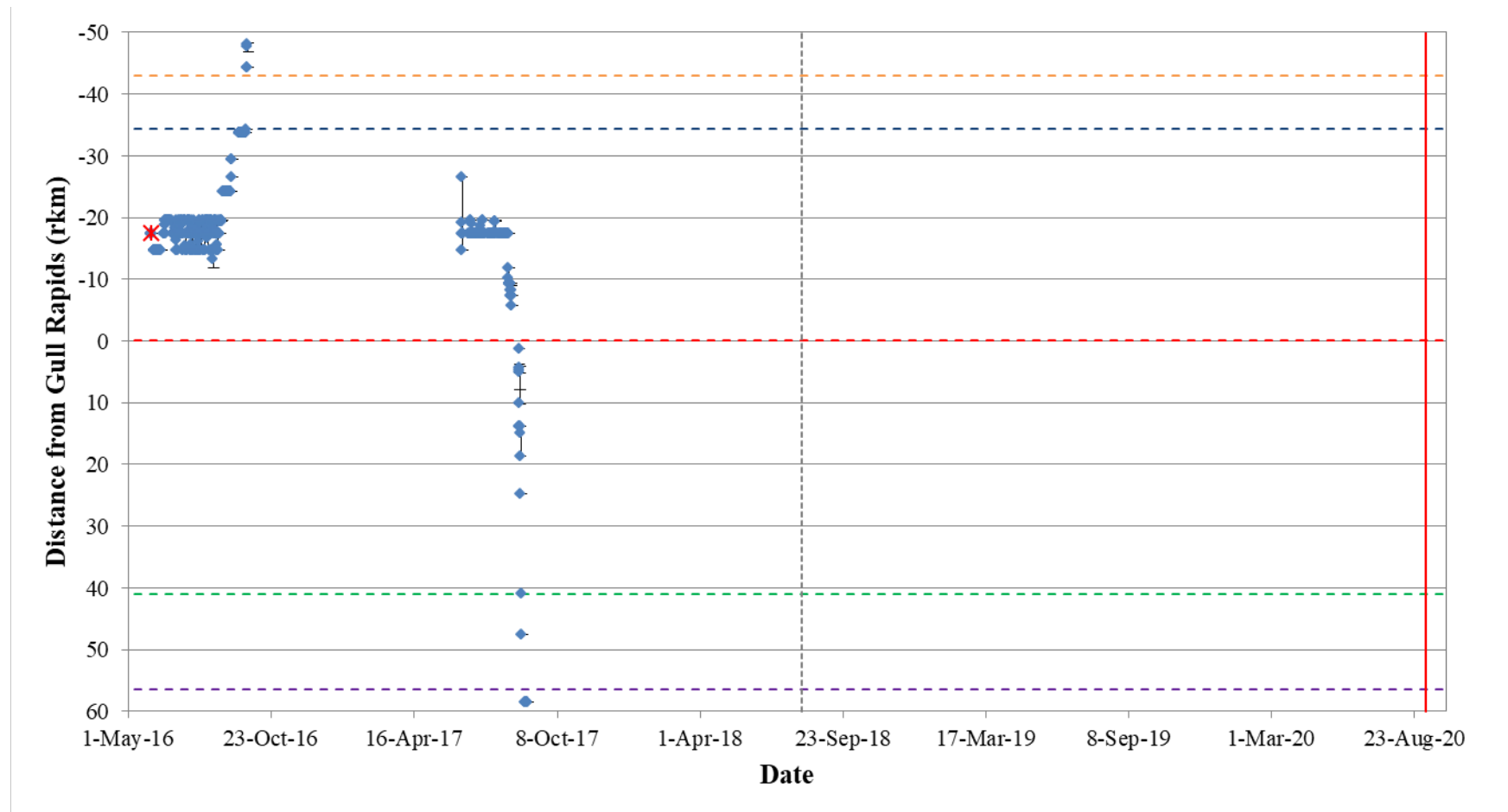


Figure A2-18: Position of a Walleye tagged with an acoustic transmitter (code #53777) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

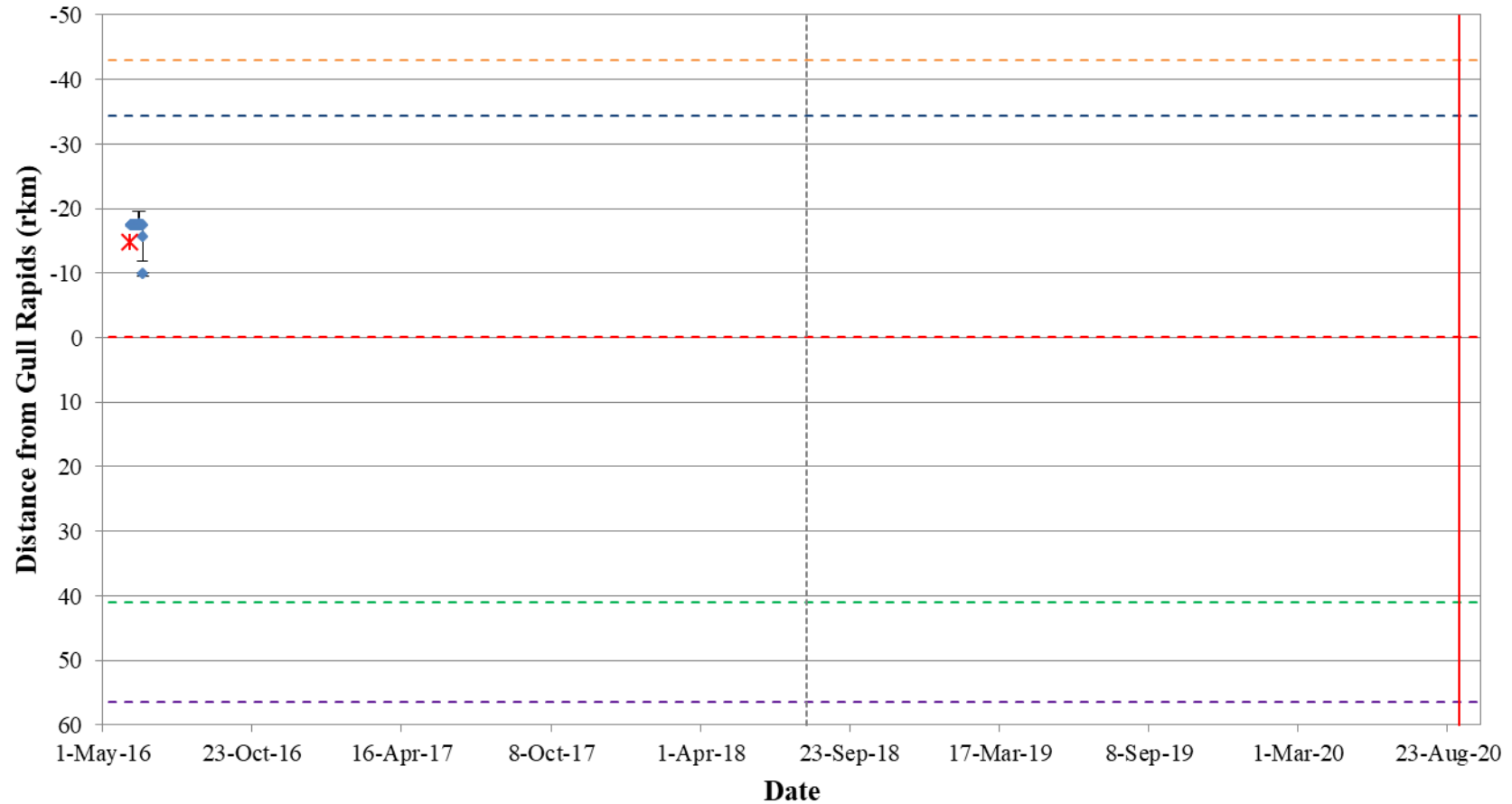


Figure A2-19: Position of a Walleye tagged with an acoustic transmitter (code #53778) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

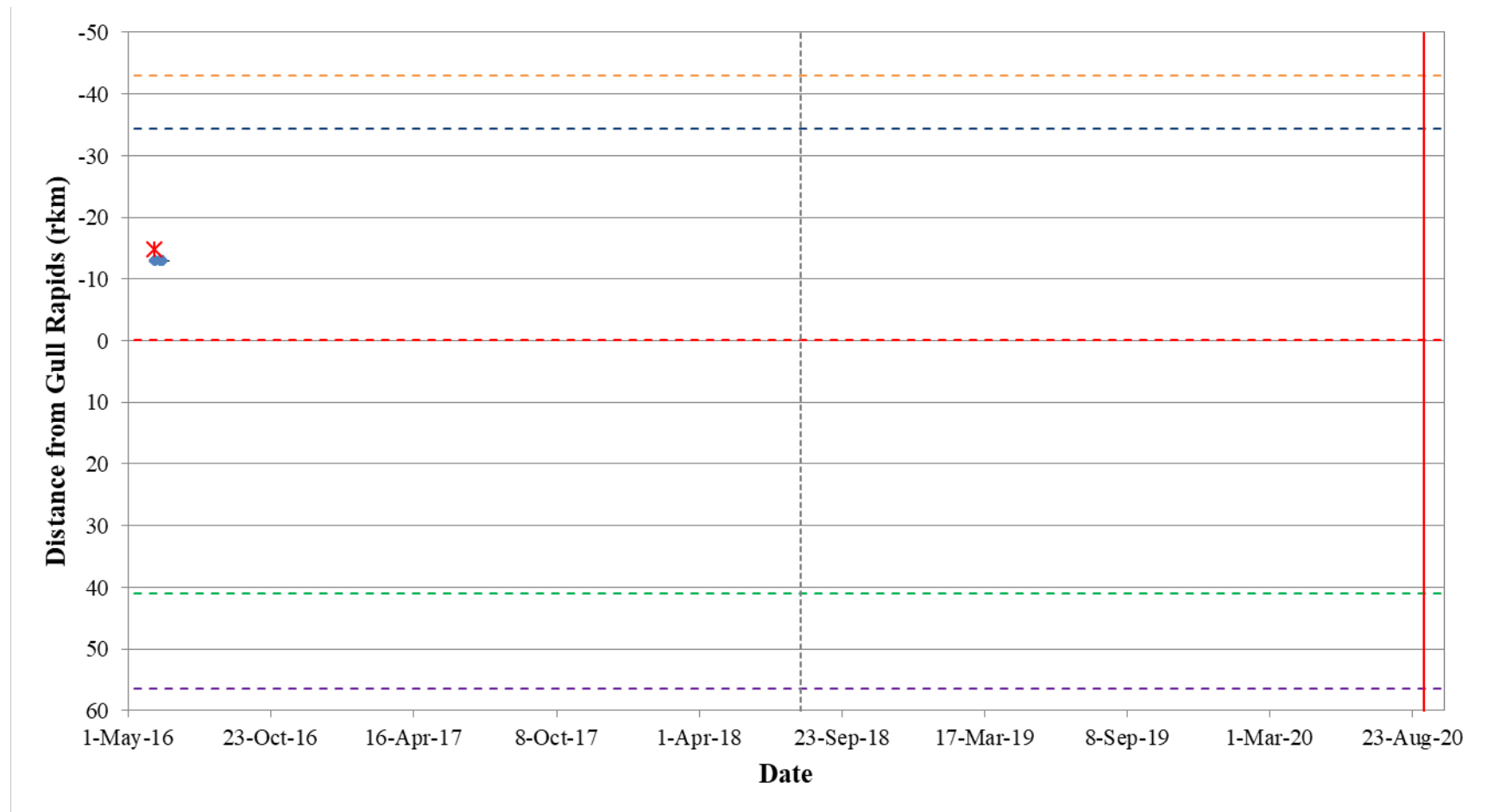


Figure A2-20: Position of a Walleye tagged with an acoustic transmitter (code #53779) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

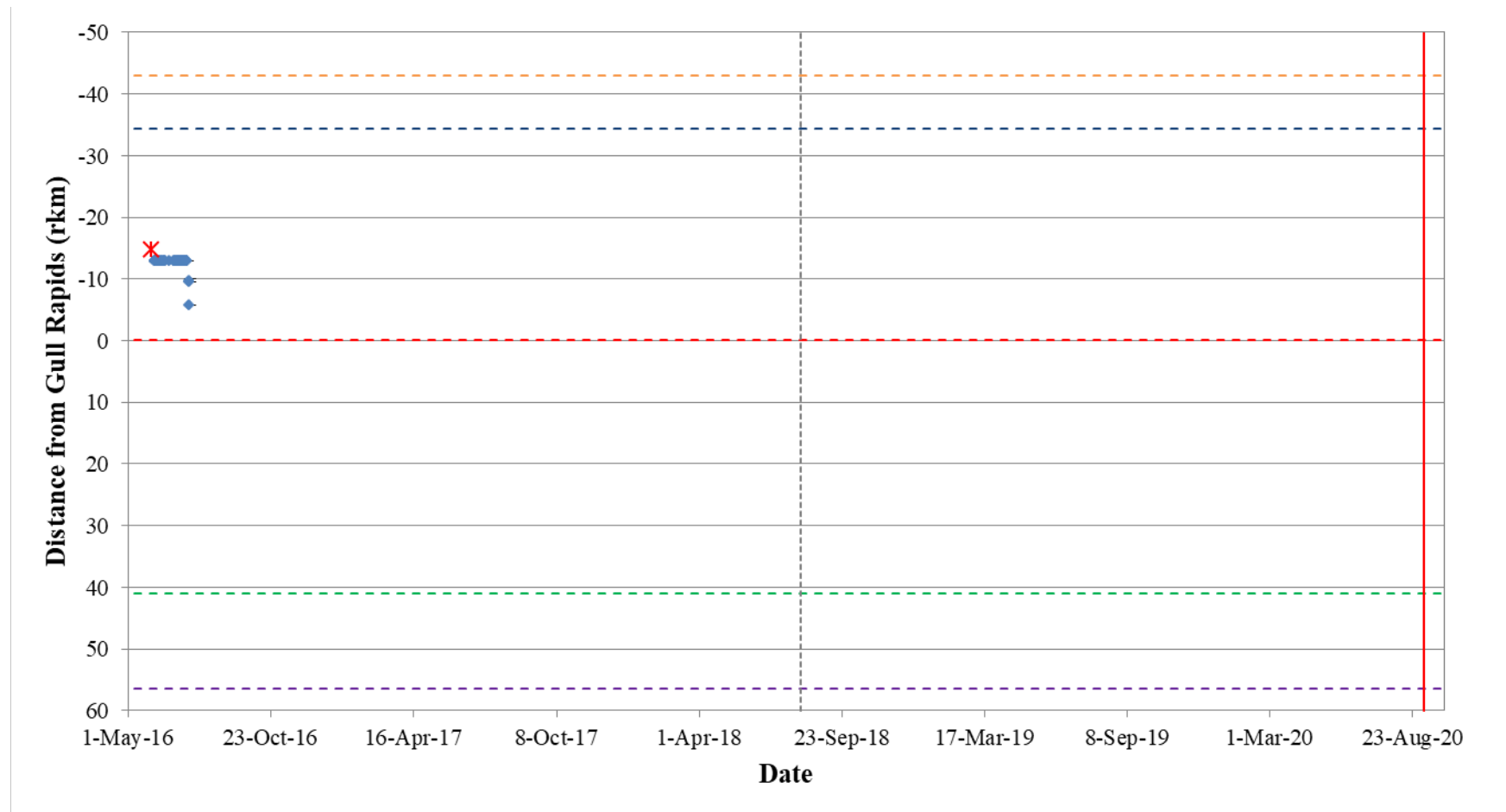


Figure A2-21: Position of a Walleye tagged with an acoustic transmitter (code #53780) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

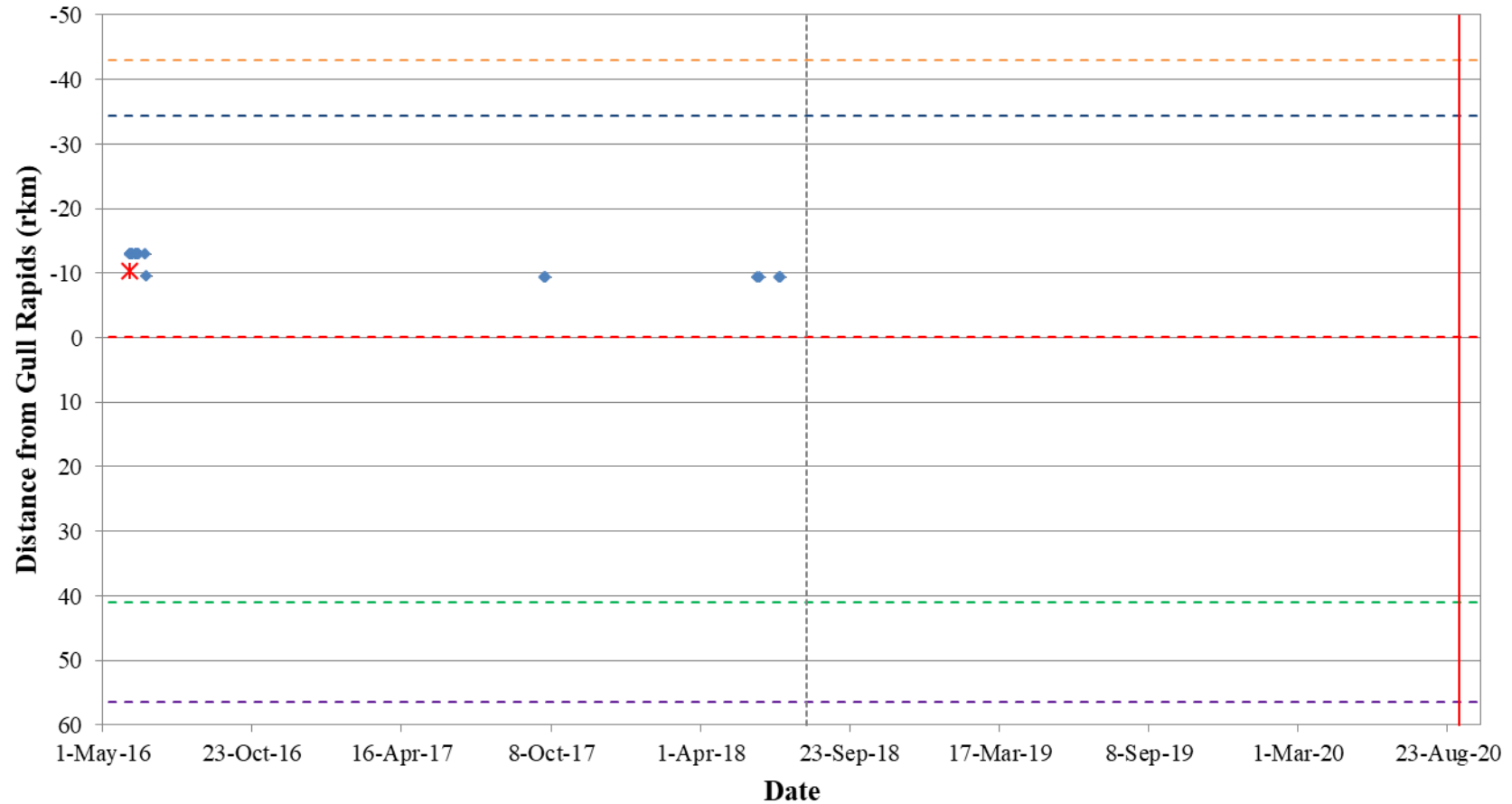


Figure A2-22: Position of a Walleye tagged with an acoustic transmitter (code #53781) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

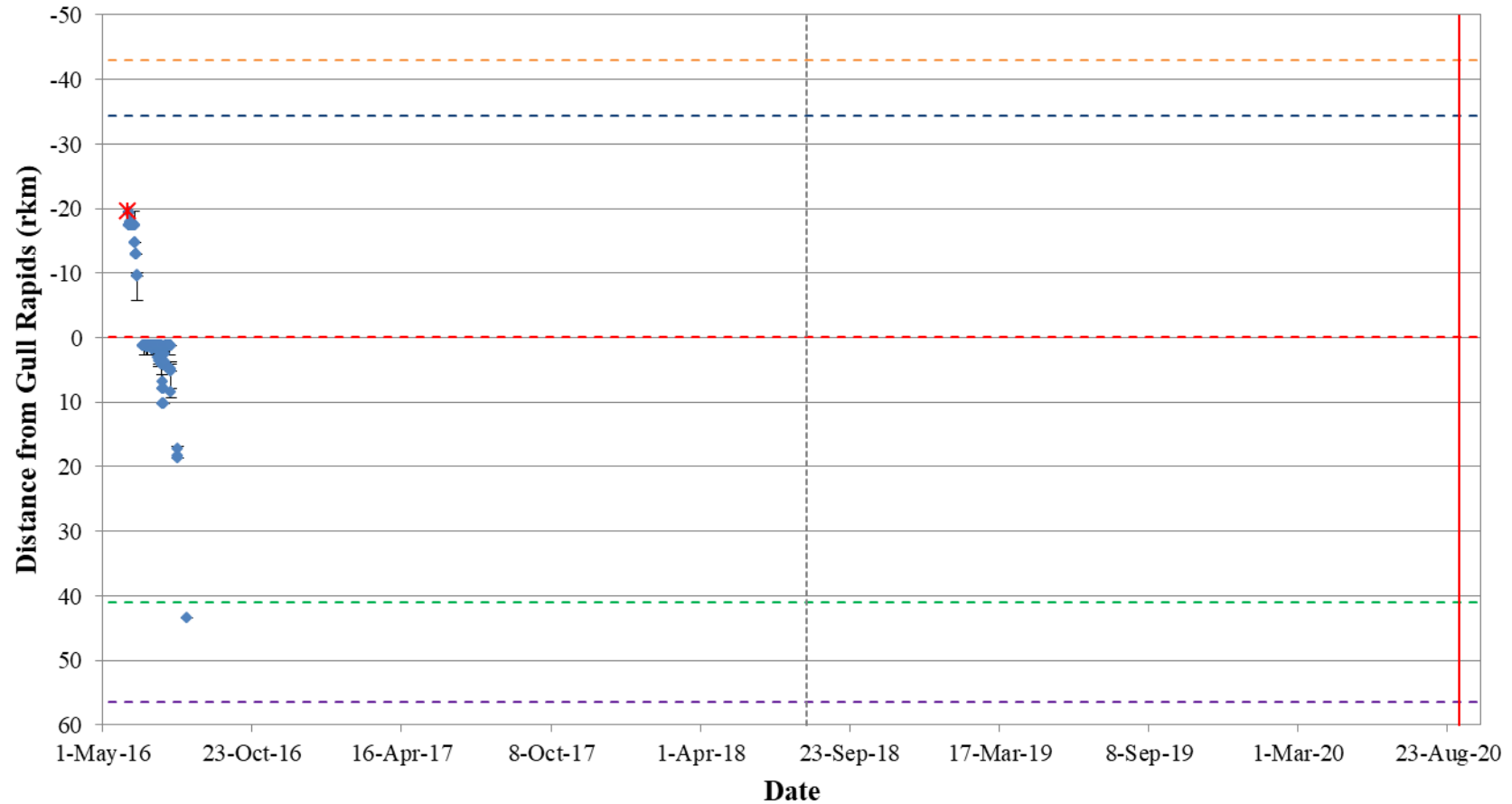


Figure A2-23: Position of a Walleye tagged with an acoustic transmitter (code #53782) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

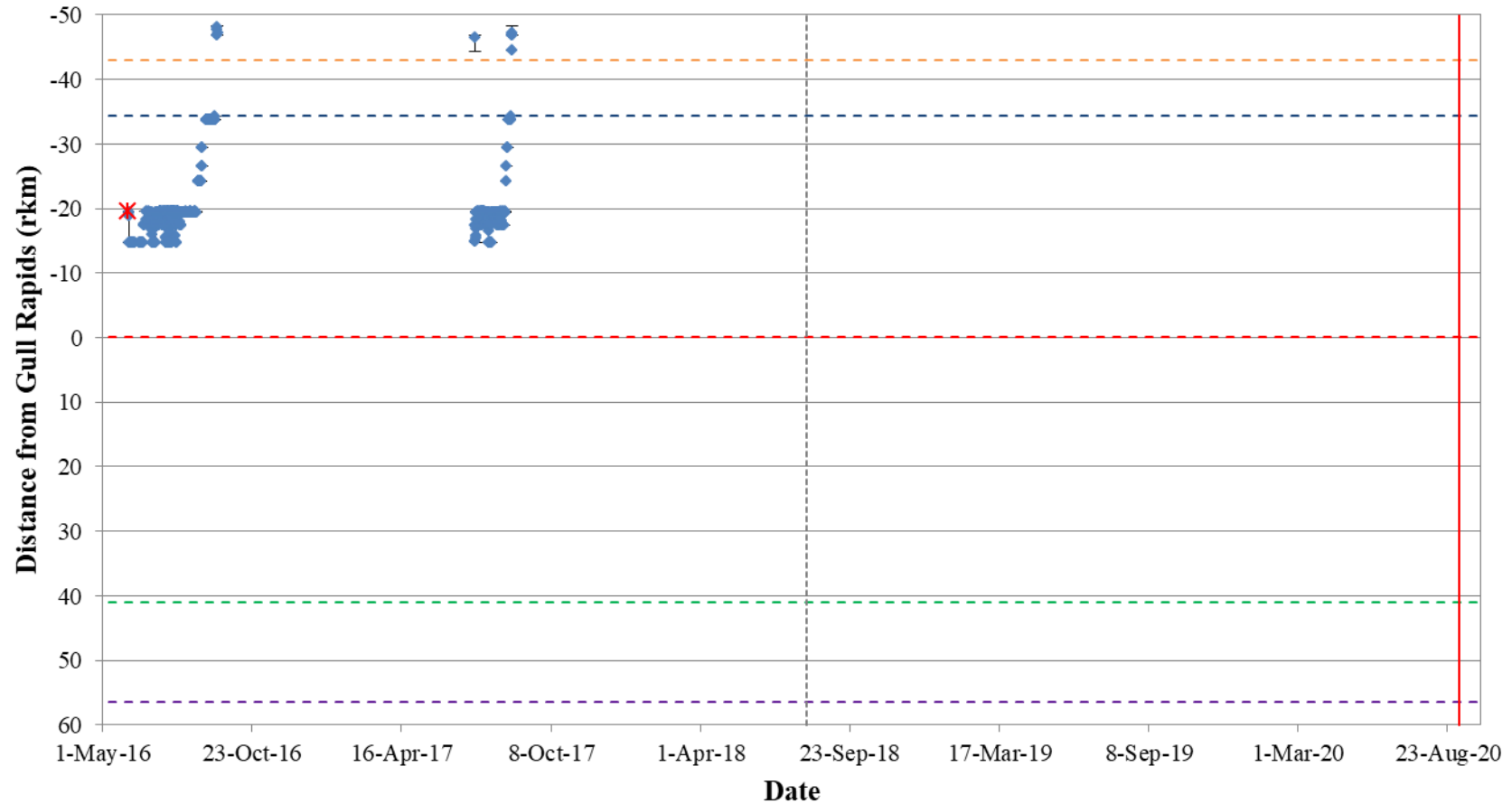


Figure A2-24: Position of a Walleye tagged with an acoustic transmitter (code #53783) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

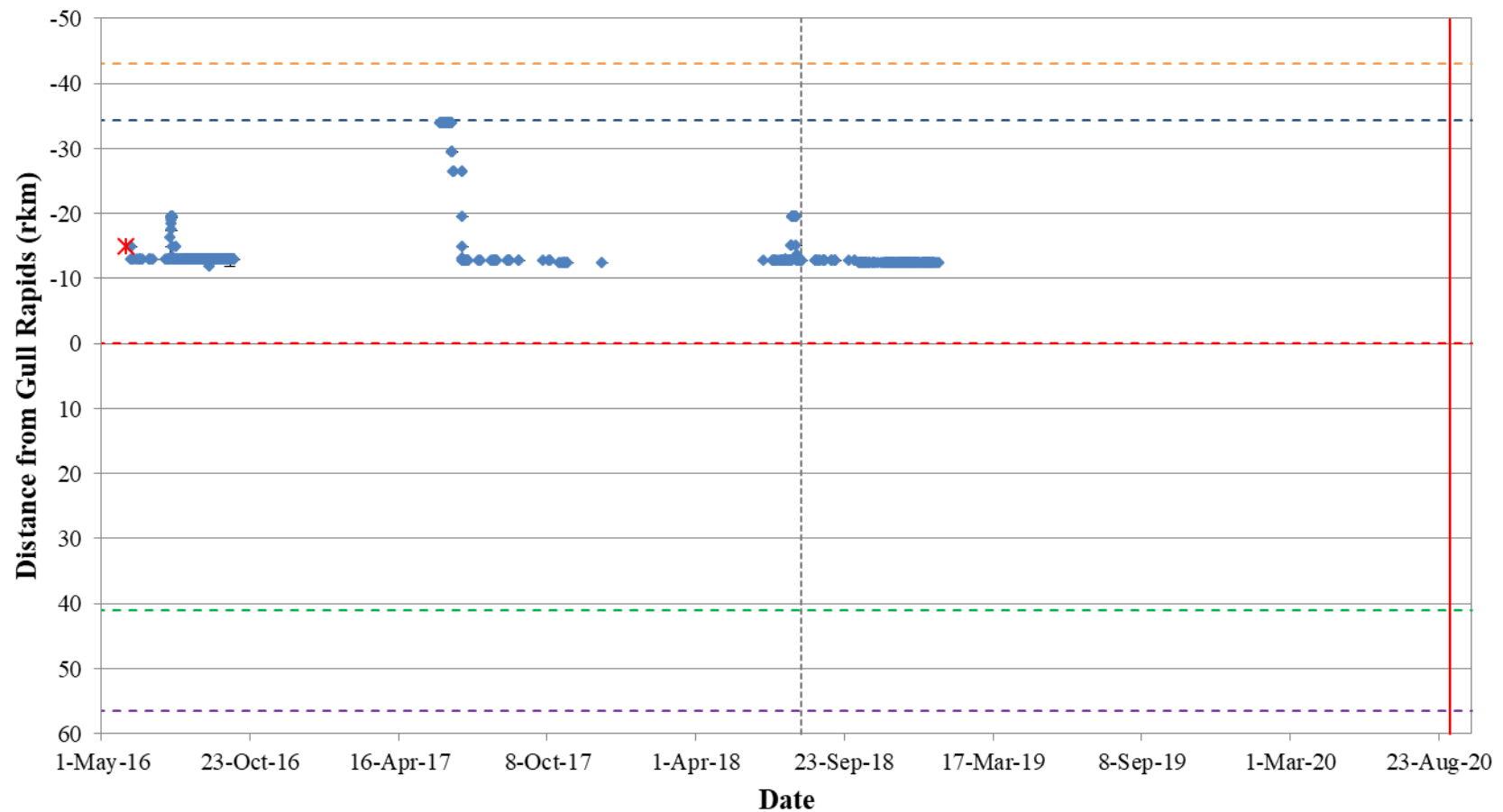


Figure A2-25: Position of a Walleye tagged with an acoustic transmitter (code #53784) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

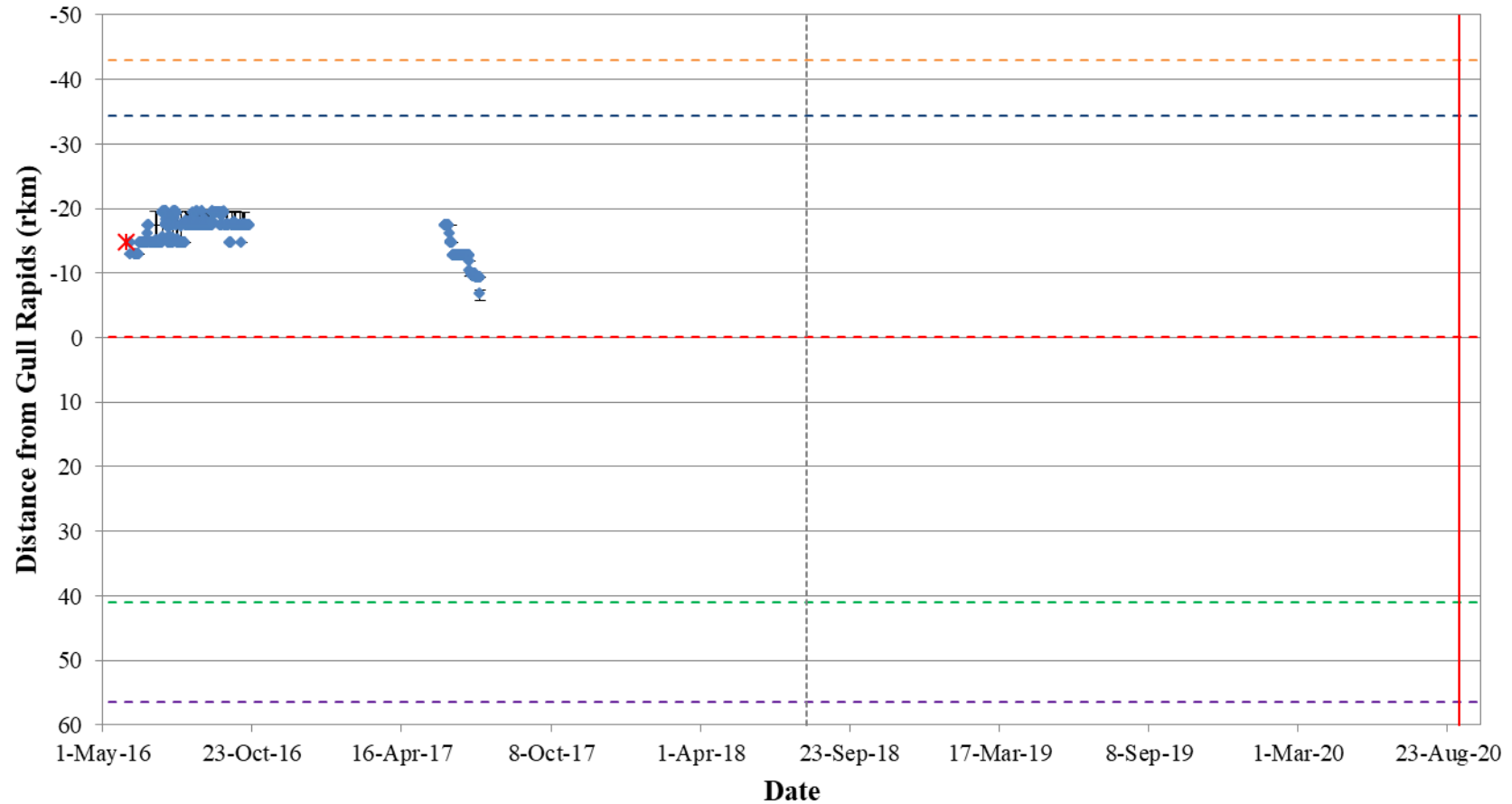


Figure A2-26: Position of a Walleye tagged with an acoustic transmitter (code #53785) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

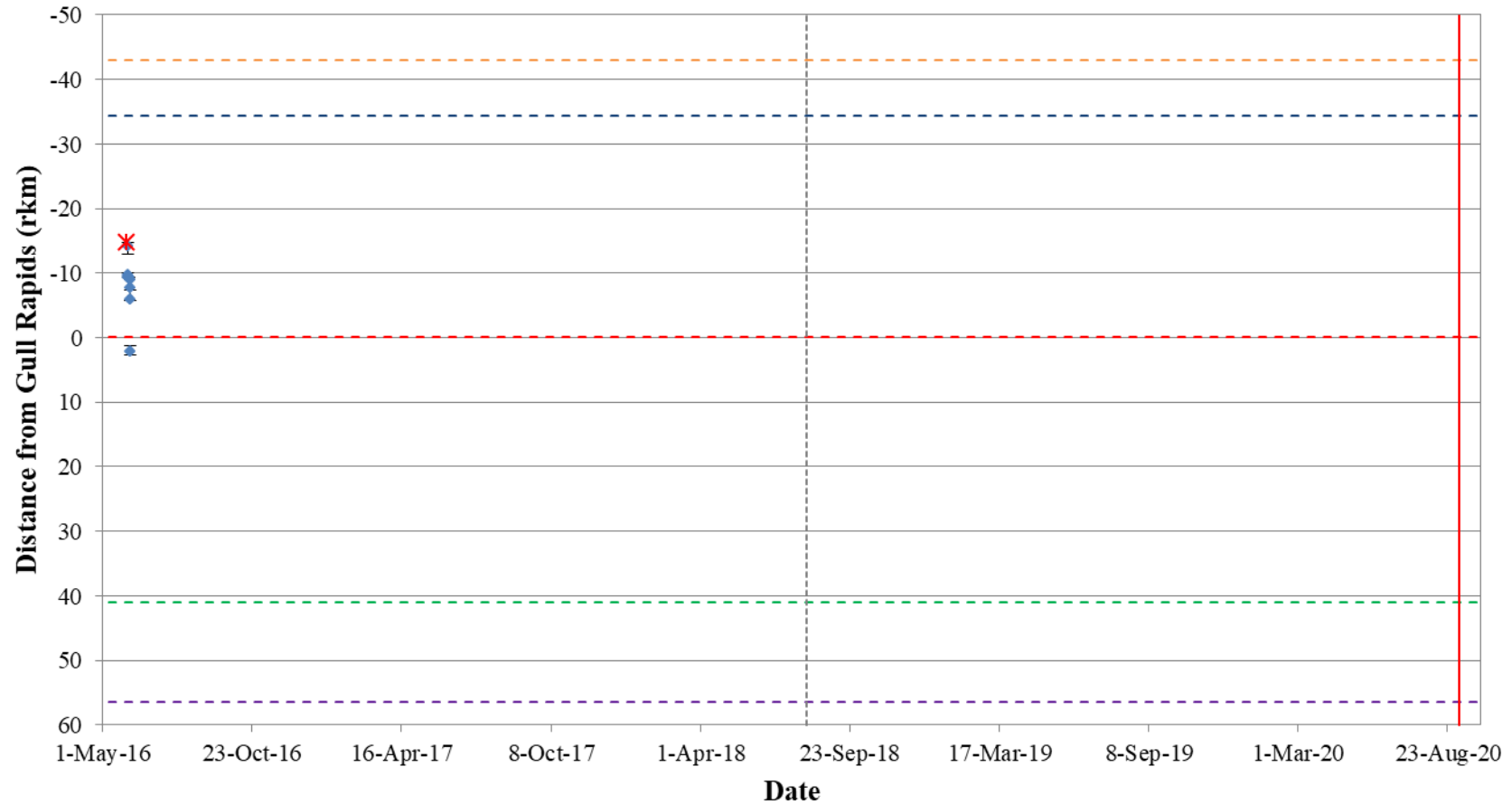


Figure A2-27: Position of a Walleye tagged with an acoustic transmitter (code #53786) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

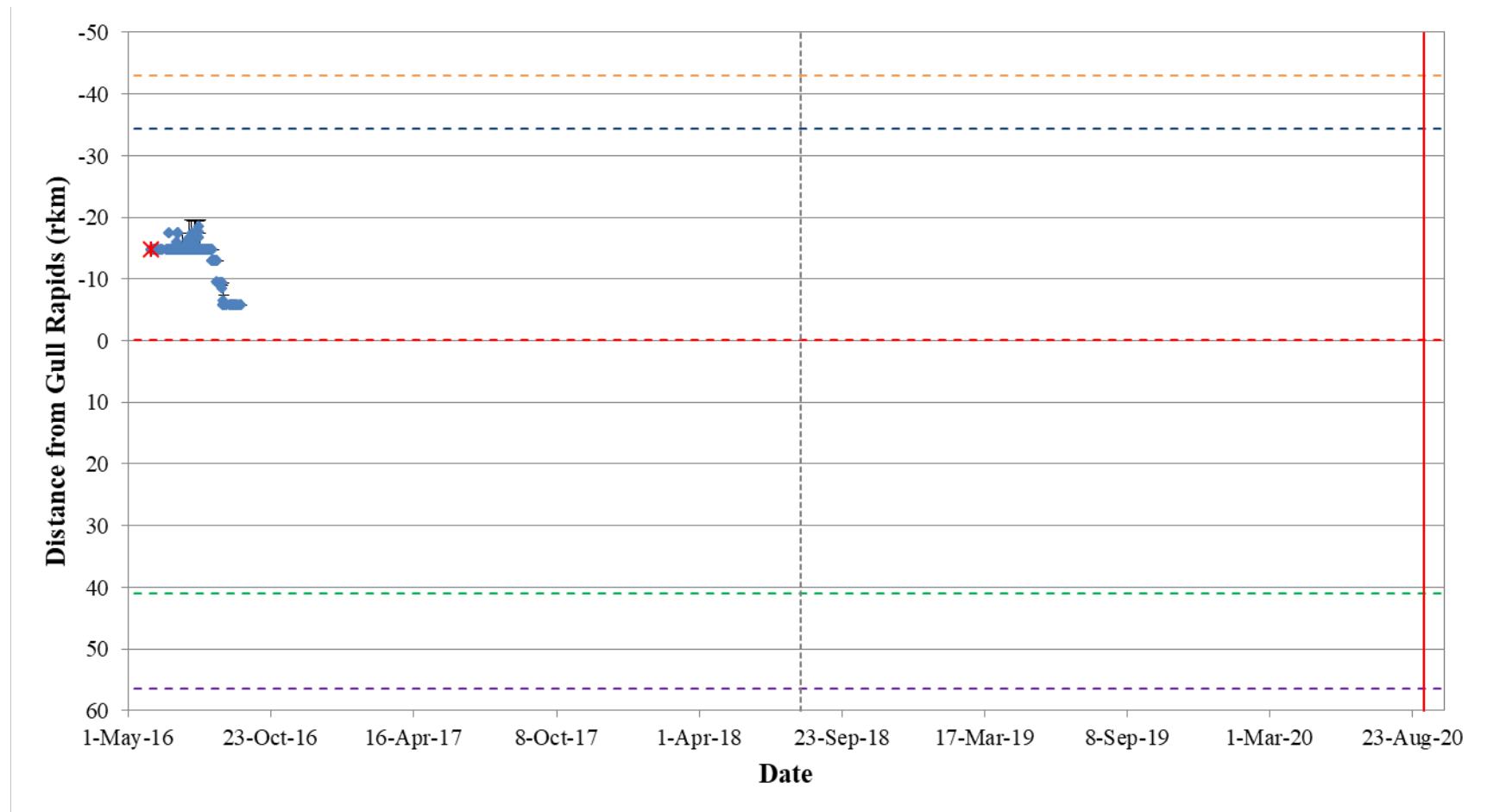


Figure A2-28: Position of a Walleye tagged with an acoustic transmitter (code #53787) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

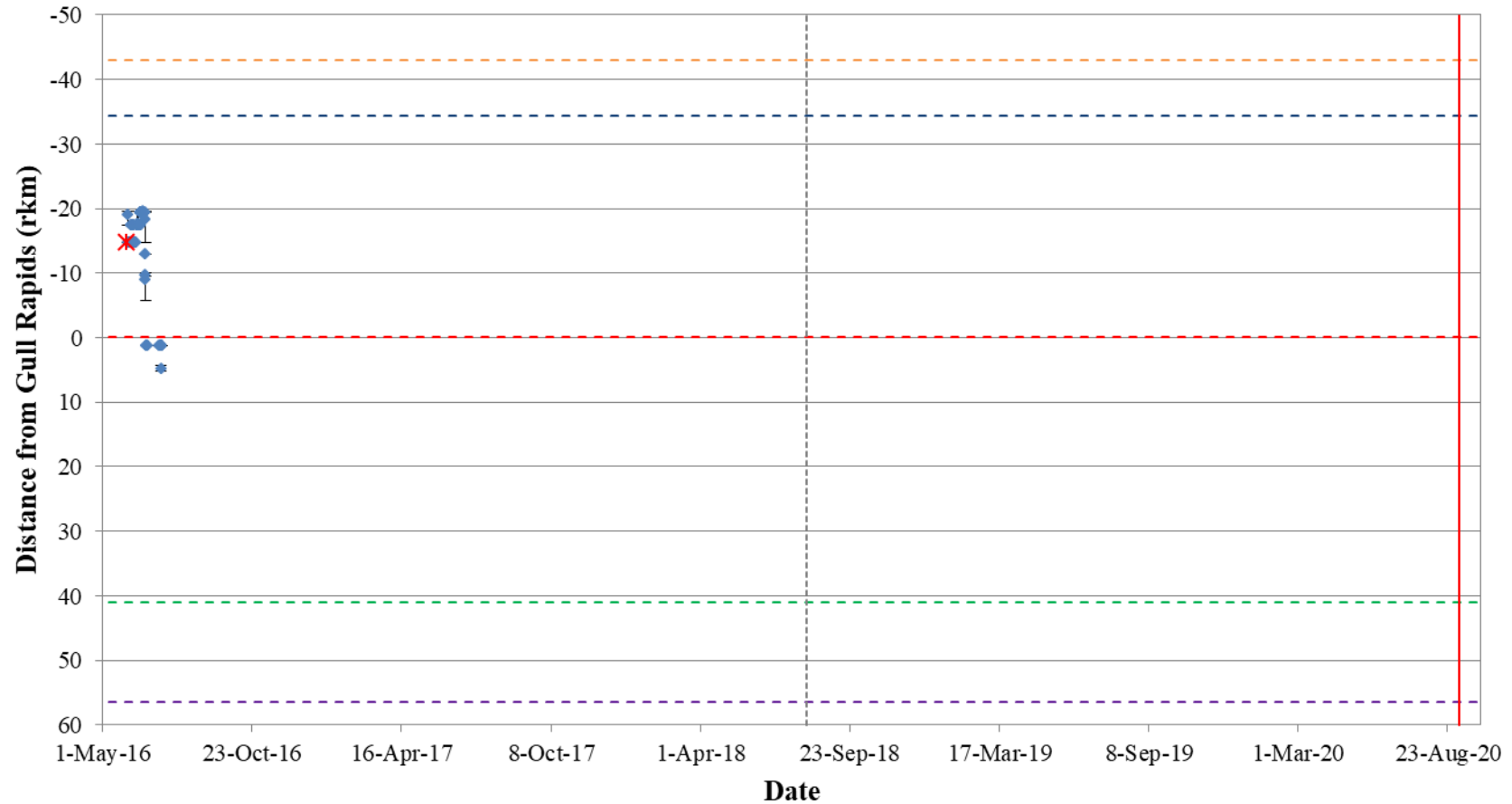


Figure A2-29: Position of a Walleye tagged with an acoustic transmitter (code #53788) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

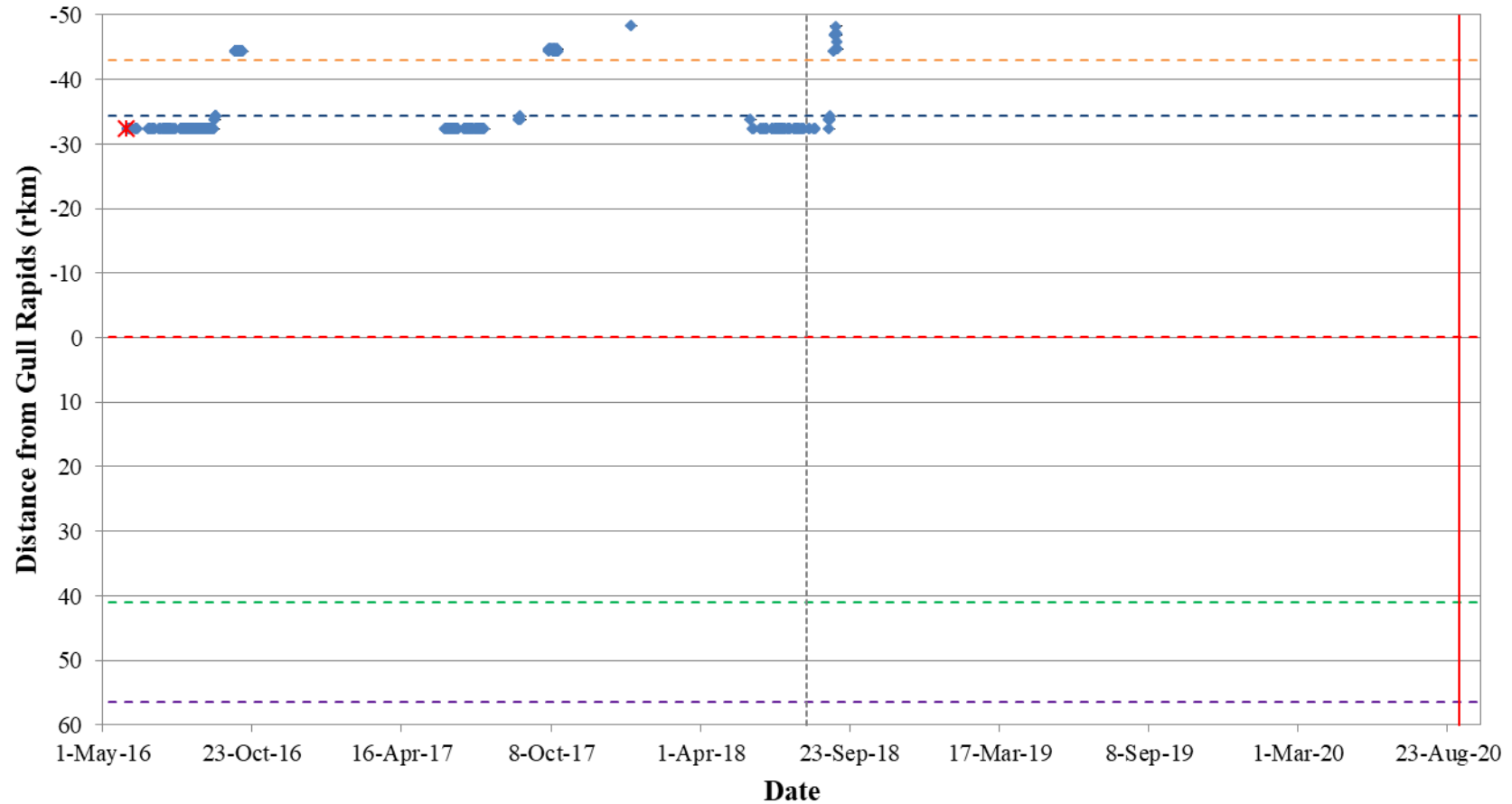


Figure A2-30: Position of a Walleye tagged with an acoustic transmitter (code #53789) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

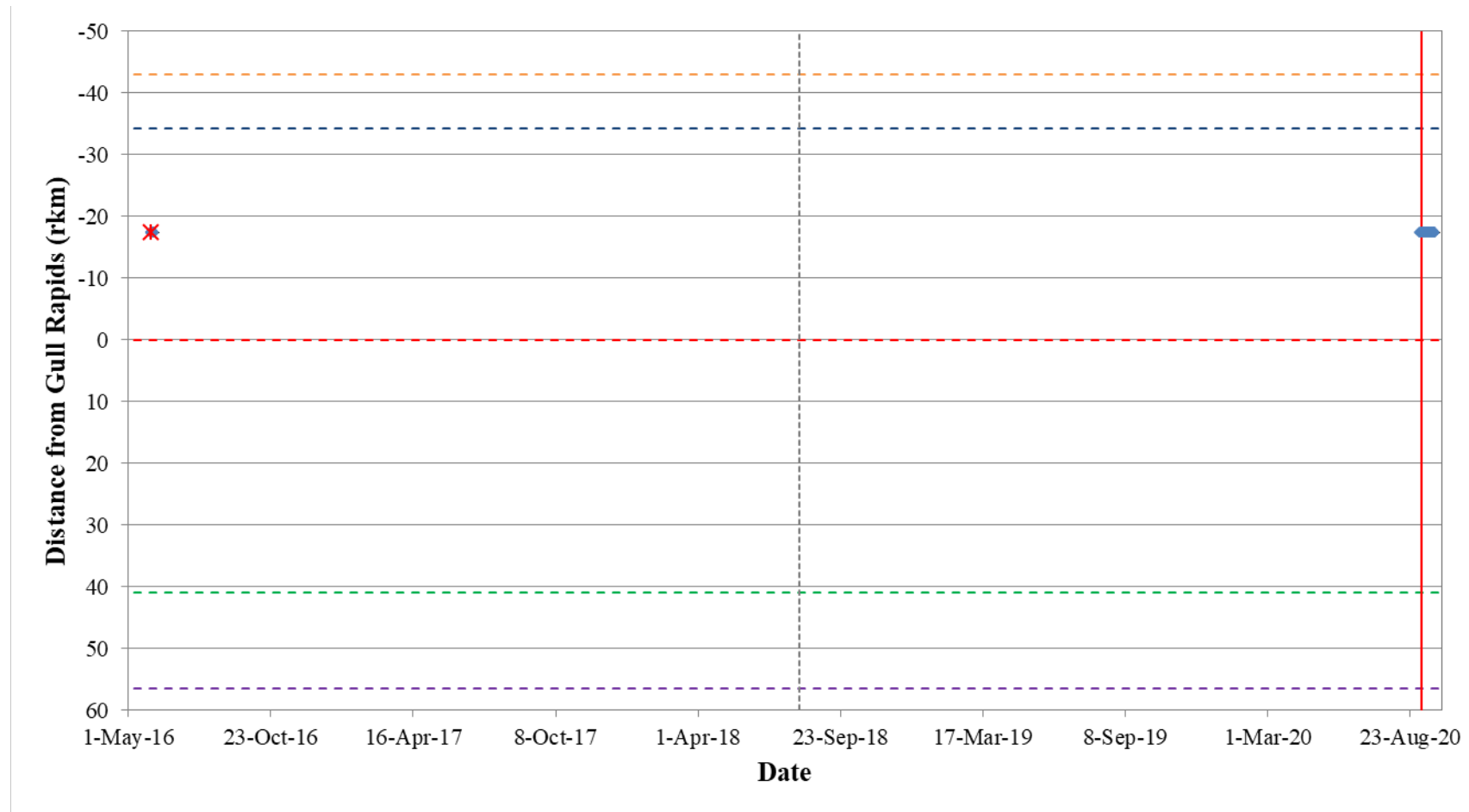


Figure A2-31: Position of a Walleye tagged with an acoustic transmitter (code #53790) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

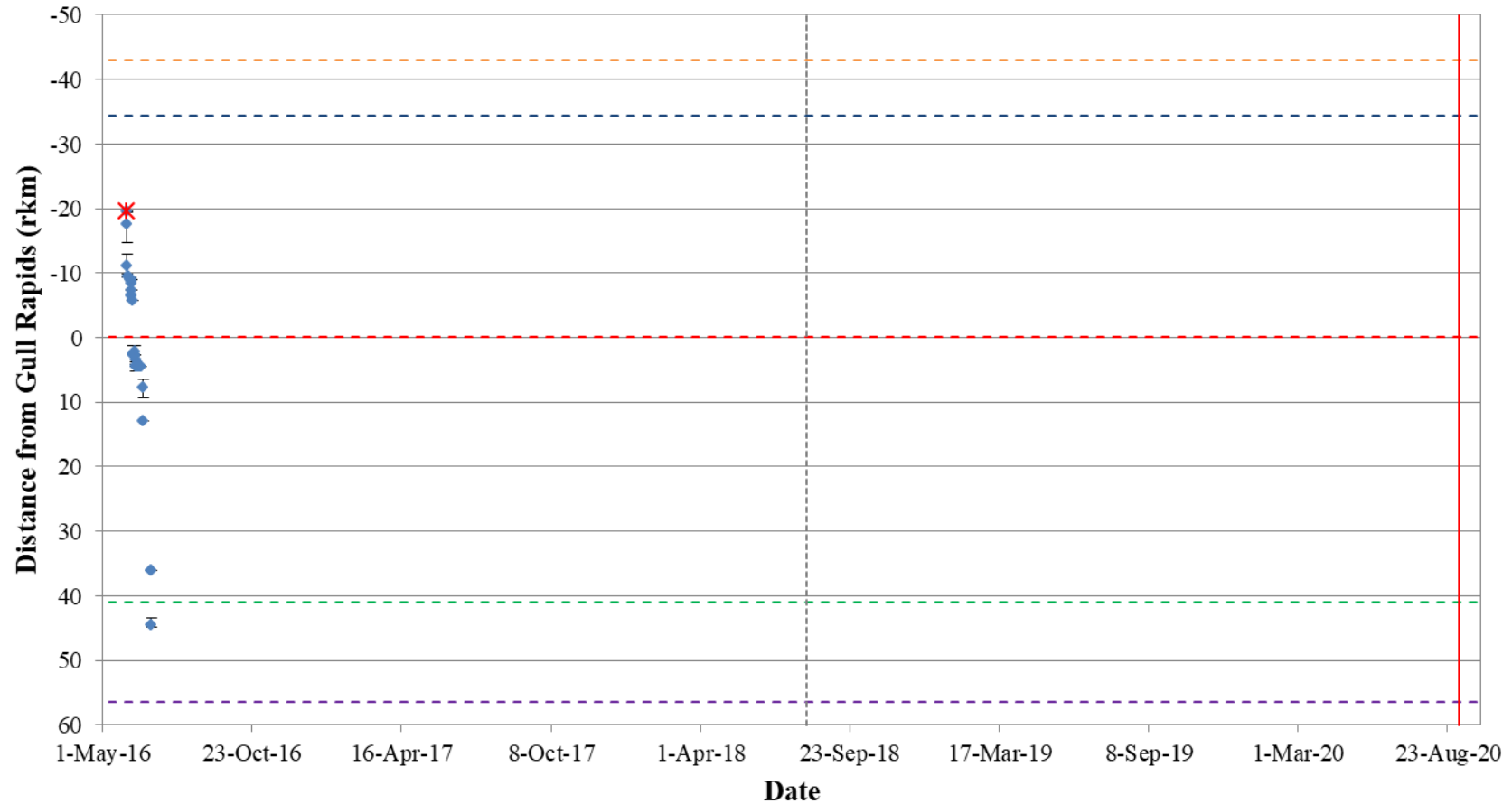


Figure A2-32: Position of a Walleye tagged with an acoustic transmitter (code #53791) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

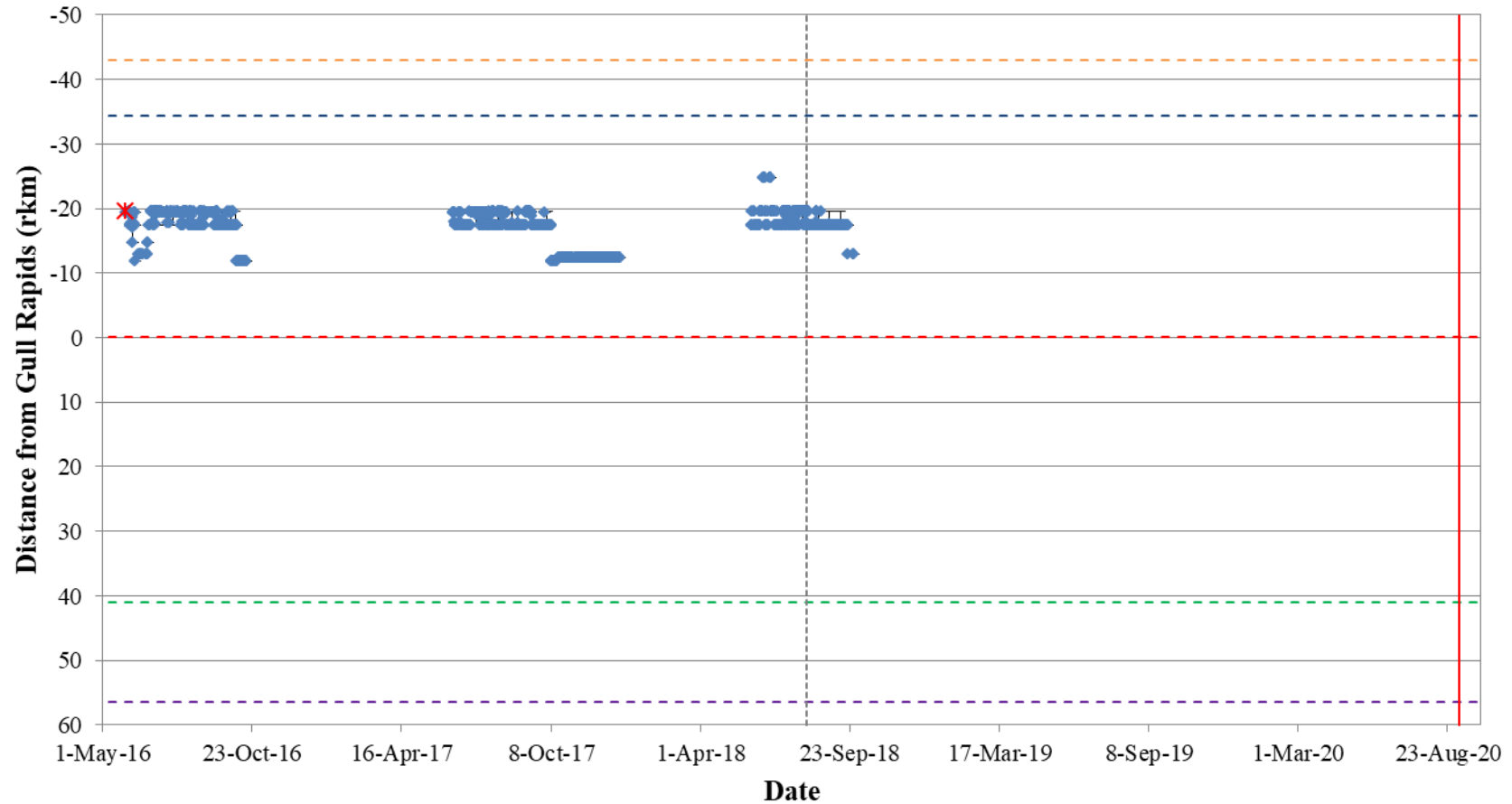


Figure A2-33: Position of a Walleye tagged with an acoustic transmitter (code #53792) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

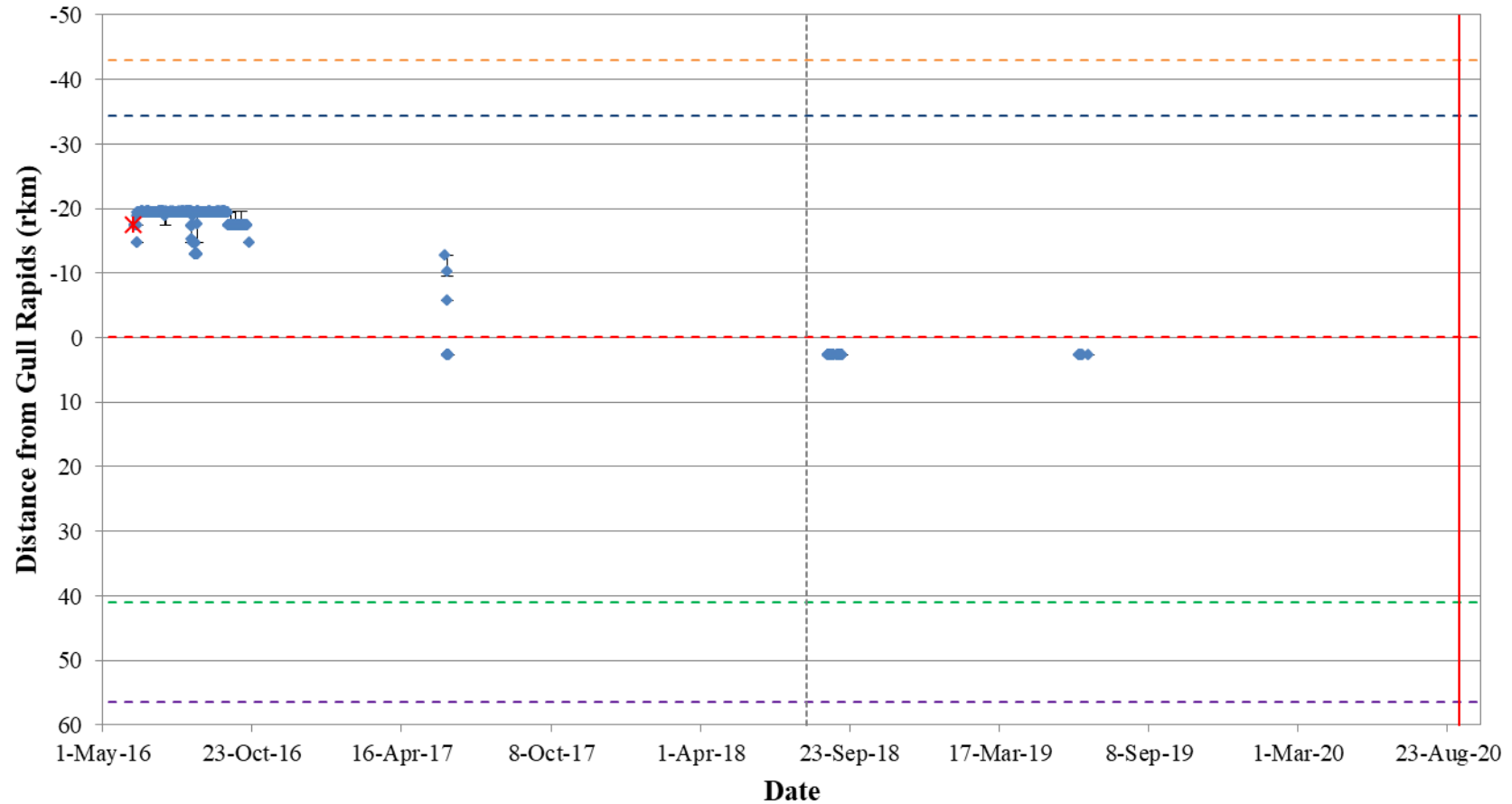


Figure A2-34: Position of a Walleye tagged with an acoustic transmitter (code #53793) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

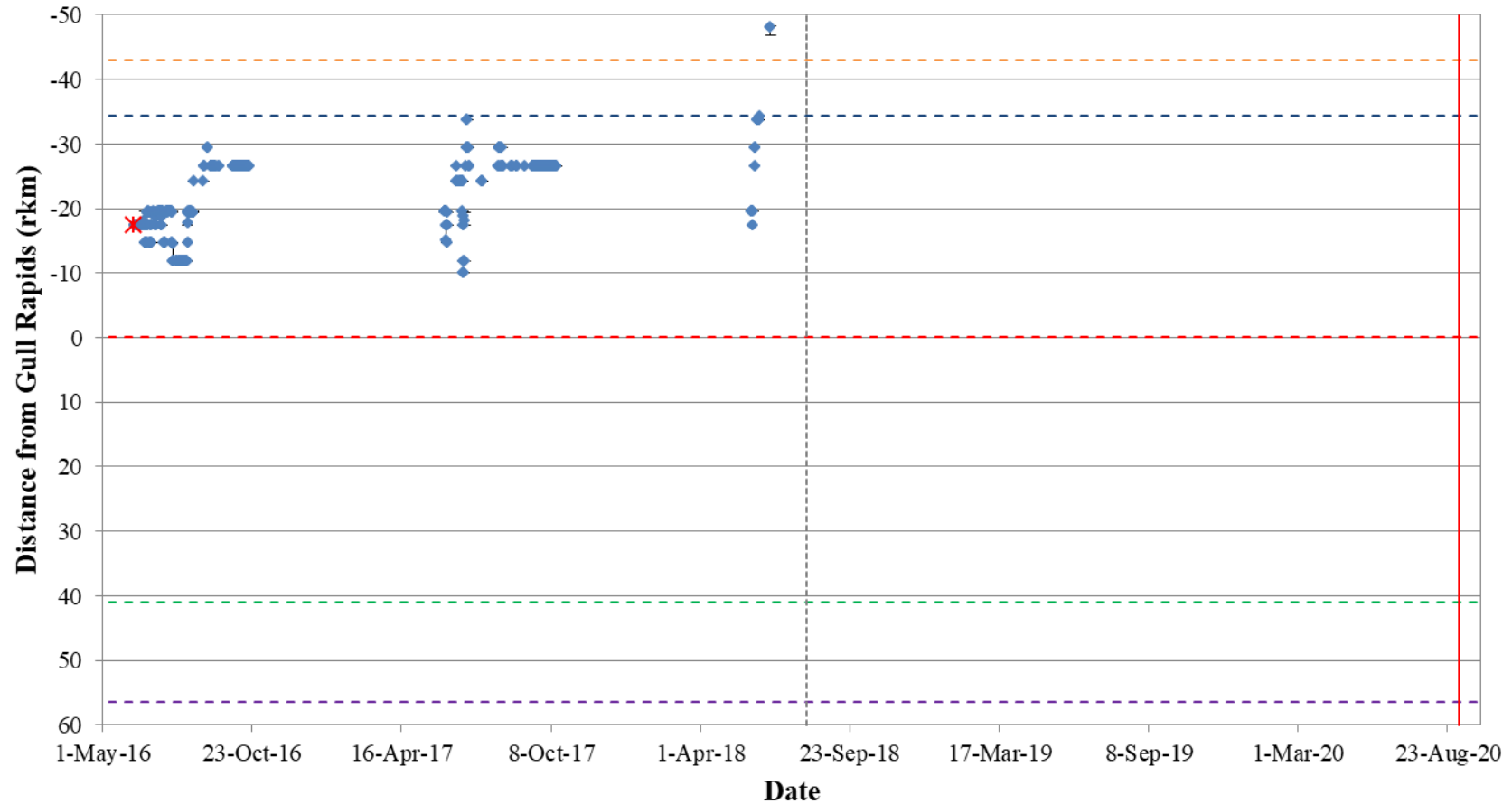


Figure A2-35: Position of a Walleye tagged with an acoustic transmitter (code #53794) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

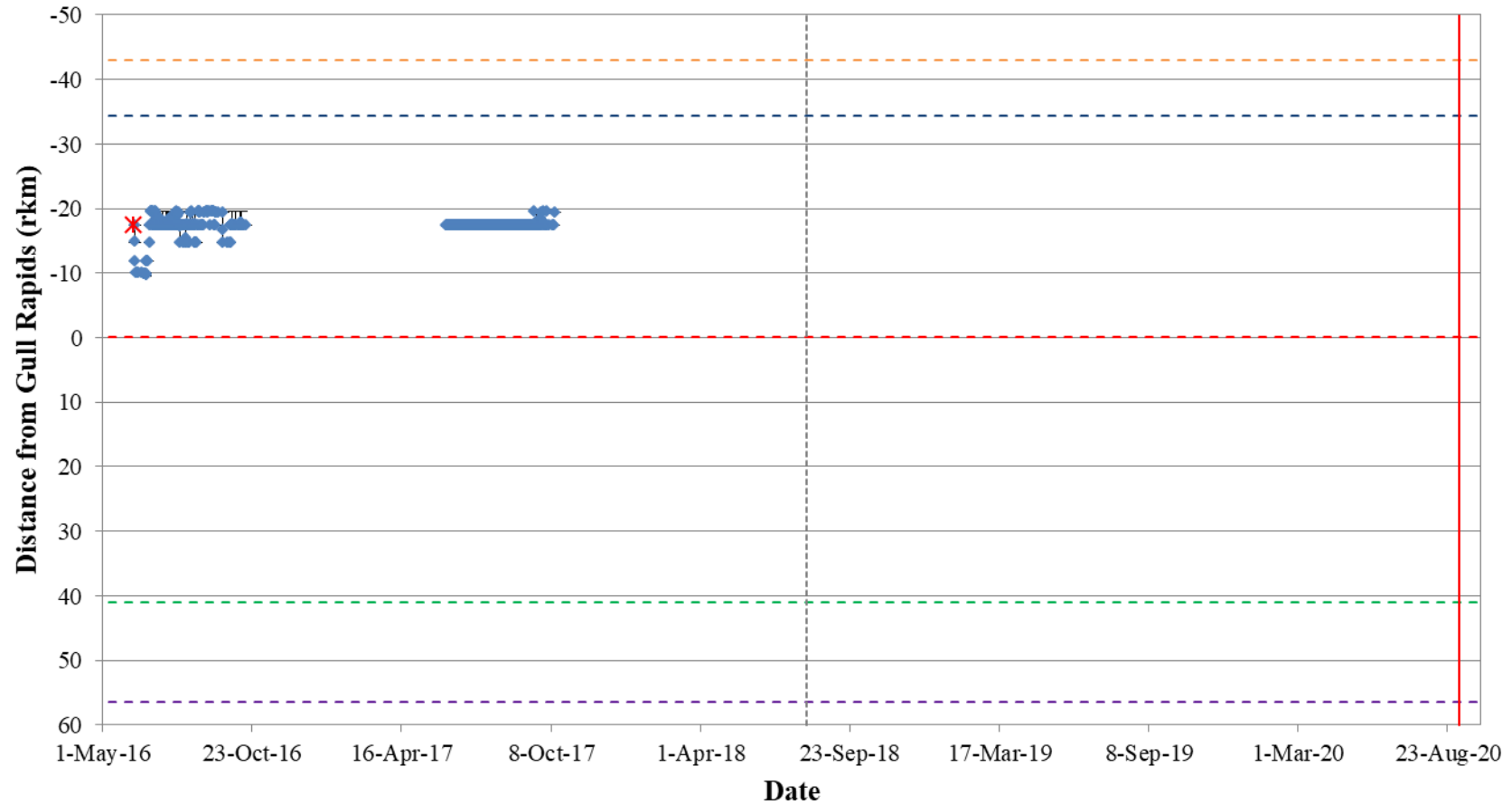


Figure A2-36: Position of a Walleye tagged with an acoustic transmitter (code #53795) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

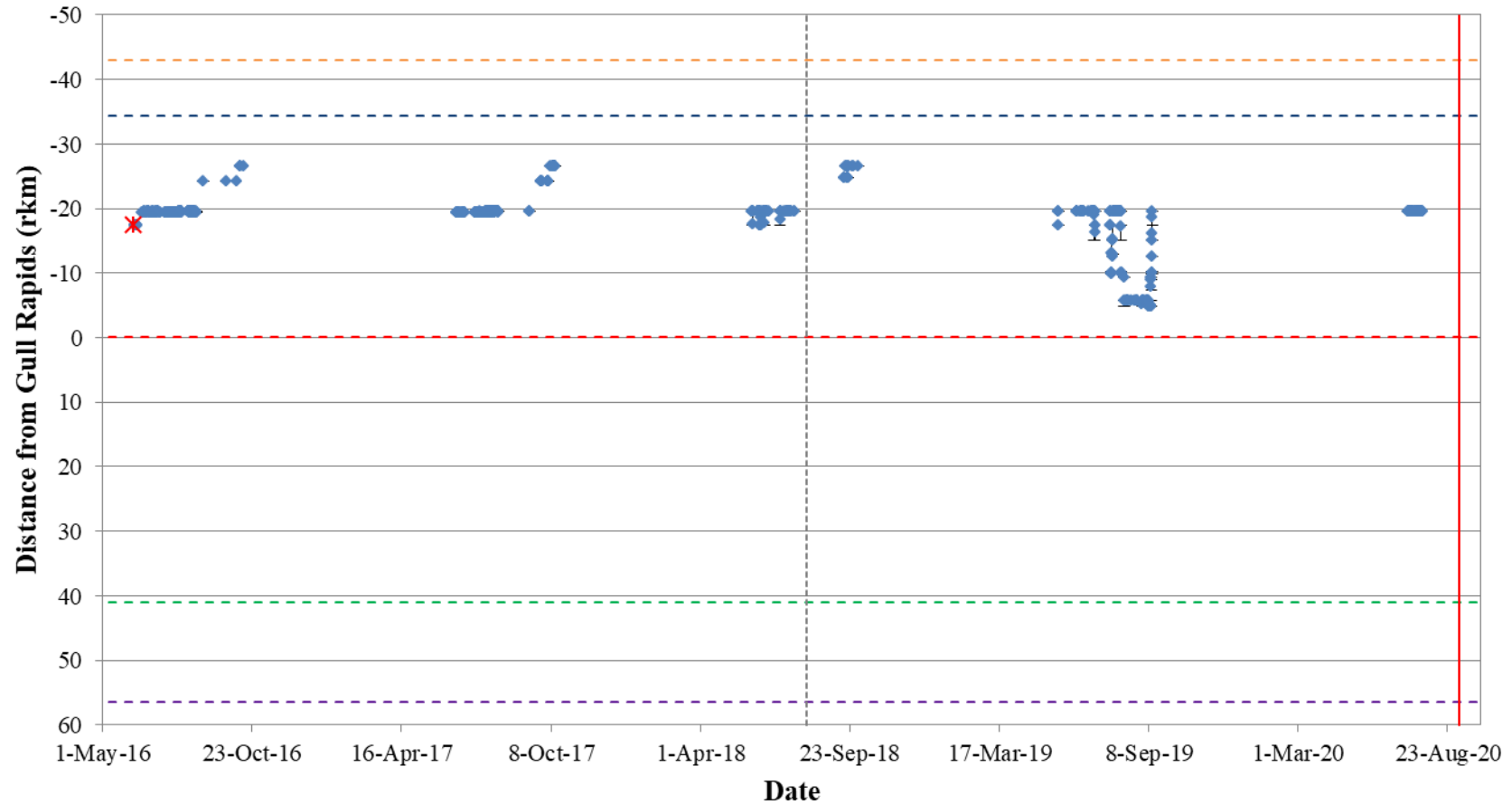


Figure A2-37: Position of a Walleye tagged with an acoustic transmitter (code #53796) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

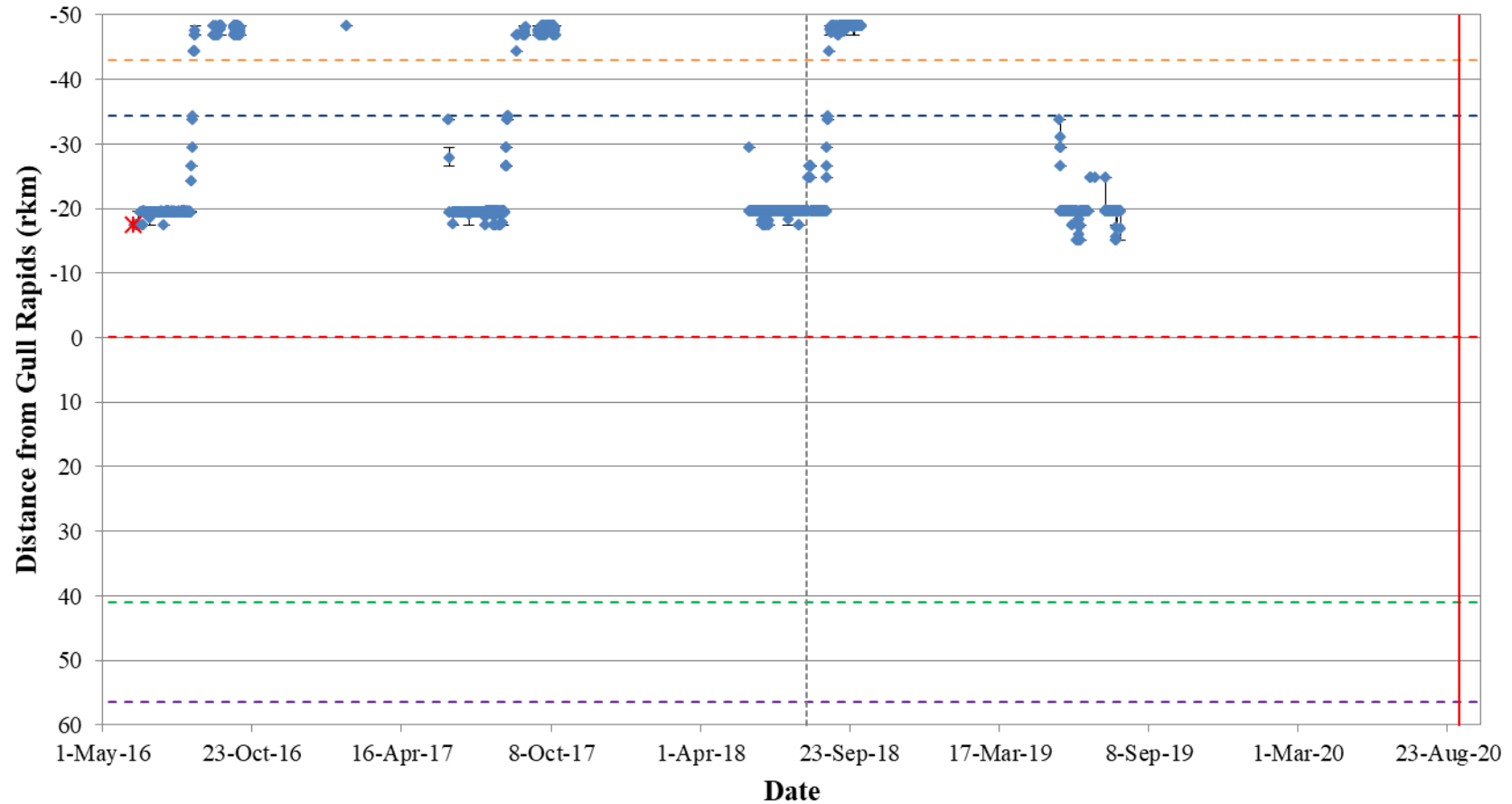


Figure A2-38: Position of a Walleye tagged with an acoustic transmitter (code #53797) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

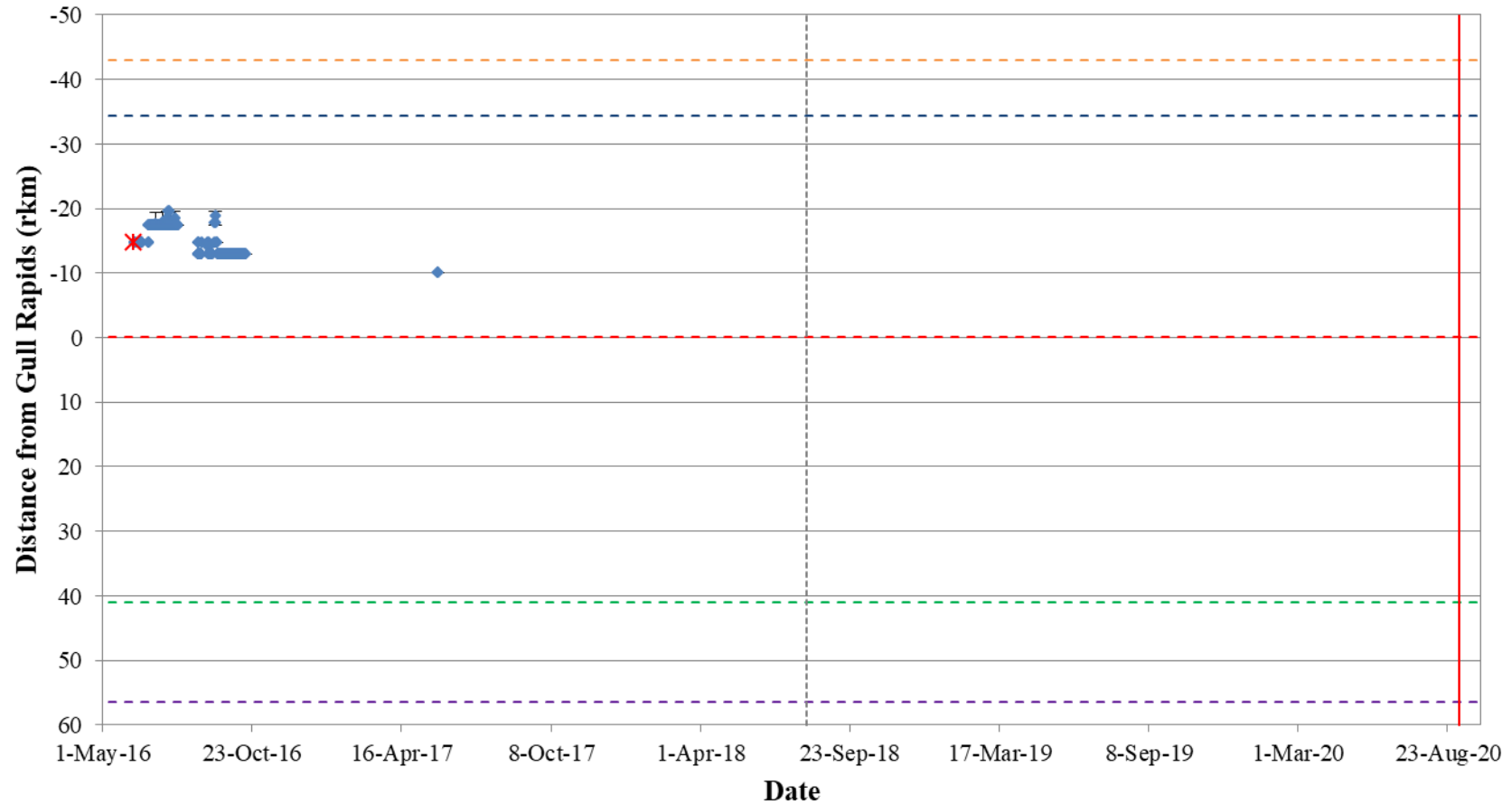


Figure A2-39: Position of a Walleye tagged with an acoustic transmitter (code #53798) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

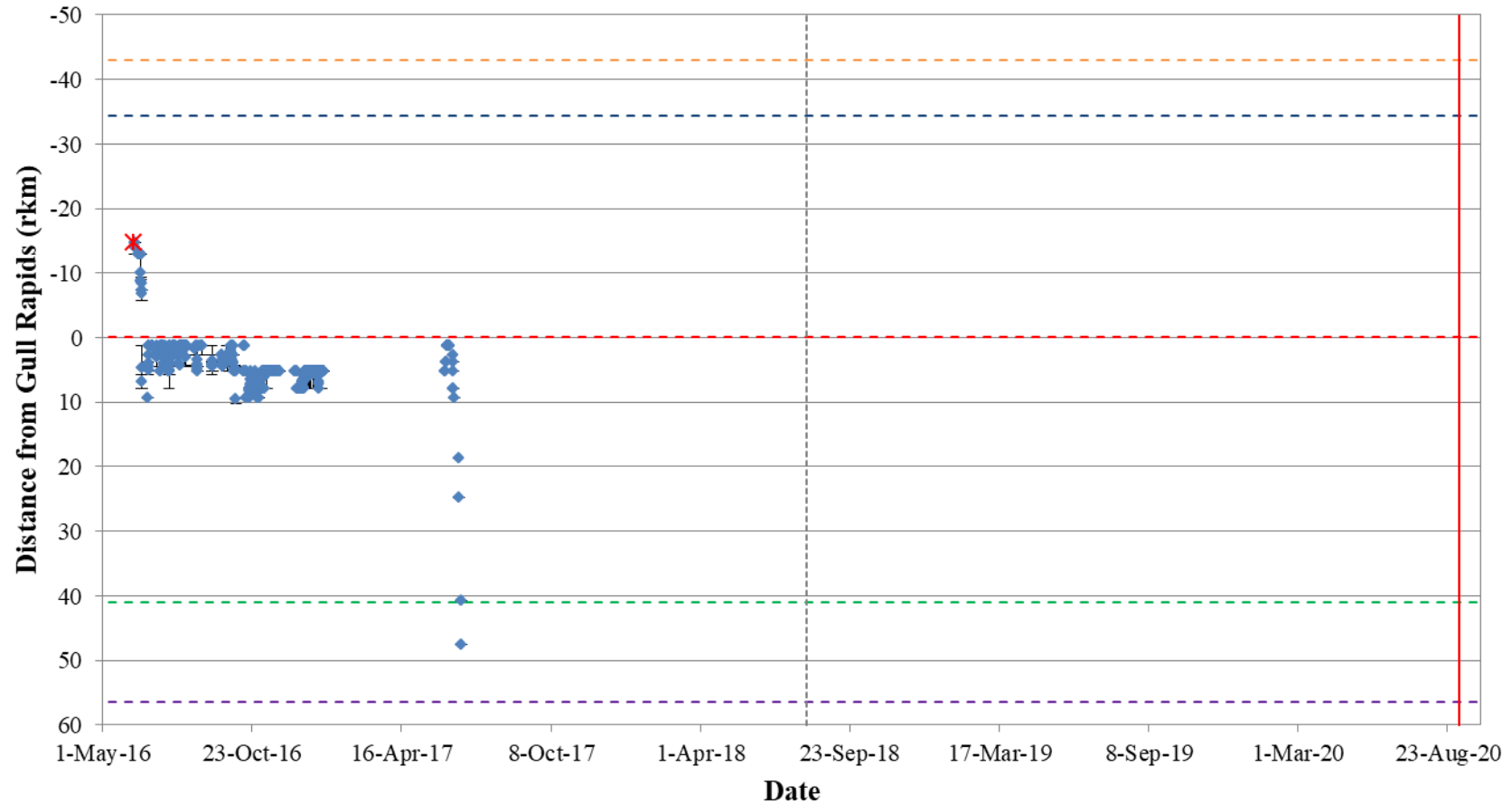


Figure A2-40: Position of a Walleye tagged with an acoustic transmitter (code #53799) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

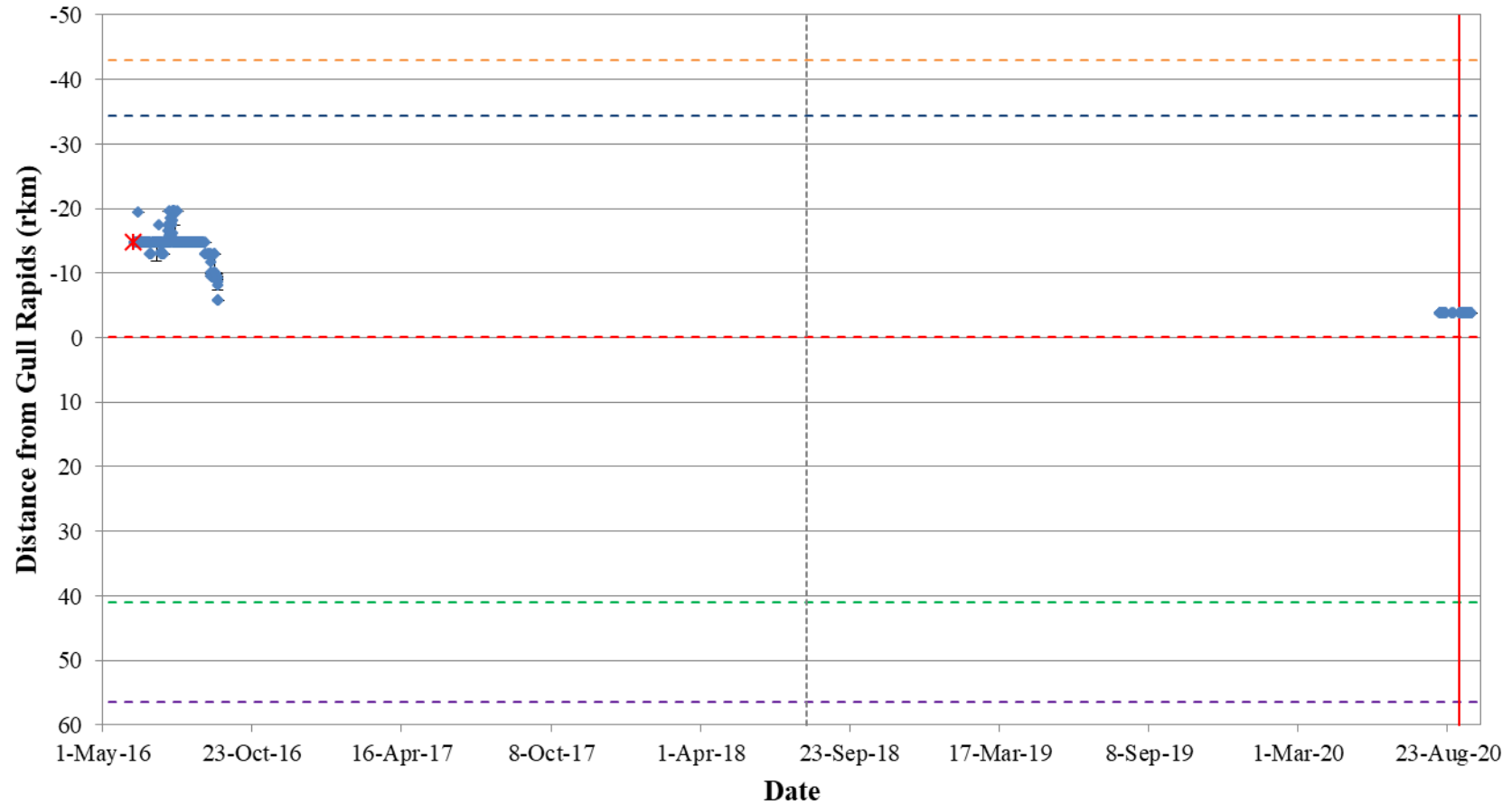


Figure A2-41: Position of a Walleye tagged with an acoustic transmitter (code #53800) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

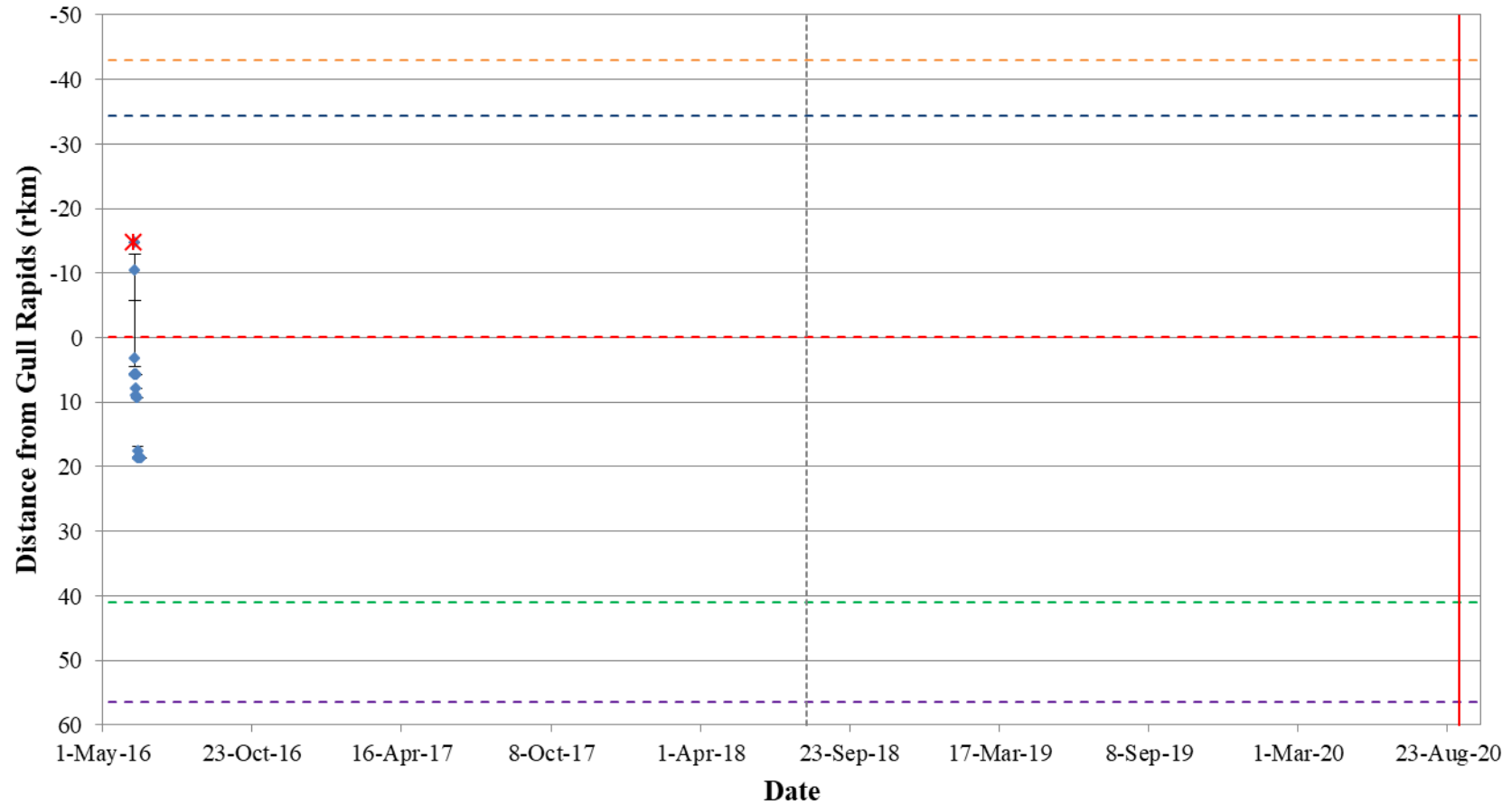


Figure A2-42: Position of a Walleye tagged with an acoustic transmitter (code #53801) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

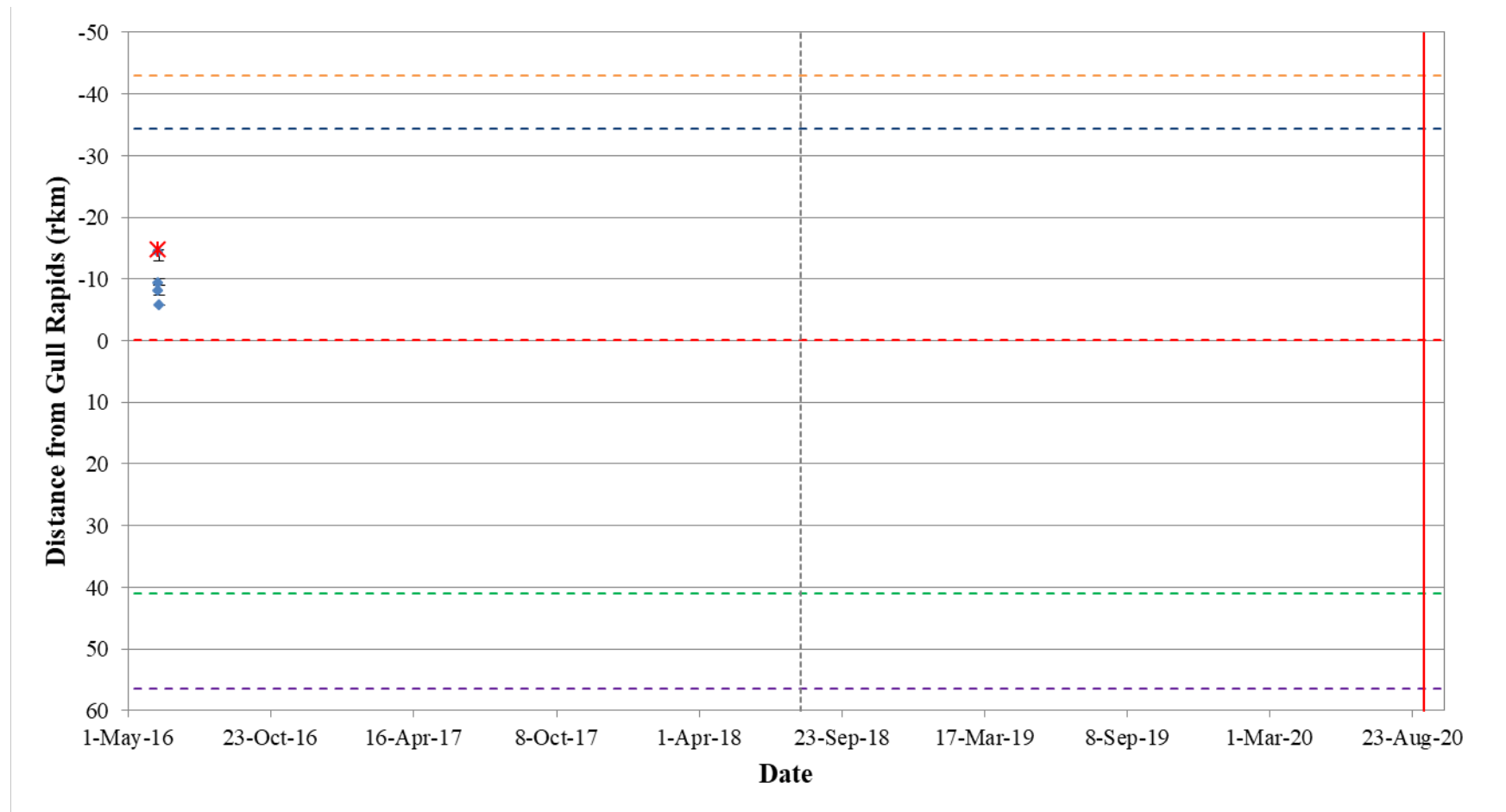


Figure A2-43: Position of a Walleye tagged with an acoustic transmitter (code #53802) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

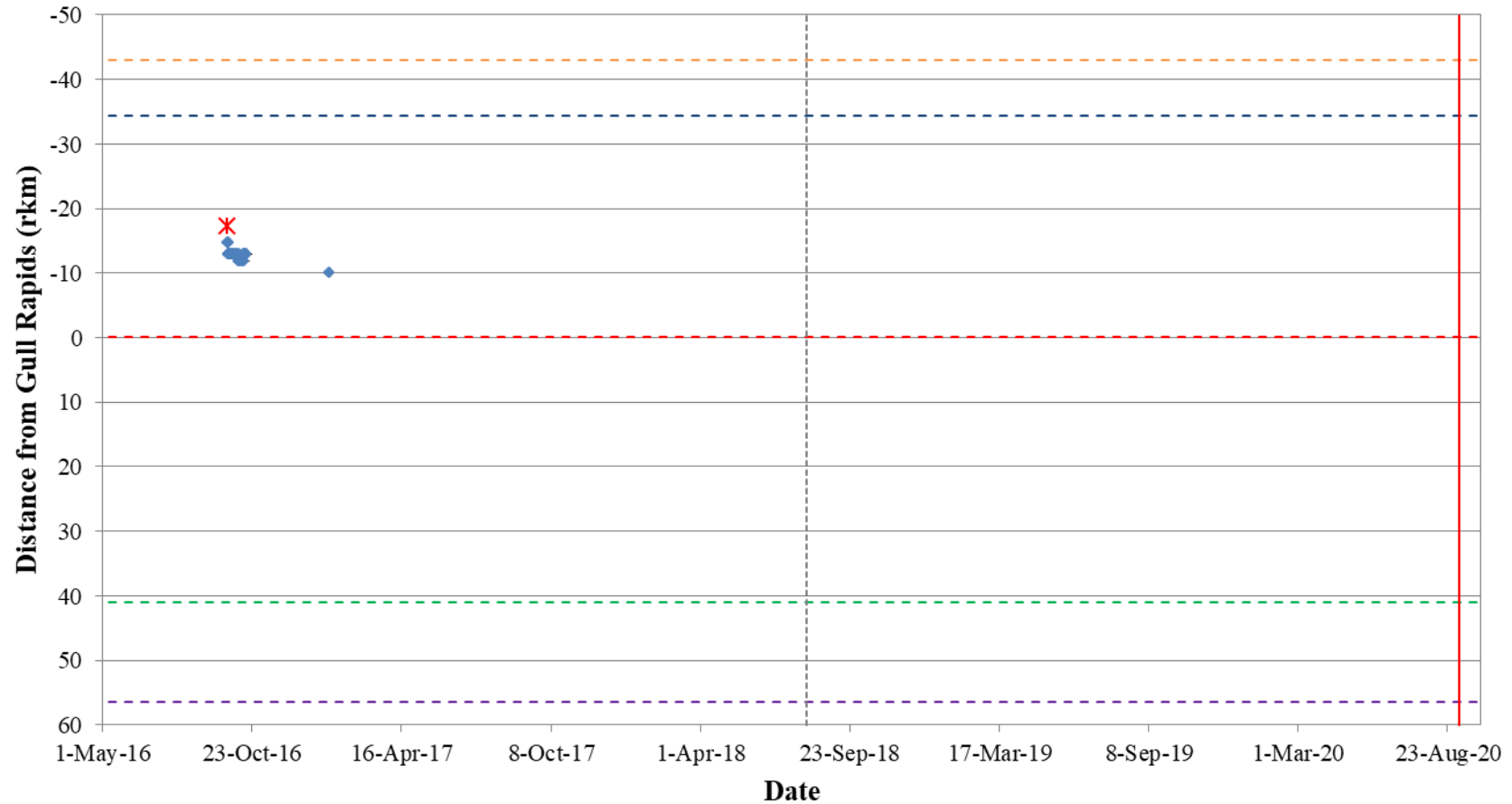


Figure A2-44: Position of a Walleye tagged with an acoustic transmitter (code #53803) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

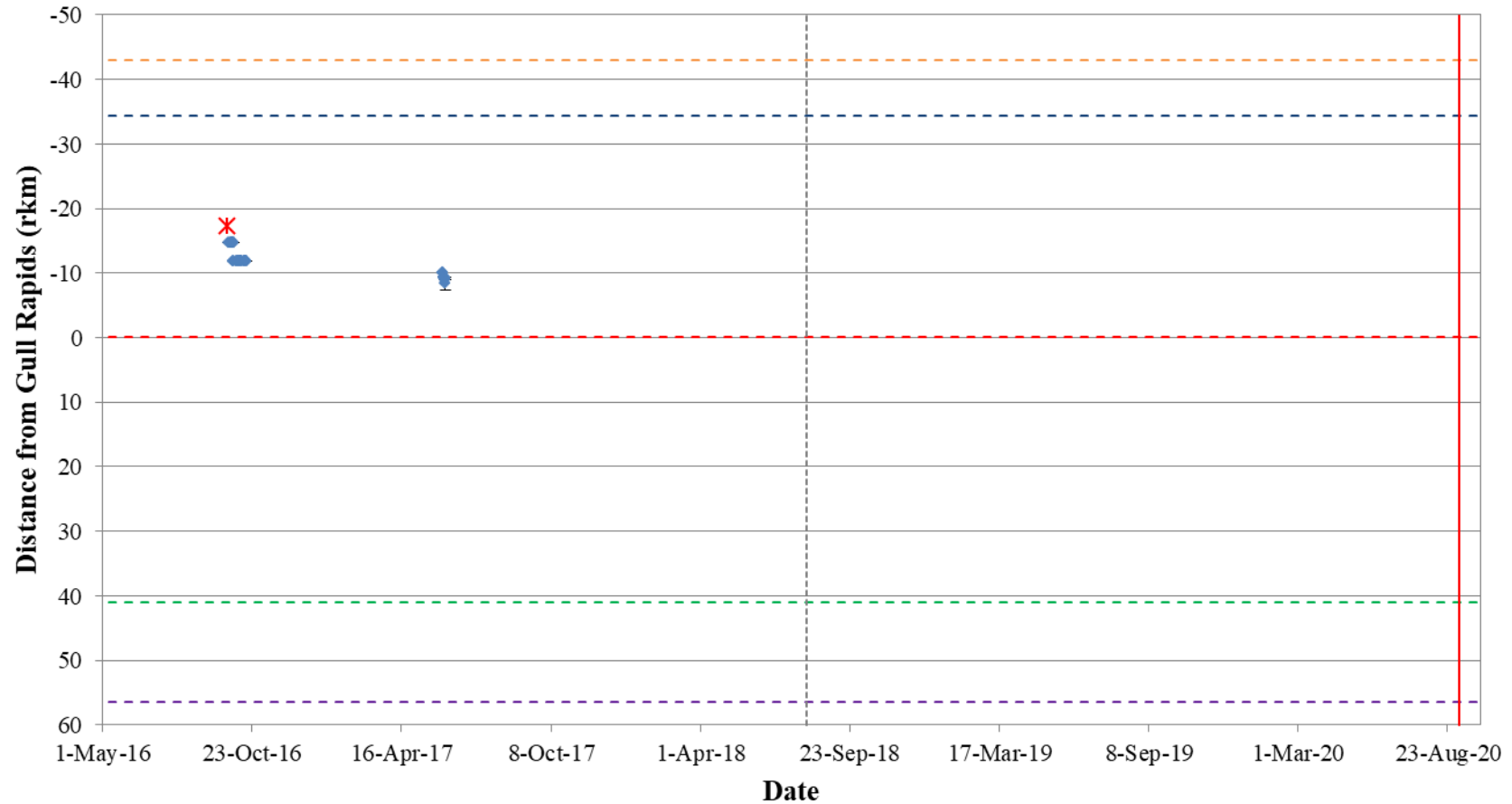


Figure A2-45: Position of a Walleye tagged with an acoustic transmitter (code #53804) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

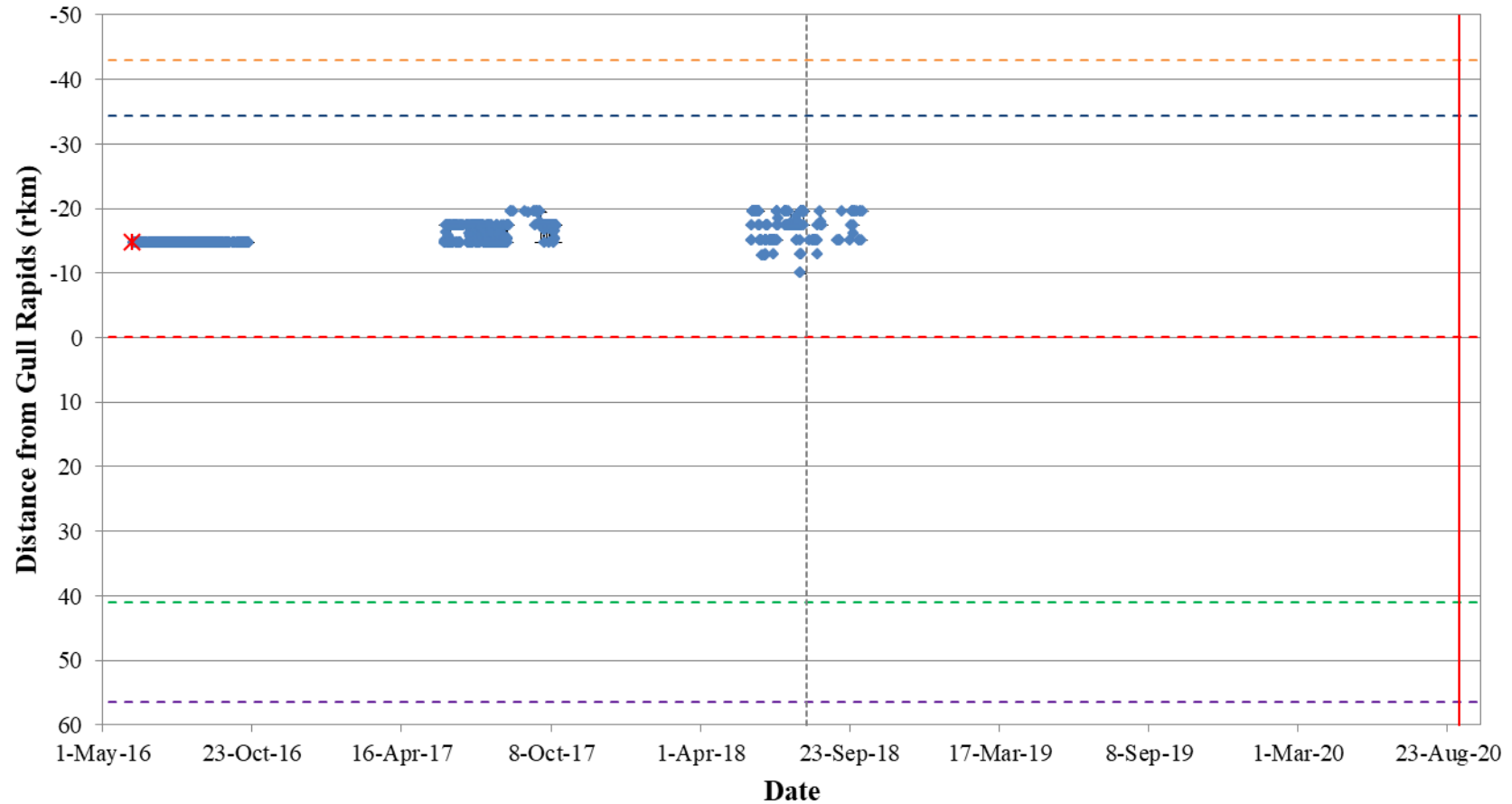


Figure A2-46: Position of a Walleye tagged with an acoustic transmitter (code #53805) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

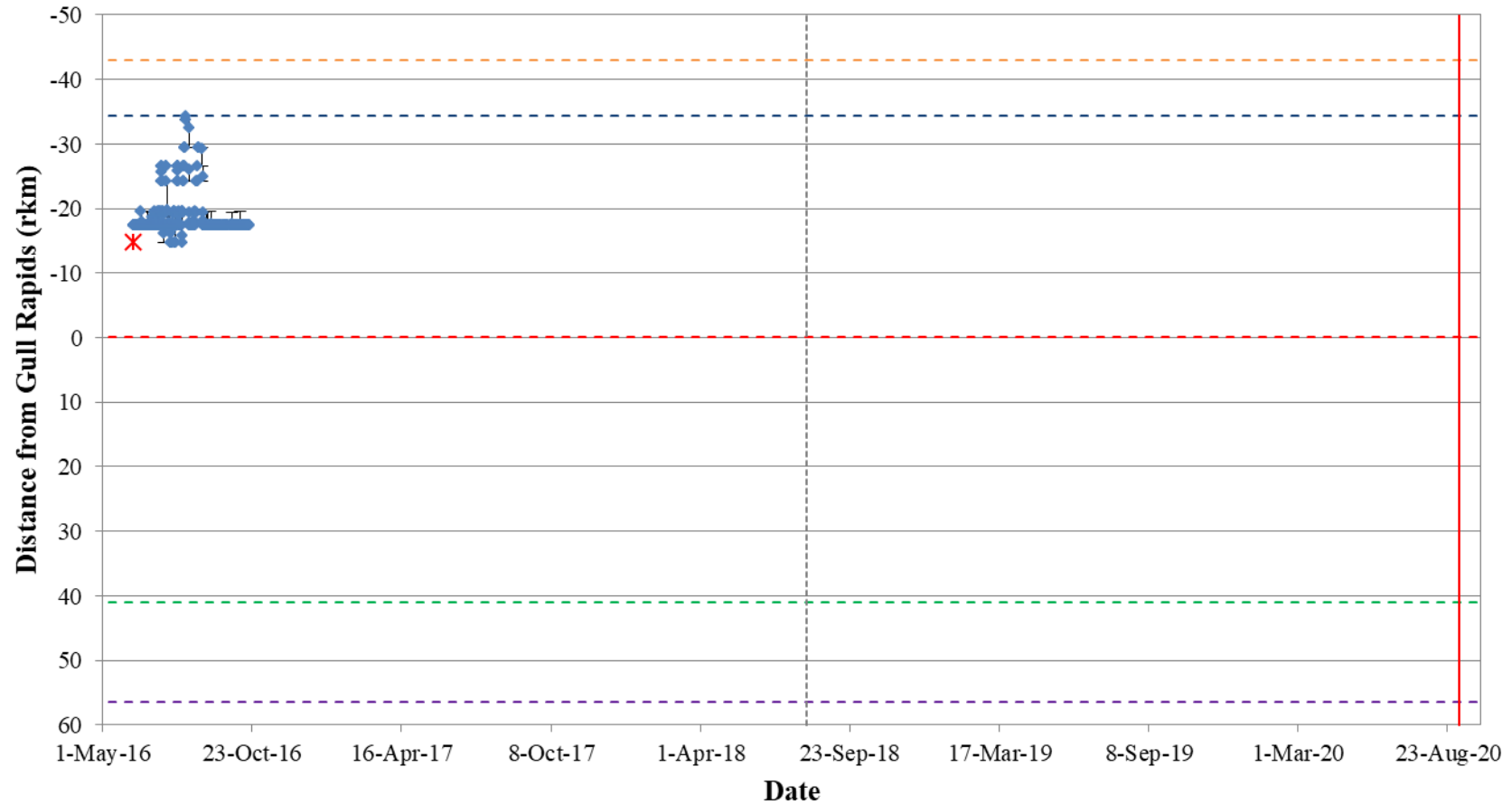


Figure A2-47: Position of a Walleye tagged with an acoustic transmitter (code #53806) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

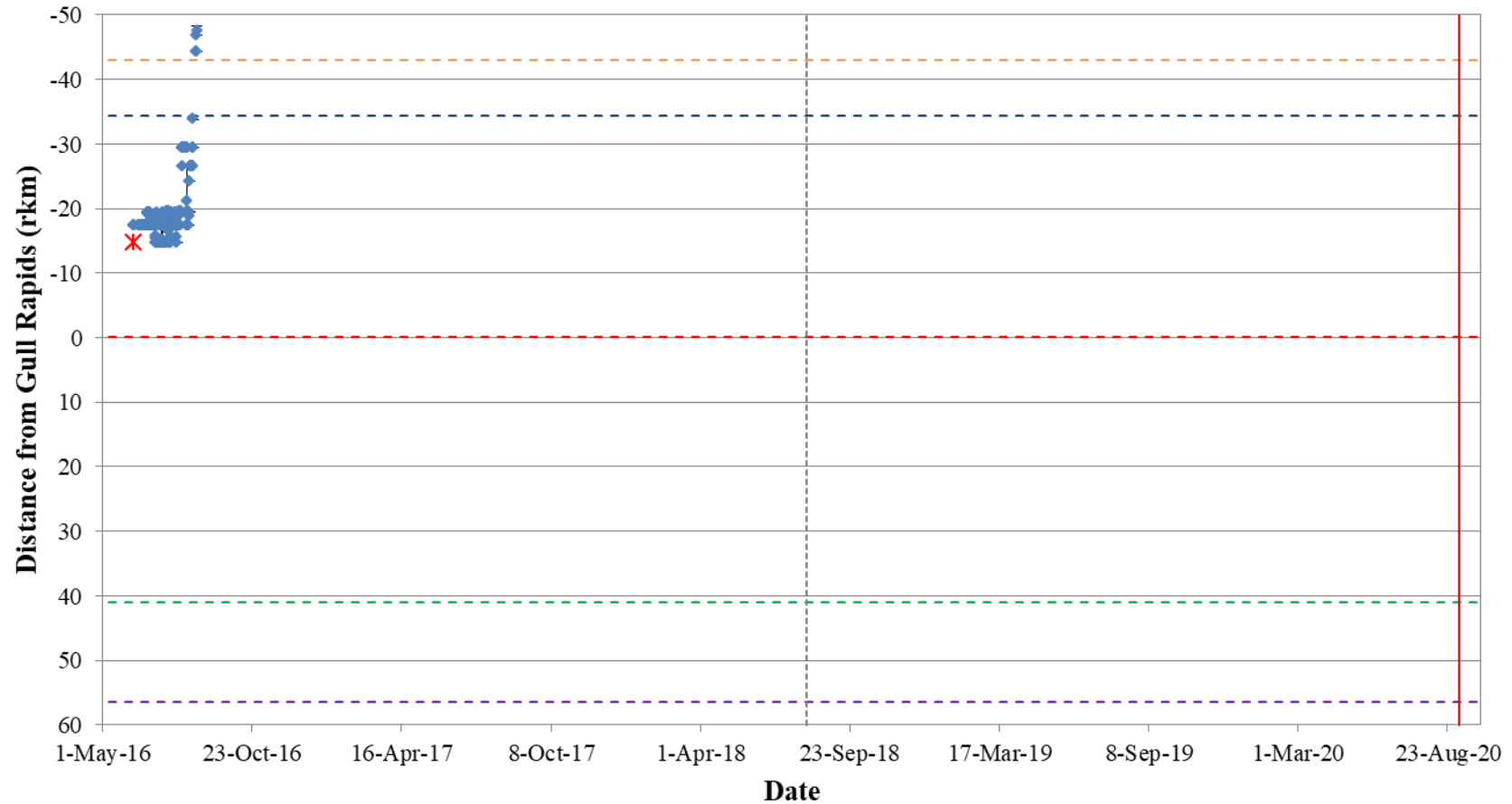


Figure A2-48: Position of a Walleye tagged with an acoustic transmitter (code #53807) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).



Figure A2-49: Position of a Walleye tagged with an acoustic transmitter (code #25739) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1, 2018, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

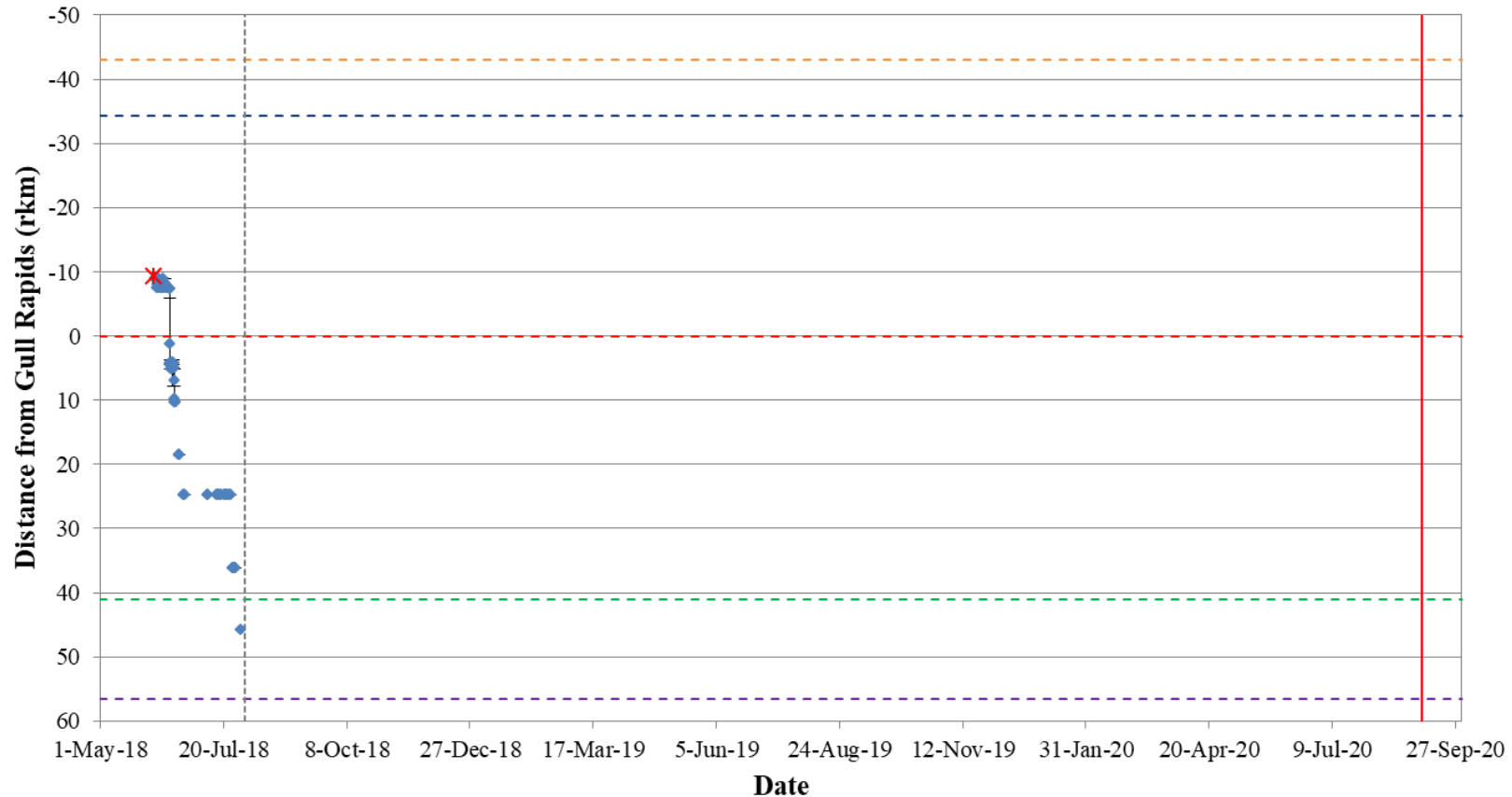


Figure A2-50: Position of a Walleye tagged with an acoustic transmitter (code #25740) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1, 2018, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

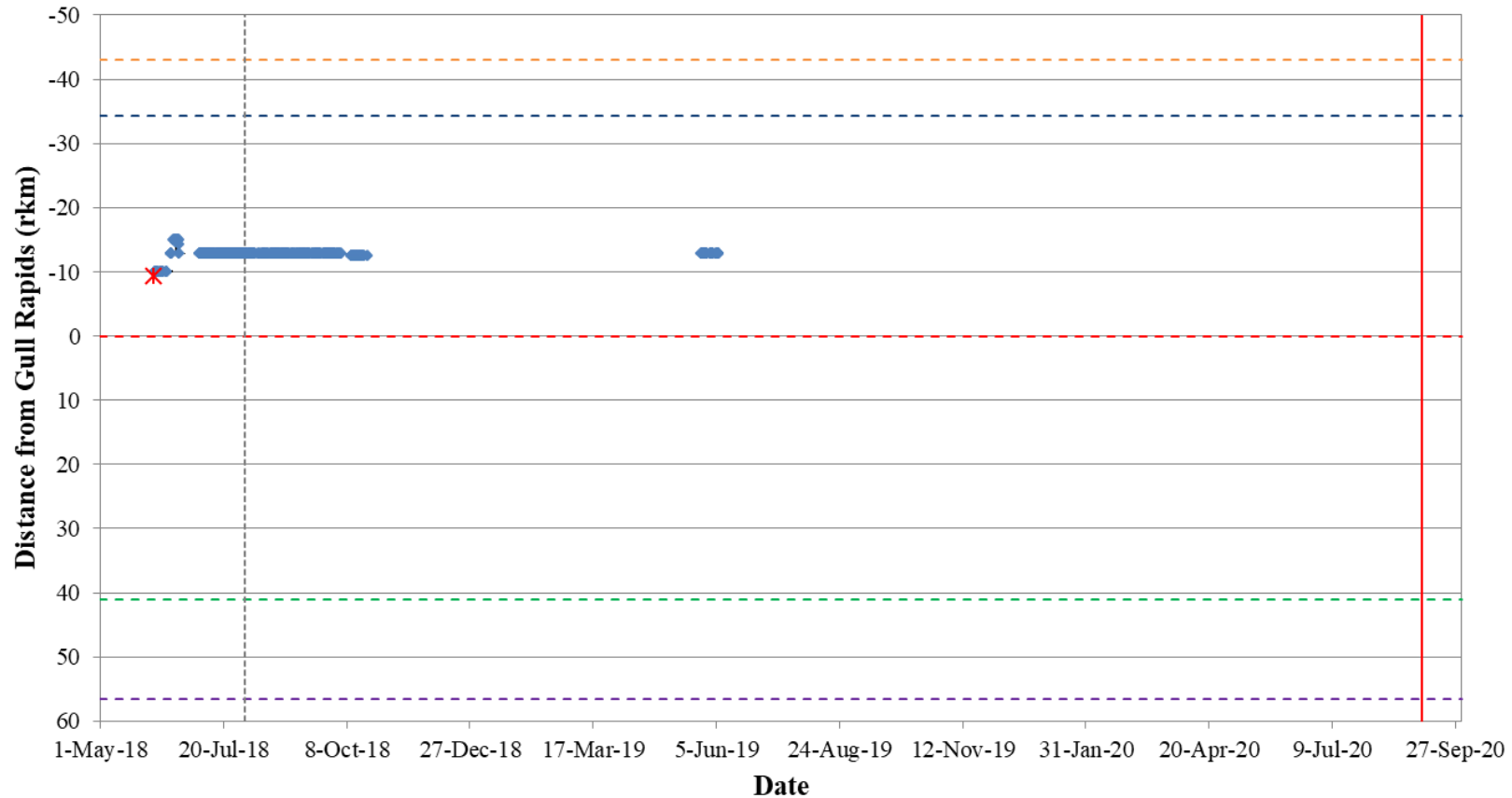


Figure A2-51: Position of a Walleye tagged with an acoustic transmitter (code #25742) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1, 2018, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

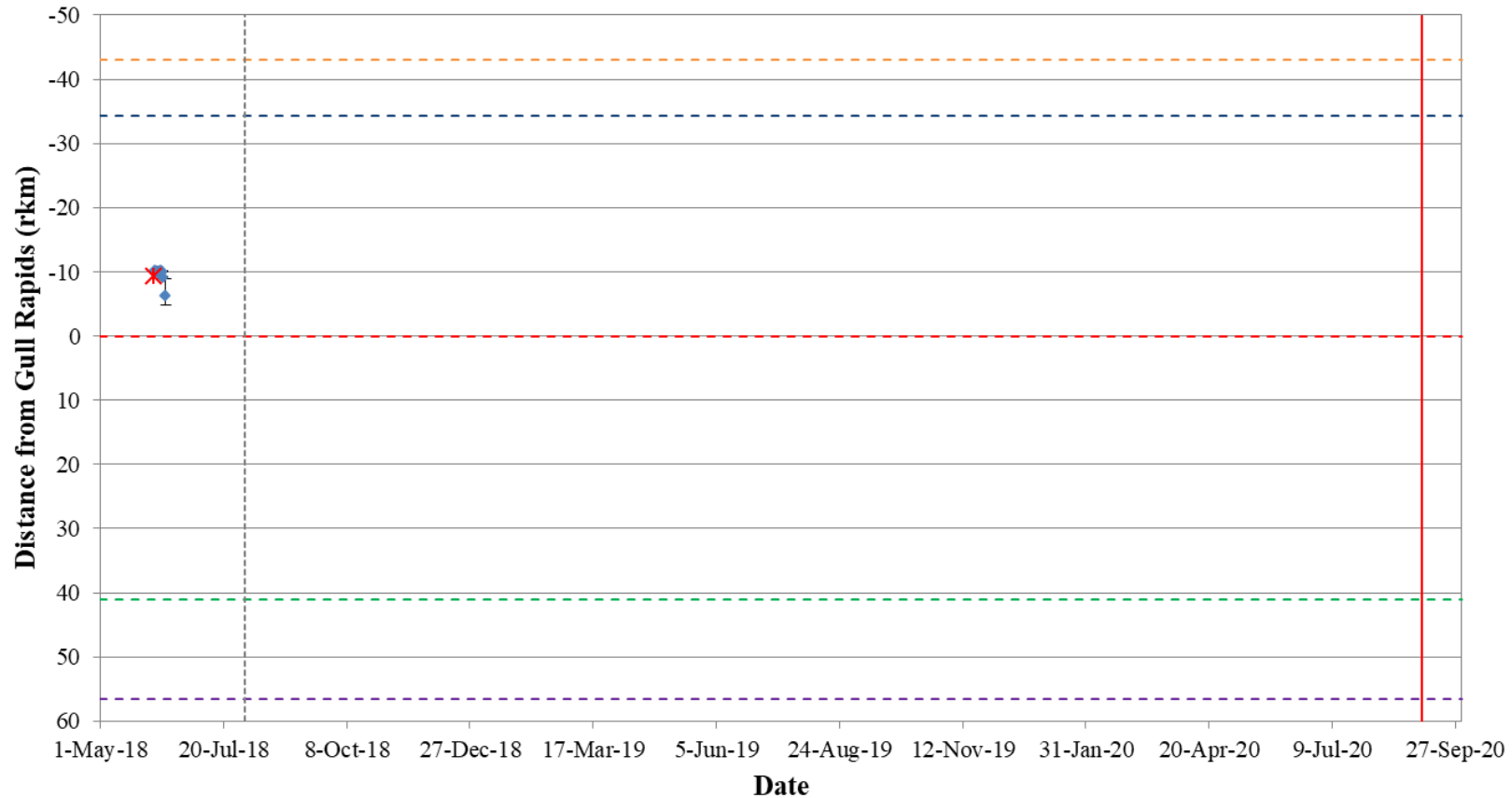


Figure A2-52: Position of a Walleye tagged with an acoustic transmitter (code #25743) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1, 2018, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

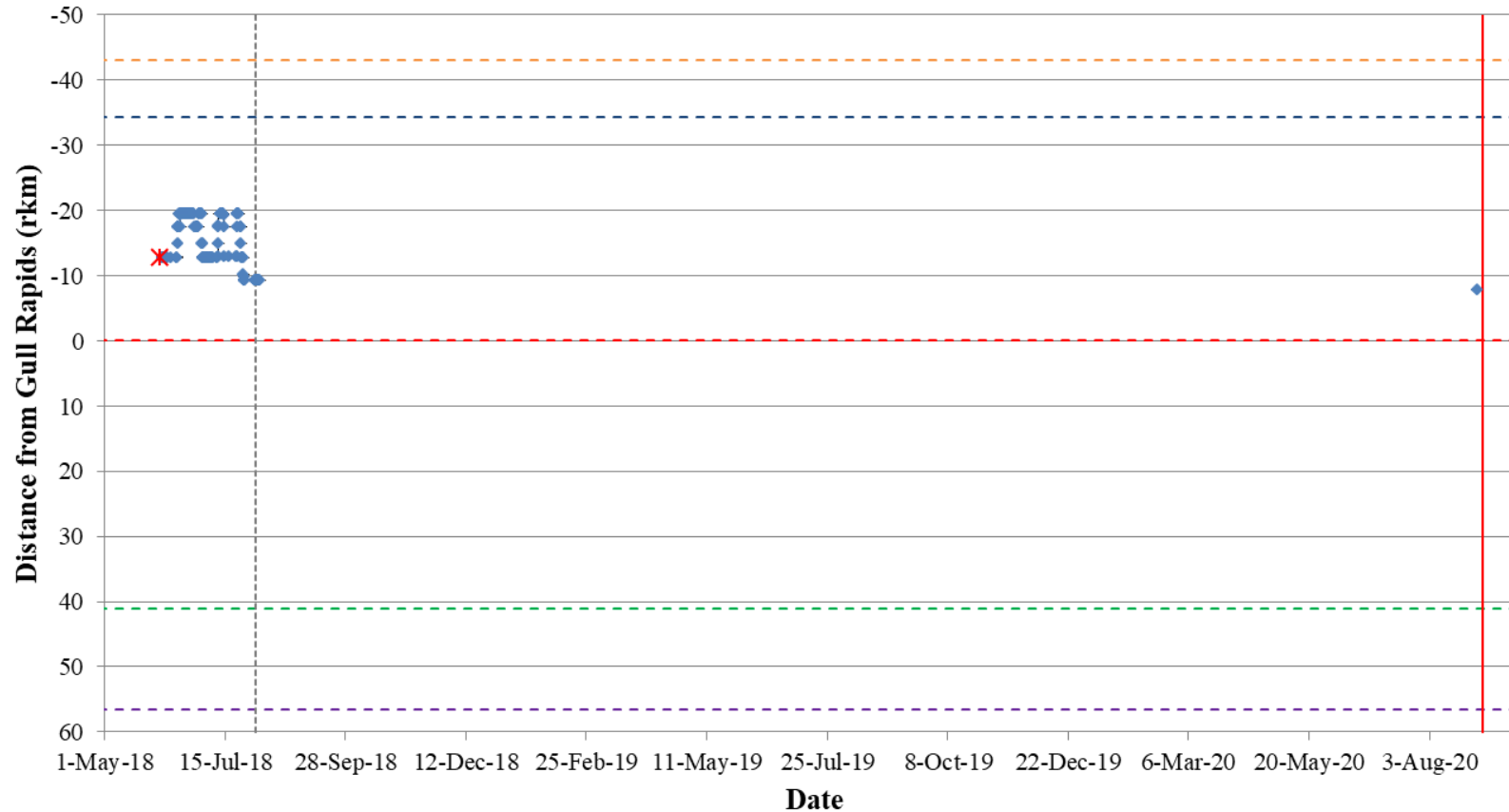


Figure A2-53: Position of a Walleye tagged with an acoustic transmitter (code #25744) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1, 2018, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

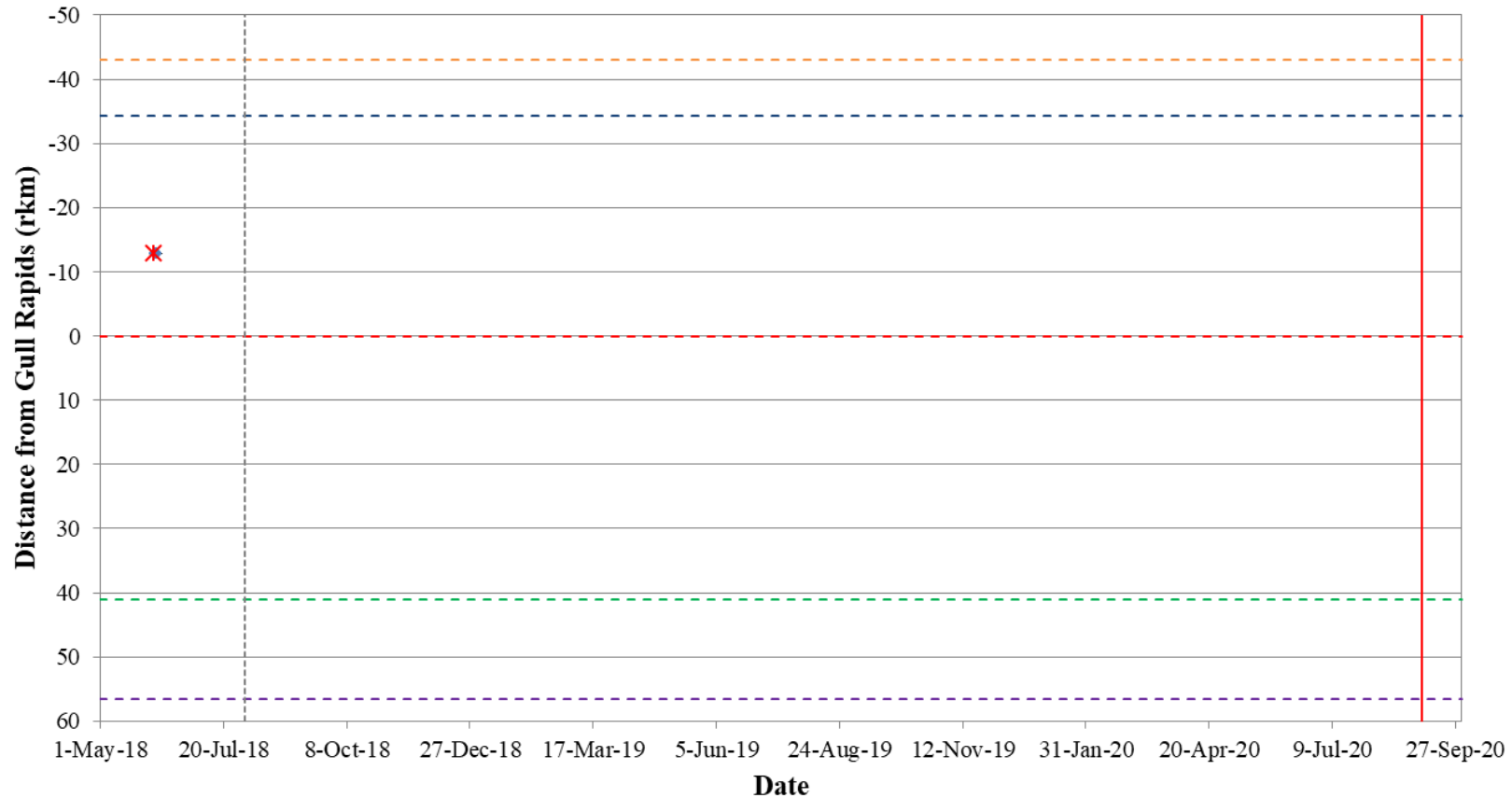


Figure A2-54: Position of a Walleye tagged with an acoustic transmitter (code #25745) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1, 2018, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

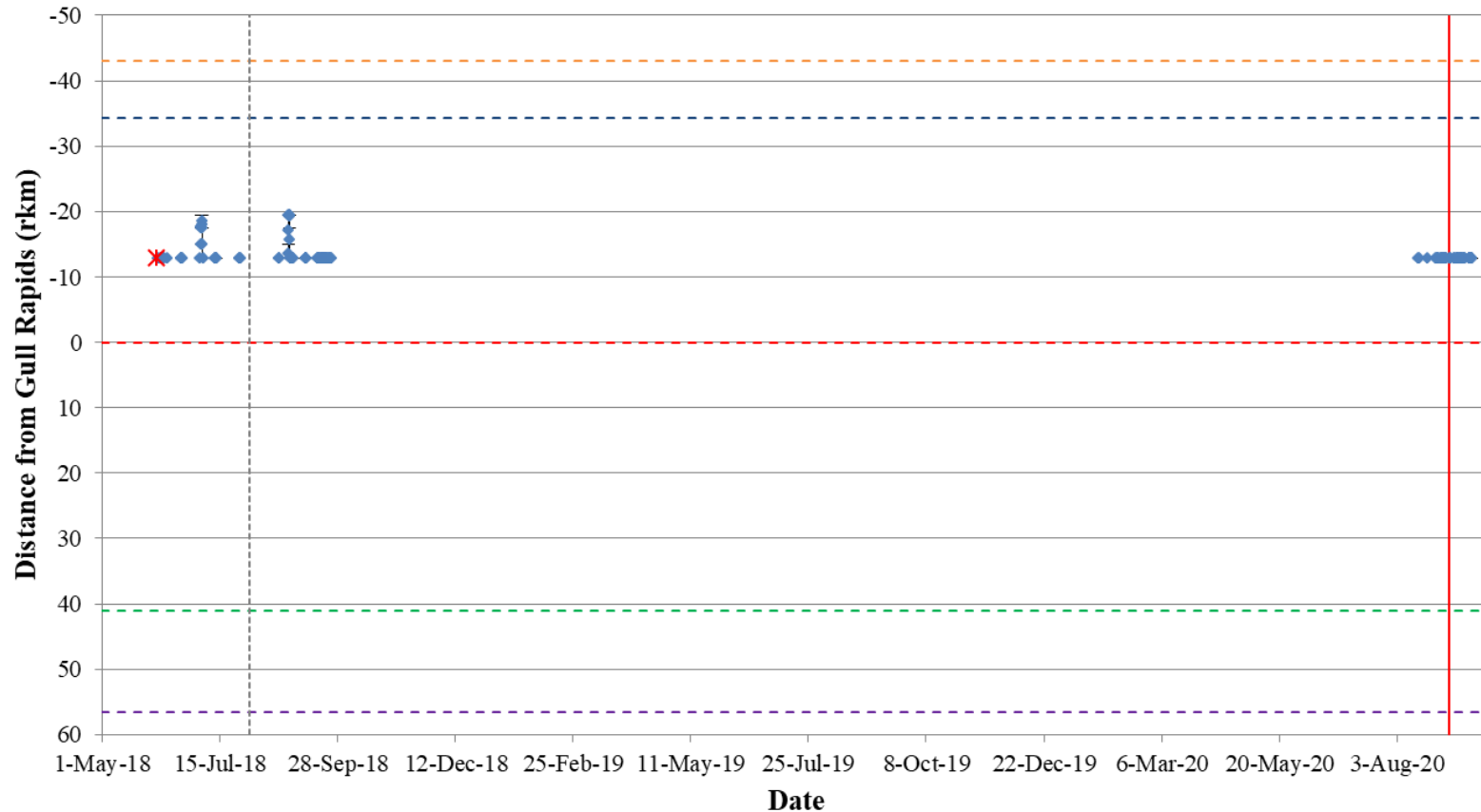


Figure A2-55: Position of a Walleye tagged with an acoustic transmitter (code #25746) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1, 2018, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

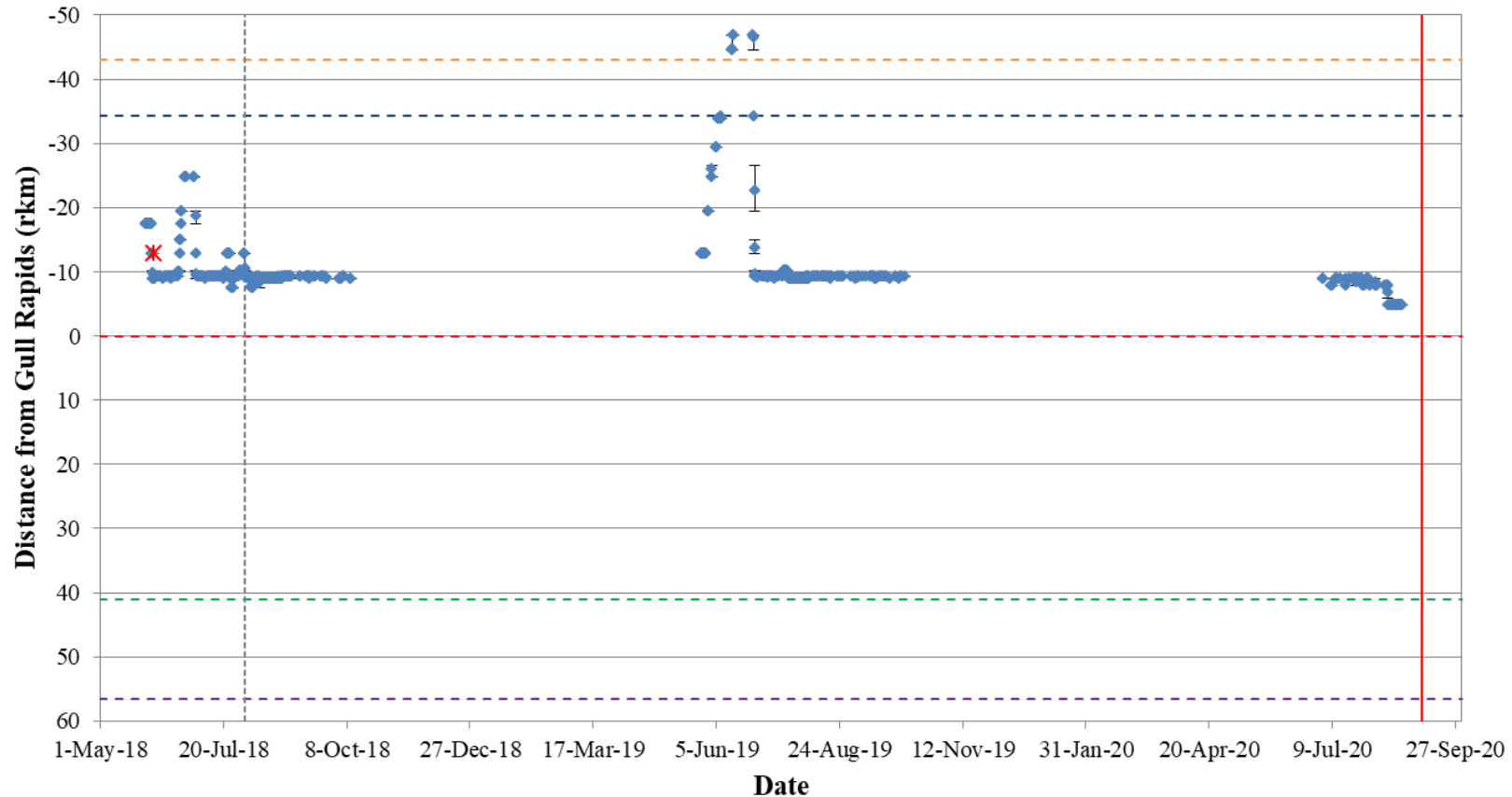


Figure A2-56: Position of a Walleye tagged with an acoustic transmitter (code #25747) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1, 2018, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).



Figure A2-57: Position of a Walleye tagged with an acoustic transmitter (code #25748) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1, 2018, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

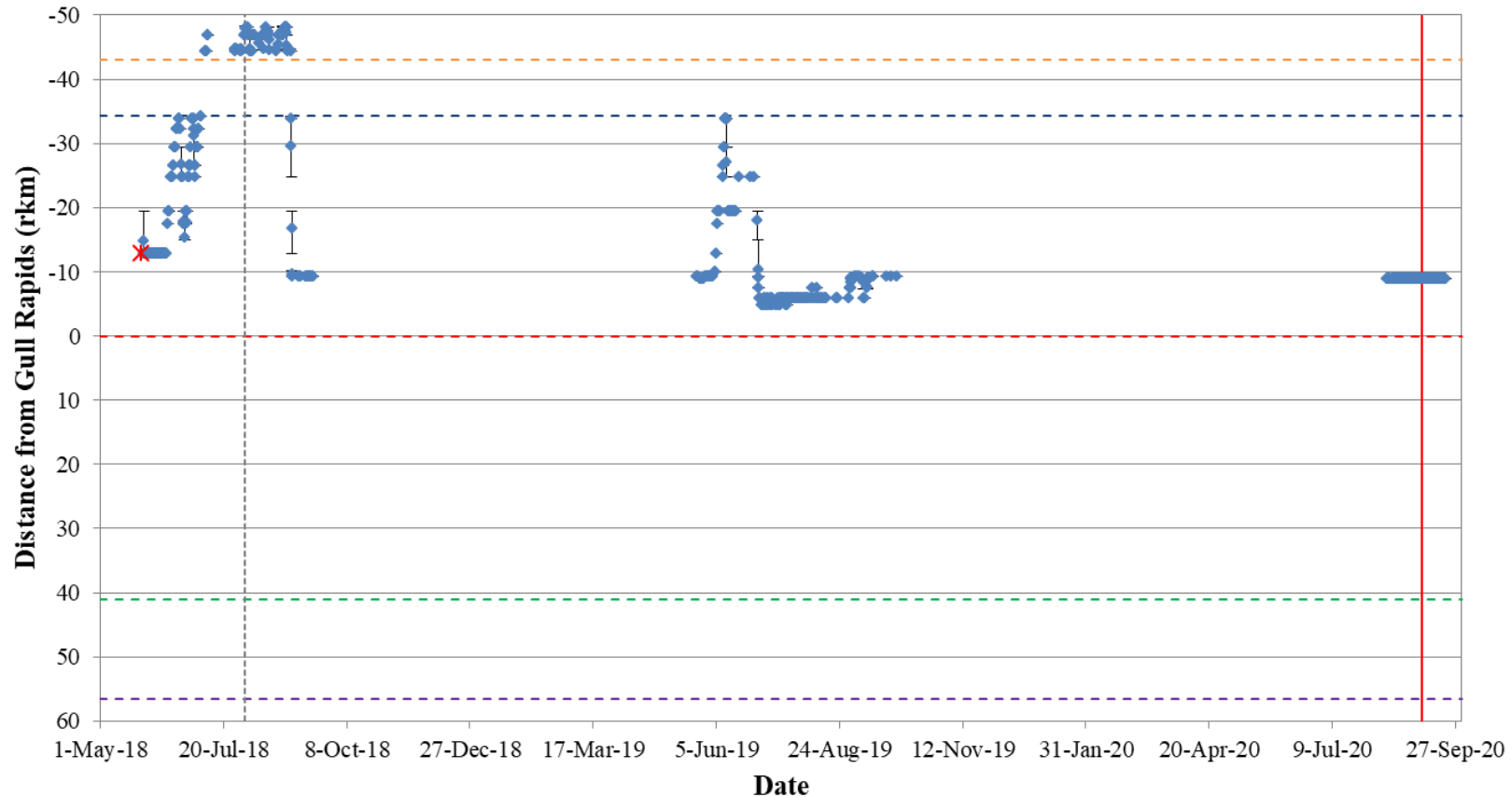


Figure A2-58: Position of a Walleye tagged with an acoustic transmitter (code #25749) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1, 2018, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

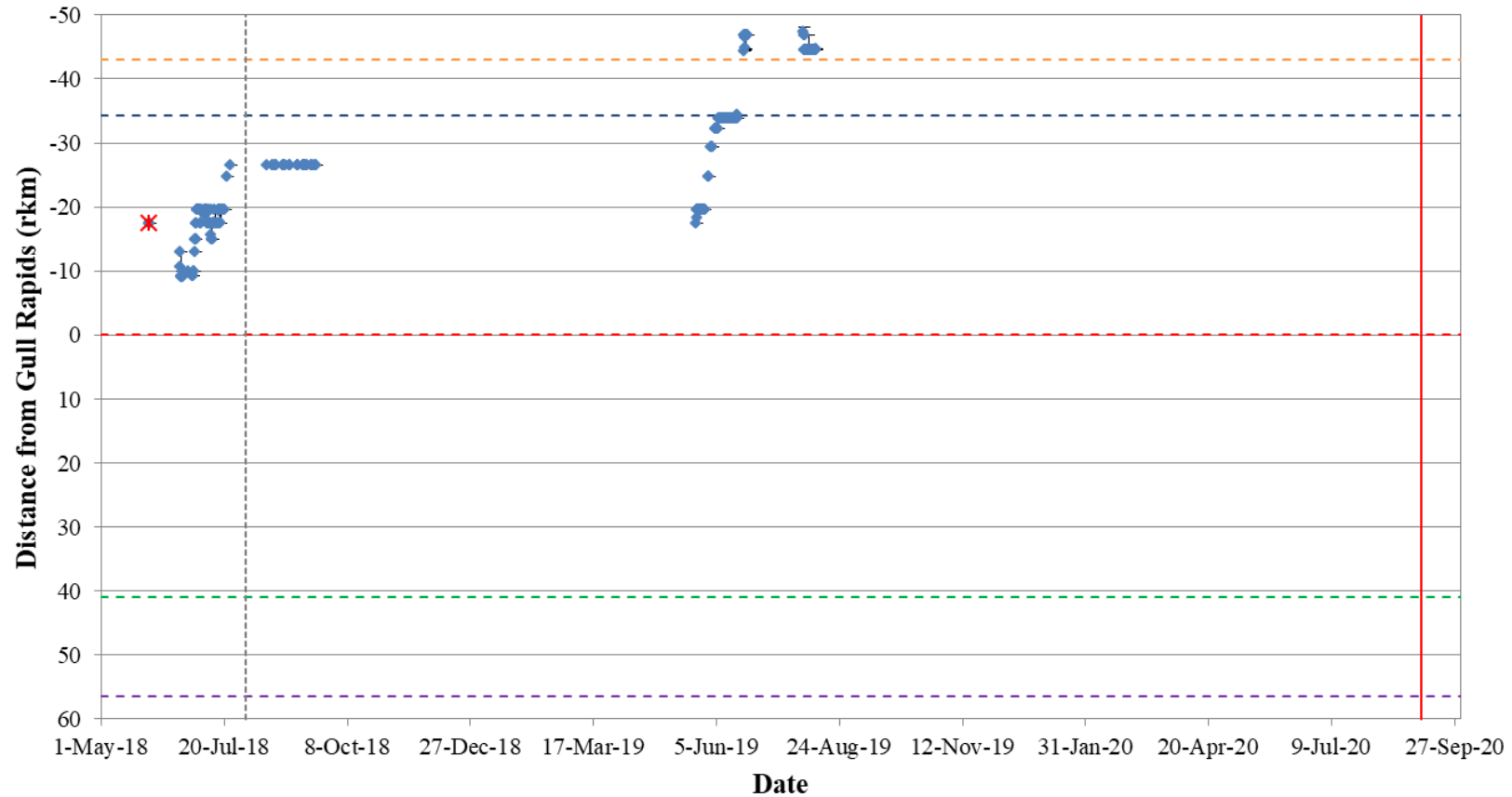


Figure A2-59: Position of a Walleye tagged with an acoustic transmitter (code #25750) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1, 2018, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

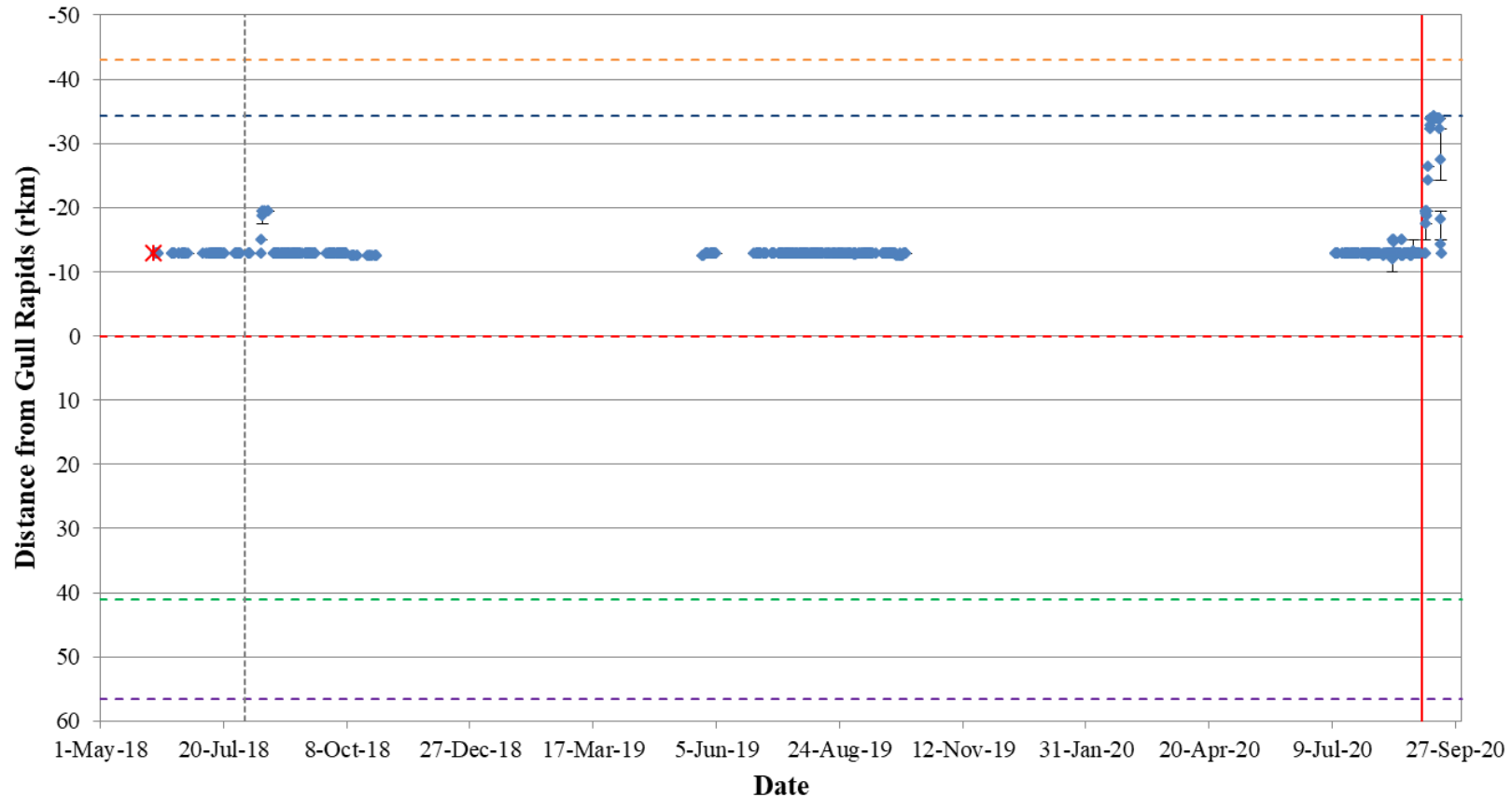


Figure A2-60: Position of a Walleye tagged with an acoustic transmitter (code #25751) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1, 2018, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

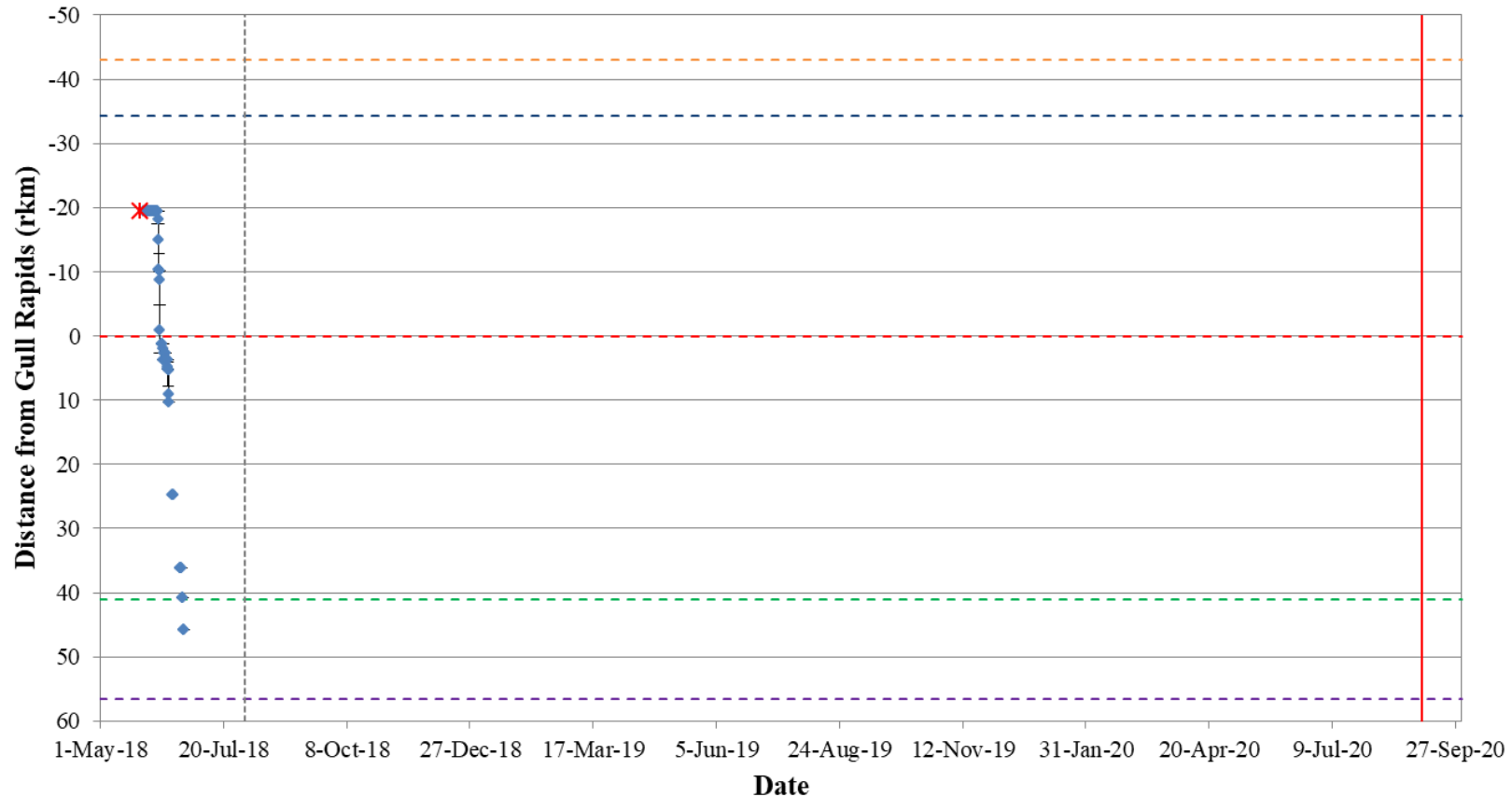


Figure A2-61: Position of a Walleye tagged with an acoustic transmitter (code #25752) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1, 2018, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).



Figure A2-62: Position of a Walleye tagged with an acoustic transmitter (code #25753) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1, 2018, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).



Figure A2-63: Position of a Walleye tagged with an acoustic transmitter (code #25754) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1, 2018, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

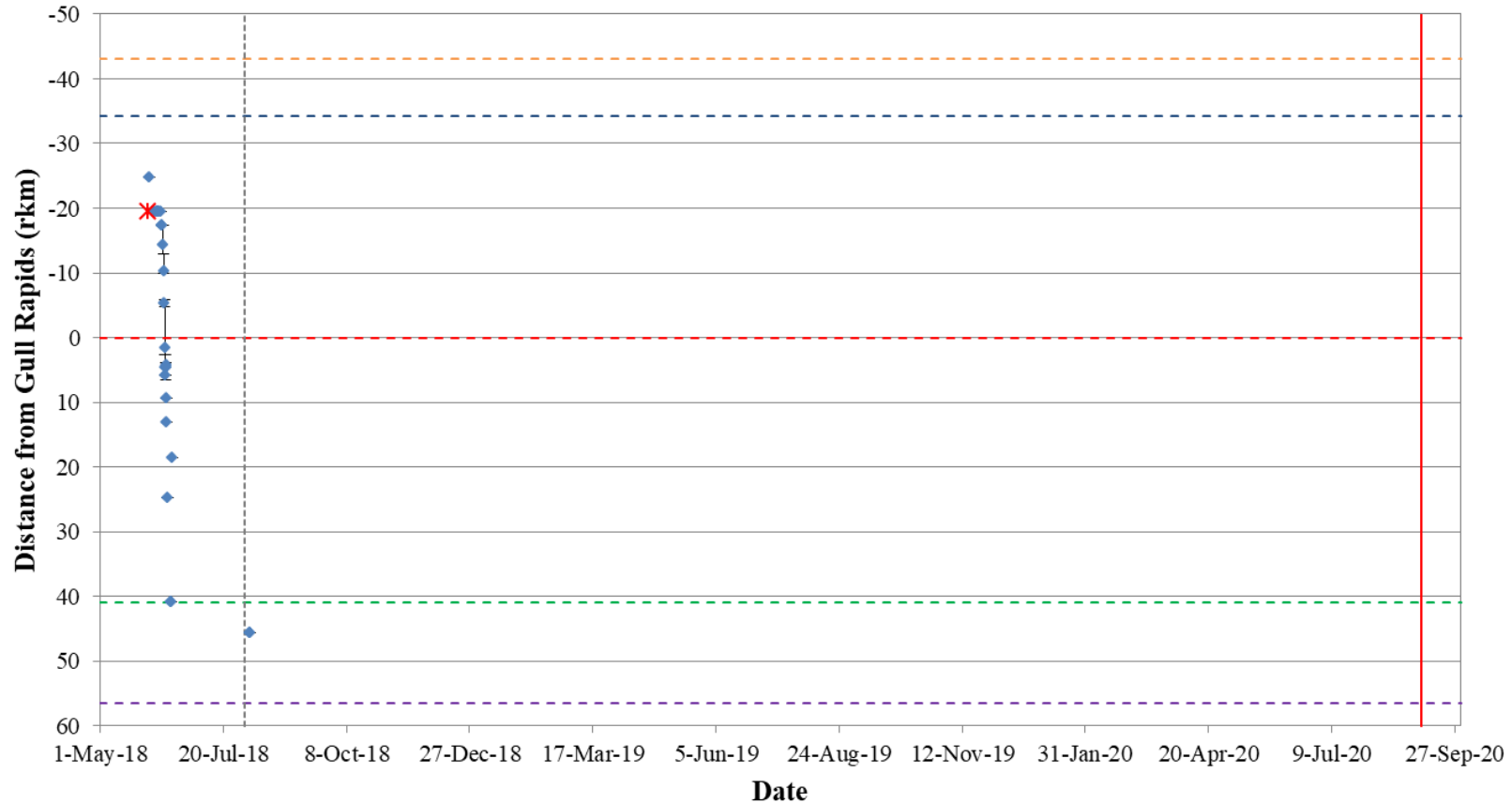


Figure A2-64: Position of a Walleye tagged with an acoustic transmitter (code #25755) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1, 2018, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

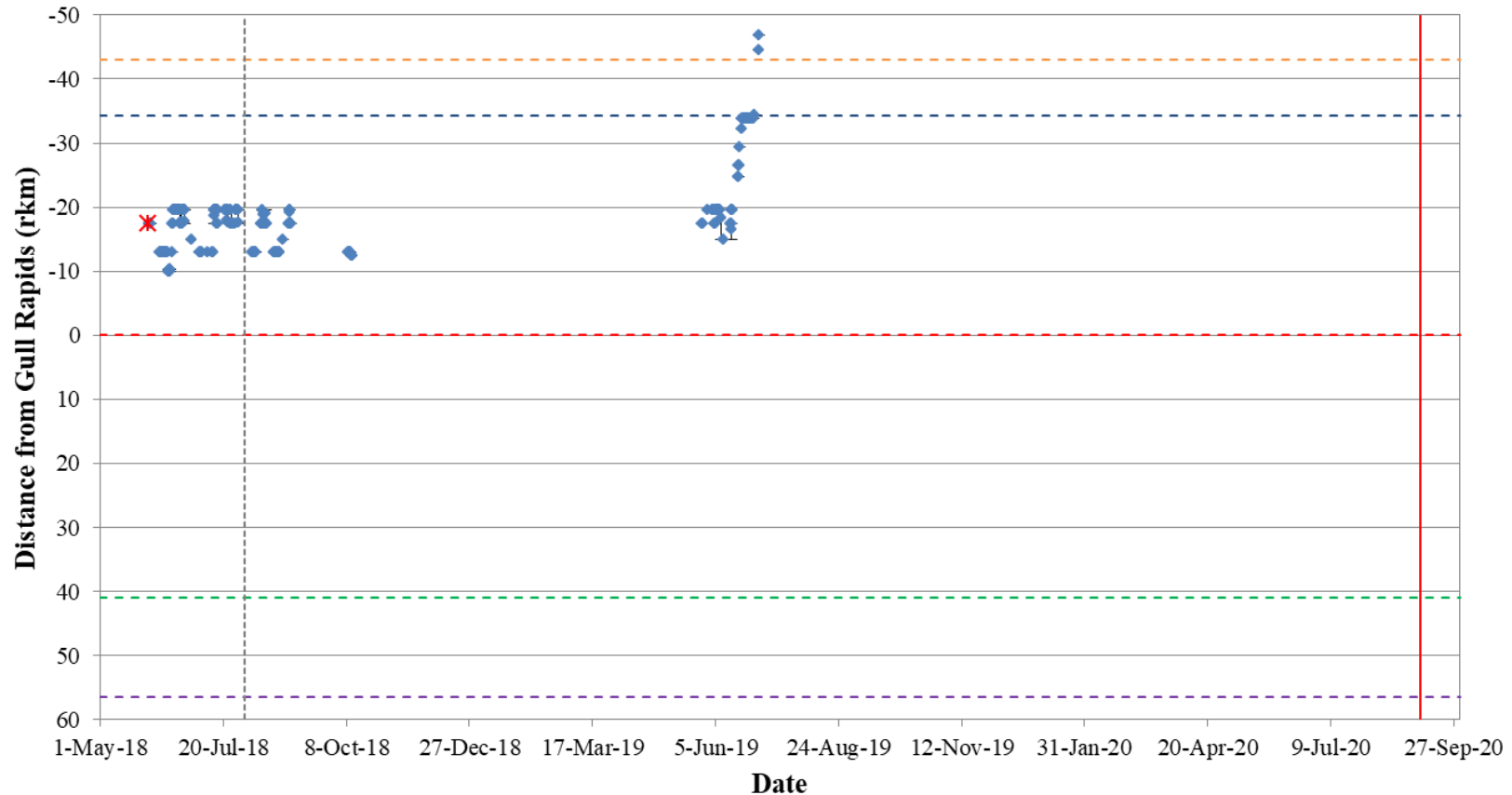


Figure A2-65: Position of a Walleye tagged with an acoustic transmitter (code #25756) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1, 2018, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

APPENDIX 3:

LOCATION SUMMARY FOR INDIVIDUAL ACOUSTIC TAGGED WALLEYE IN STEPHENS LAKE JUNE 2016 TO SEPTEMBER 2020

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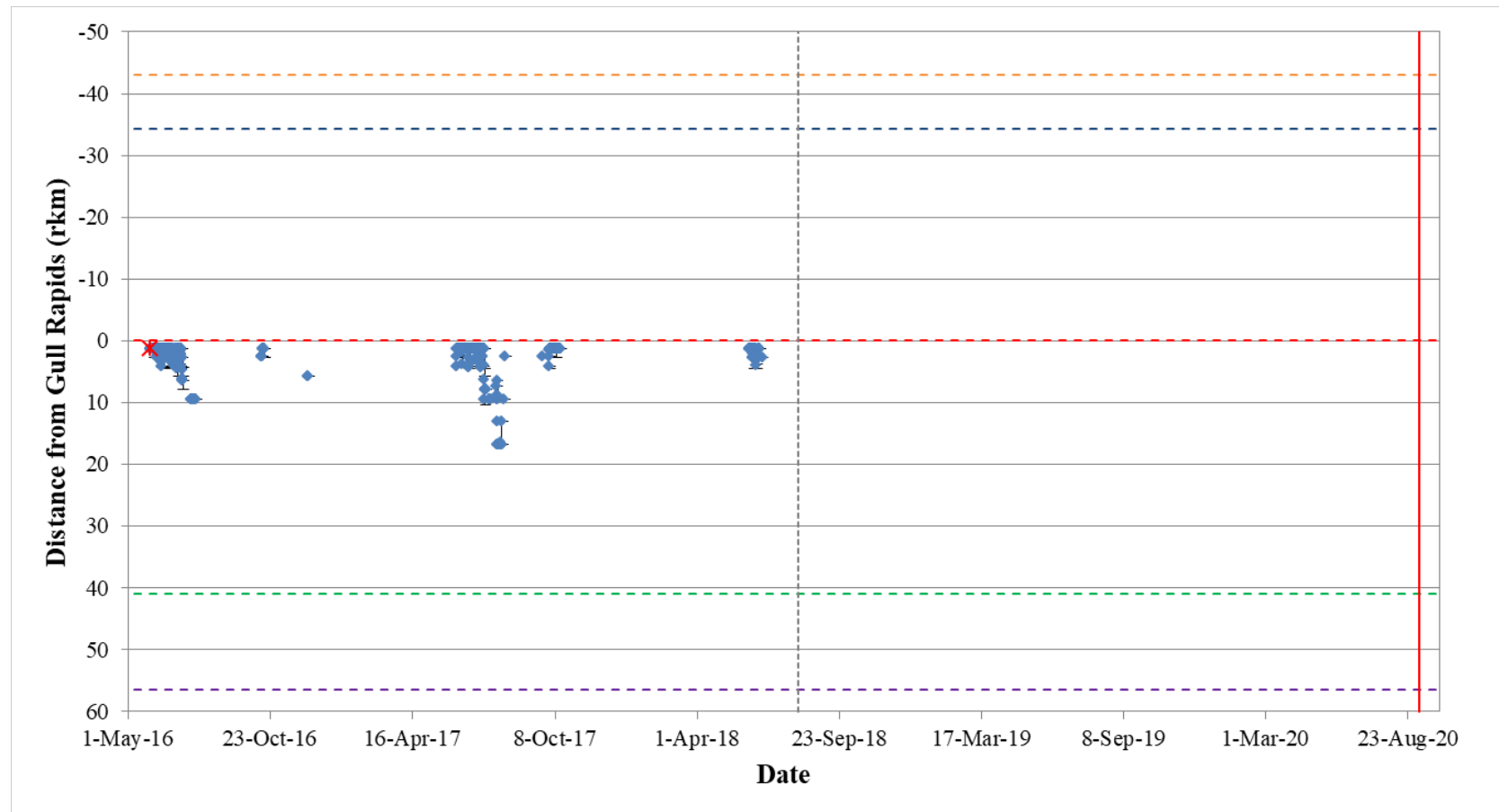


Figure A3-1: Position of a Walleye tagged with an acoustic transmitter (code #53723) in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

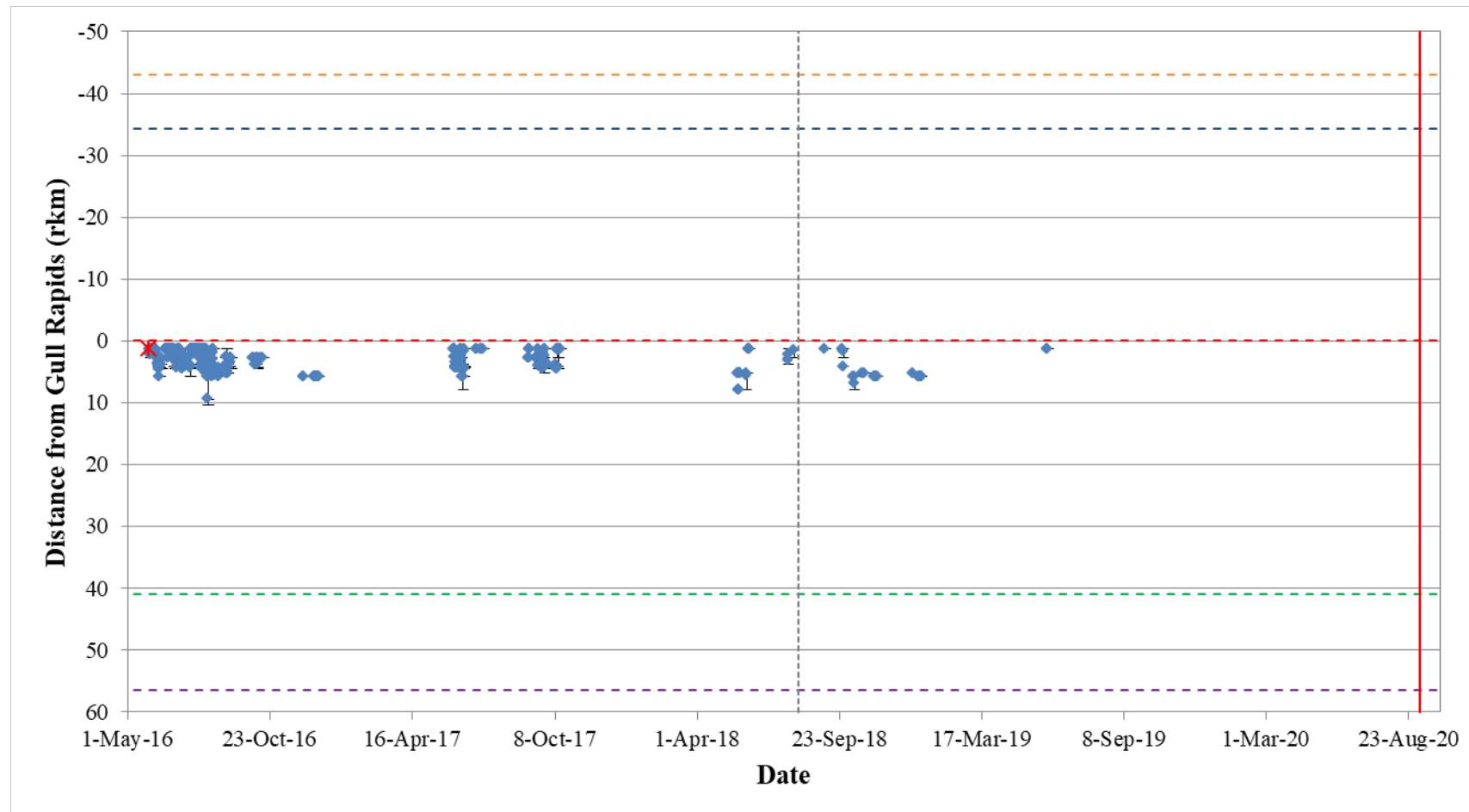


Figure A3-2: Position of a Walleye tagged with an acoustic transmitter (code #53724) in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

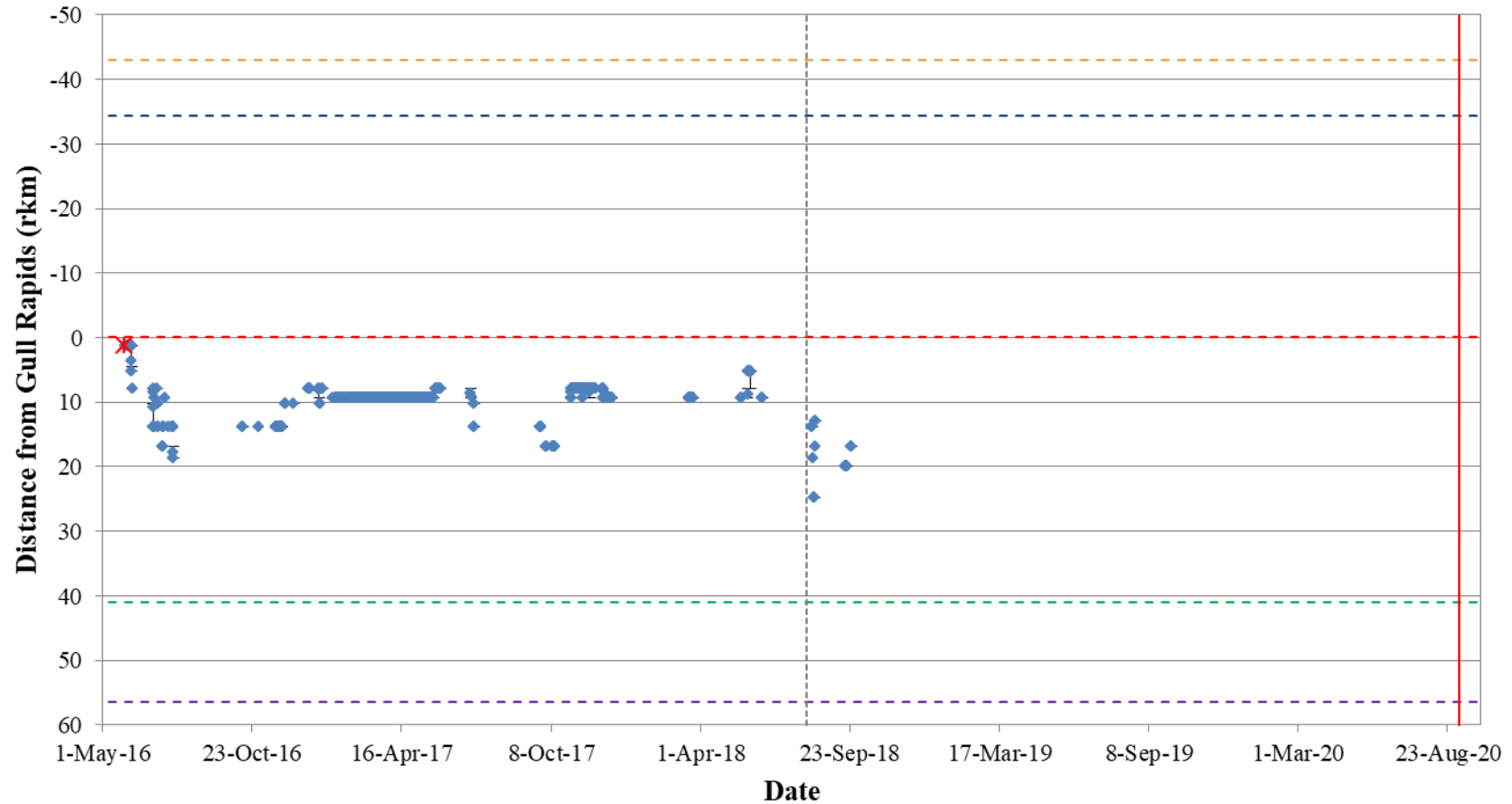


Figure A3-3: Position of a Walleye tagged with an acoustic transmitter (code #53725) in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

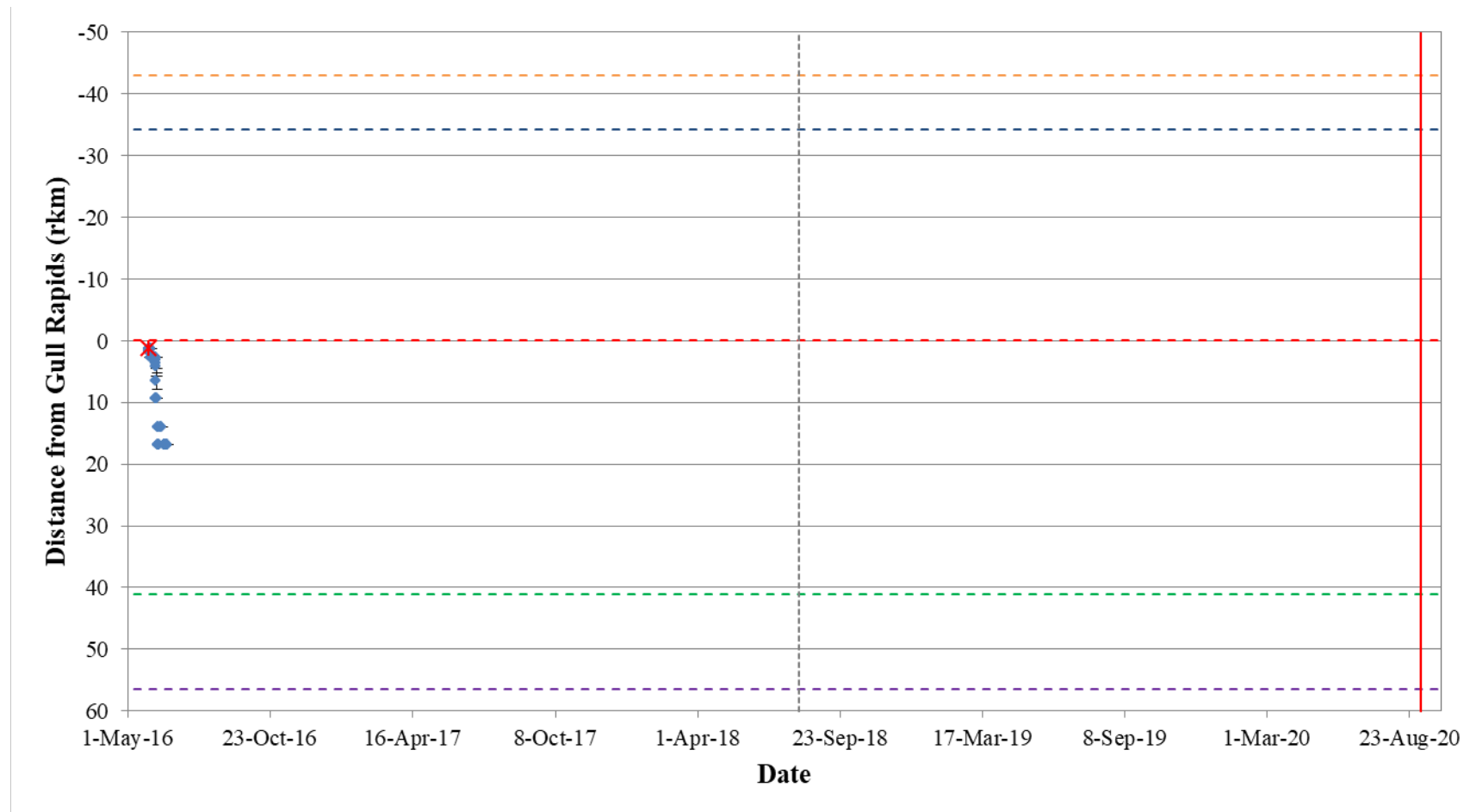


Figure A3-4: Position of a Walleye tagged with an acoustic transmitter (code #53726) in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

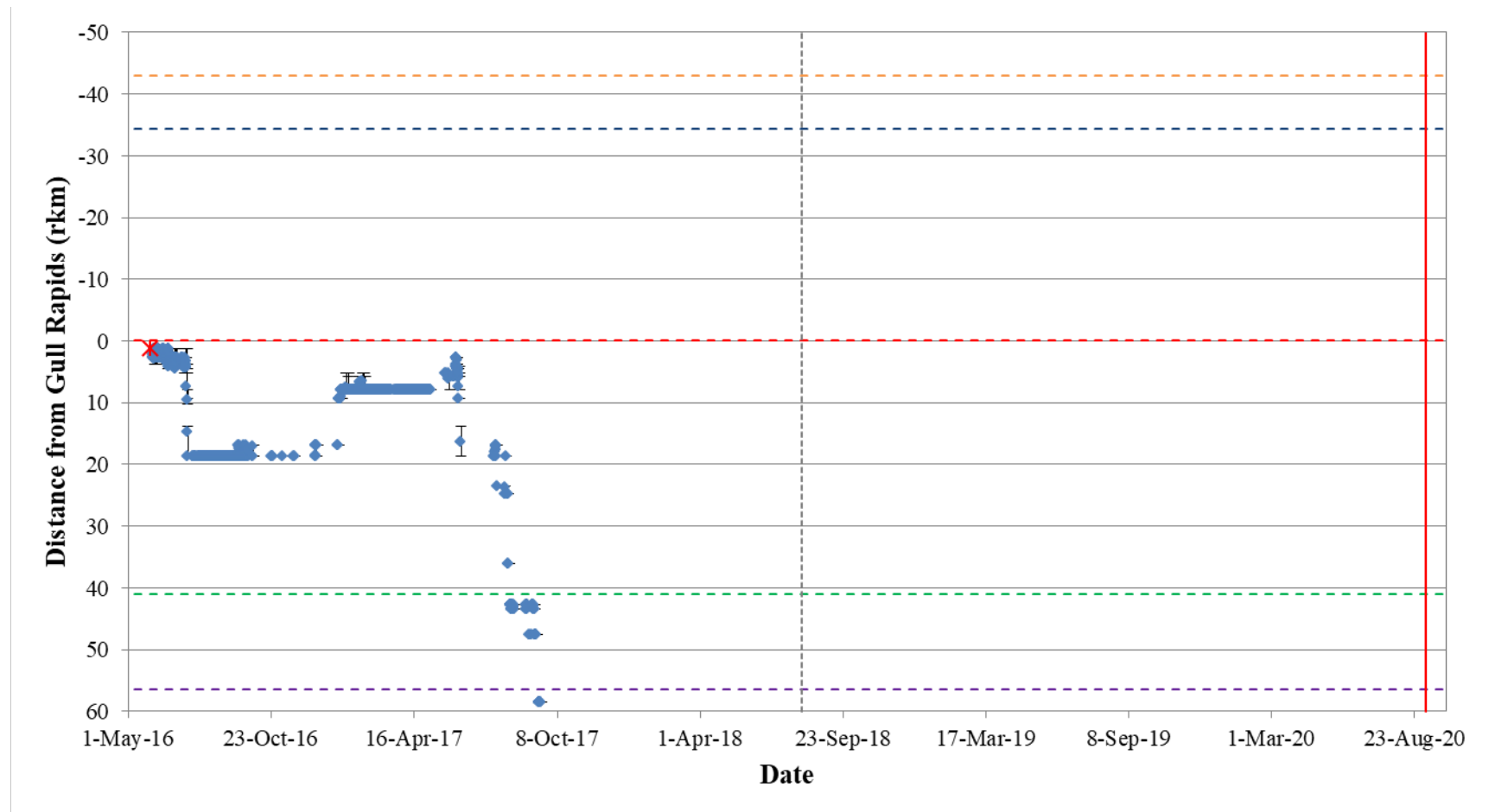


Figure A3-5: Position of a Walleye tagged with an acoustic transmitter (code #53728) in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

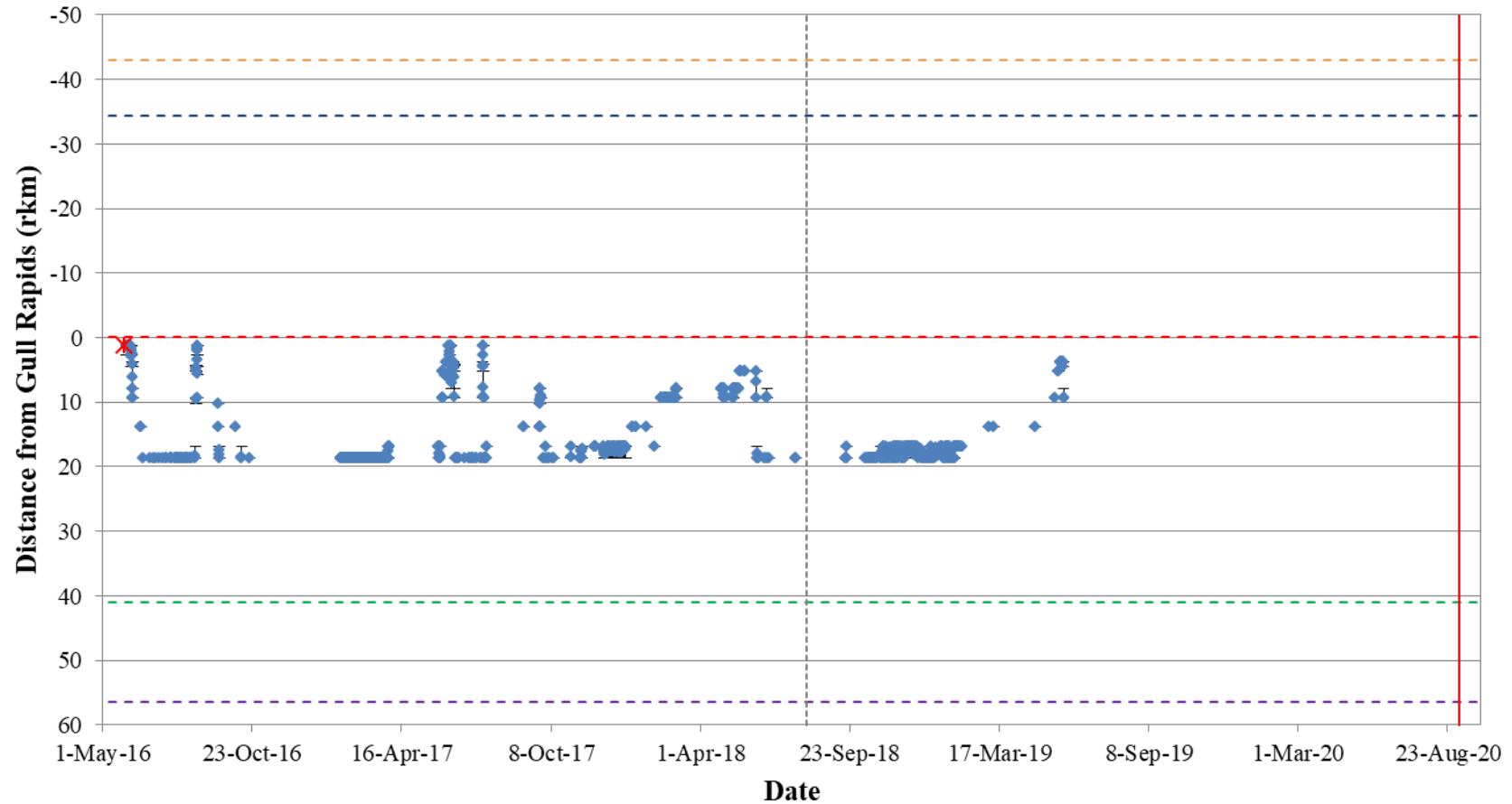


Figure A3-6: Position of a Walleye tagged with an acoustic transmitter (code #53729) in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

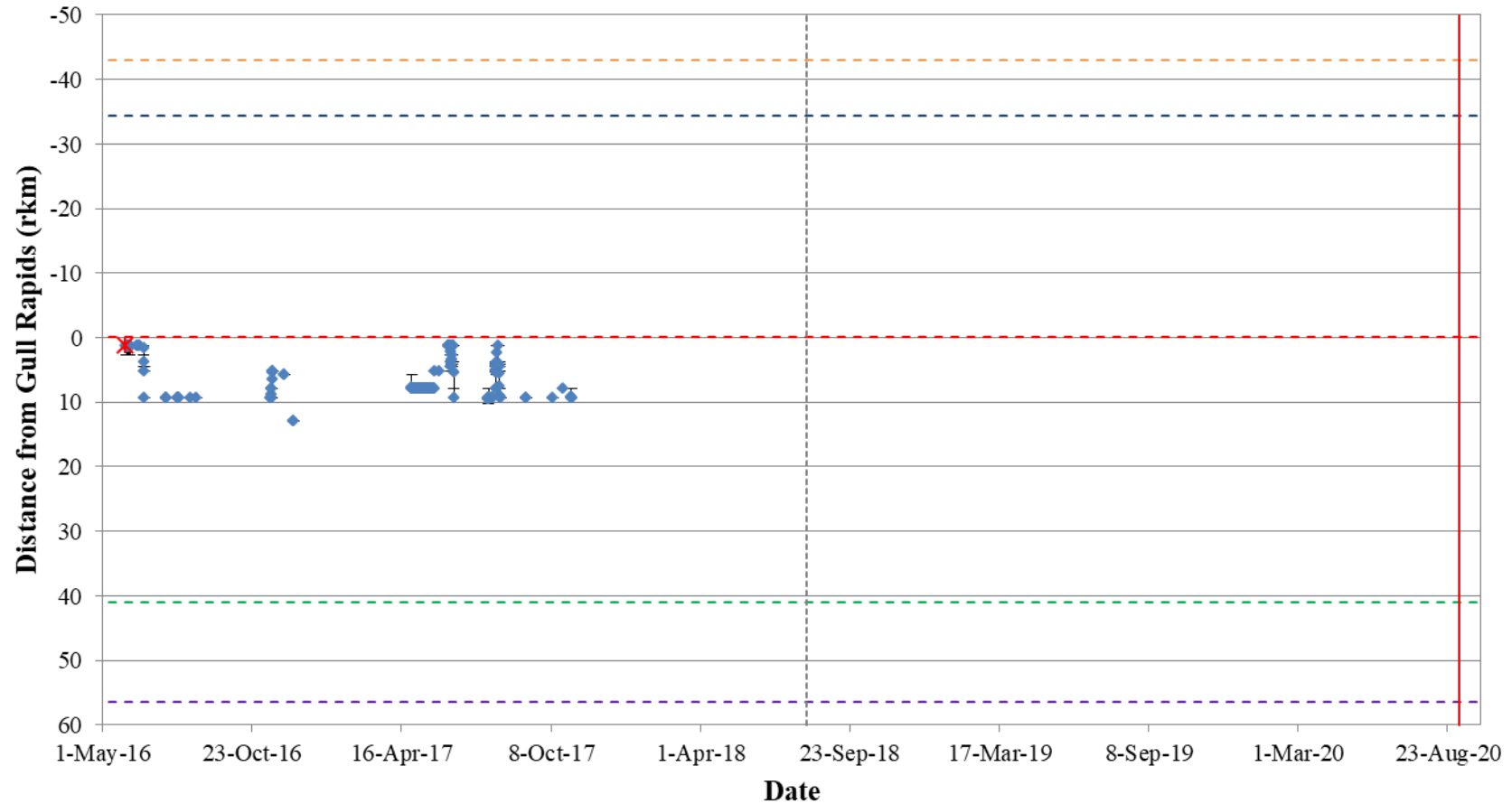


Figure A3-7: Position of a Walleye tagged with an acoustic transmitter (code #53730) in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

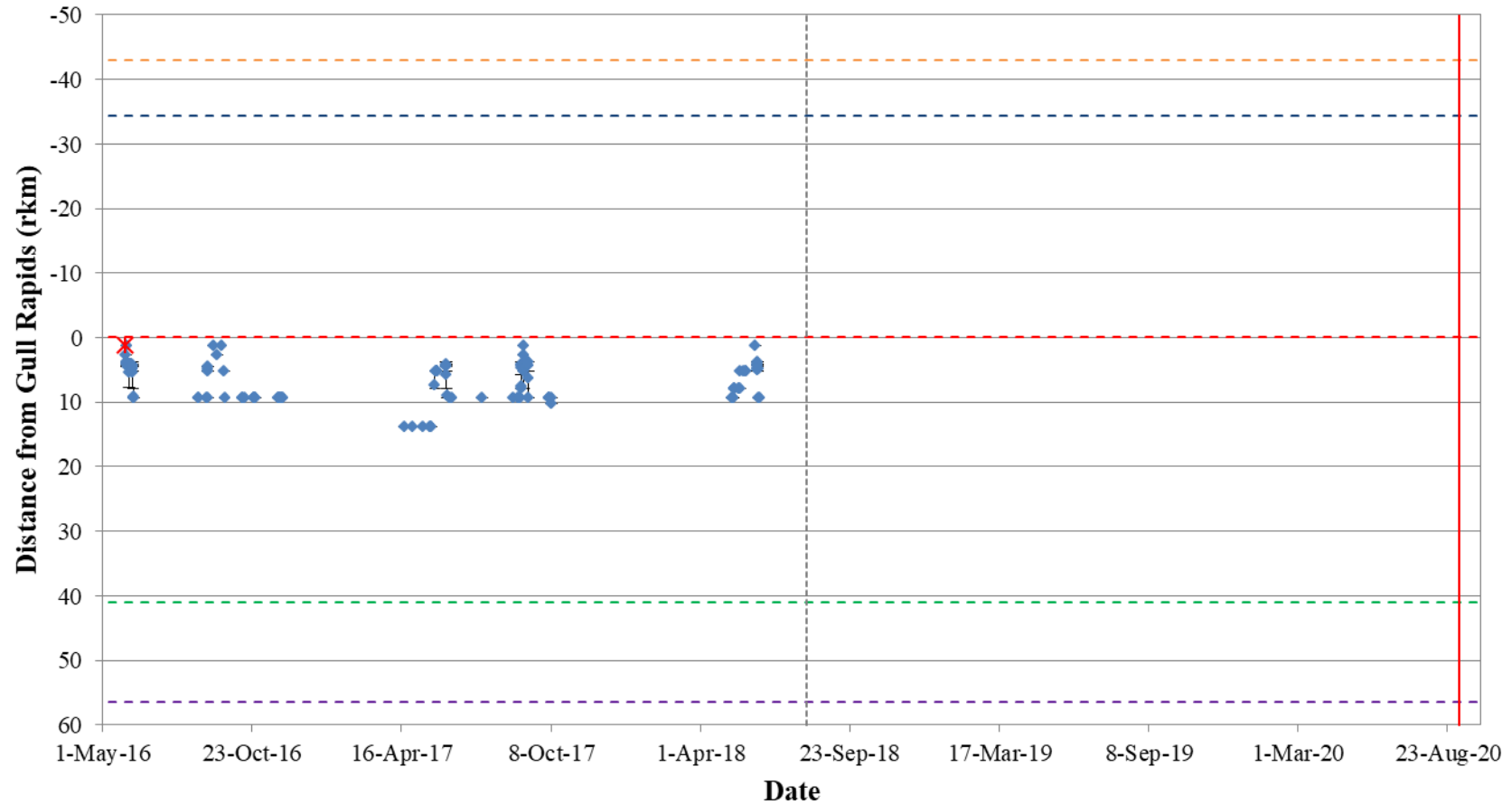


Figure A3-8: Position of a Walleye tagged with an acoustic transmitter (code #53731) in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

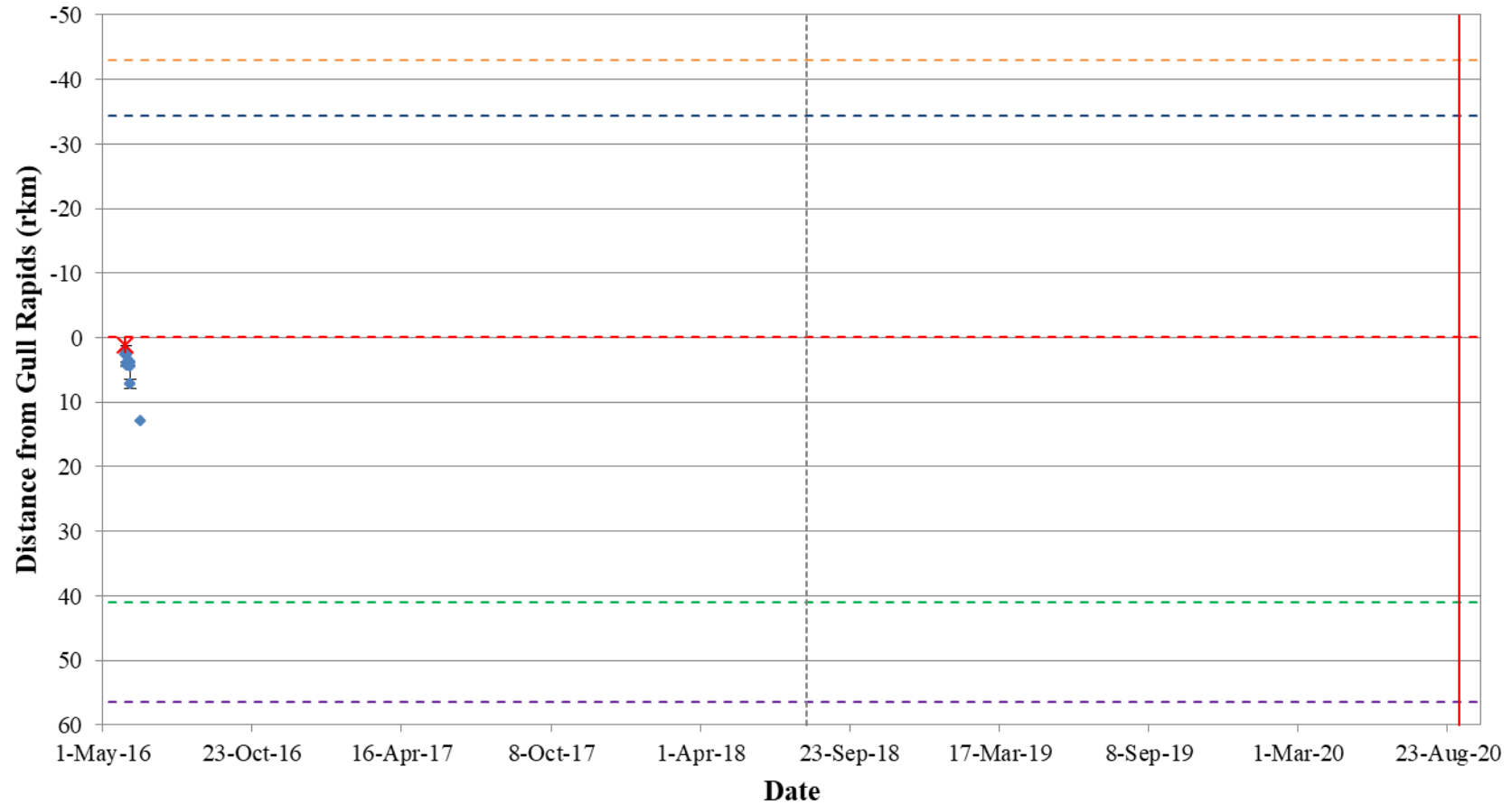


Figure A3-9: Position of a Walleye tagged with an acoustic transmitter (code #53732) in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

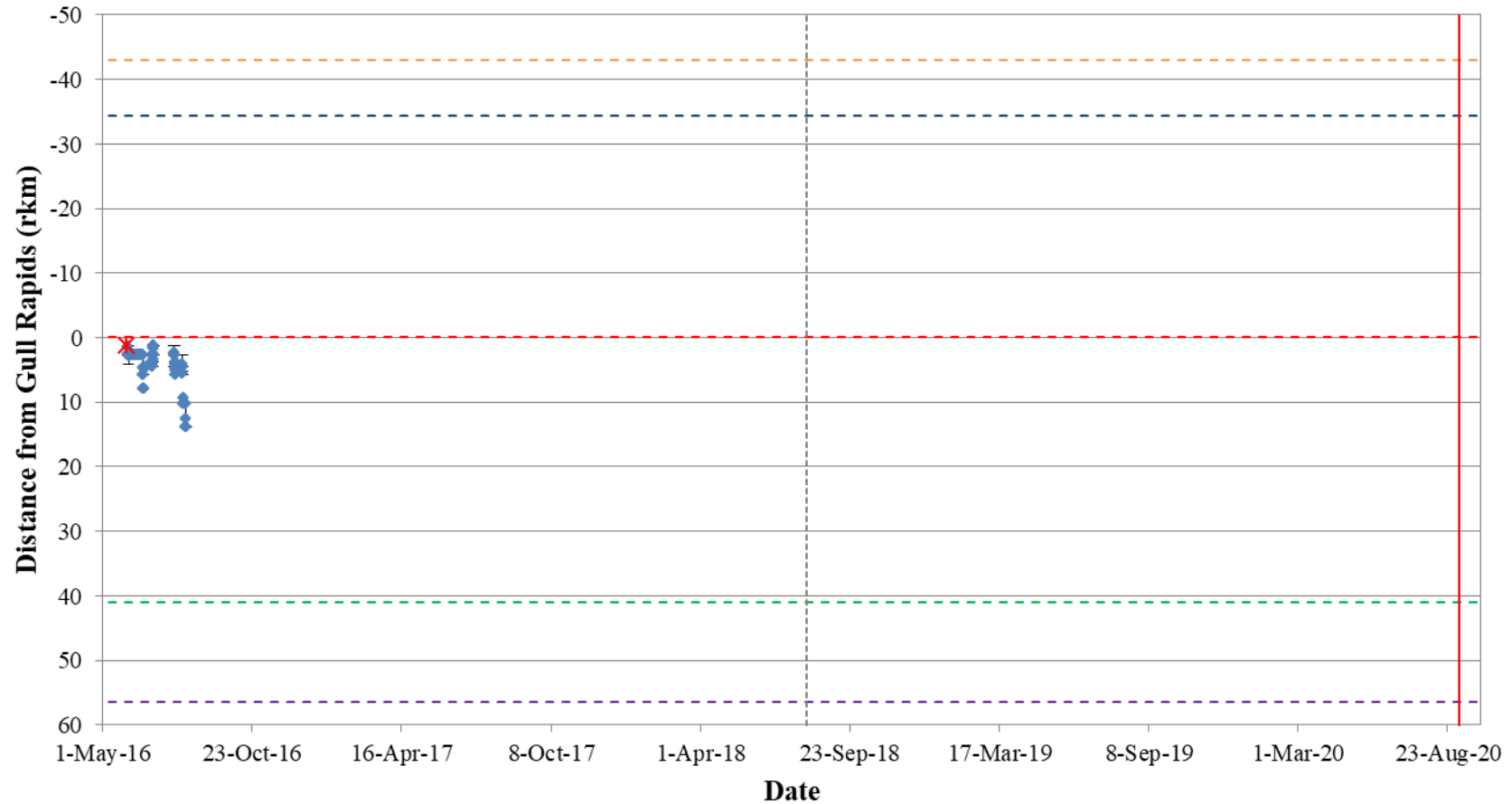


Figure A3-10: Position of a Walleye tagged with an acoustic transmitter (code #53733) in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

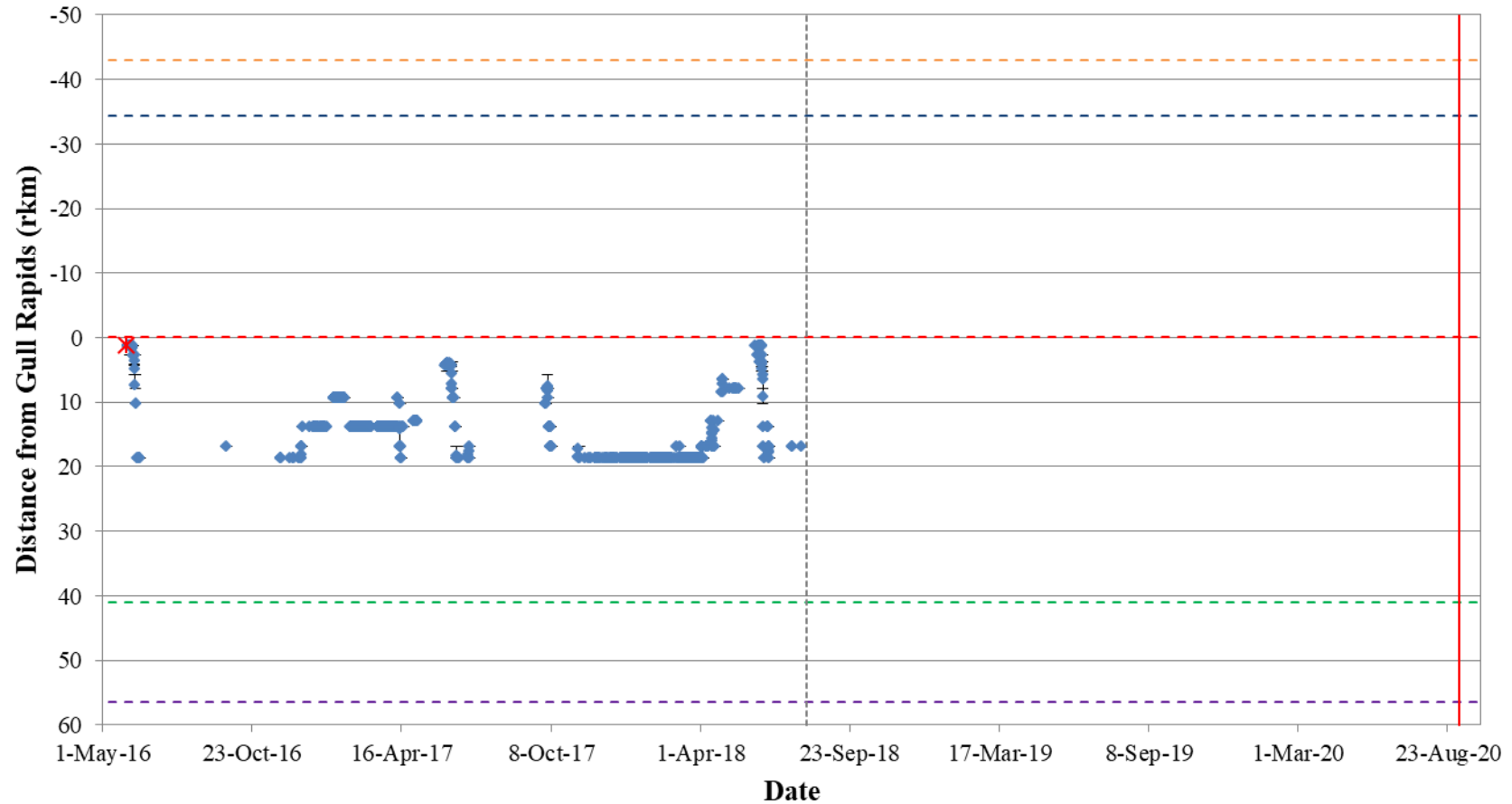


Figure A3-11: Position of a Walleye tagged with an acoustic transmitter (code #53734) in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

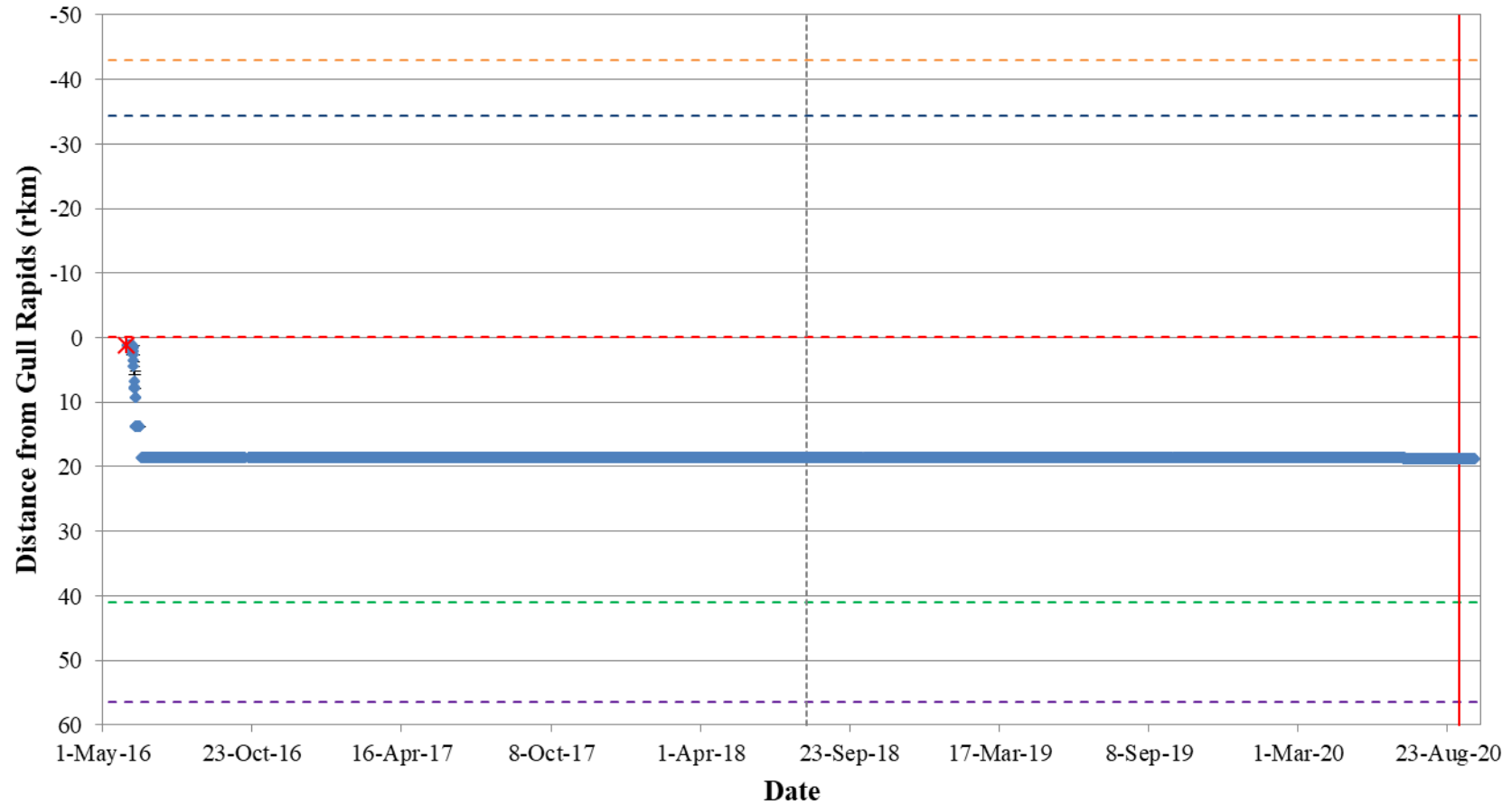


Figure A3-12: Position of a Walleye tagged with an acoustic transmitter (code #53735) in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

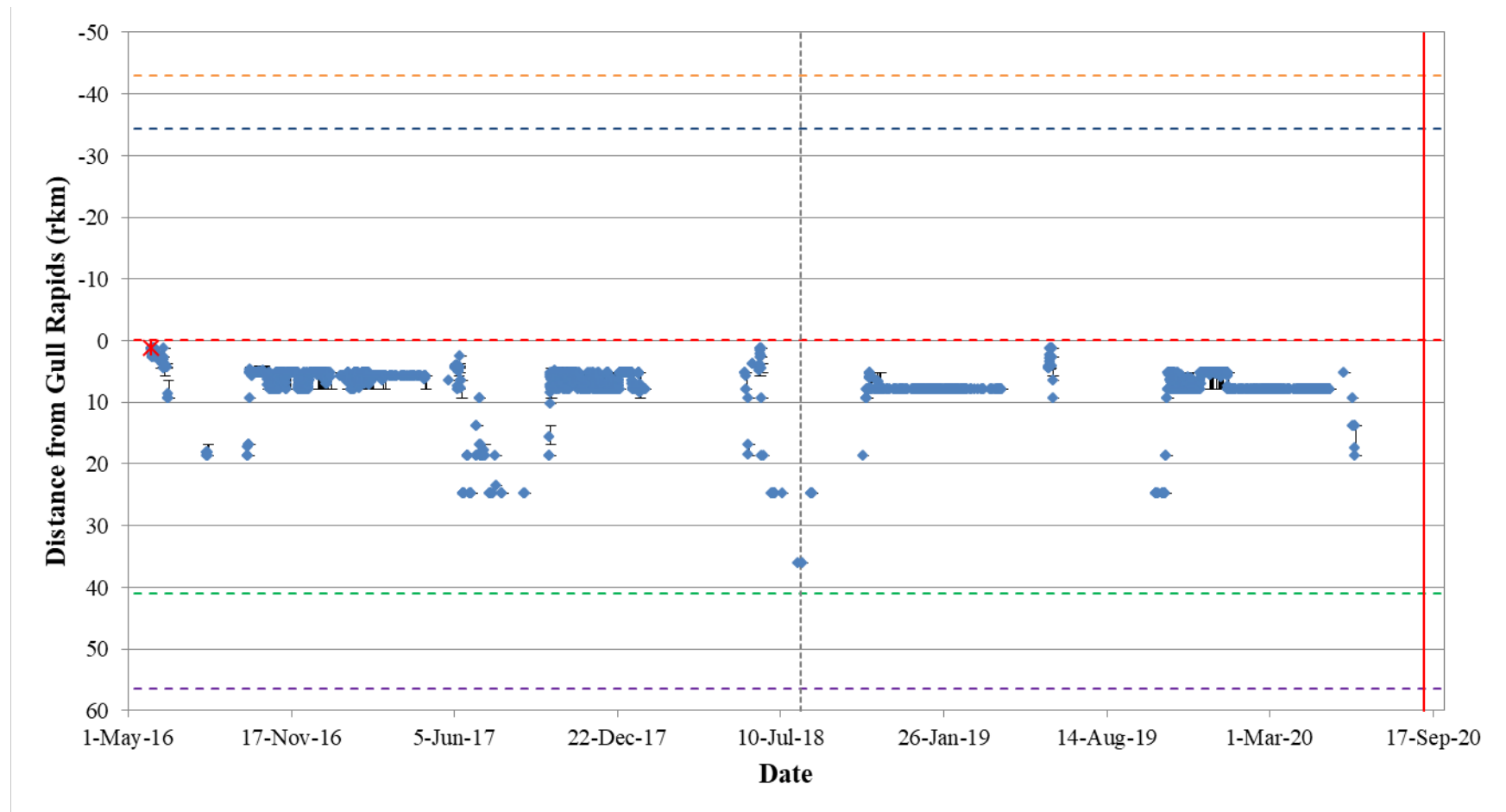


Figure A3-13: Position of a Walleye tagged with an acoustic transmitter (code #53736) in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

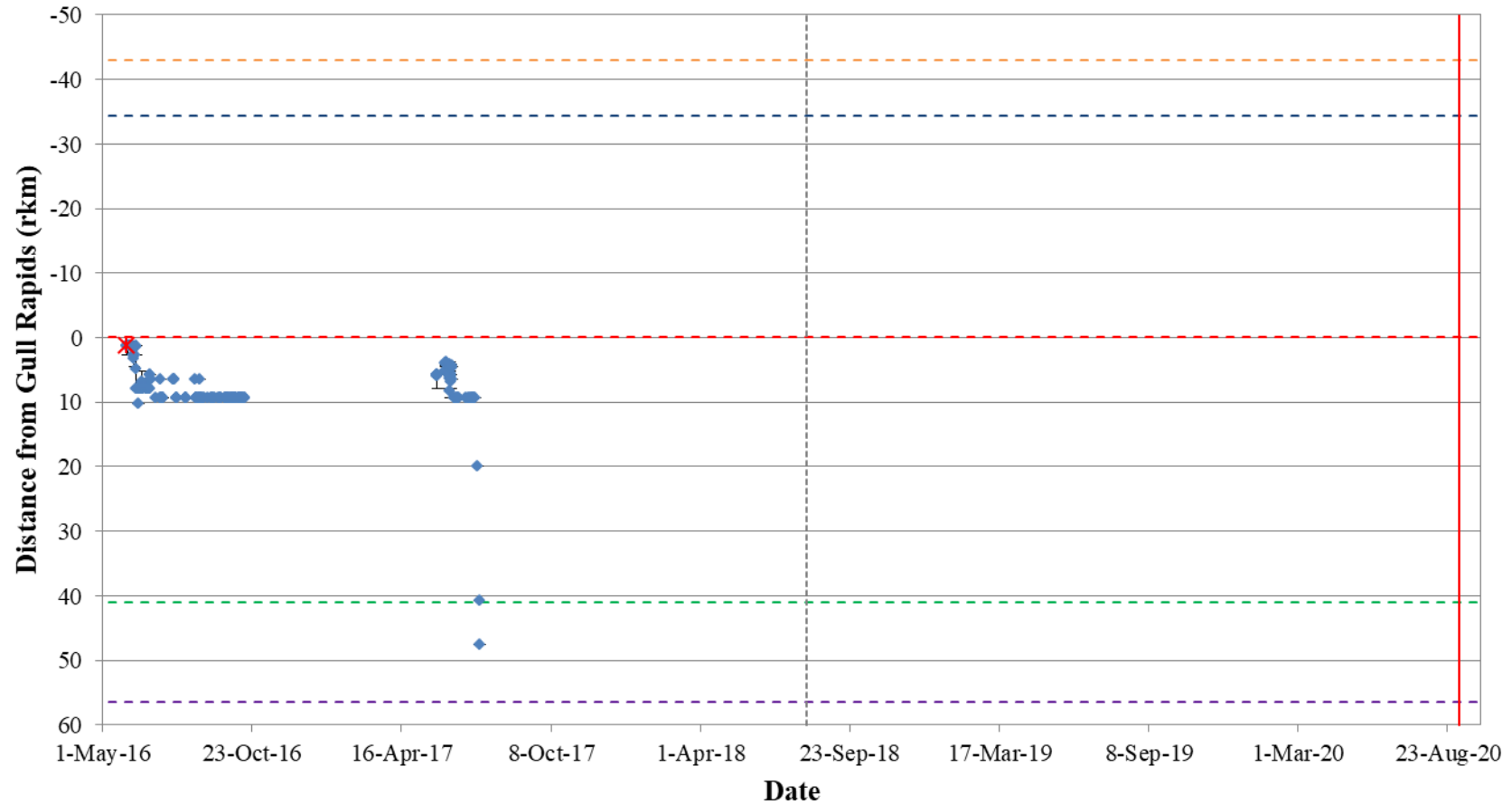


Figure A3-14: Position of a Walleye tagged with an acoustic transmitter (code #53737) in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

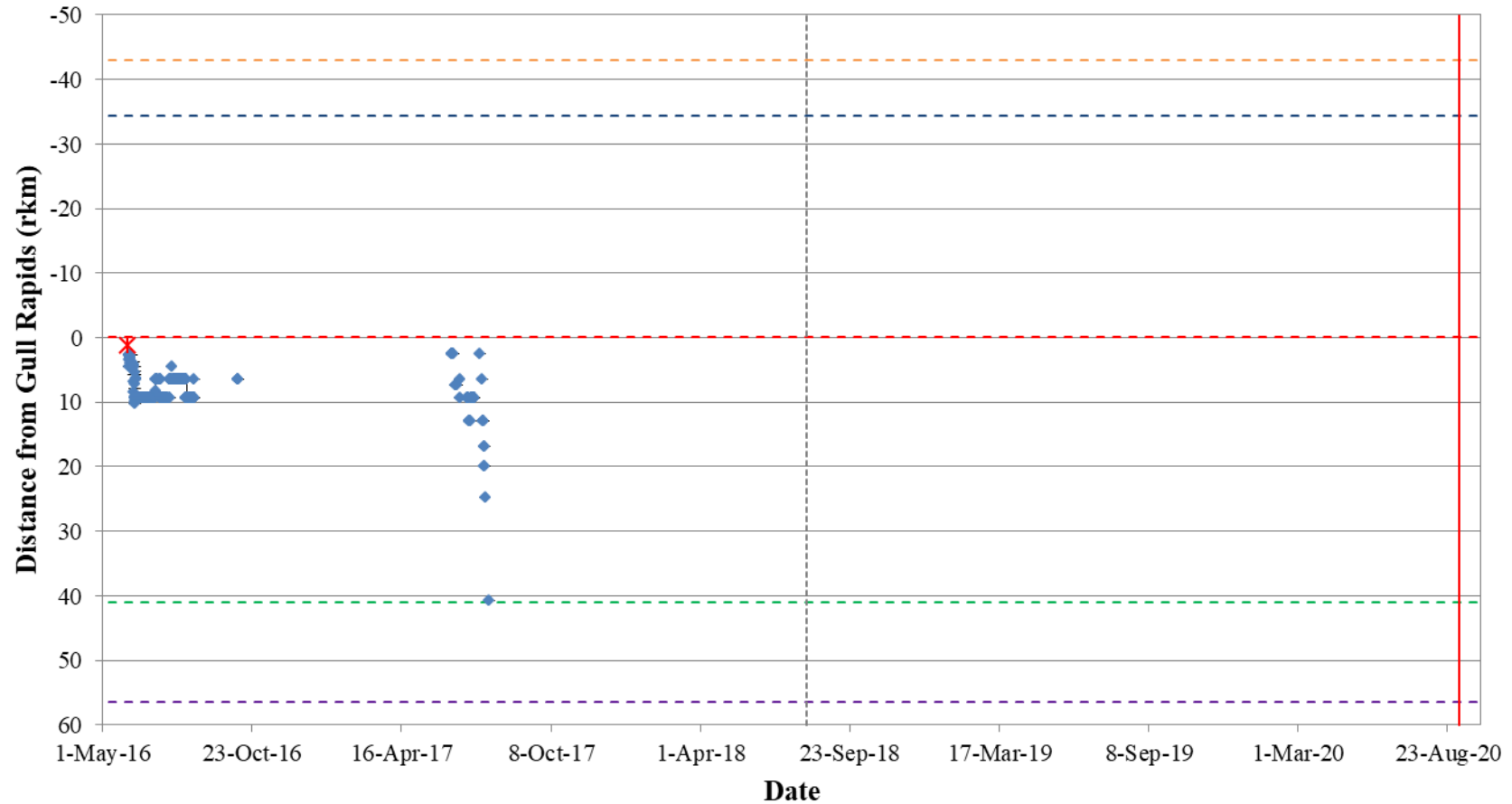


Figure A3-15: Position of a Walleye tagged with an acoustic transmitter (code #53738) in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

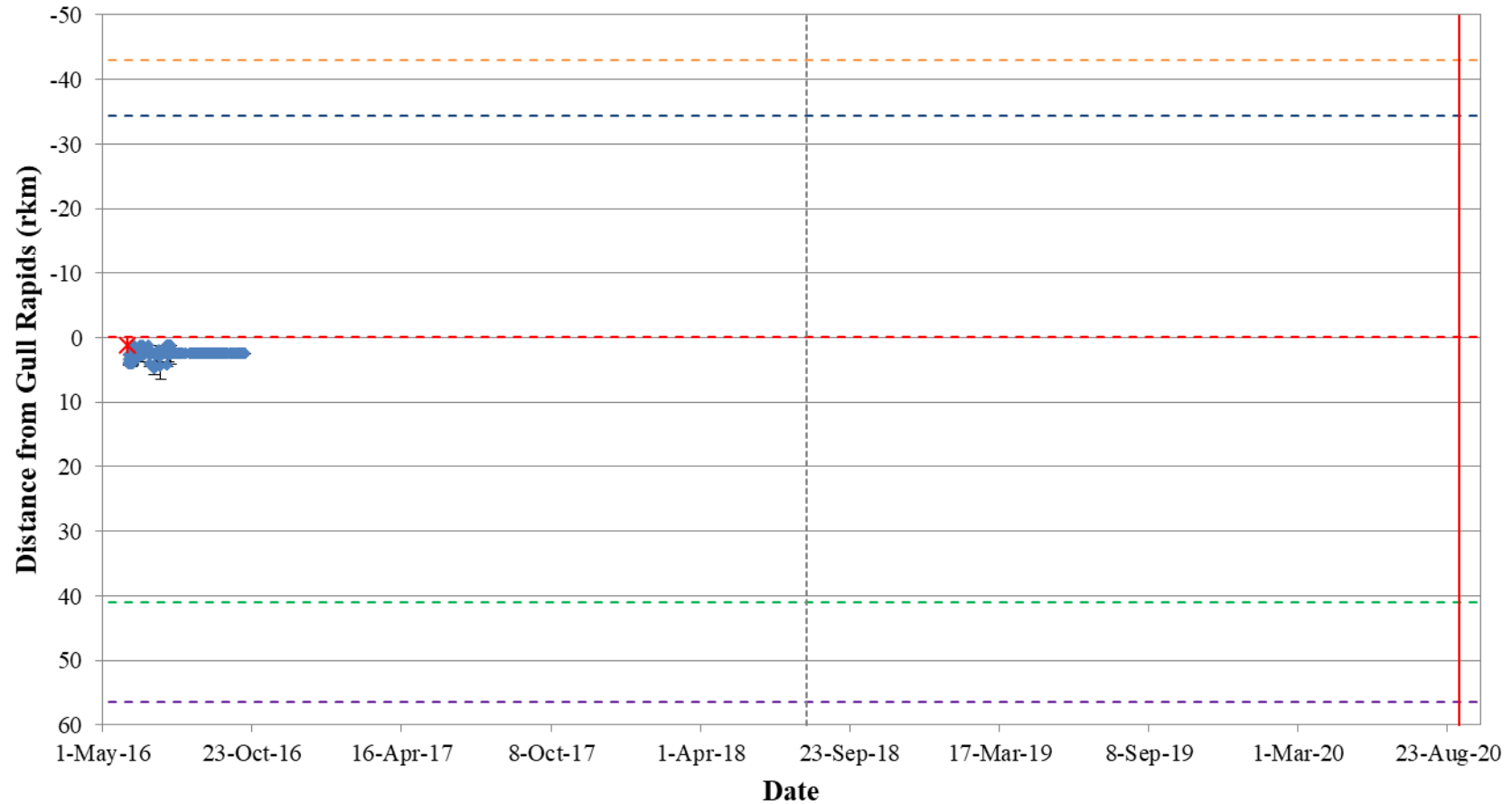


Figure A3-16: Position of a Walleye tagged with an acoustic transmitter (code #53739) in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

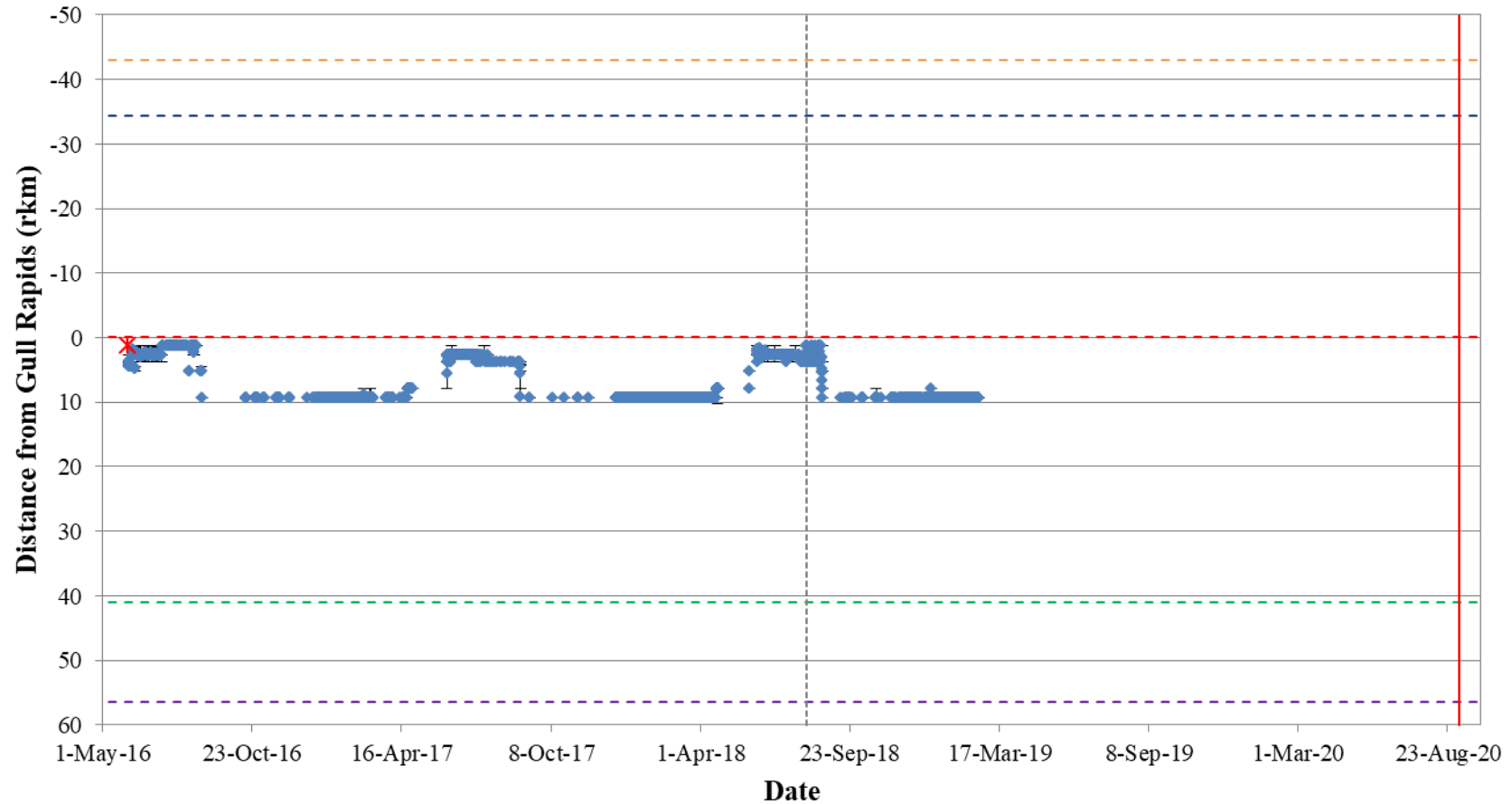


Figure A3-17: Position of a Walleye tagged with an acoustic transmitter (code #53740) in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

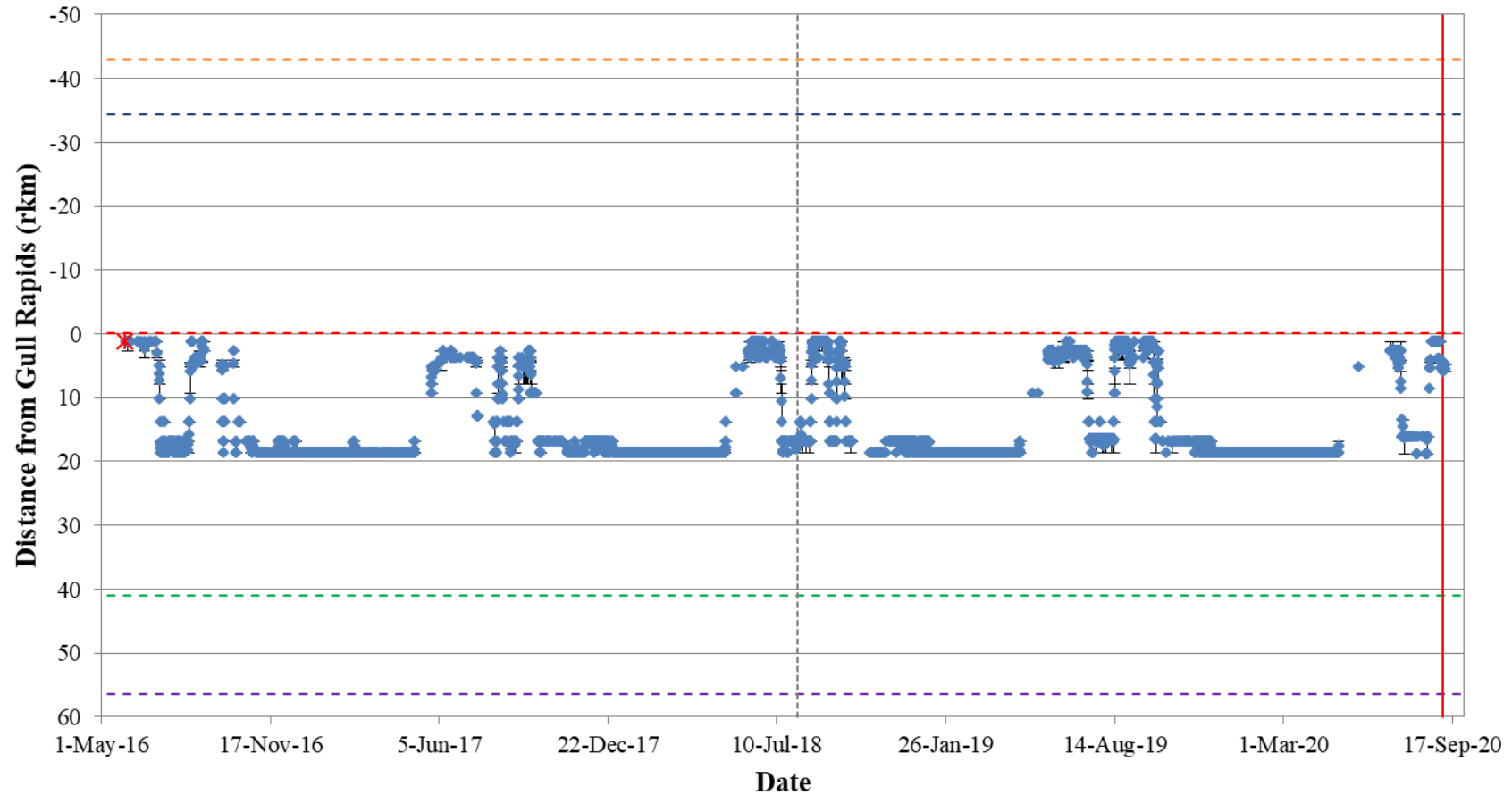


Figure A3-18: Position of a Walleye tagged with an acoustic transmitter (code #53741) in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

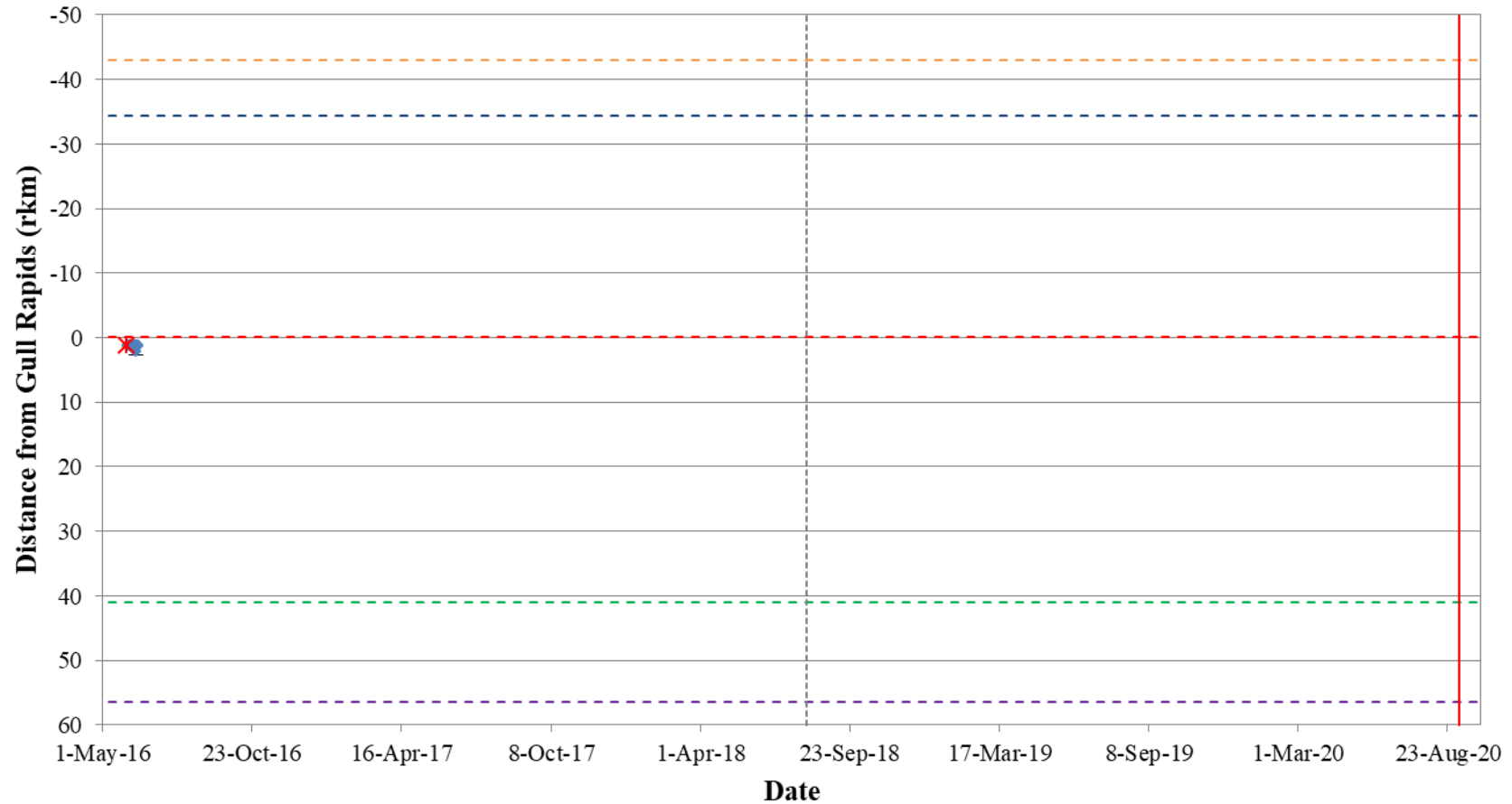


Figure A3-19: Position of a Walleye tagged with an acoustic transmitter (code #53742) in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

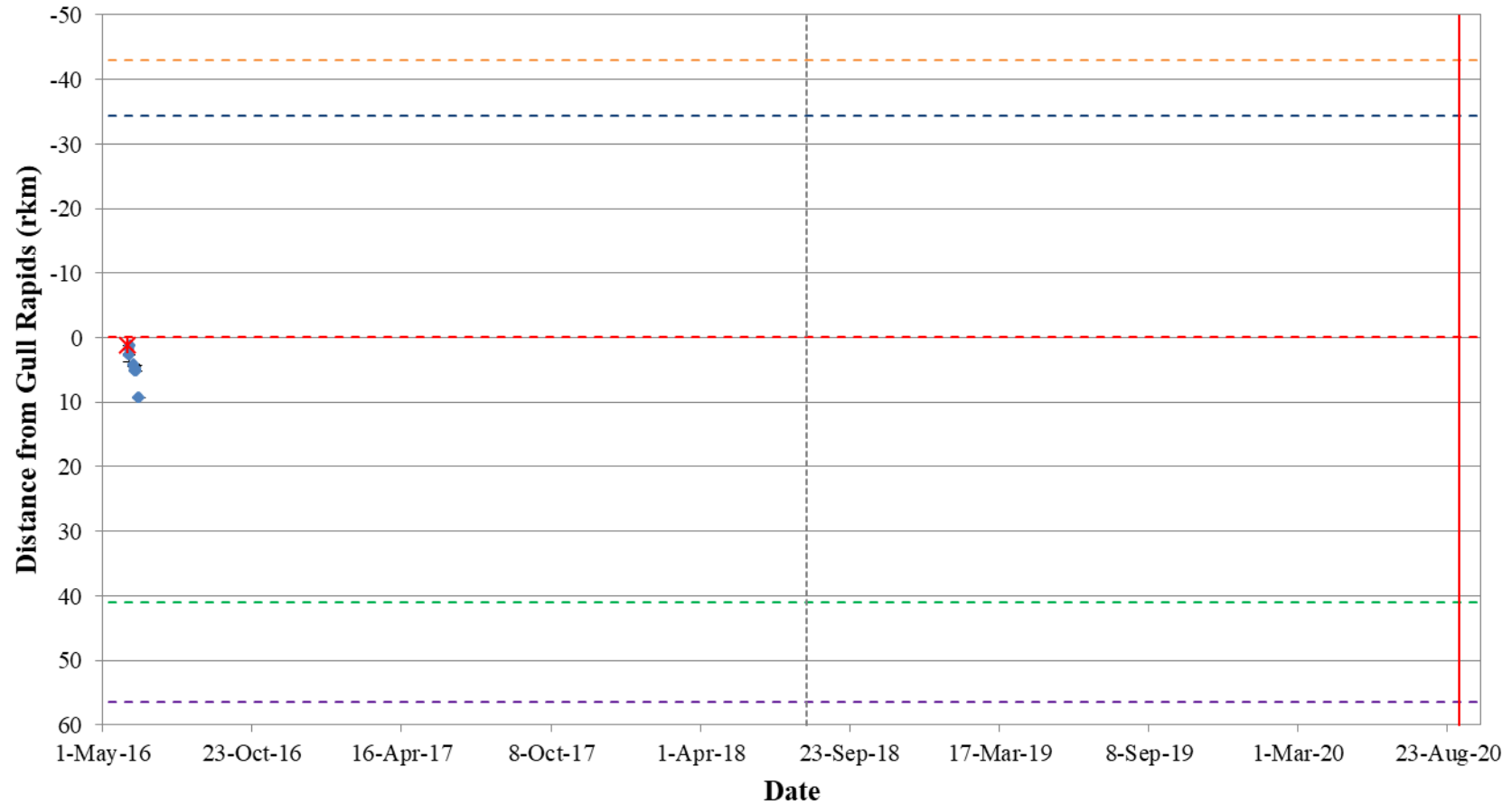


Figure A3-20: Position of a Walleye tagged with an acoustic transmitter (code #53743) in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

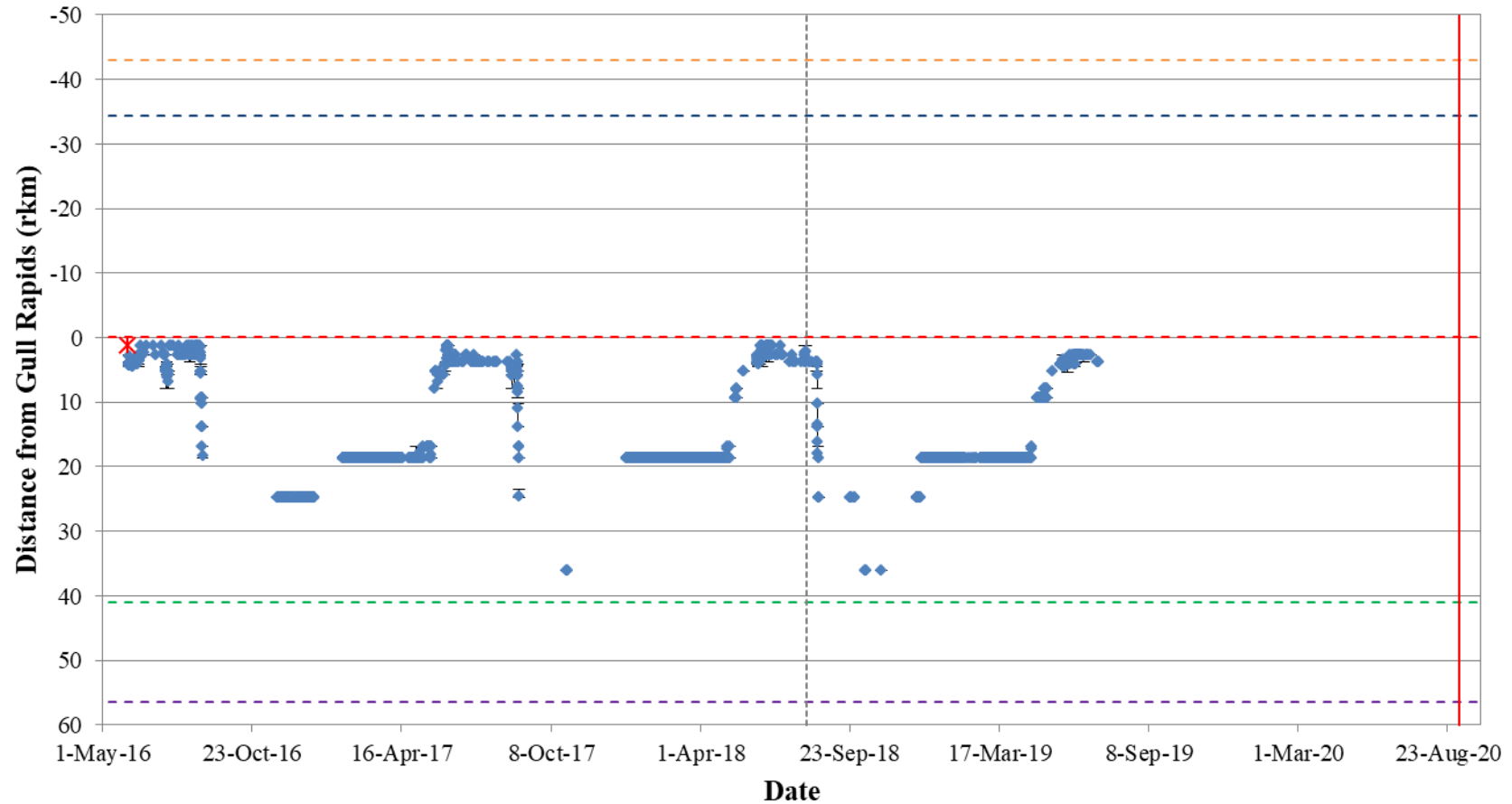


Figure A3-21: Position of a Walleye tagged with an acoustic transmitter (code #53744) in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

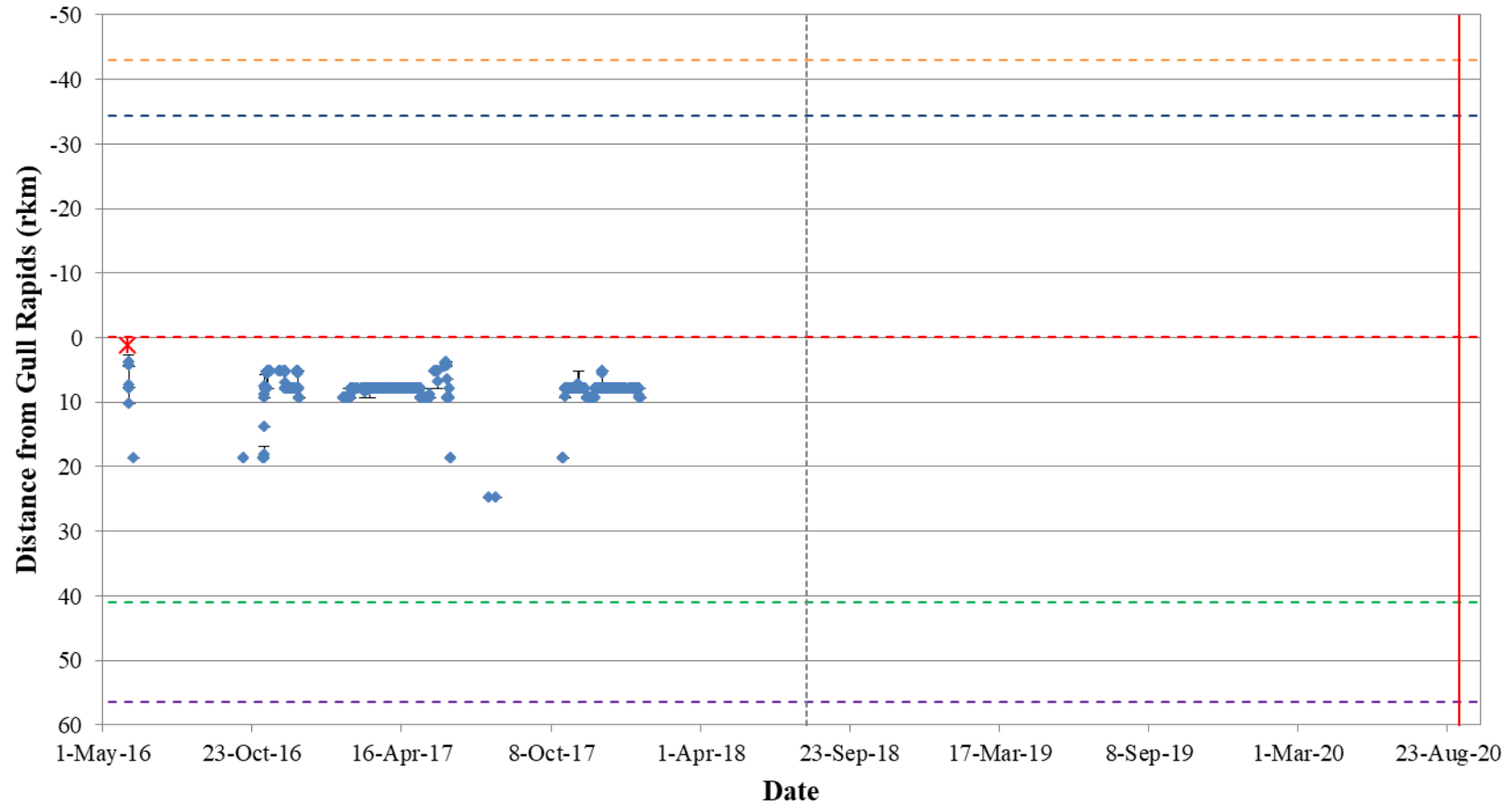


Figure A3-22: Position of a Walleye tagged with an acoustic transmitter (code #53745) in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

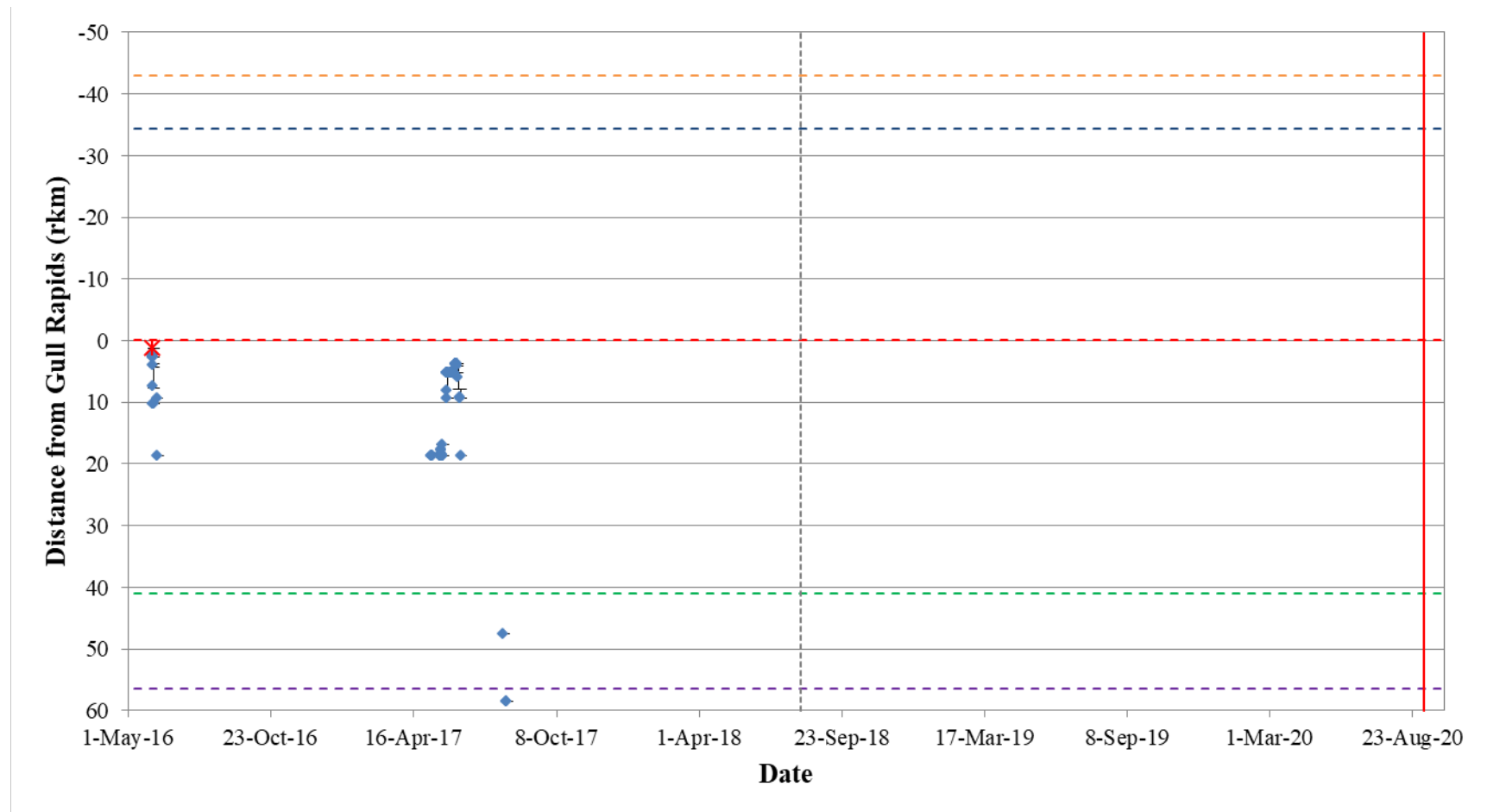


Figure A3-23: Position of a Walleye tagged with an acoustic transmitter (code #53746) in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

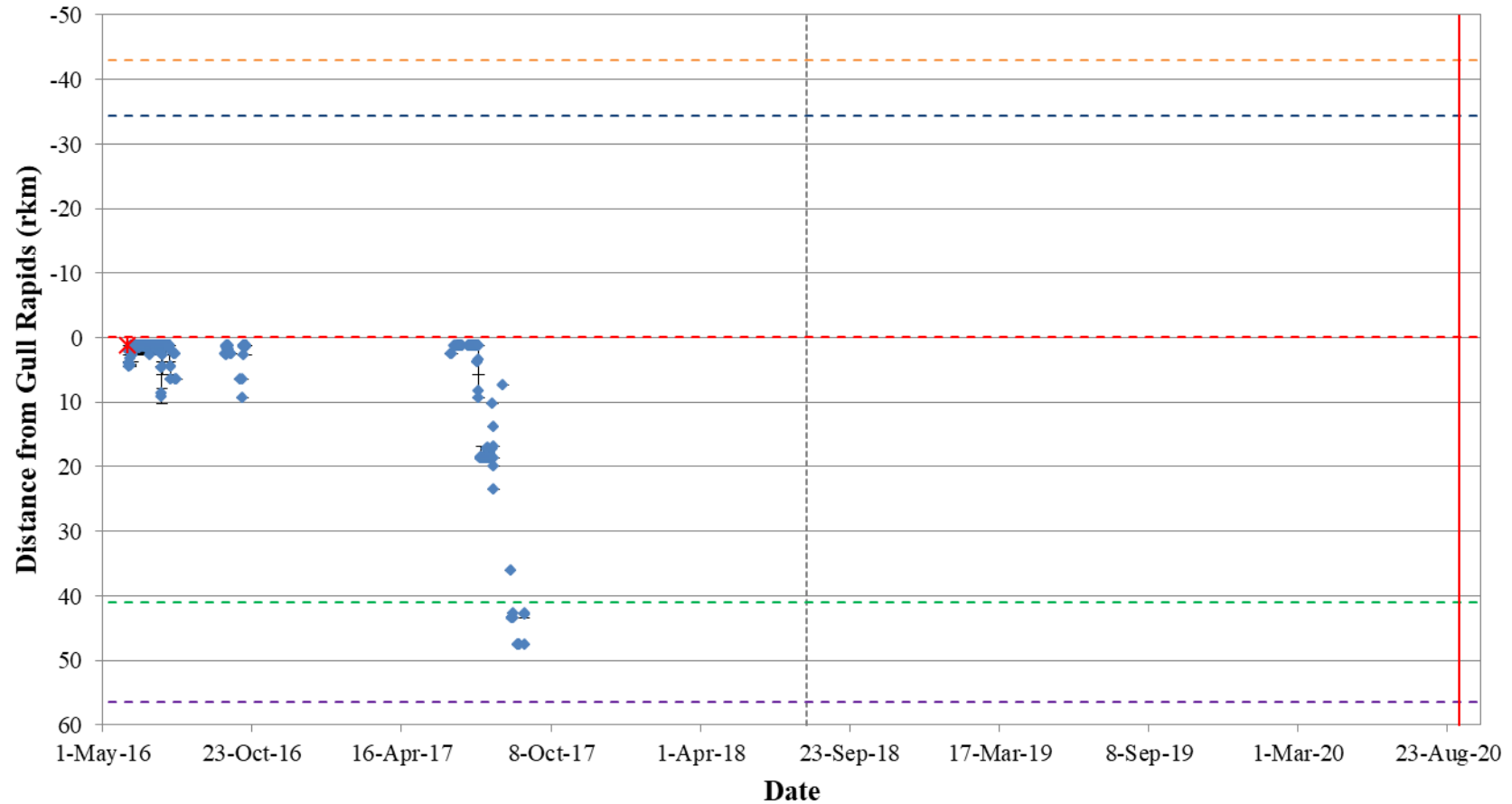


Figure A3-24: Position of a Walleye tagged with an acoustic transmitter (code #53747) in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

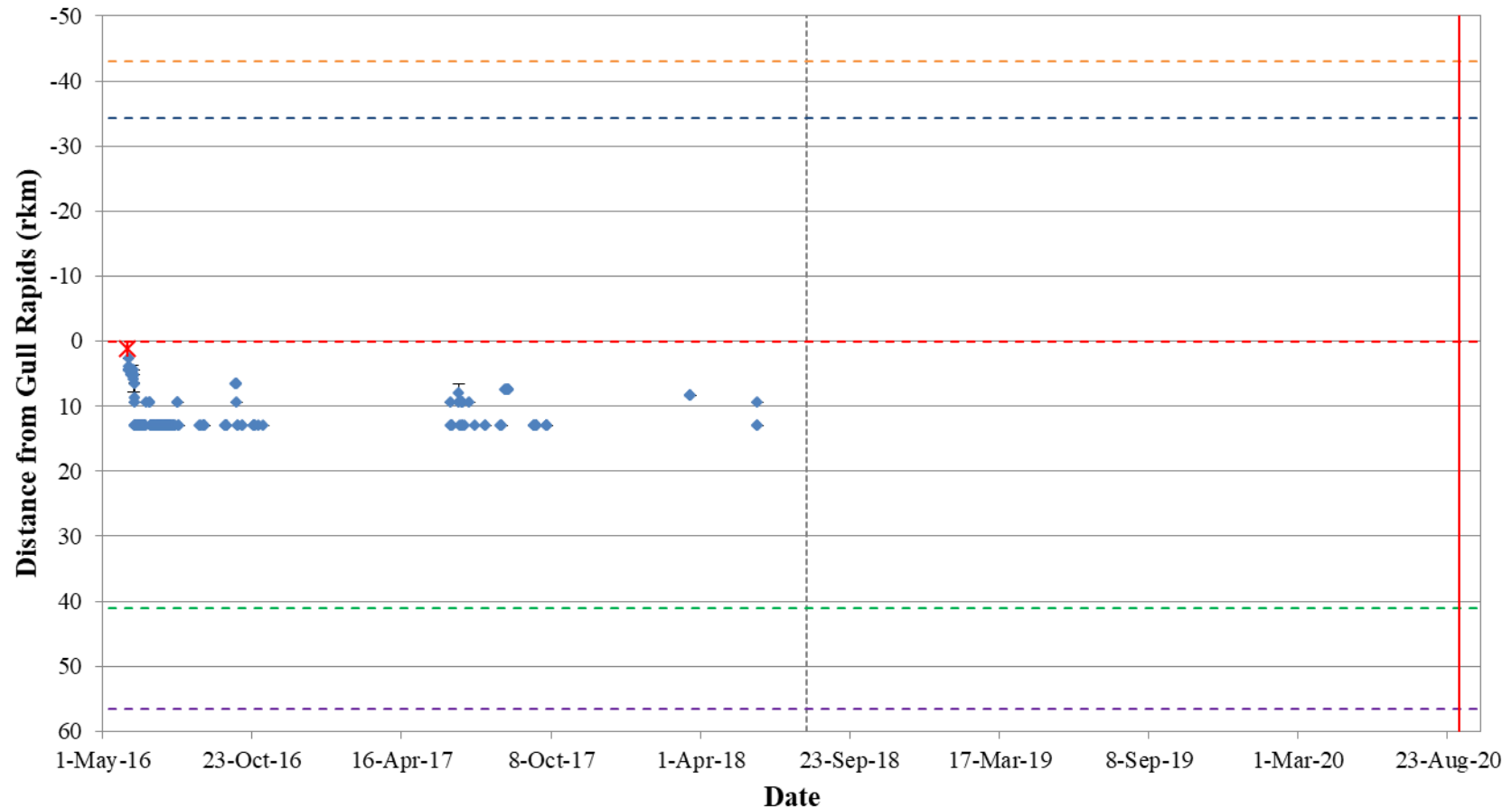


Figure A3-25: Position of a Walleye tagged with an acoustic transmitter (code #53748) in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

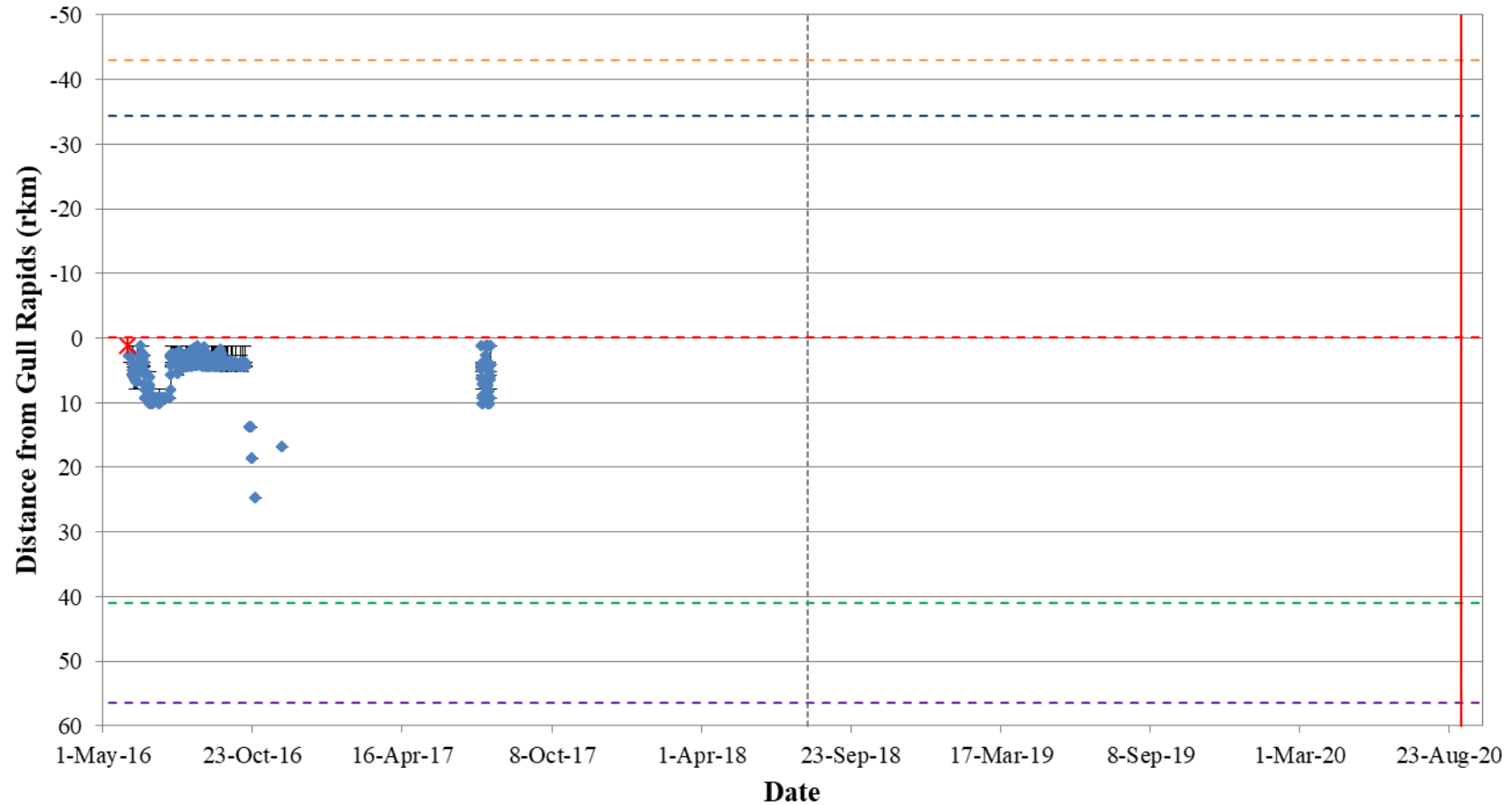


Figure A3-26: Position of a Walleye tagged with an acoustic transmitter (code #53749) in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

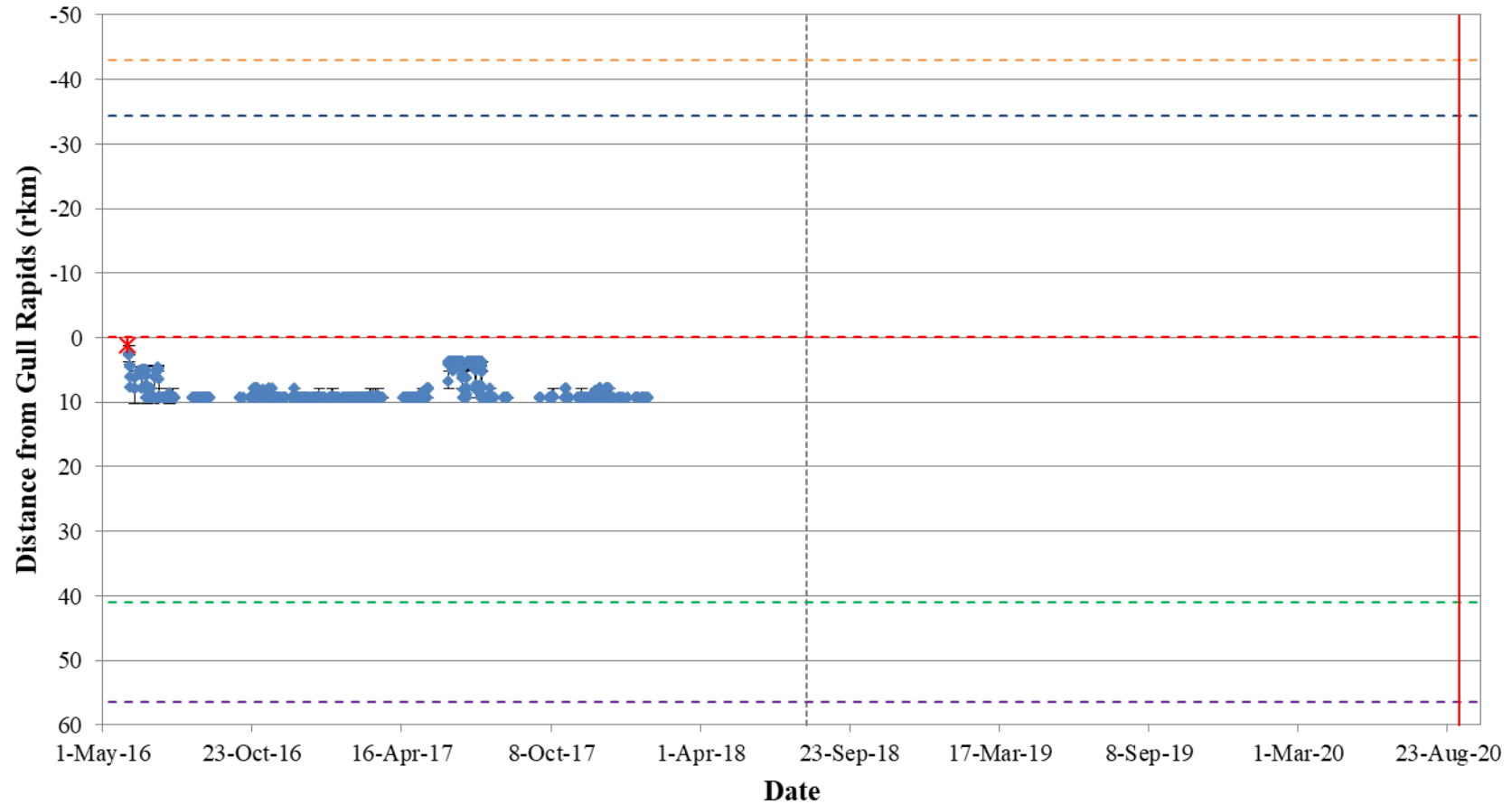


Figure A3-27: Position of a Walleye tagged with an acoustic transmitter (code #53750) in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

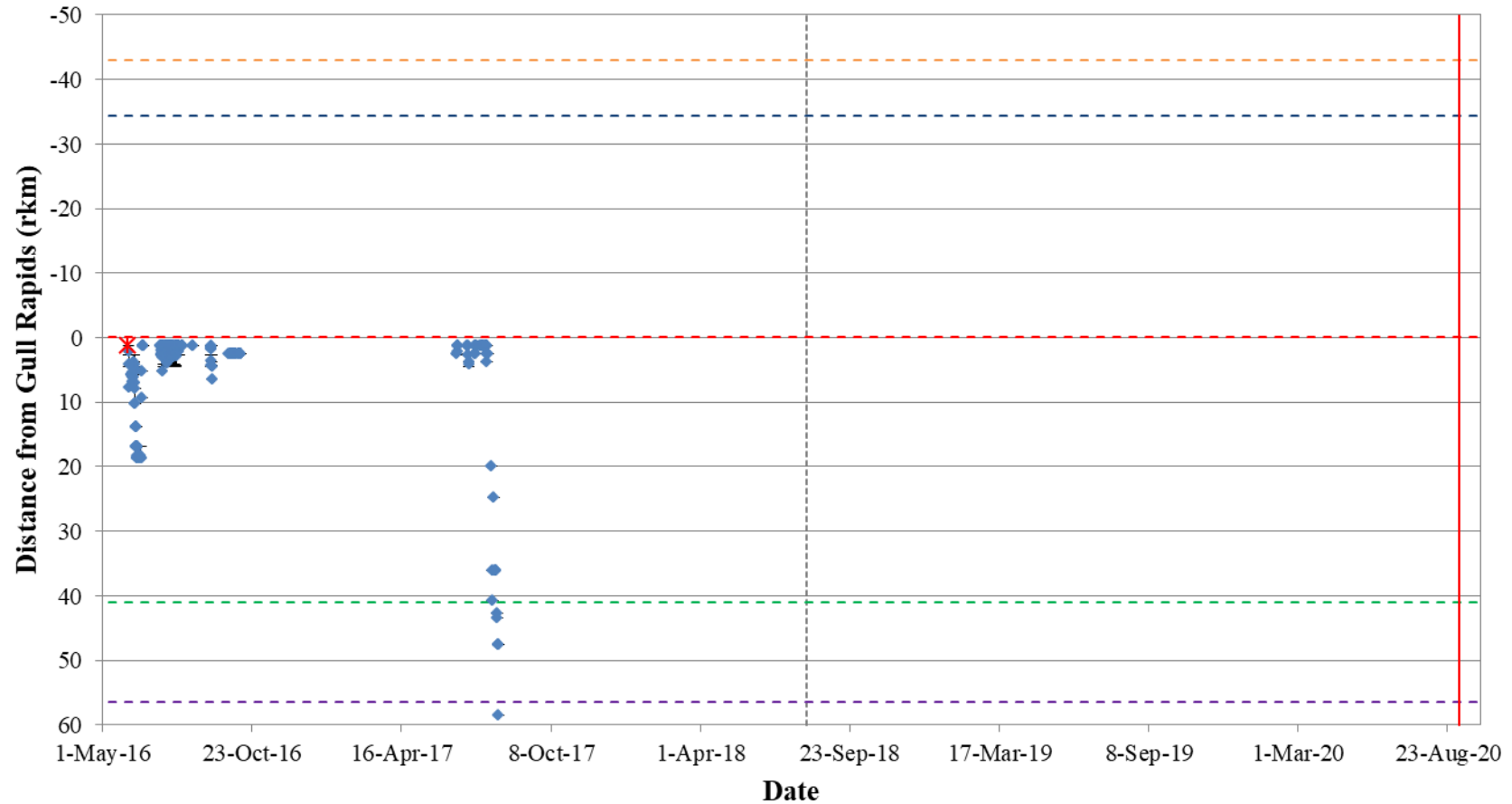


Figure A3-28: Position of a Walleye tagged with an acoustic transmitter (code #53751) in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

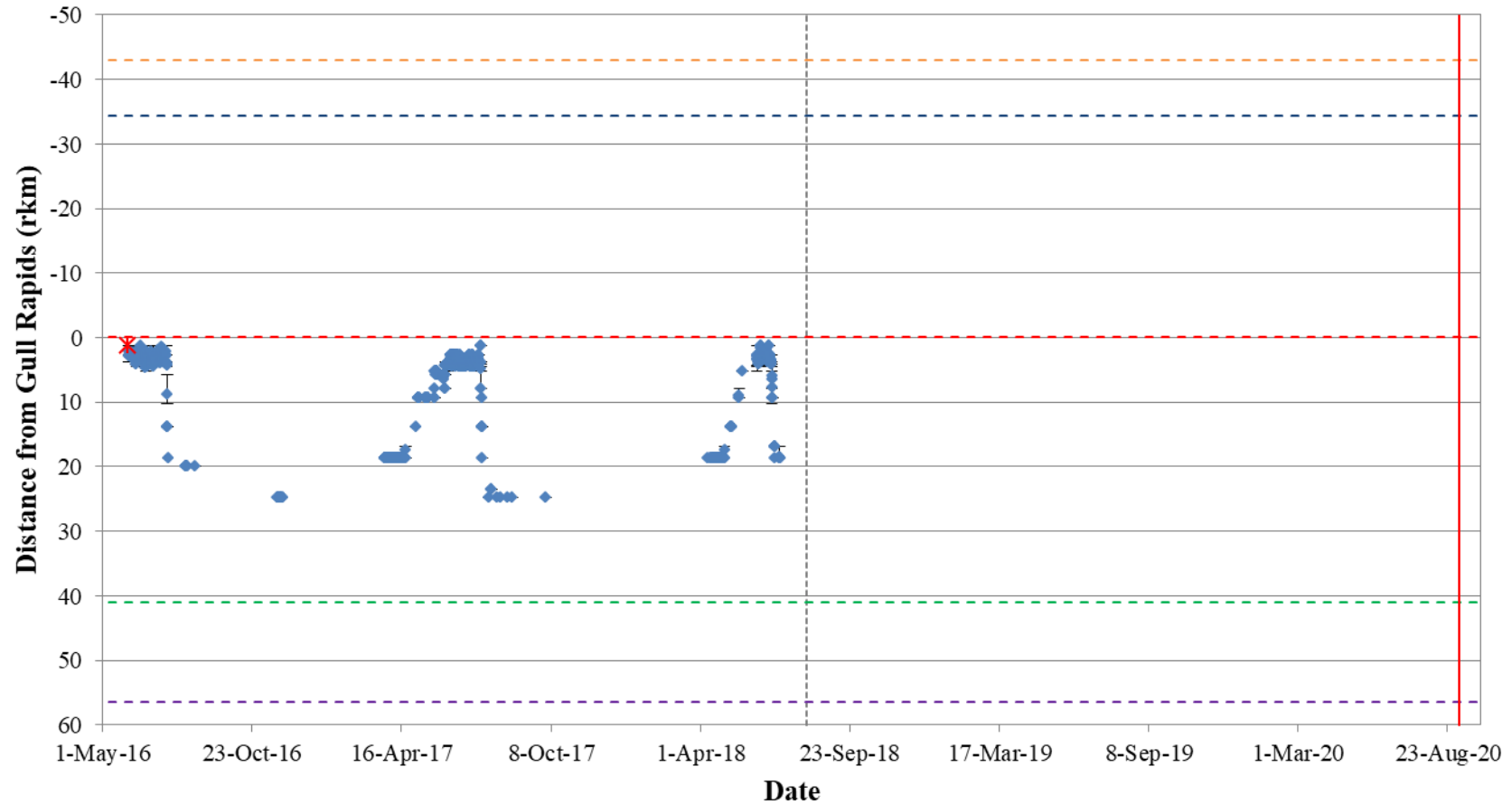


Figure A3-29: Position of a Walleye tagged with an acoustic transmitter (code #53752) in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

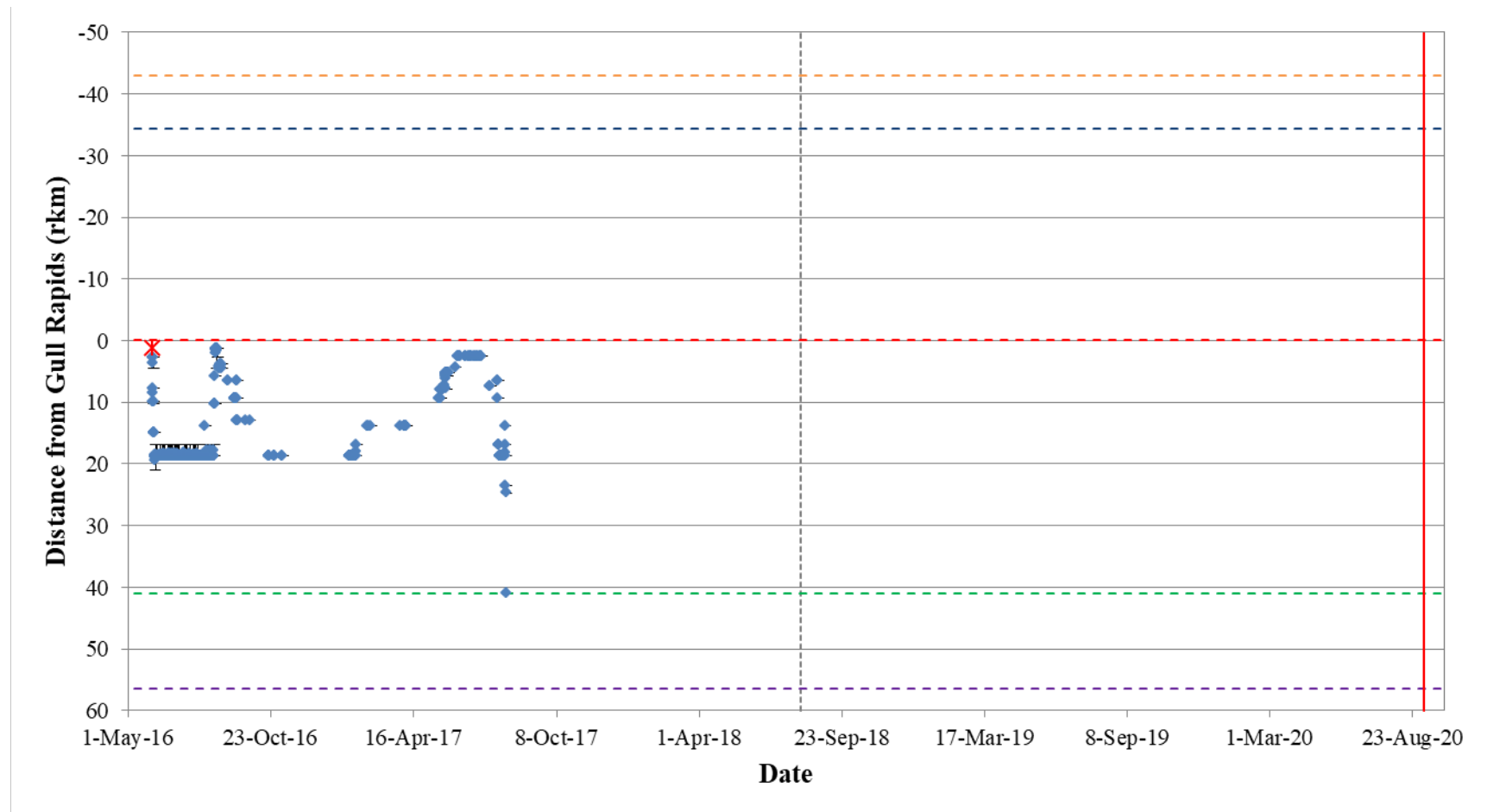


Figure A3-30: Position of a Walleye tagged with an acoustic transmitter (code #53753) in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

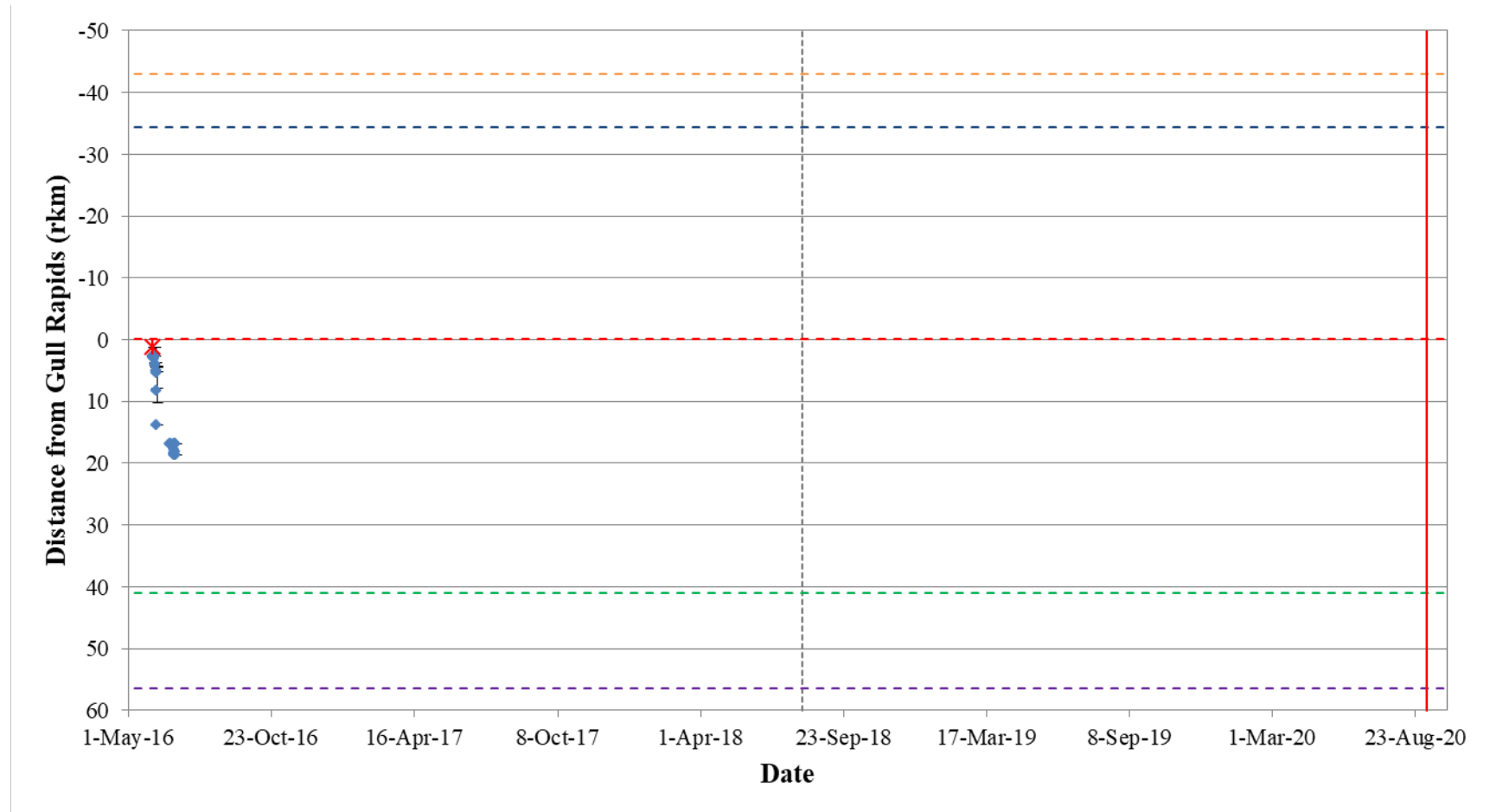


Figure A3-31: Position of a Walleye tagged with an acoustic transmitter (code #53754) in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

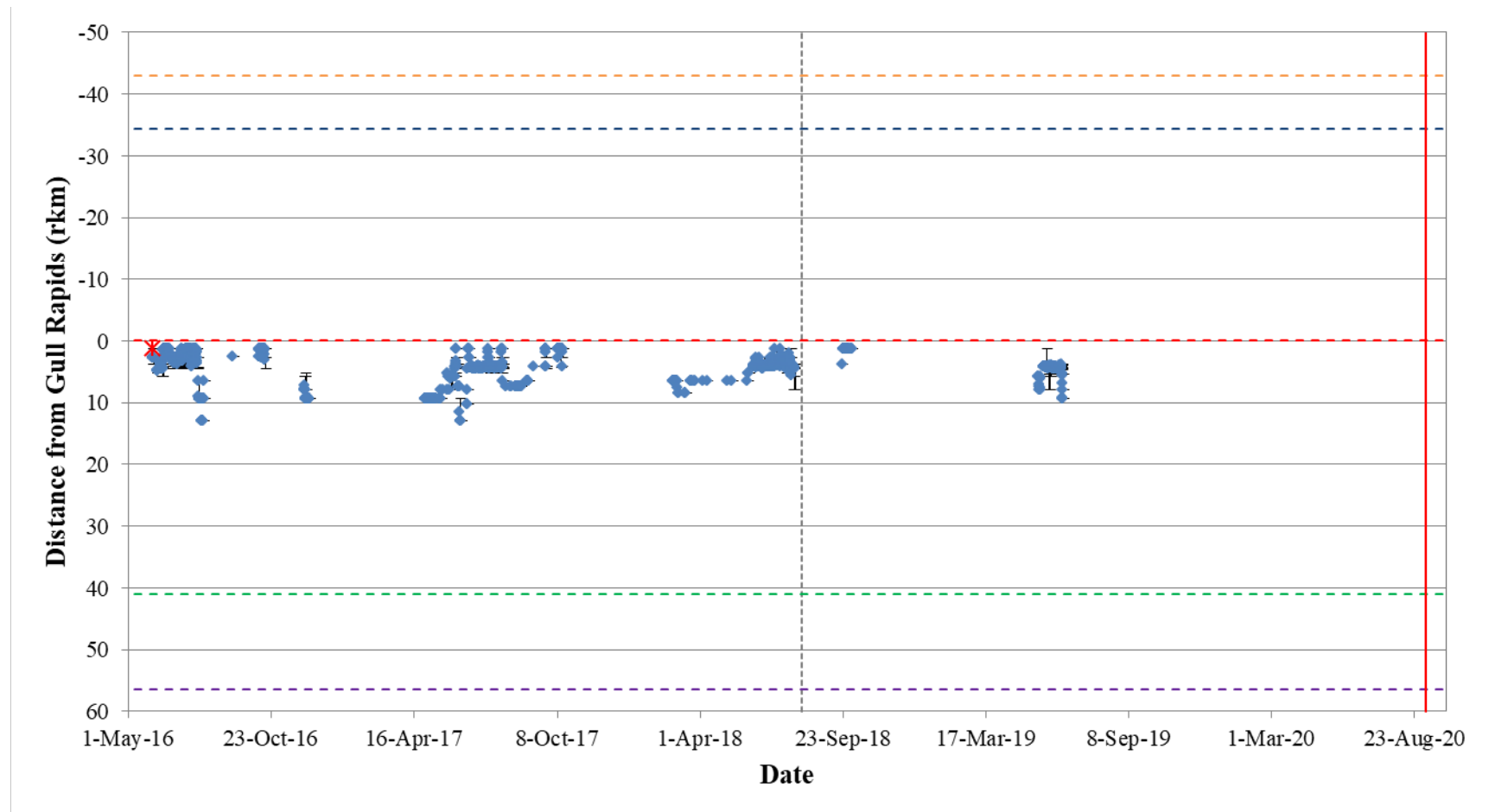


Figure A3-32: Position of a Walleye tagged with an acoustic transmitter (code #53755) in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

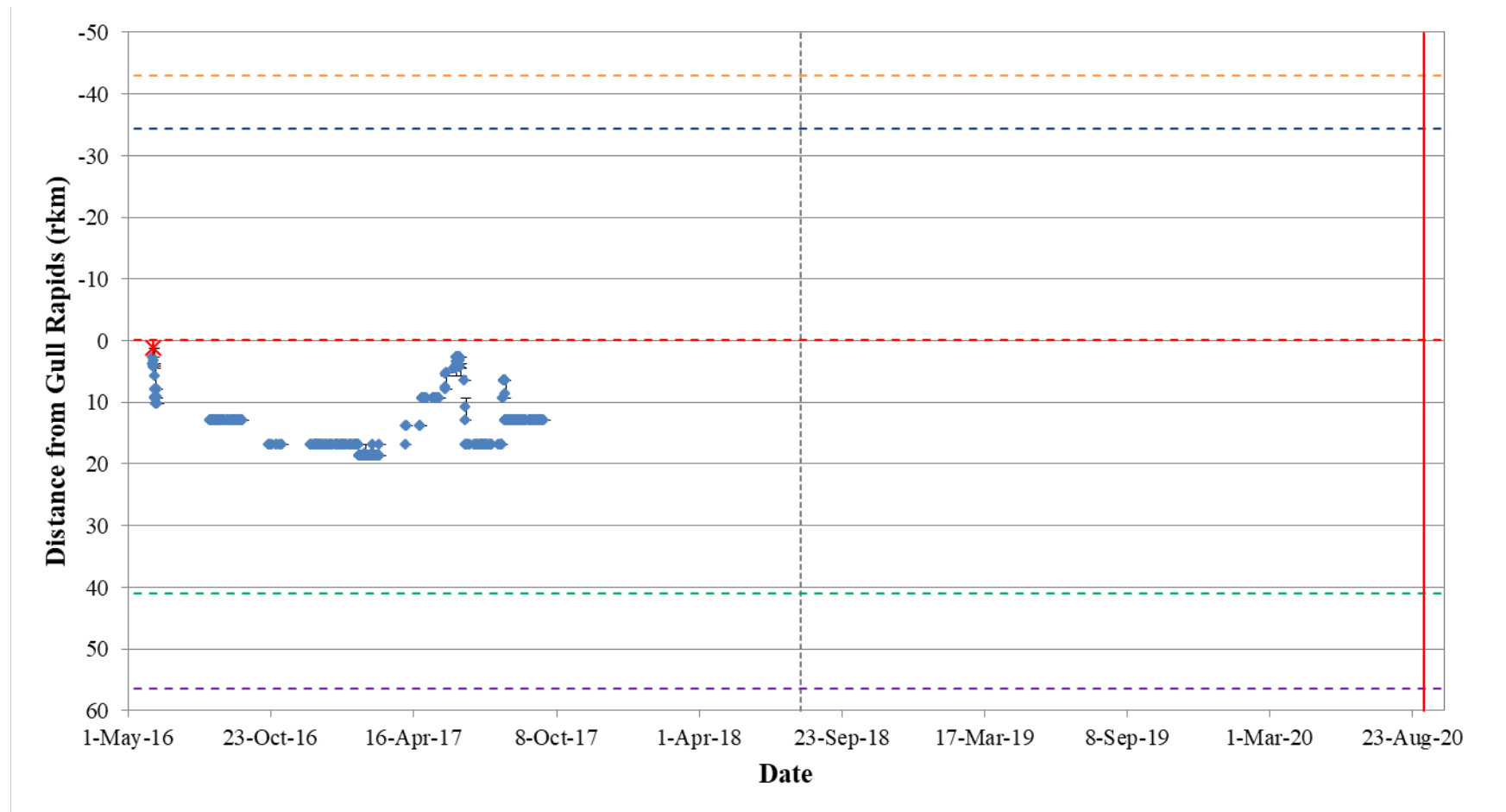


Figure A3-33: Position of a Walleye tagged with an acoustic transmitter (code #53756) in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

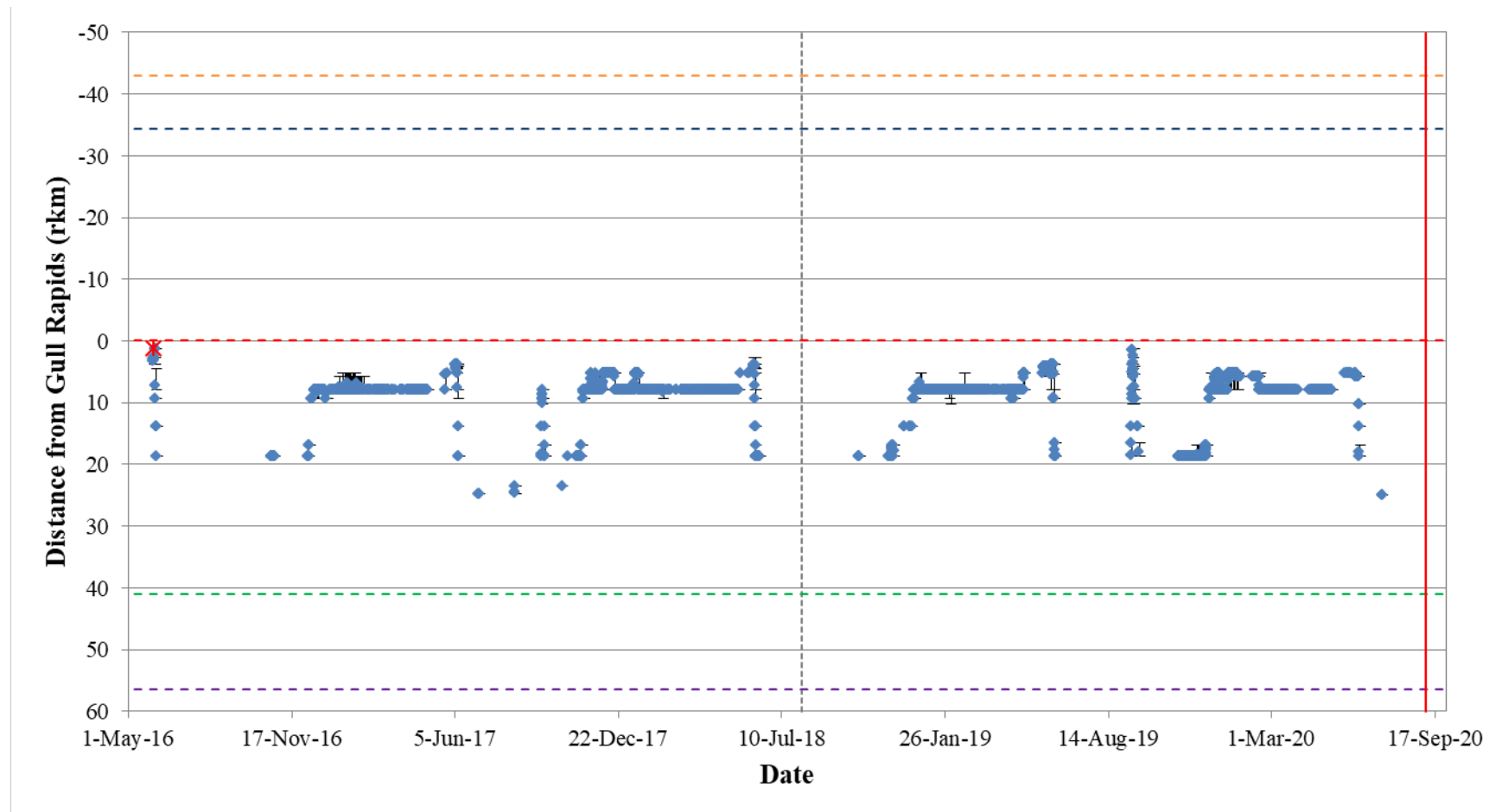


Figure A3-34: Position of a Walleye tagged with an acoustic transmitter (code #53757) in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

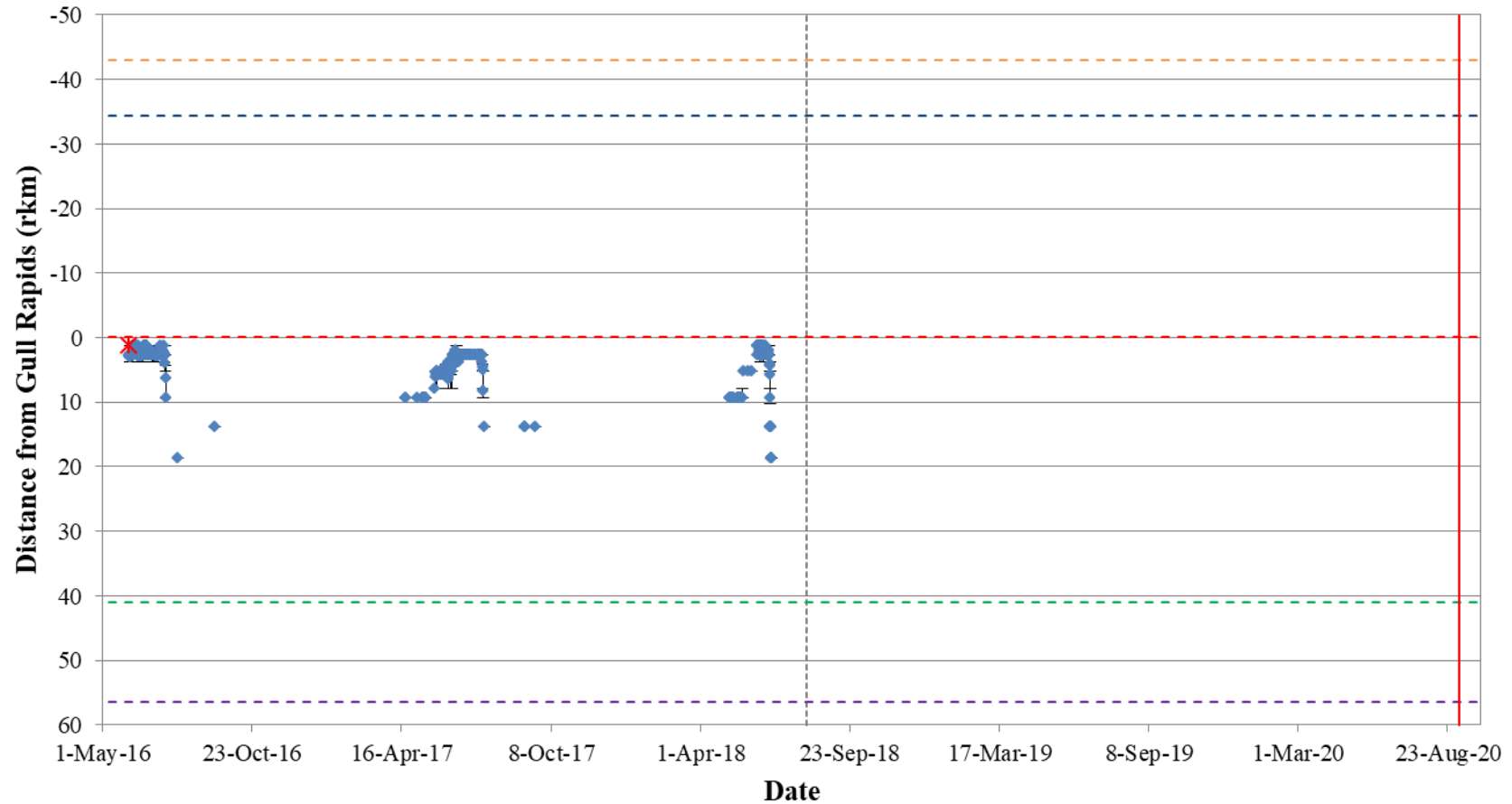


Figure A3-35: Position of a Walleye tagged with an acoustic transmitter (code #53808) in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

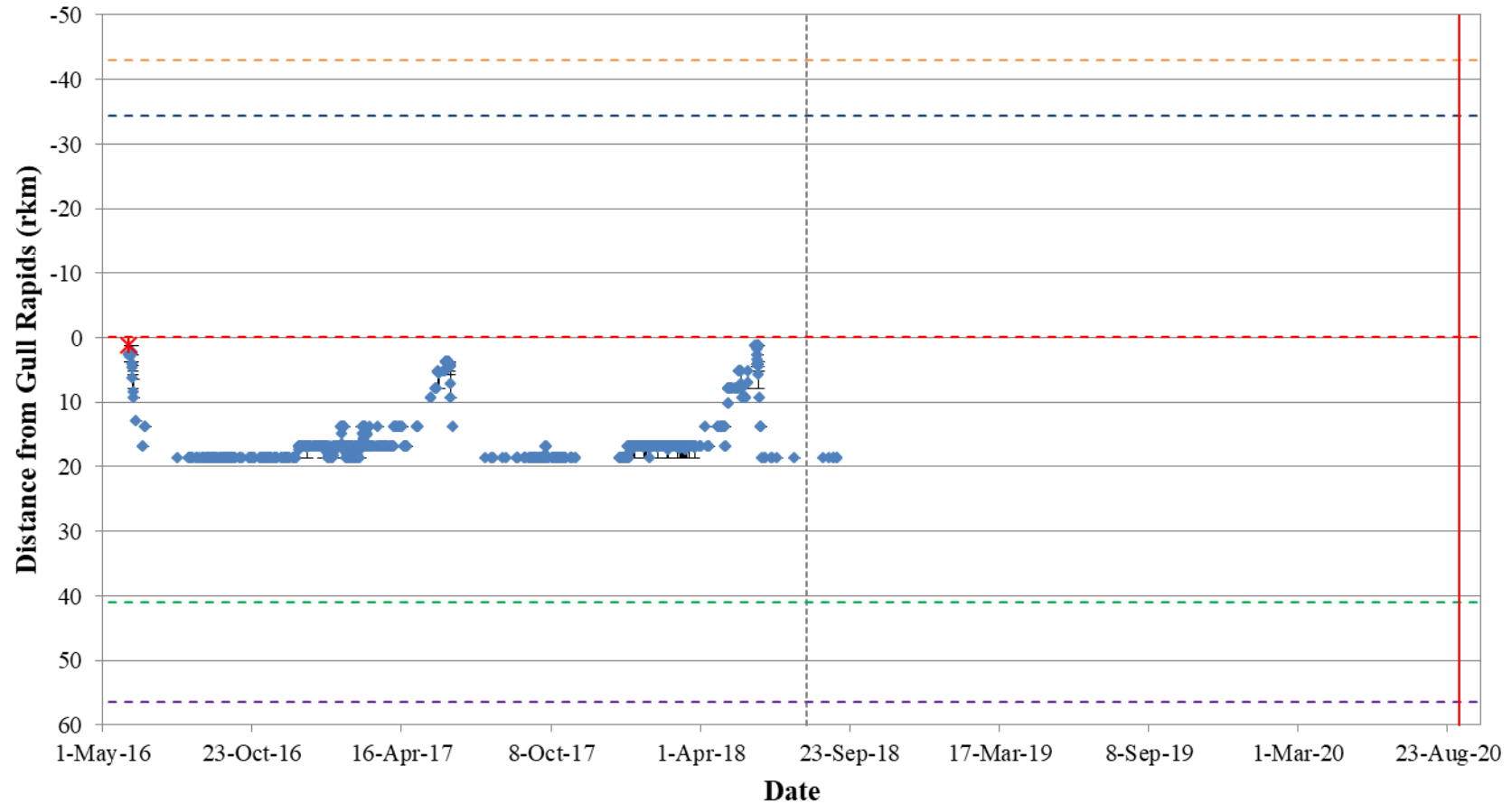


Figure A3-36: Position of a Walleye tagged with an acoustic transmitter (code #53809) in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

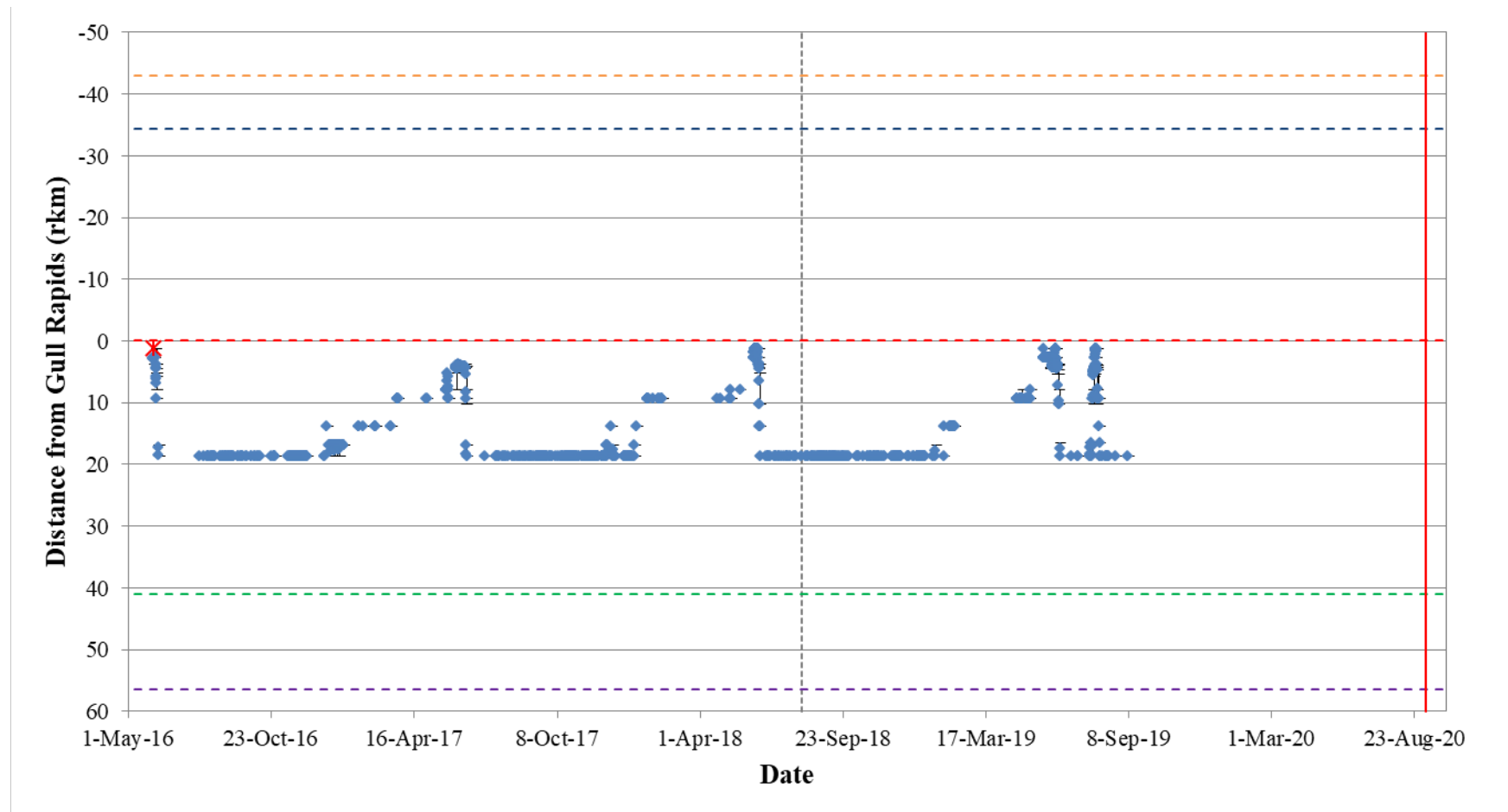


Figure A3-37: Position of a Walleye tagged with an acoustic transmitter (code #53810) in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

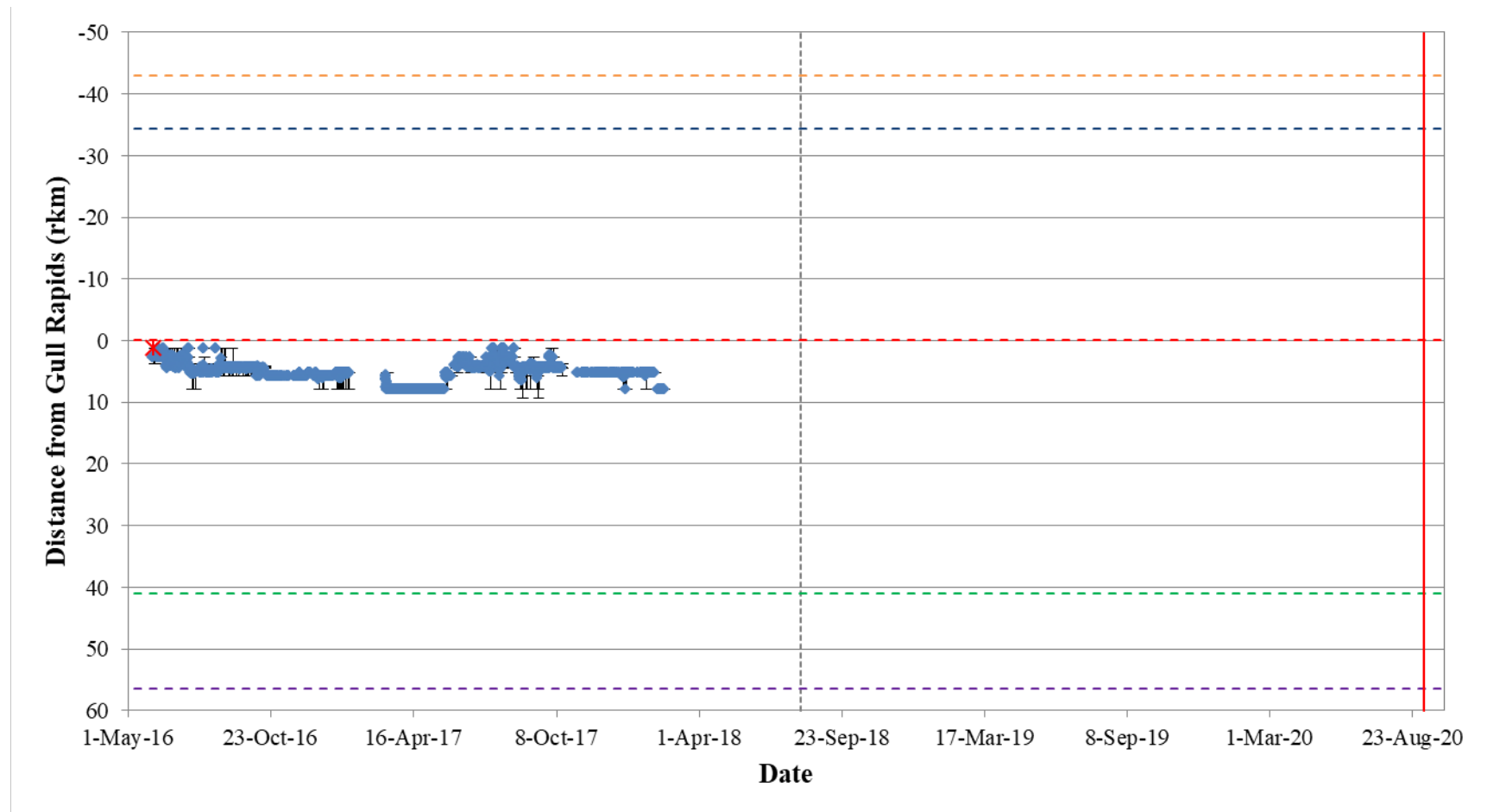


Figure A3-38: Position of a Walleye tagged with an acoustic transmitter (code #53811) in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

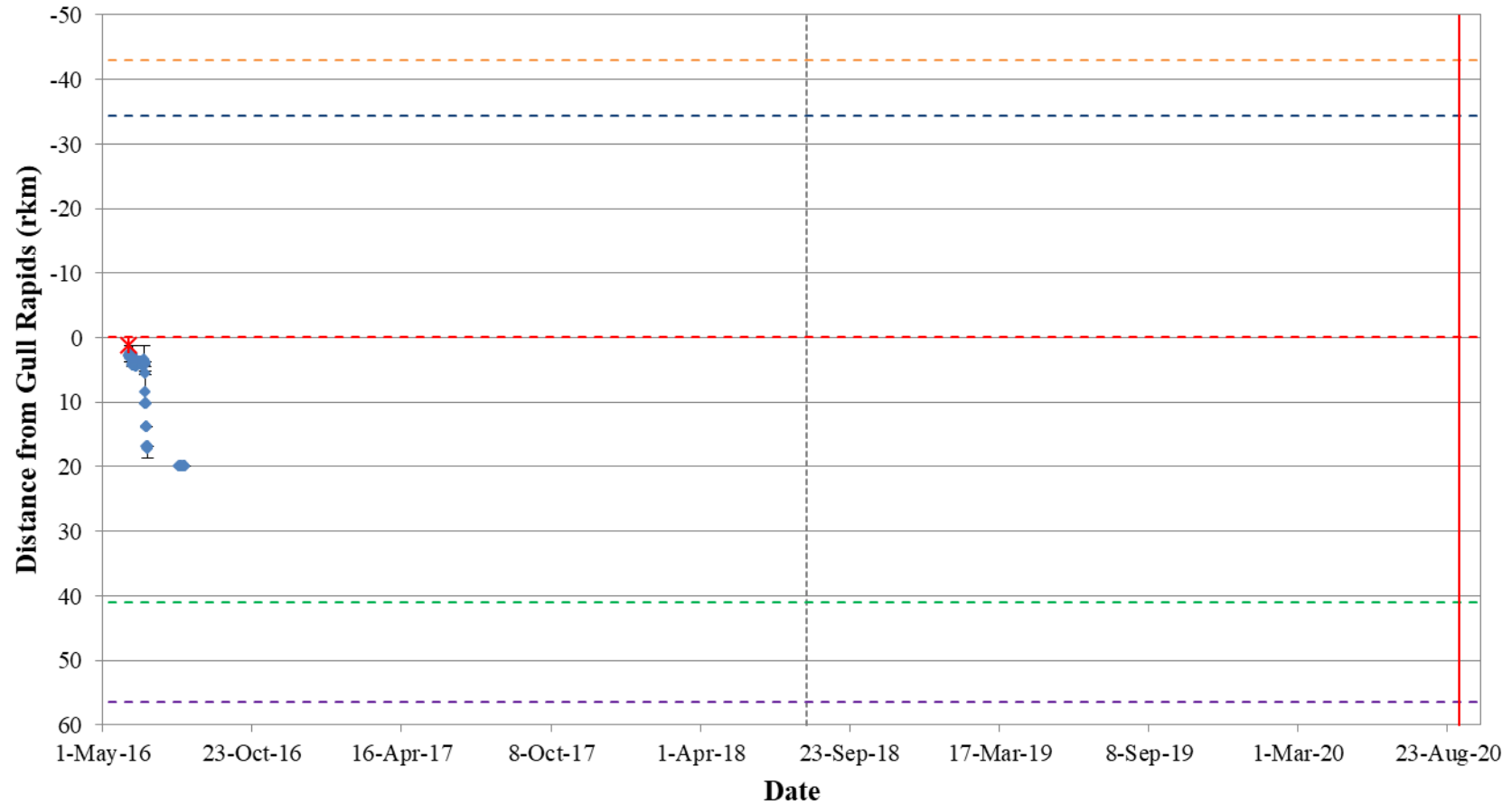


Figure A3-39: Position of a Walleye tagged with an acoustic transmitter (code #53812) in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1, 2016, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

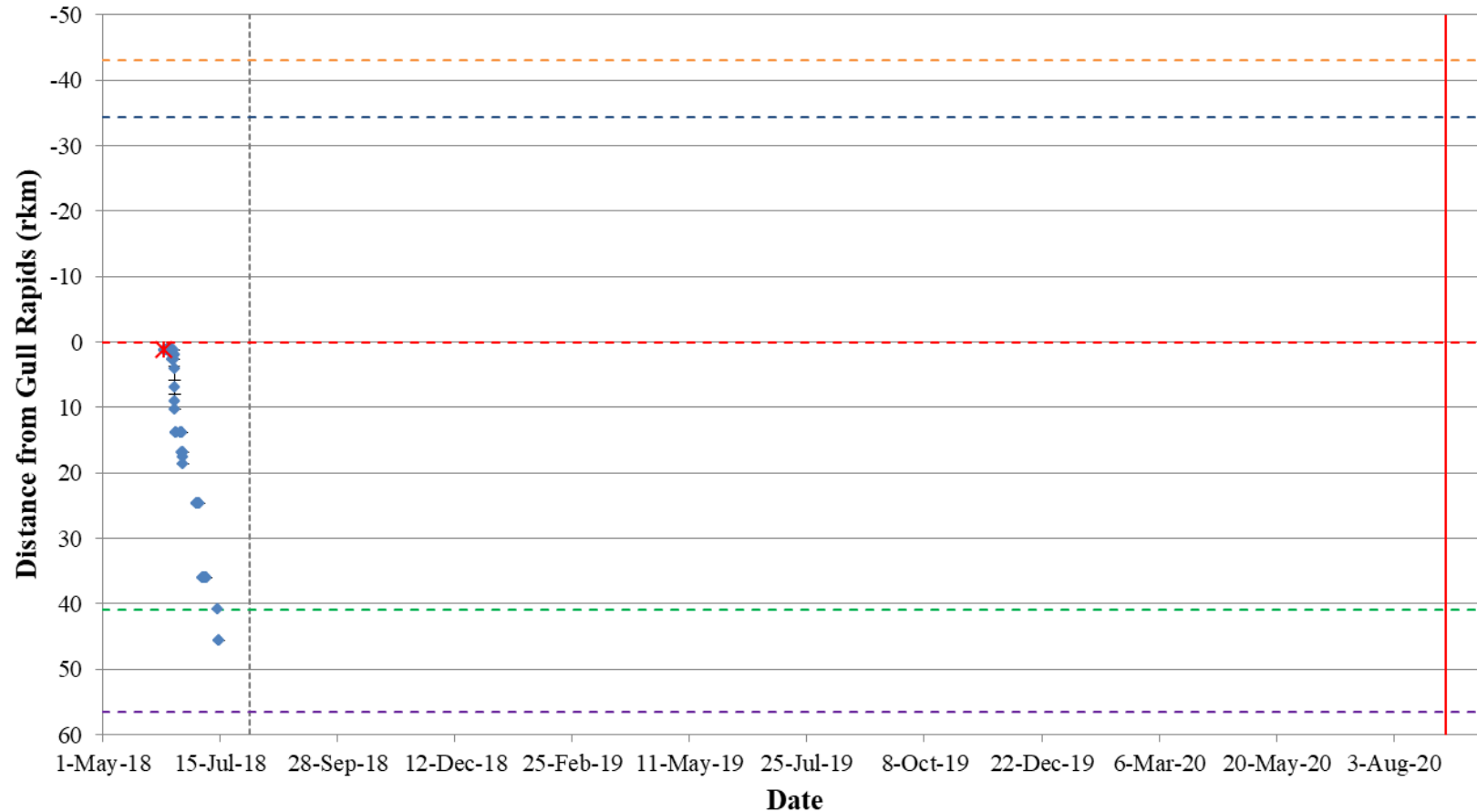


Figure A3-40: Position of a Walleye tagged with an acoustic transmitter (code #25732) in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1, 2018, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

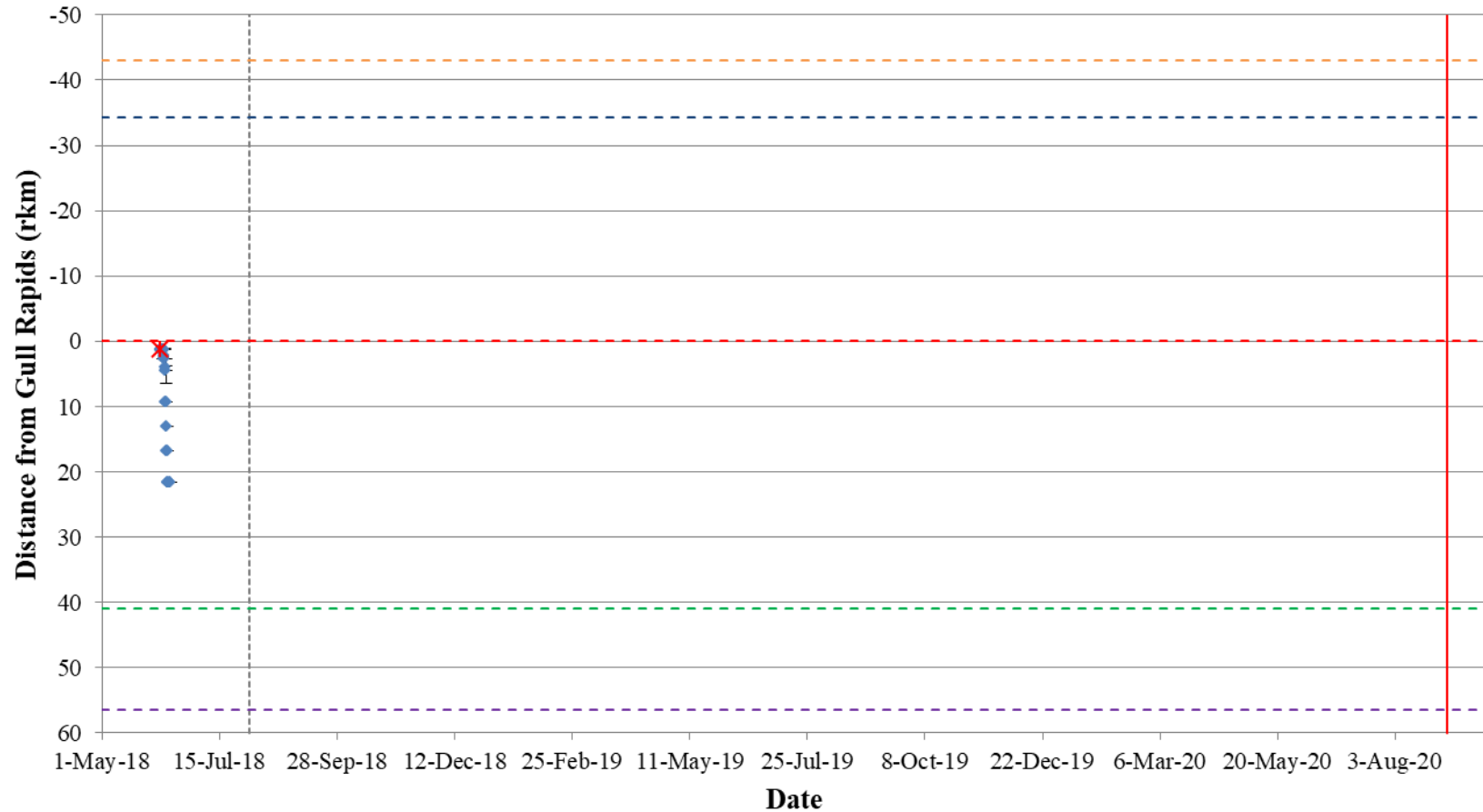


Figure A3-41: Position of a Walleye tagged with an acoustic transmitter (code #25734) in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1, 2018, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

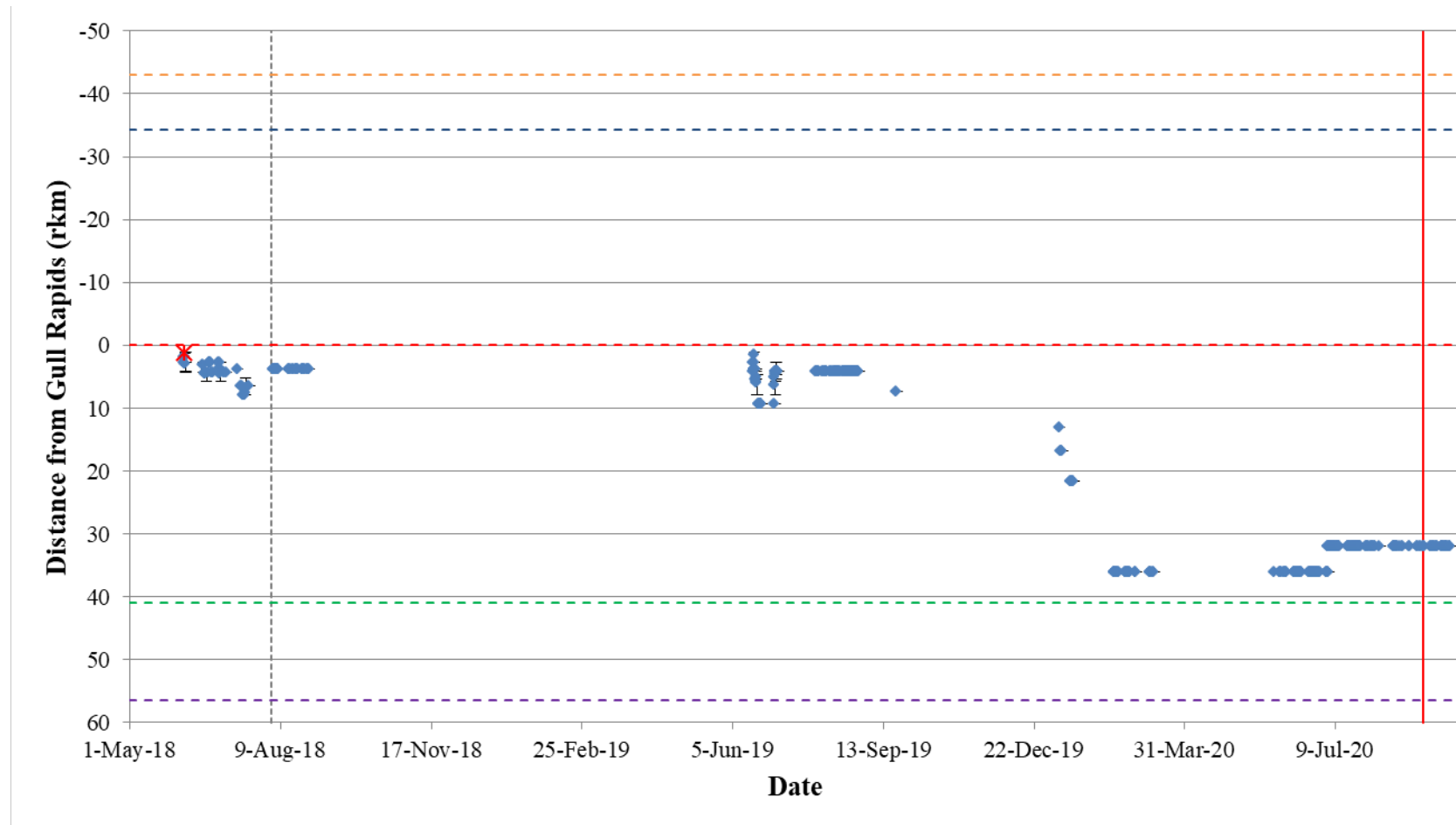


Figure A3-42: Position of a Walleye tagged with an acoustic transmitter (code #25735) in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1, 2018, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

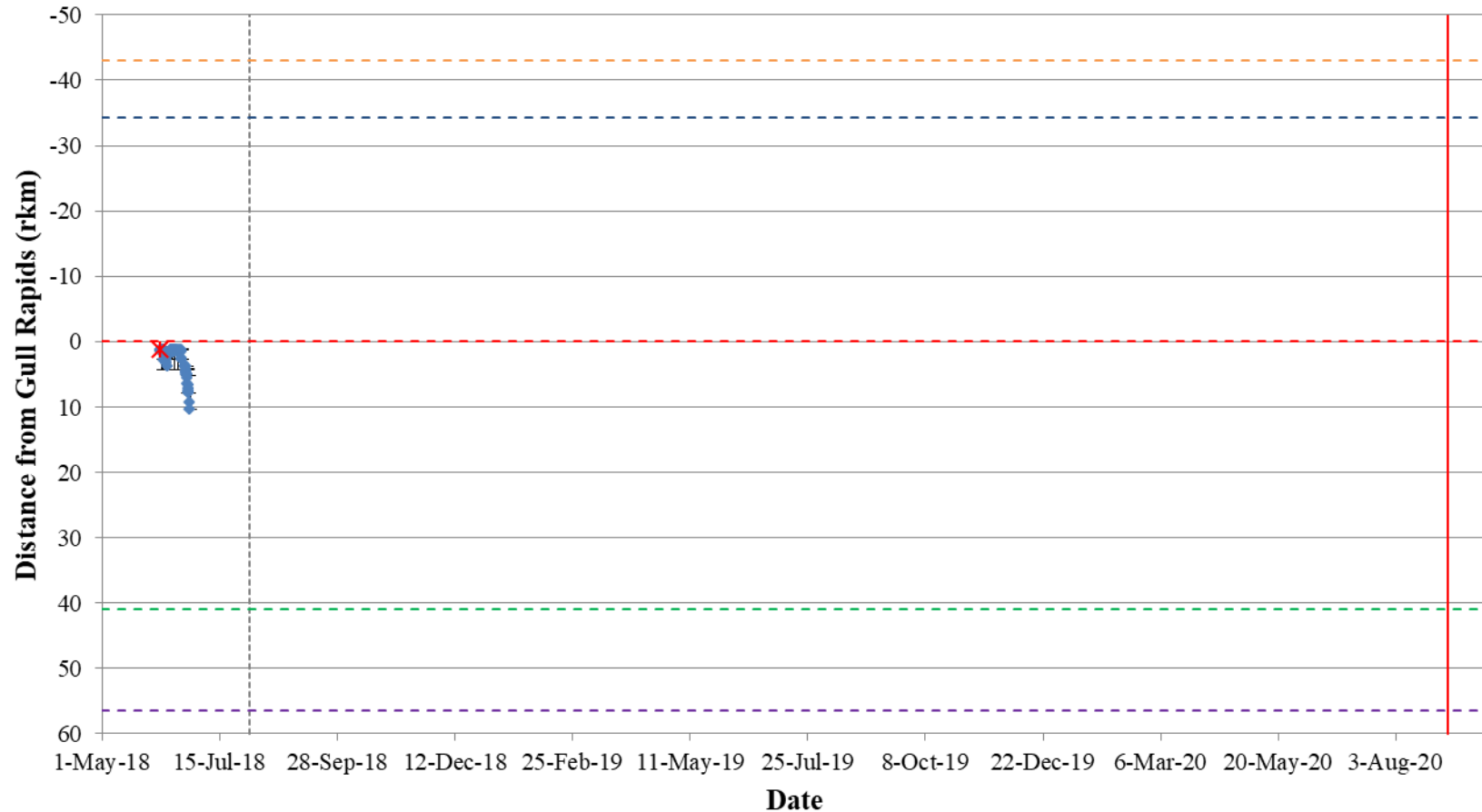


Figure A3-43: Position of a Walleye tagged with an acoustic transmitter (code #25736) in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1, 2018, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

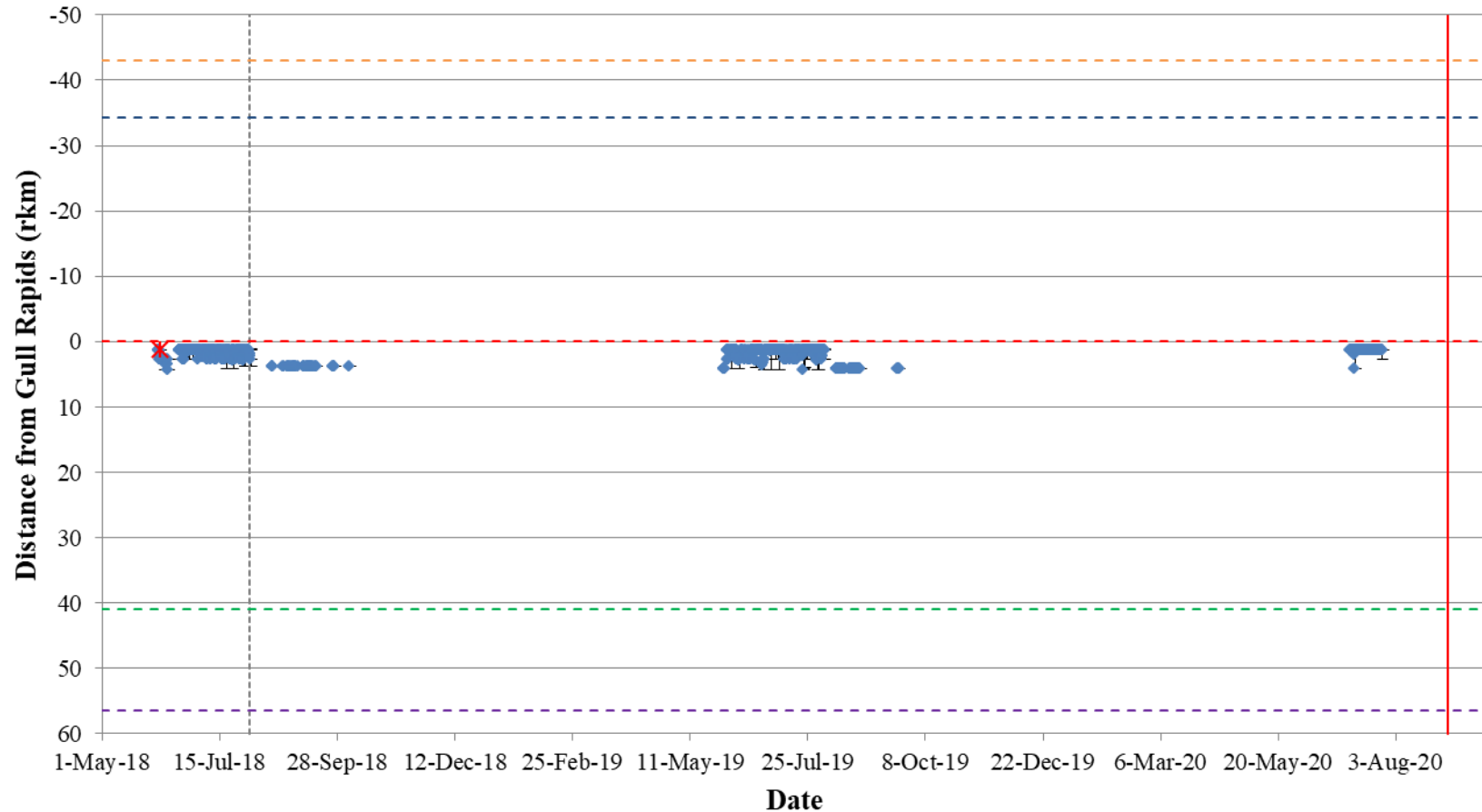


Figure A3-44: Position of a Walleye tagged with an acoustic transmitter (code #25737) in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1, 2018, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

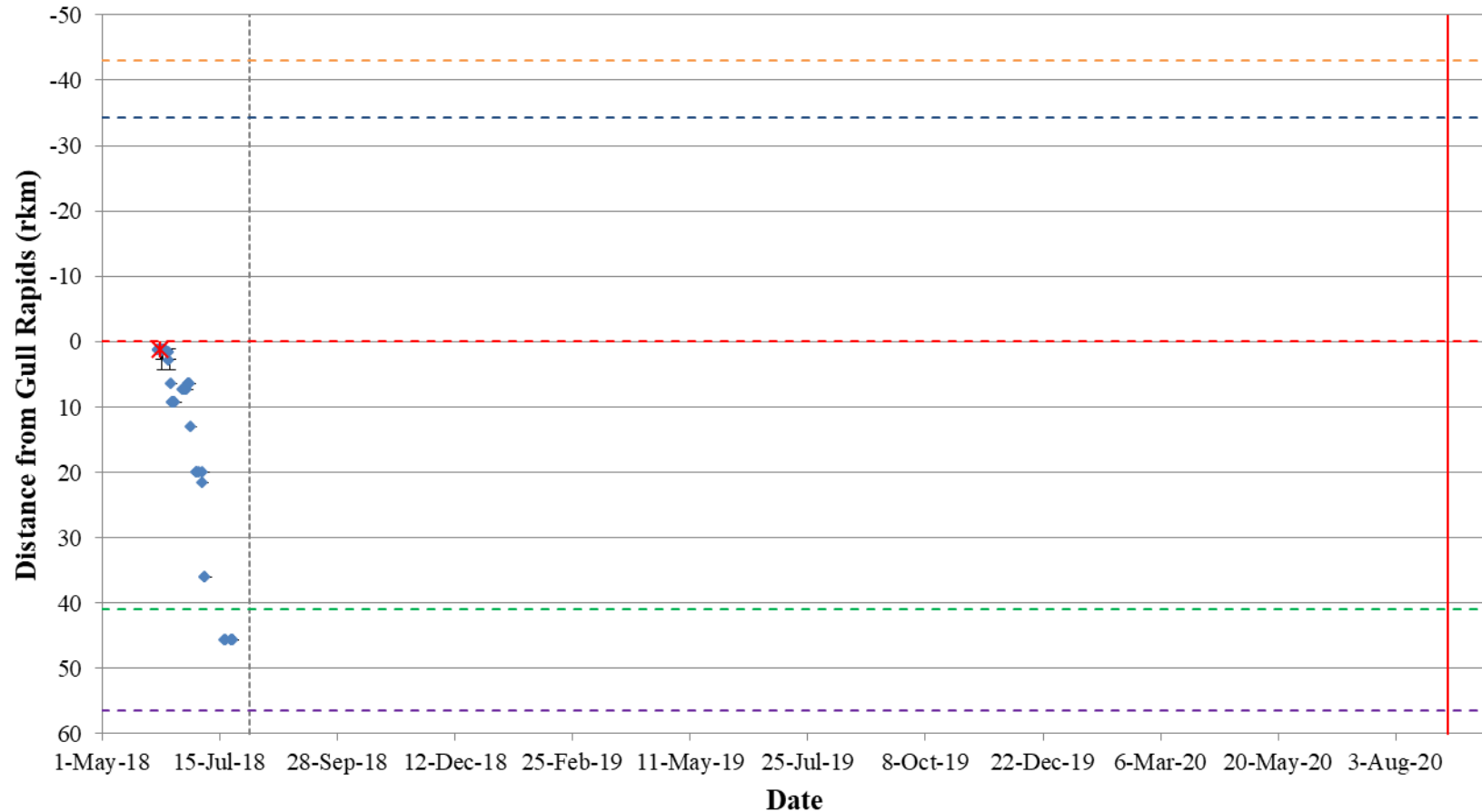


Figure A3-45: Position of a Walleye tagged with an acoustic transmitter (code #25738) in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1, 2018, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

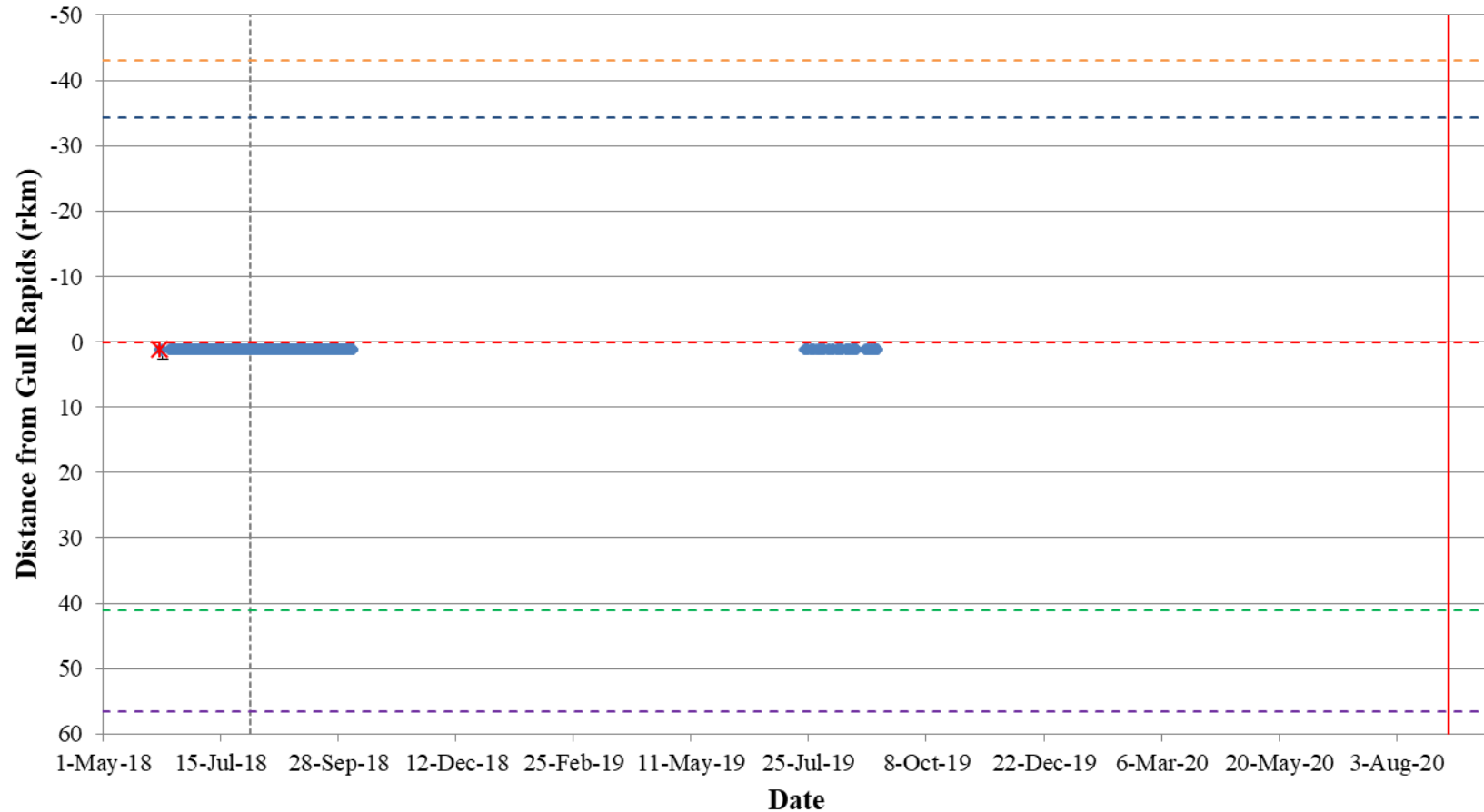


Figure A3-46: Position of a Walleye tagged with an acoustic transmitter (code #25741) in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1, 2018, to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

APPENDIX 4:

LOCATION SUMMARY FOR INDIVIDUAL ACOUSTIC TAGGED WALLEYE UPSTREAM OF THE KEEYASK GS, MAY TO SEPTEMBER 2020

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| Figure A4-1: Position of a Walleye tagged with an acoustic transmitter (code #20147) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. | 219 |
| Figure A4-2: Position of a Walleye tagged with an acoustic transmitter (code #20148) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. | 220 |
| Figure A4-3: Position of a Walleye tagged with an acoustic transmitter (code #20149) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. | 221 |
| Figure A4-4: Position of a Walleye tagged with an acoustic transmitter (code #20150) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. | 222 |
| Figure A4-5: Position of a Walleye tagged with an acoustic transmitter (code #20151) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. | 223 |
| Figure A4-6: Position of a Walleye tagged with an acoustic transmitter (code #20153) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. | 224 |
| Figure A4-7: Position of a Walleye tagged with an acoustic transmitter (code #20154) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. | 225 |
| Figure A4-8: Position of a Walleye tagged with an acoustic transmitter (code #20155) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. | 226 |
| Figure A4-9: Position of a Walleye tagged with an acoustic transmitter (code #20156) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. | 227 |
| Figure A4-10: Position of a Walleye tagged with an acoustic transmitter (code #20157) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. | 228 |

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| Figure A4-12: Position of a Walleye tagged with an acoustic transmitter (code #20159) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. | 230 |
| Figure A4-13: Position of a Walleye tagged with an acoustic transmitter (code #20160) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. | 231 |
| Figure A4-14: Position of a Walleye tagged with an acoustic transmitter (code #20161) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. | 232 |
| Figure A4-15: Position of a Walleye tagged with an acoustic transmitter (code #20162) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. | 233 |
| Figure A4-16: Position of a Walleye tagged with an acoustic transmitter (code #20163) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. | 234 |
| Figure A4-17: Position of a Walleye tagged with an acoustic transmitter (code #20164) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. | 235 |
| Figure A4-18: Position of a Walleye tagged with an acoustic transmitter (code #20169) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. | 236 |
| Figure A4-19: Position of a Walleye tagged with an acoustic transmitter (code #20170) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. | 237 |
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| Figure A4-21: Position of a Walleye tagged with an acoustic transmitter (code #20176) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. | 239 |
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| Figure A4-24: Position of a Walleye tagged with an acoustic transmitter (code #20186) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. | 242 |
| Figure A4-25: Position of a Walleye tagged with an acoustic transmitter (code #20187) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. | 243 |
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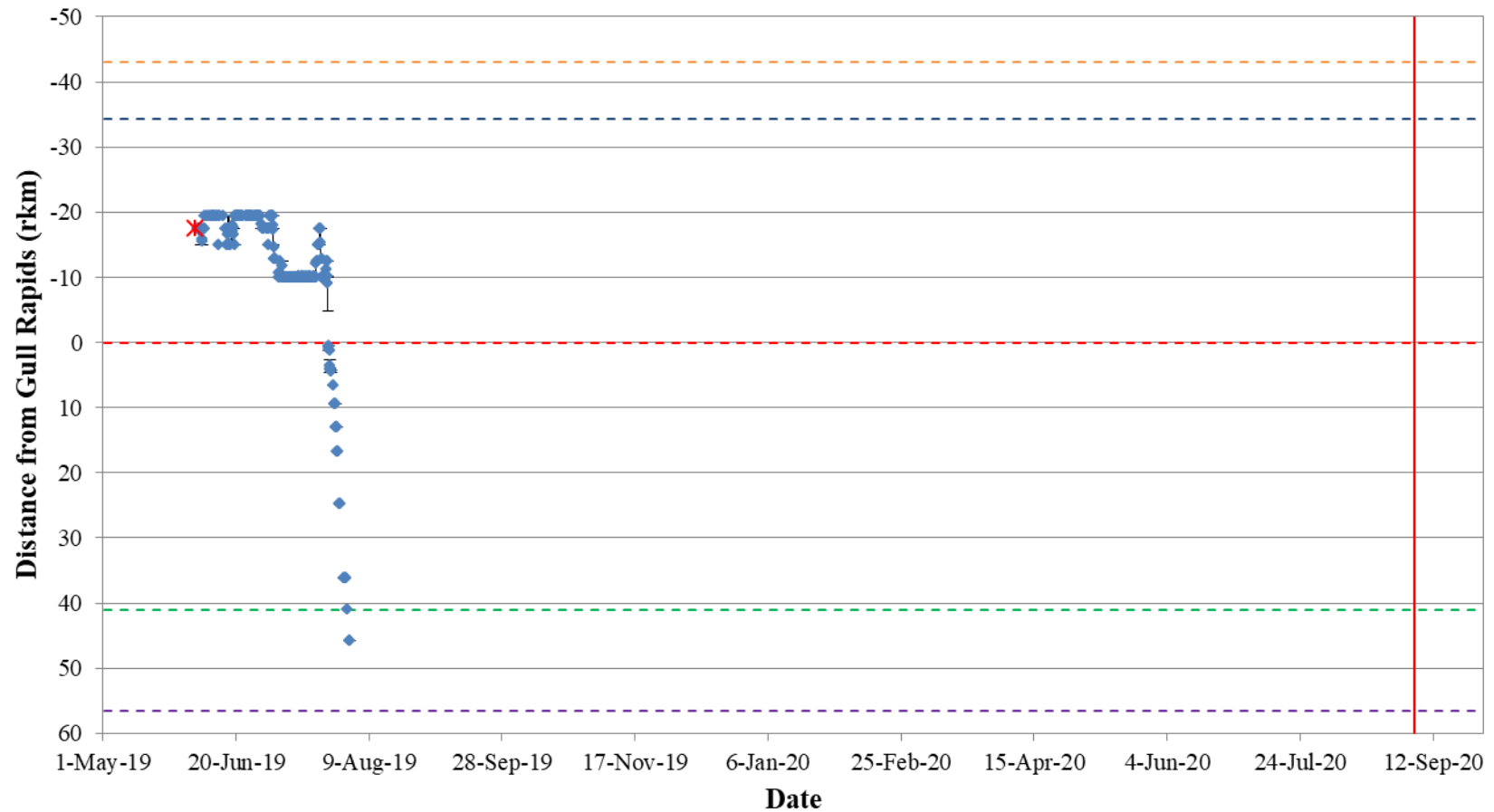


Figure A4-1: Position of a Walleye tagged with an acoustic transmitter (code #20147) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

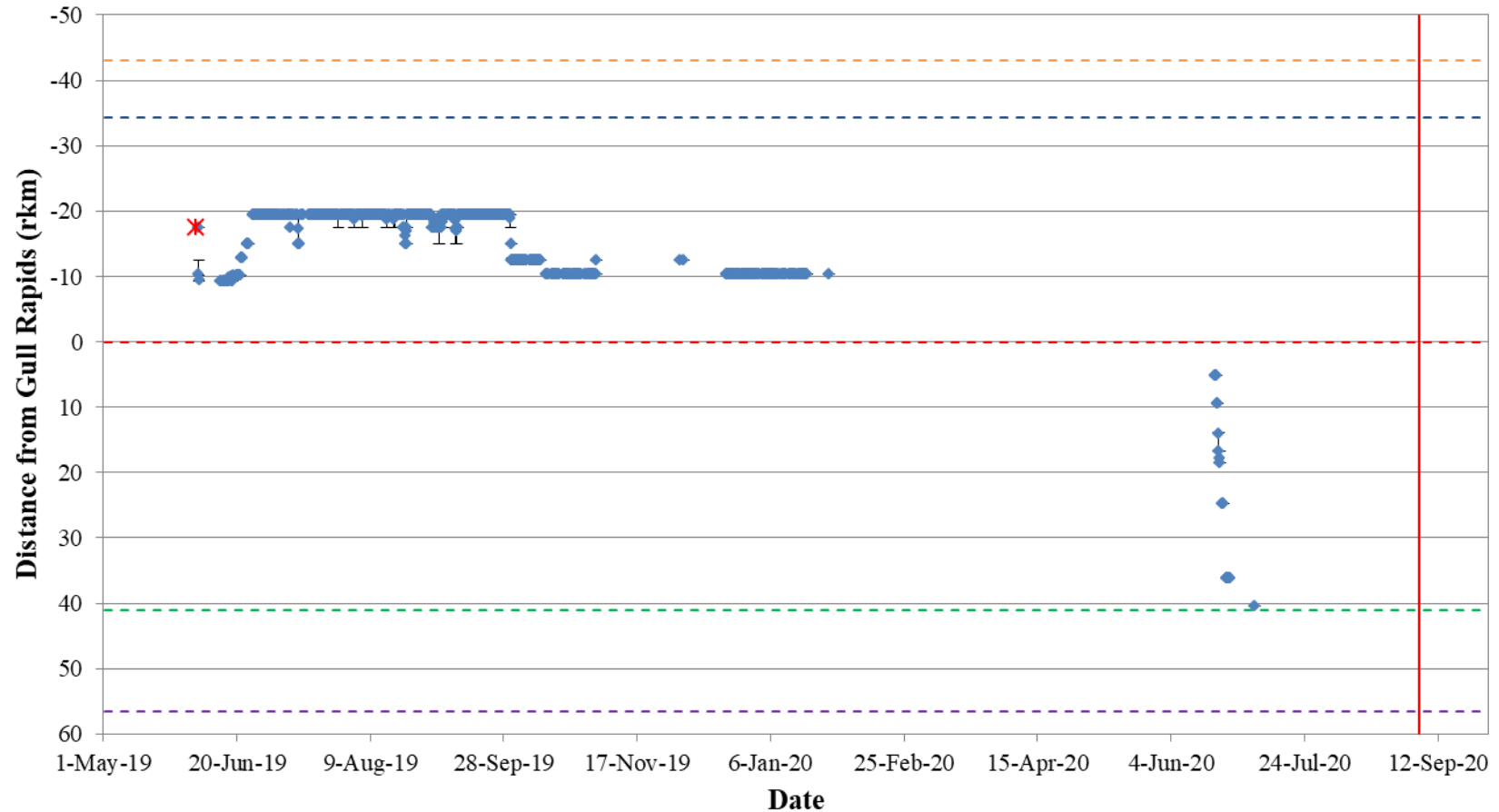


Figure A4-2: Position of a Walleye tagged with an acoustic transmitter (code #20148) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

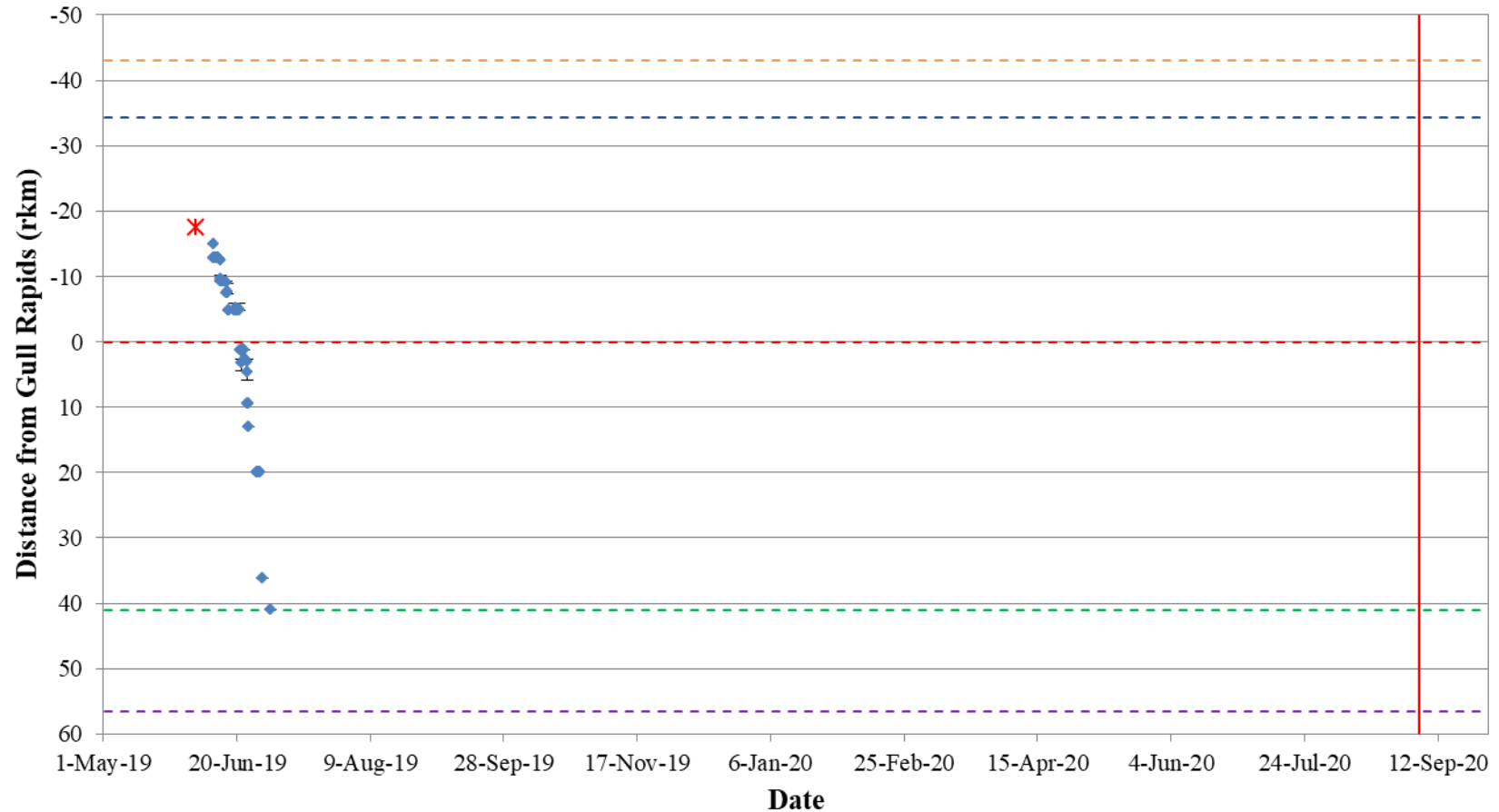


Figure A4-3: Position of a Walleye tagged with an acoustic transmitter (code #20149) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

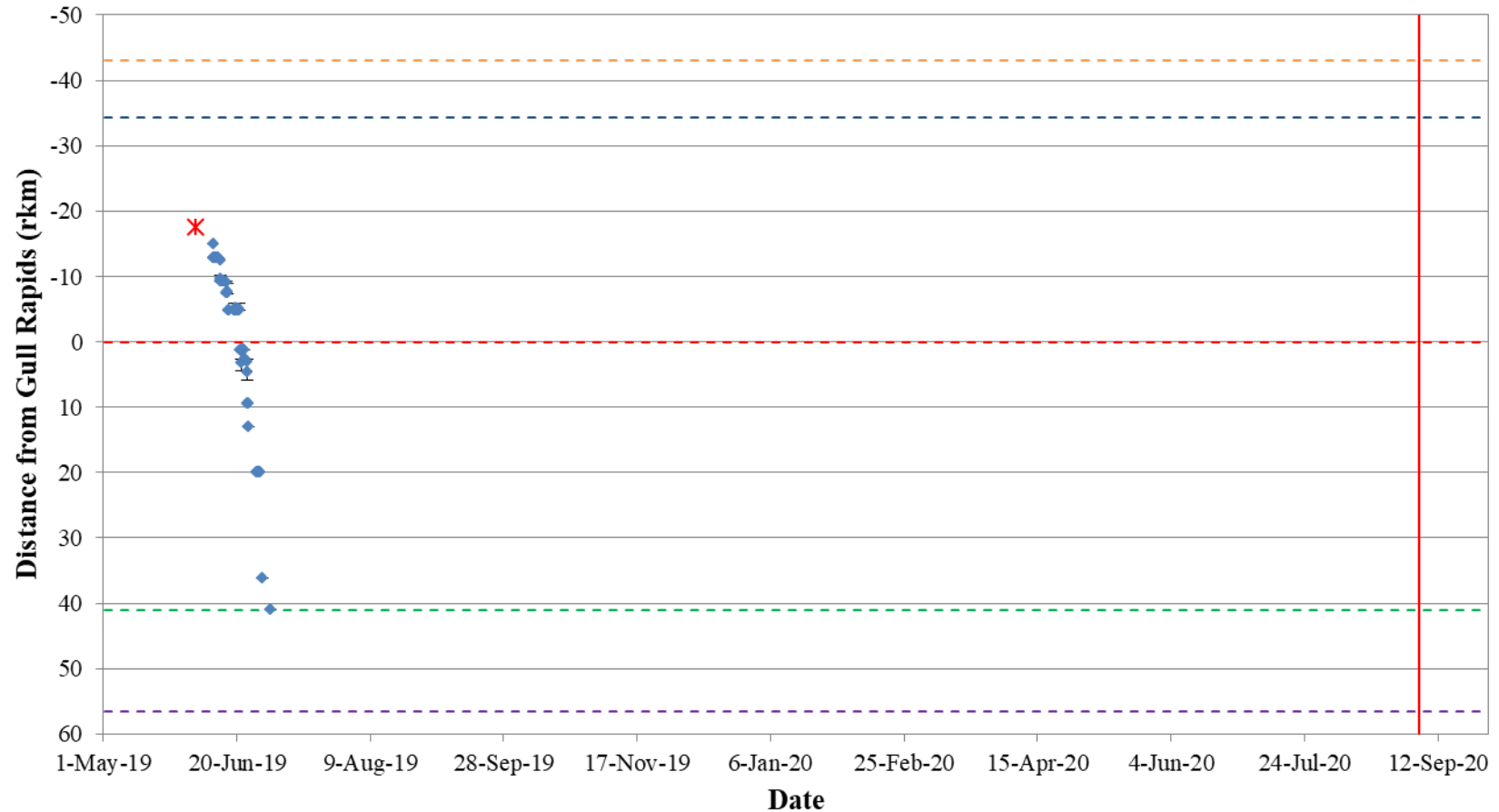


Figure A4-4: Position of a Walleye tagged with an acoustic transmitter (code #20150) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

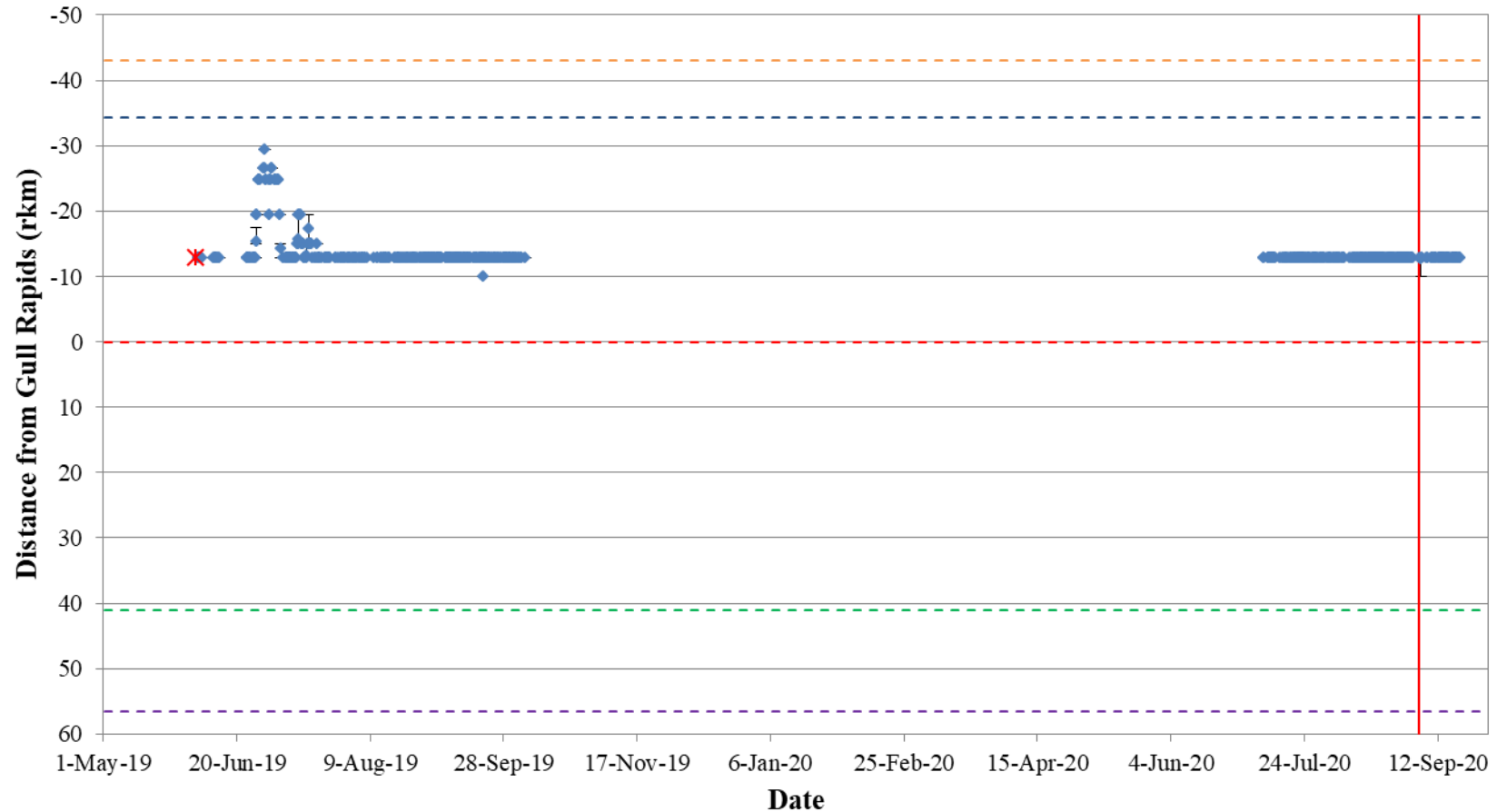
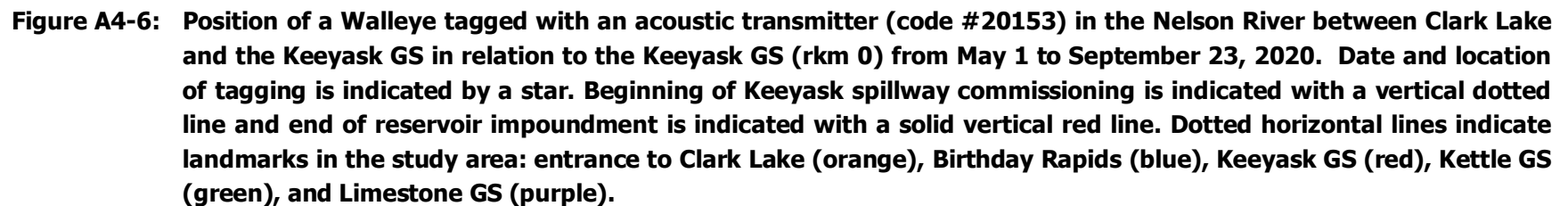


Figure A4-5: Position of a Walleye tagged with an acoustic transmitter (code #20151) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).



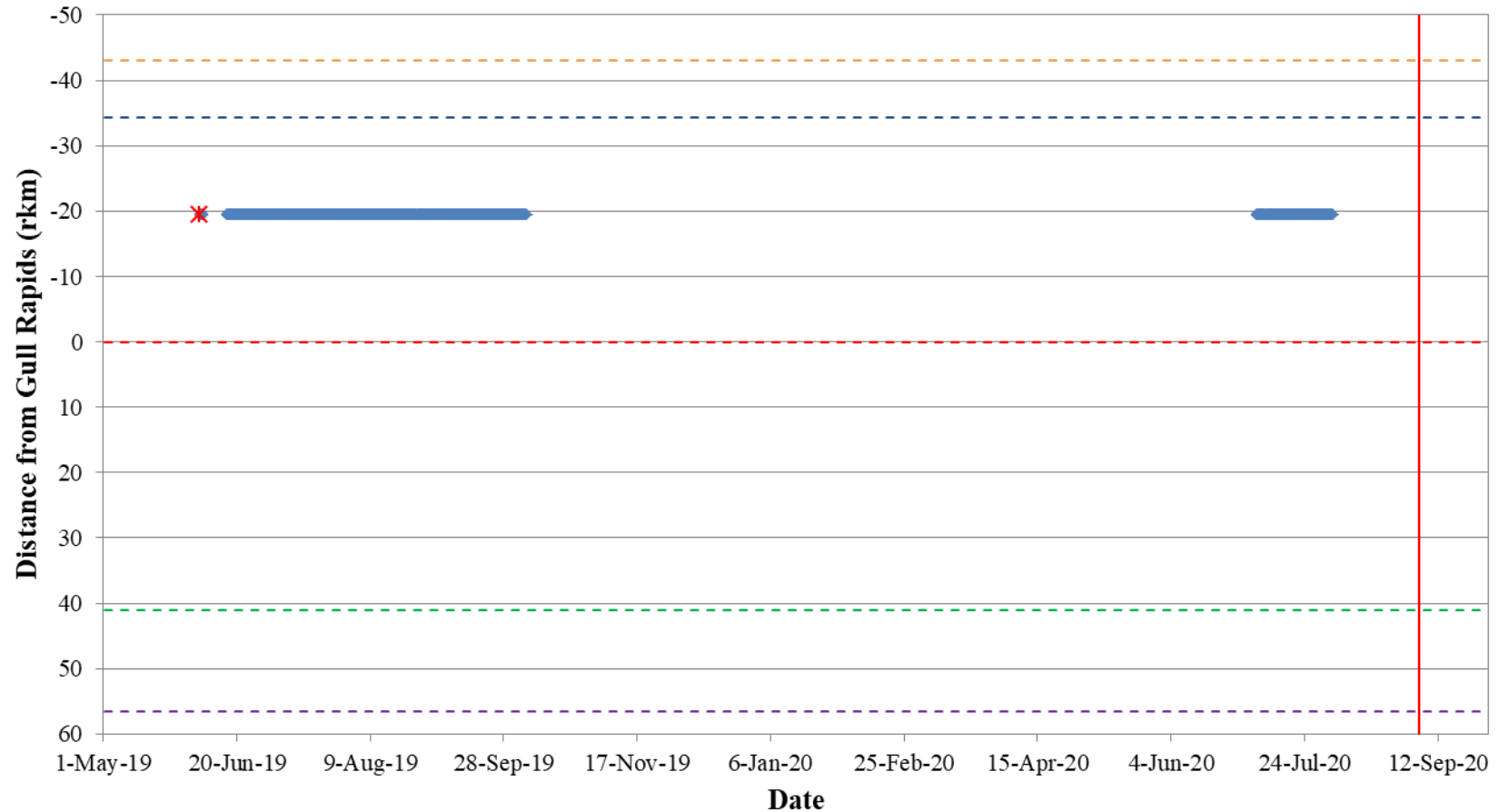


Figure A4-7: Position of a Walleye tagged with an acoustic transmitter (code #20154) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

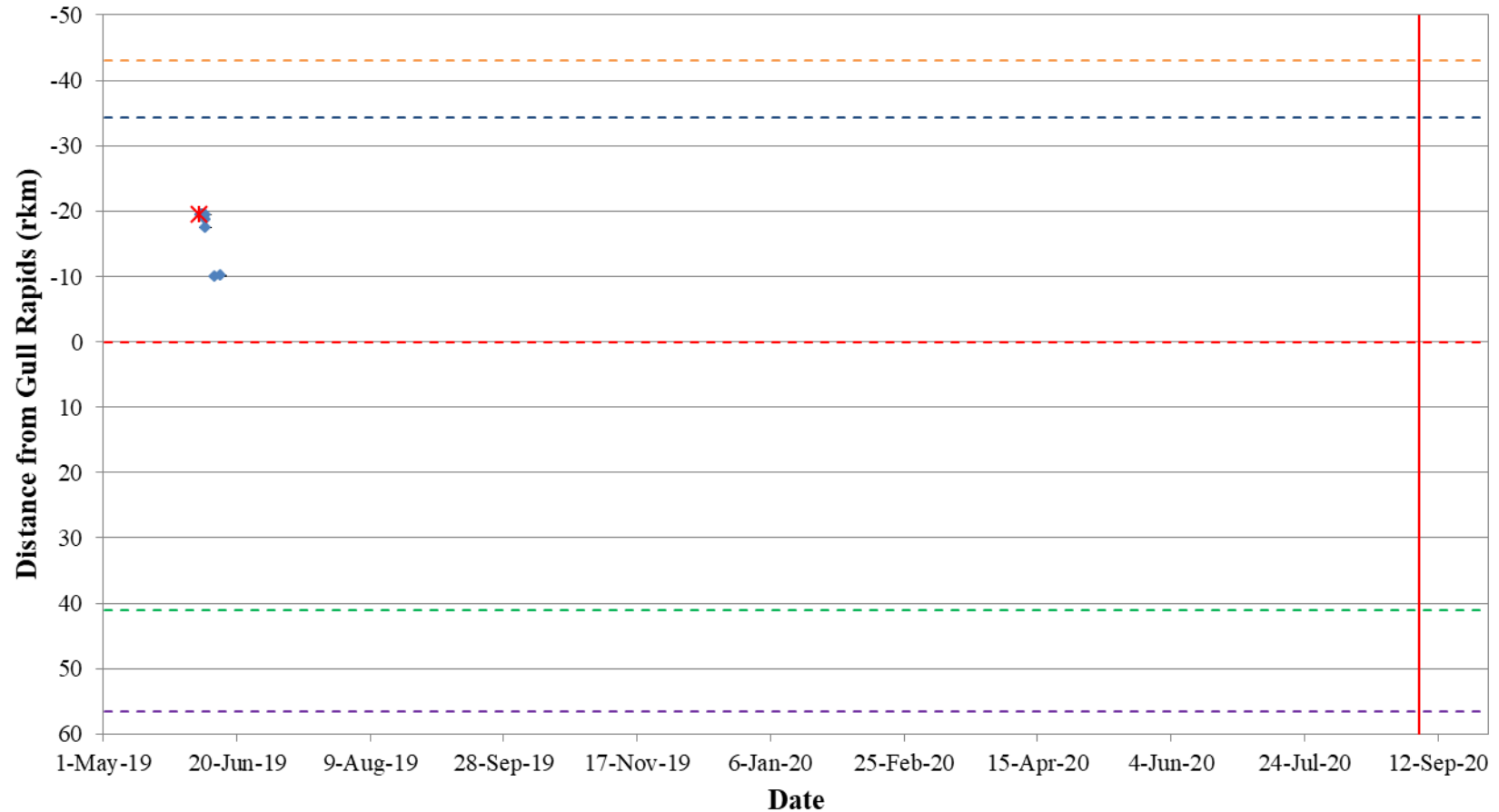


Figure A4-8: Position of a Walleye tagged with an acoustic transmitter (code #20155) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

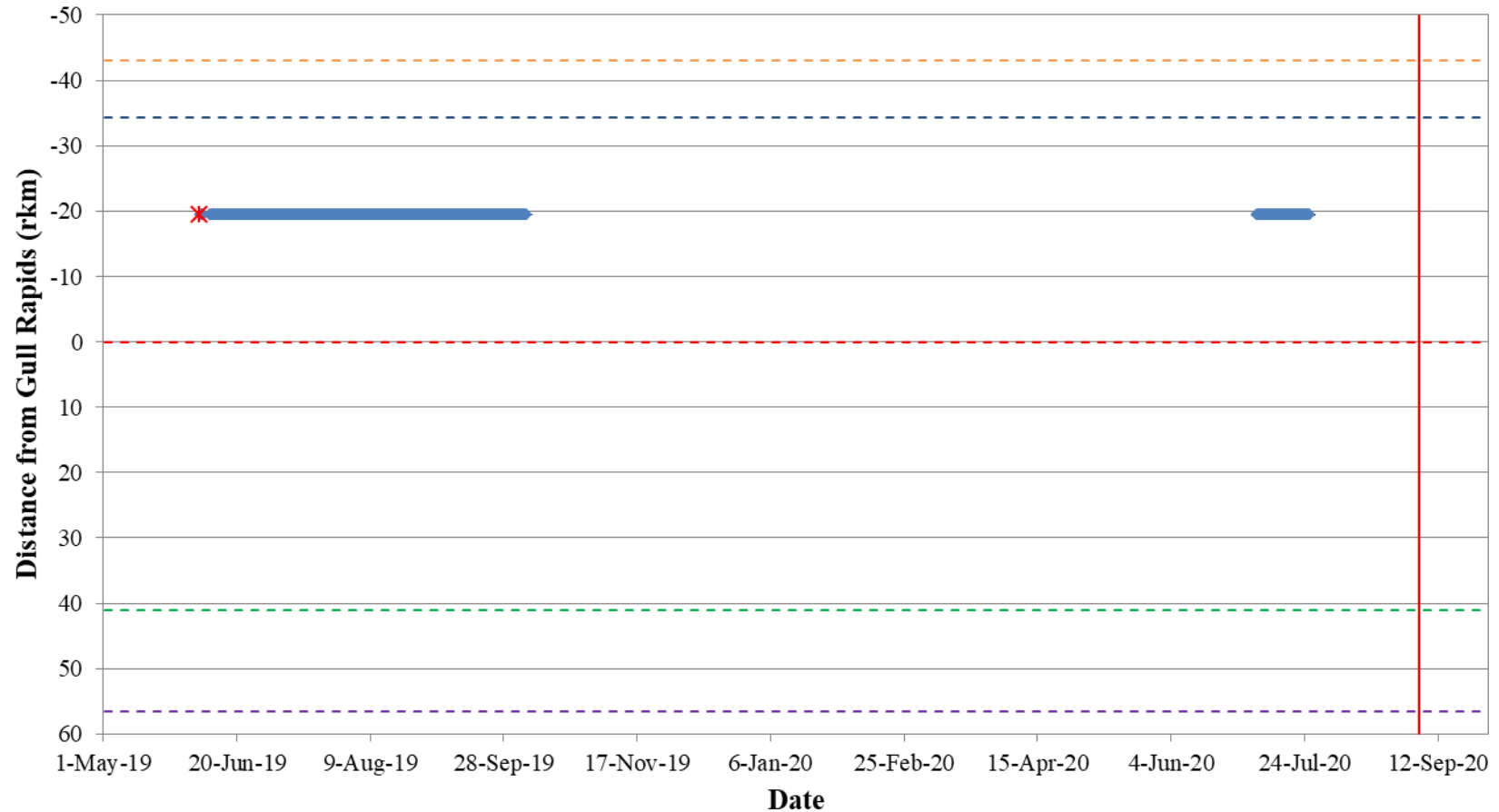


Figure A4-9: Position of a Walleye tagged with an acoustic transmitter (code #20156) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

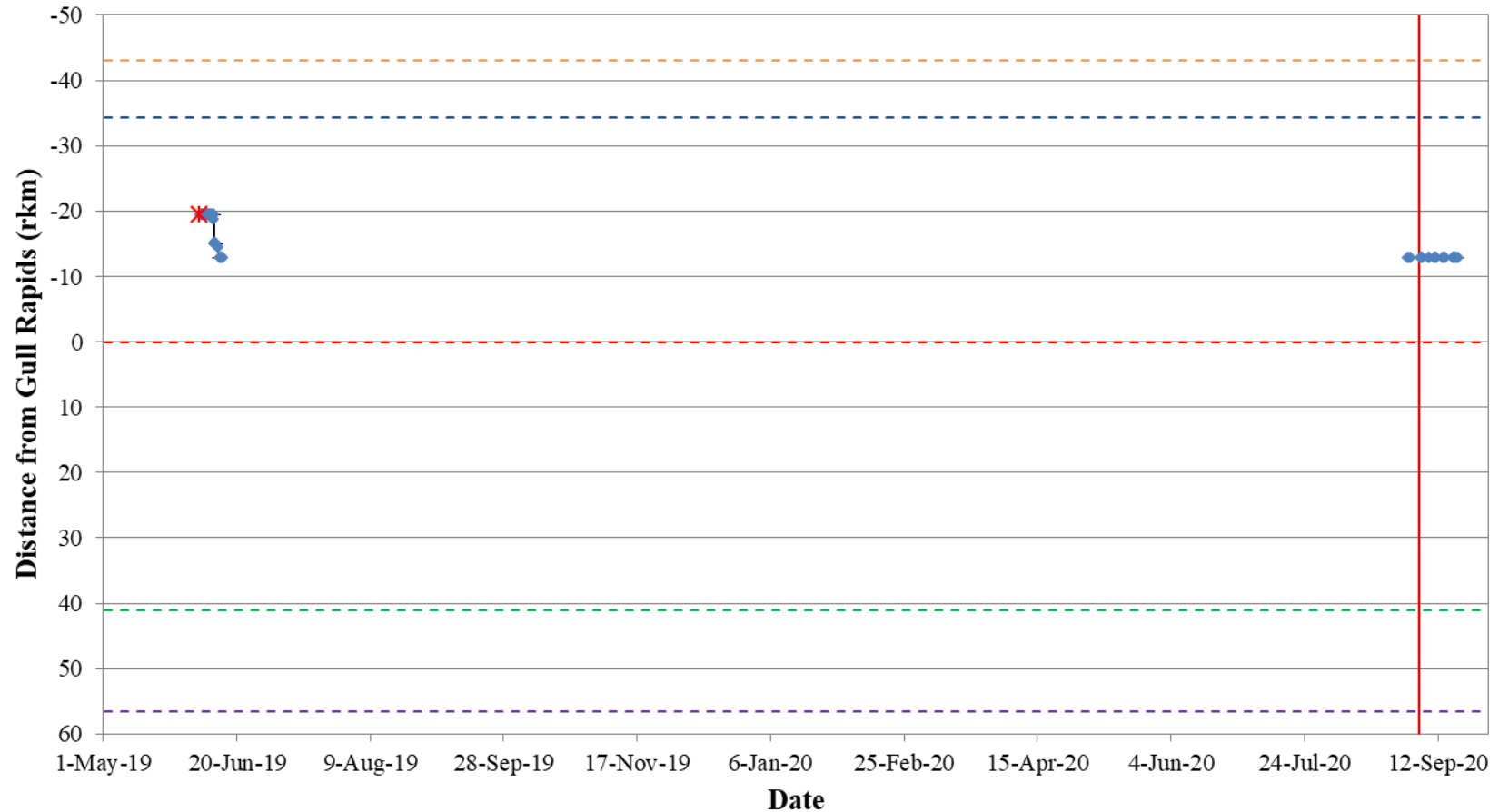


Figure A4-10: Position of a Walleye tagged with an acoustic transmitter (code #20157) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

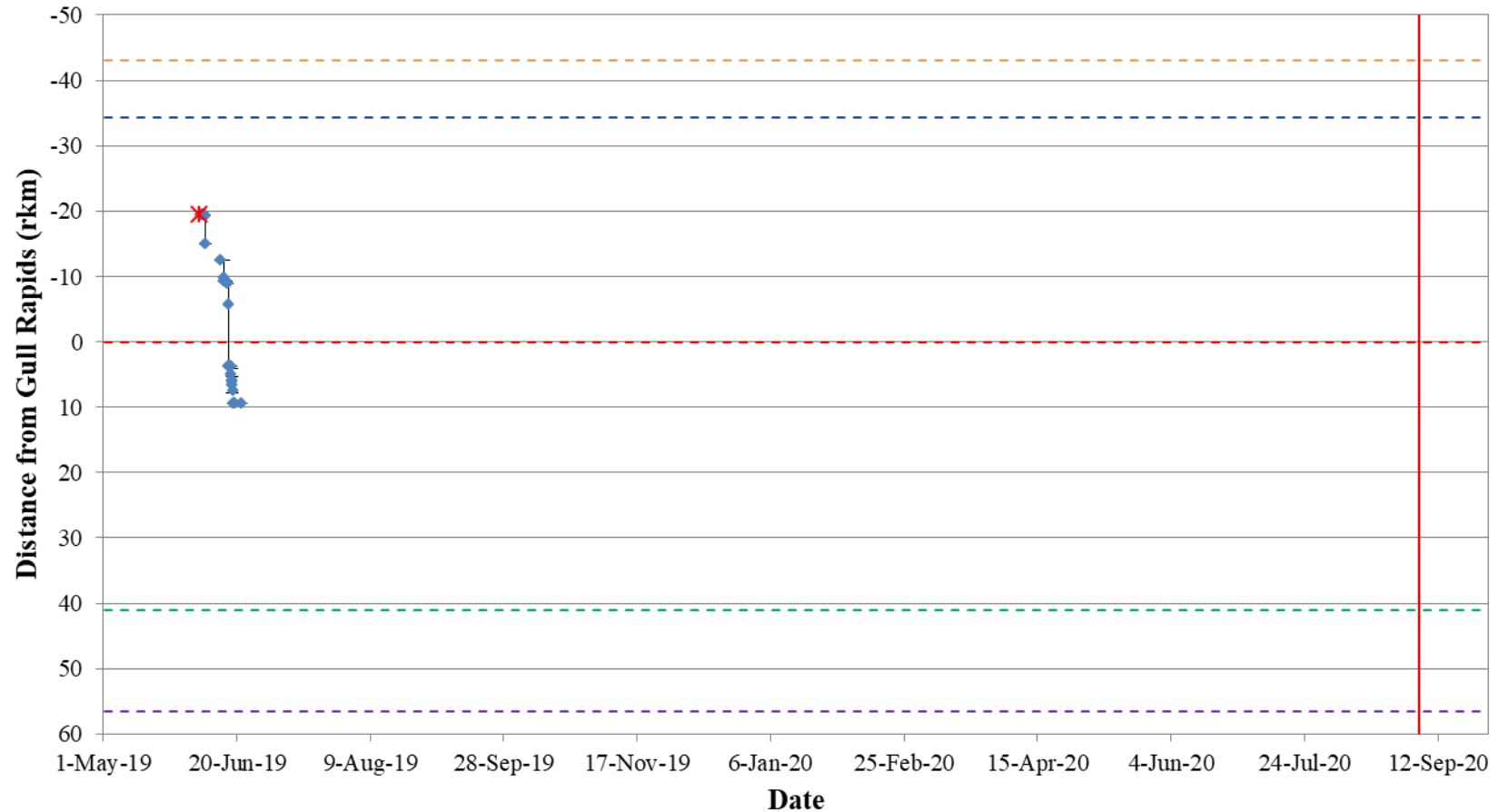


Figure A4-11: Position of a Walleye tagged with an acoustic transmitter (code #20158) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

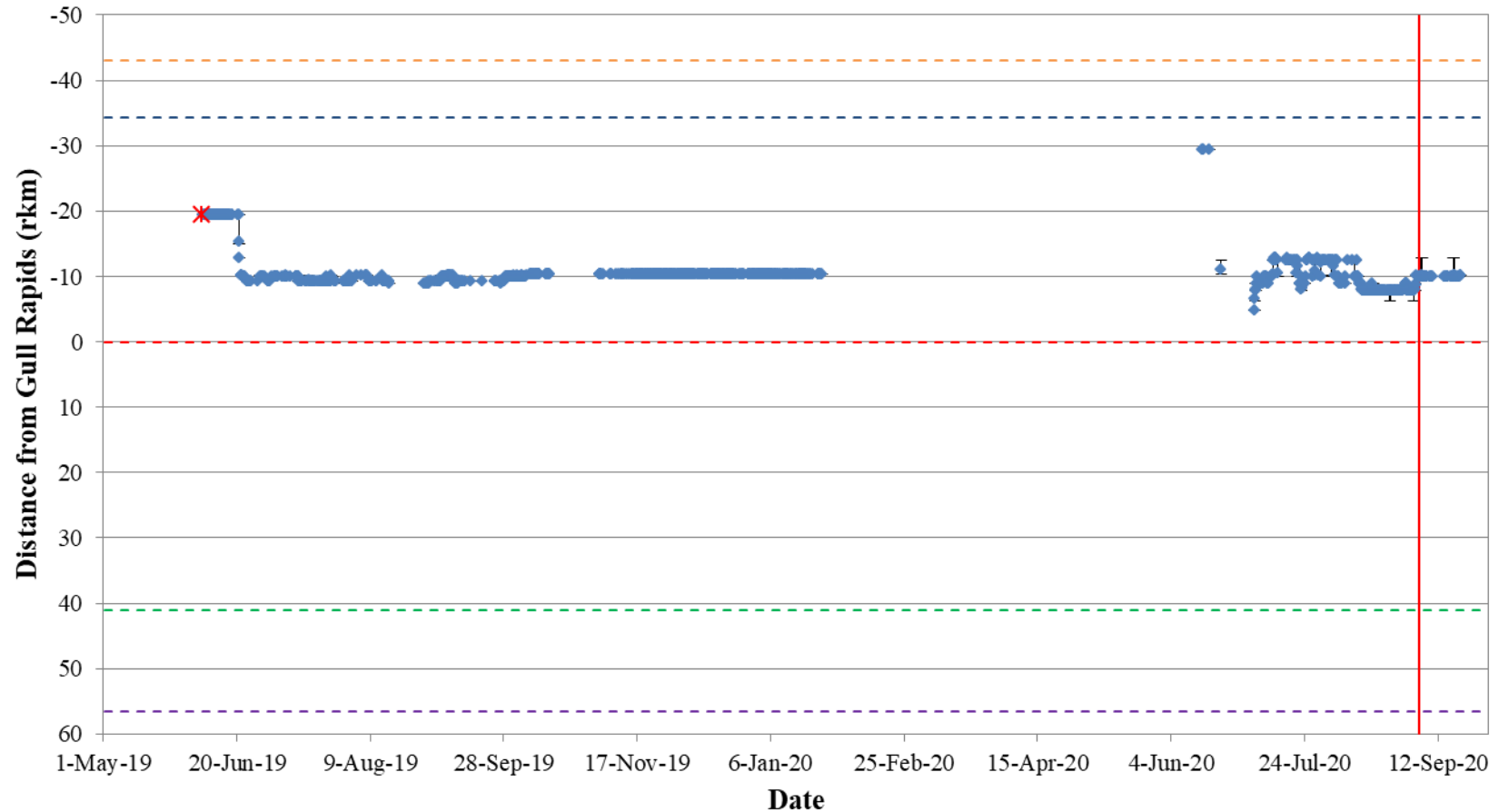


Figure A4-12: Position of a Walleye tagged with an acoustic transmitter (code #20159) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

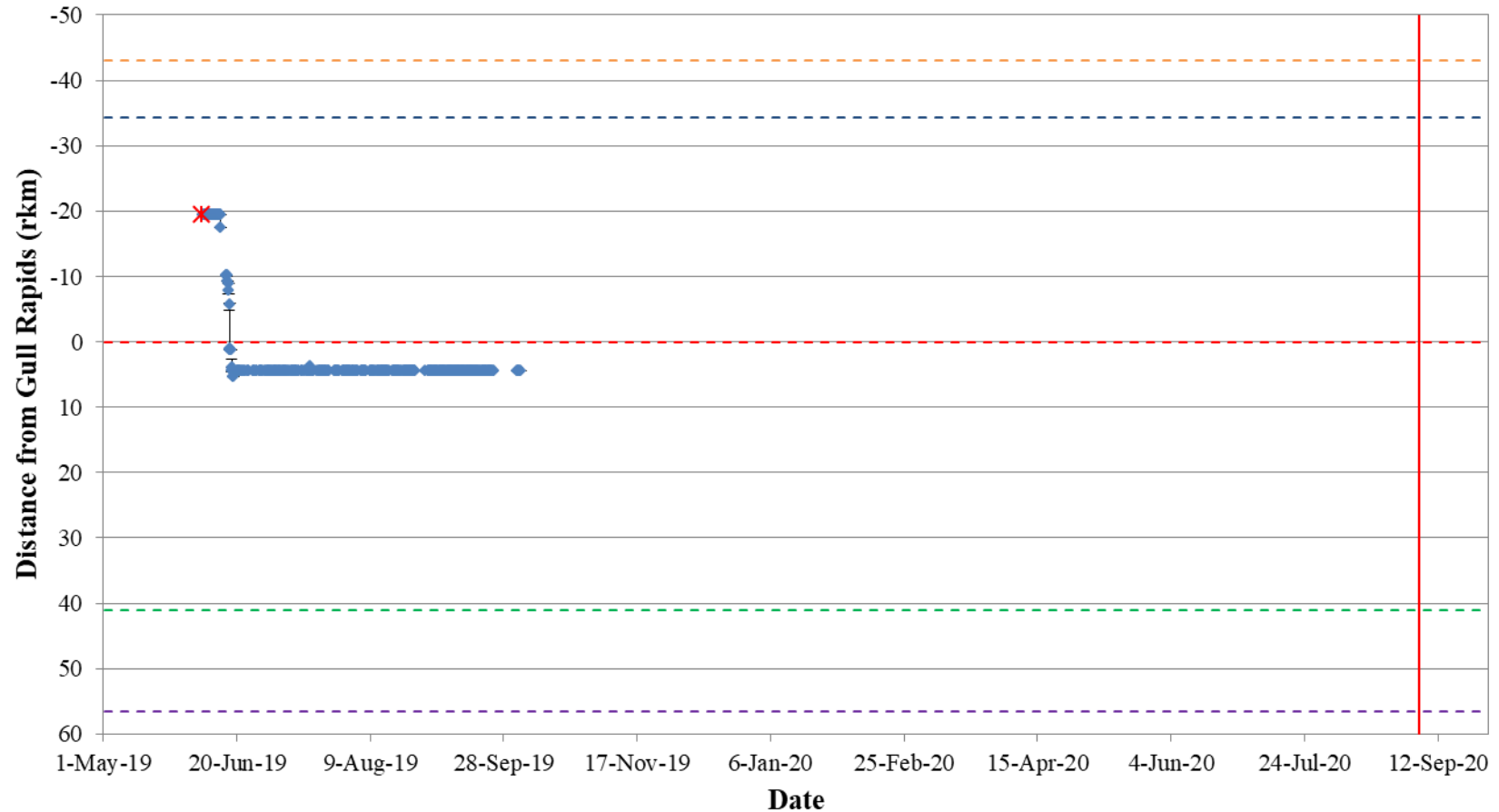


Figure A4-13: Position of a Walleye tagged with an acoustic transmitter (code #20160) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

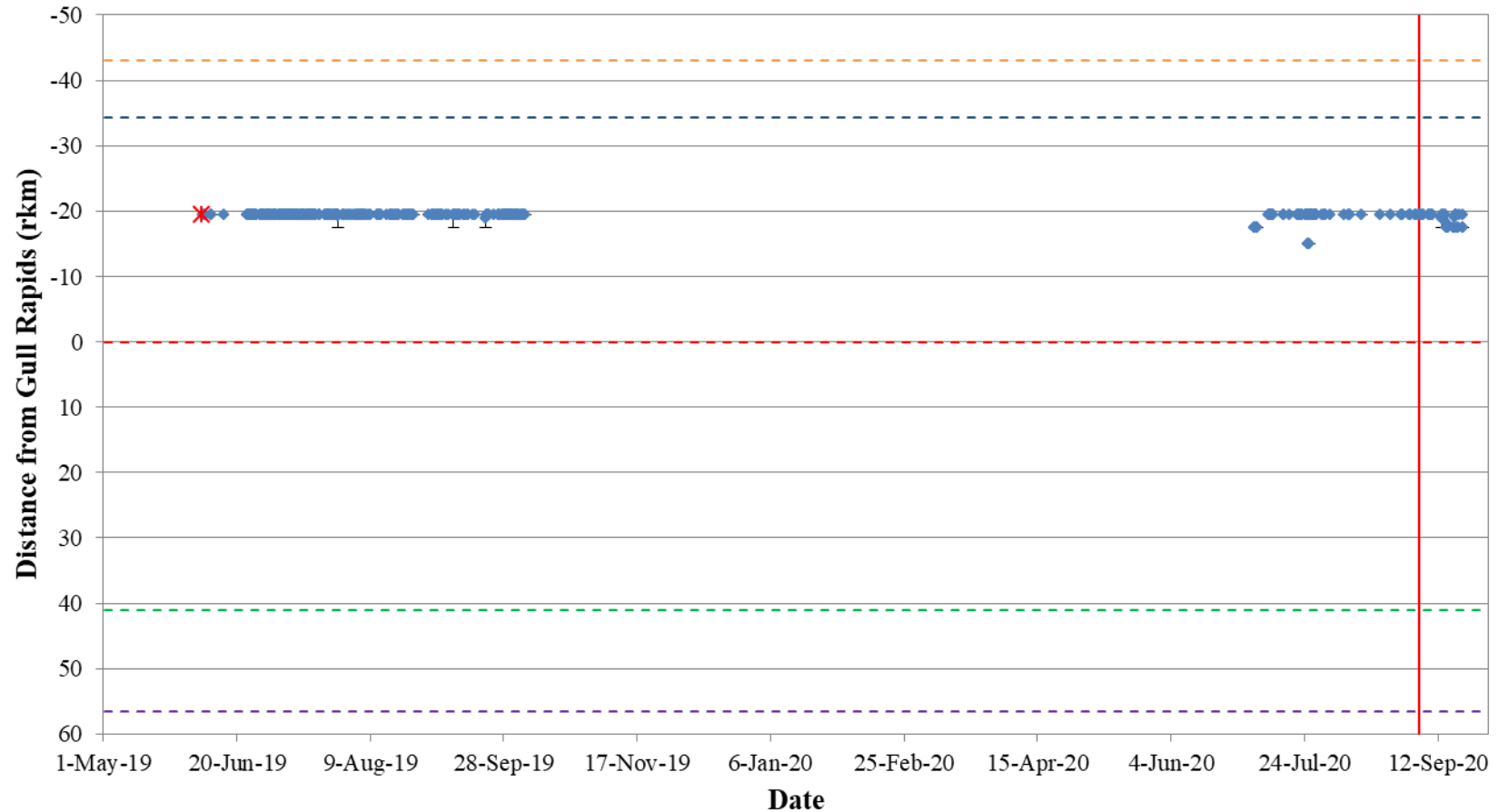
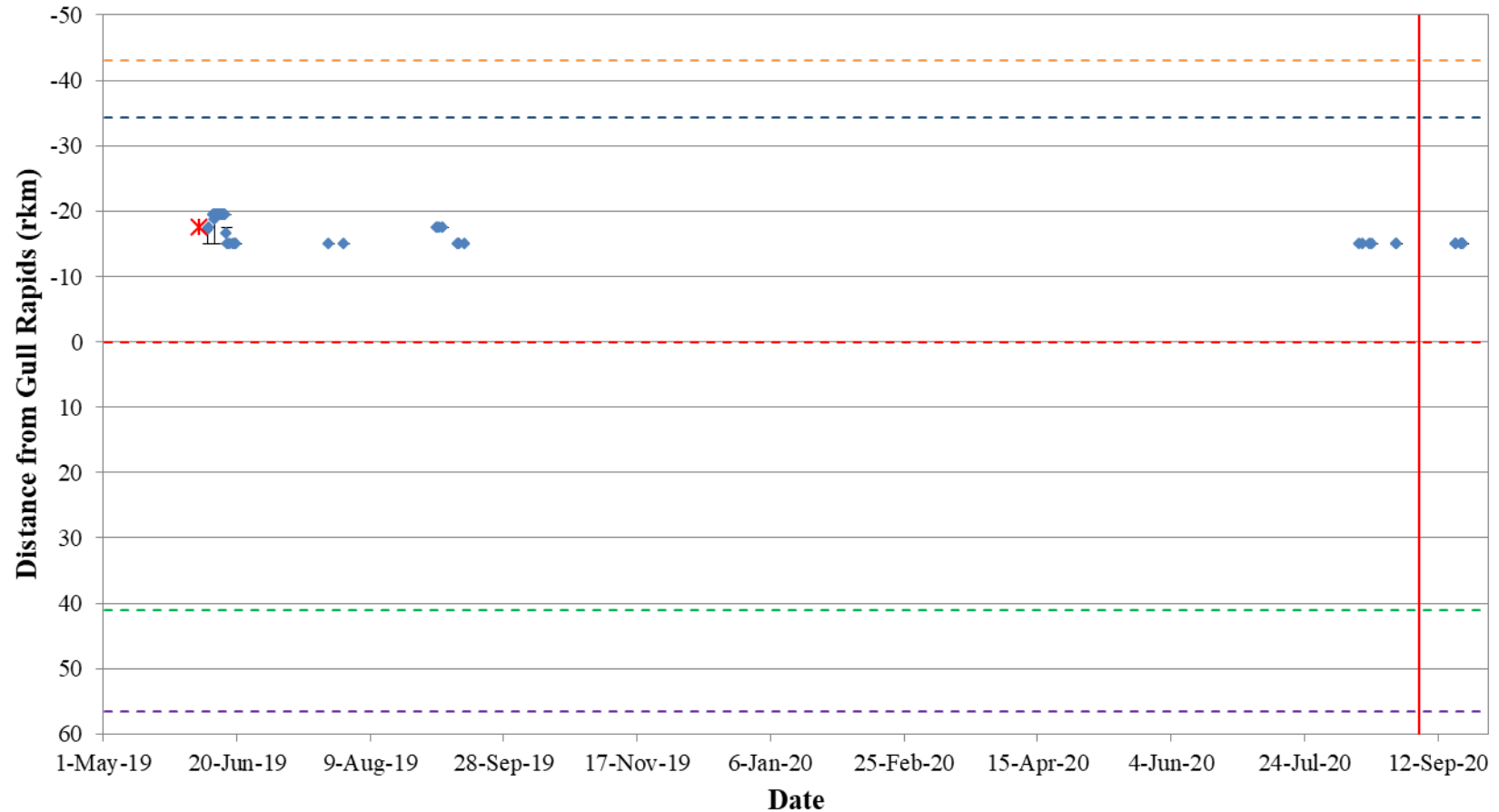


Figure A4-14: Position of a Walleye tagged with an acoustic transmitter (code #20161) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).



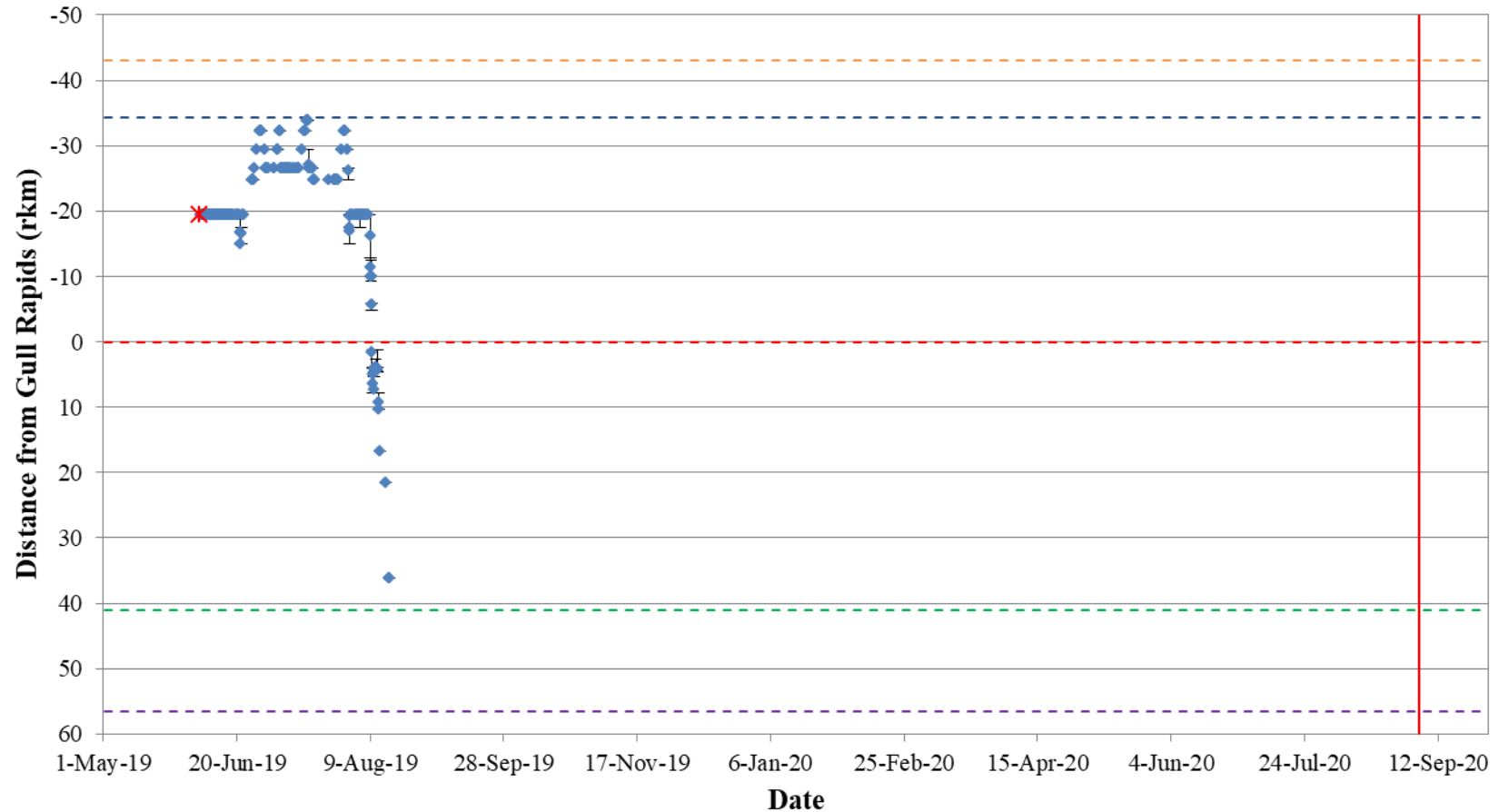


Figure A4-16: Position of a Walleye tagged with an acoustic transmitter (code #20163) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

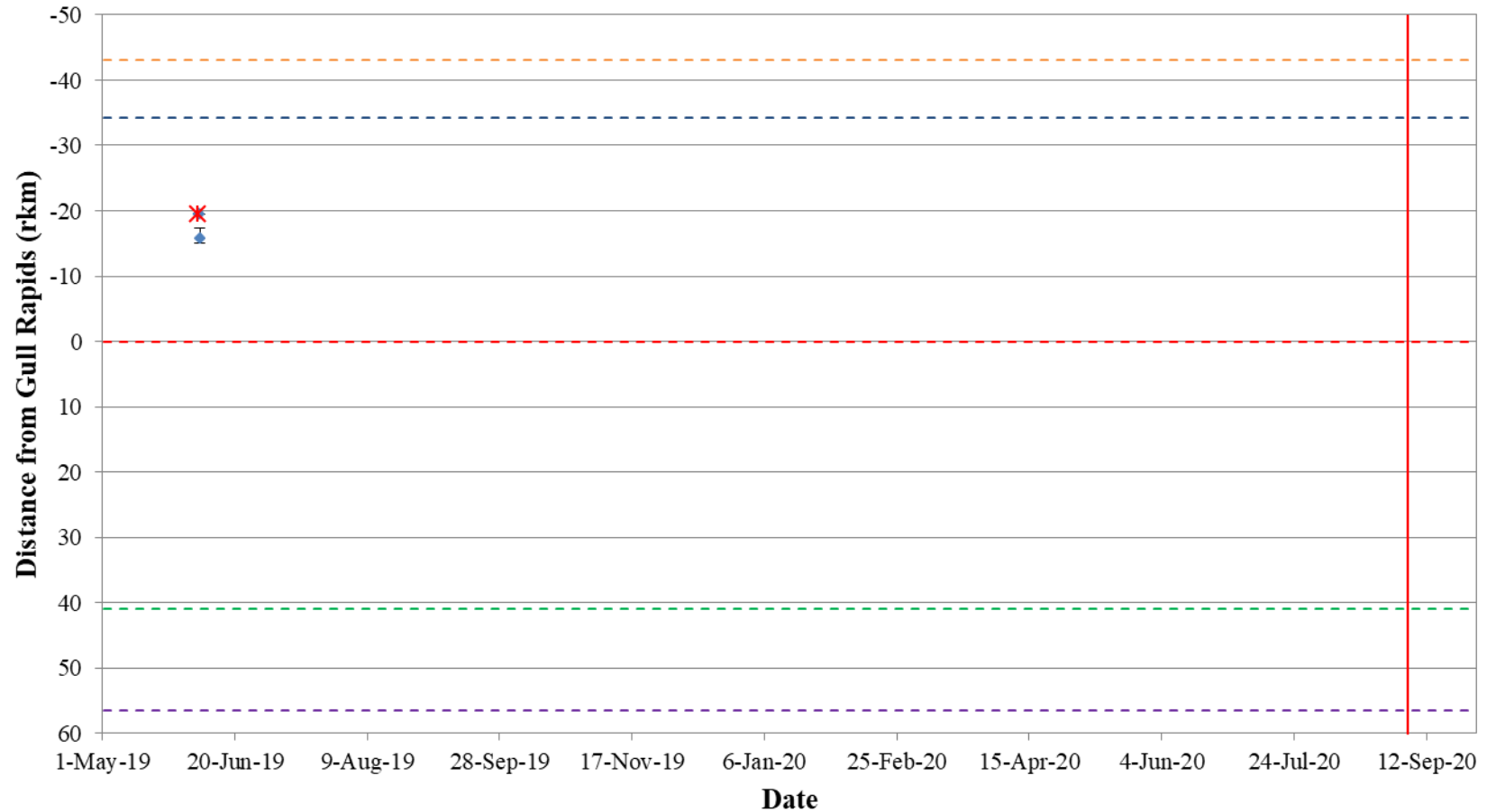


Figure A4-17: Position of a Walleye tagged with an acoustic transmitter (code #20164) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

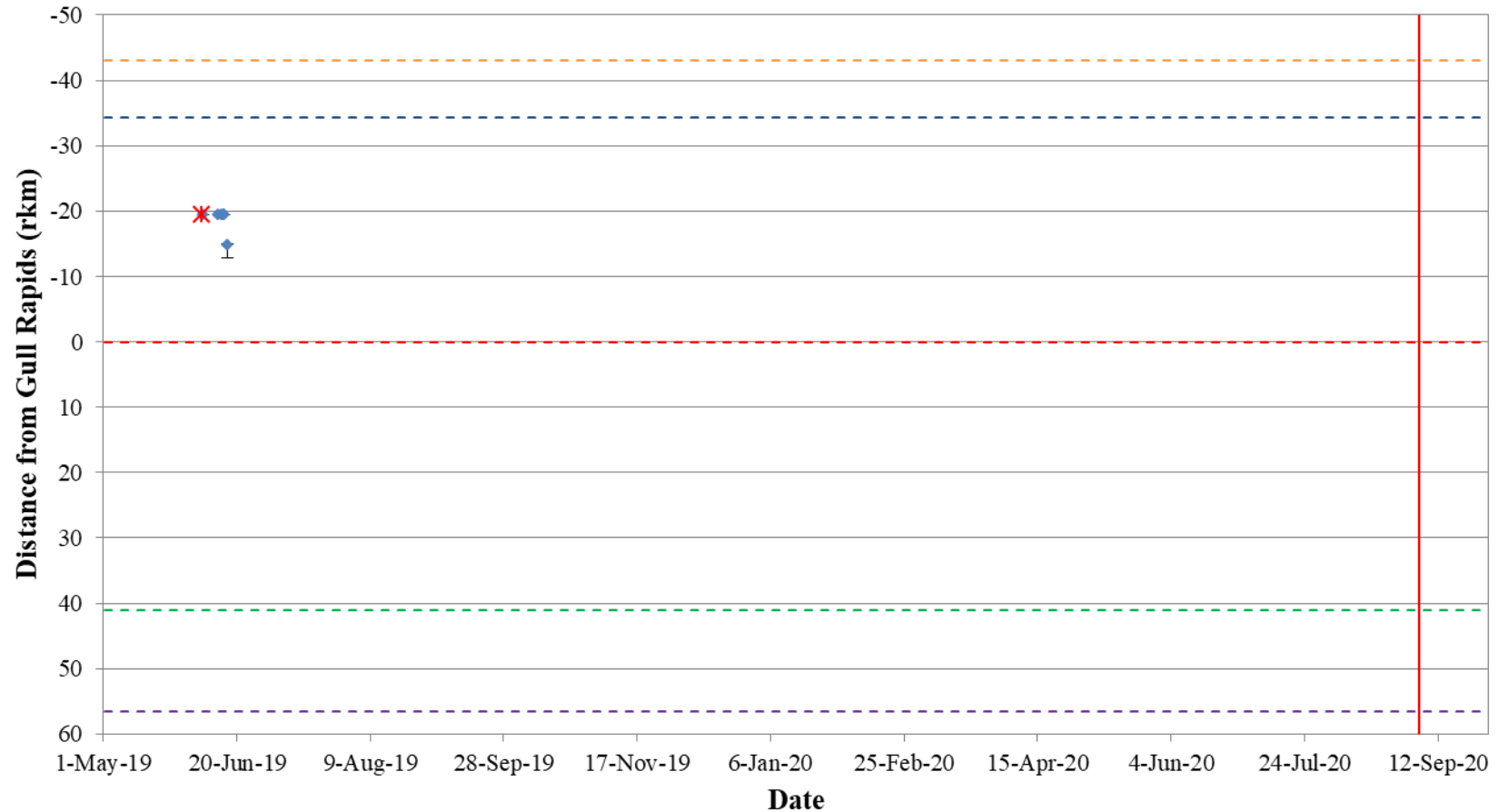


Figure A4-18: Position of a Walleye tagged with an acoustic transmitter (code #20169) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

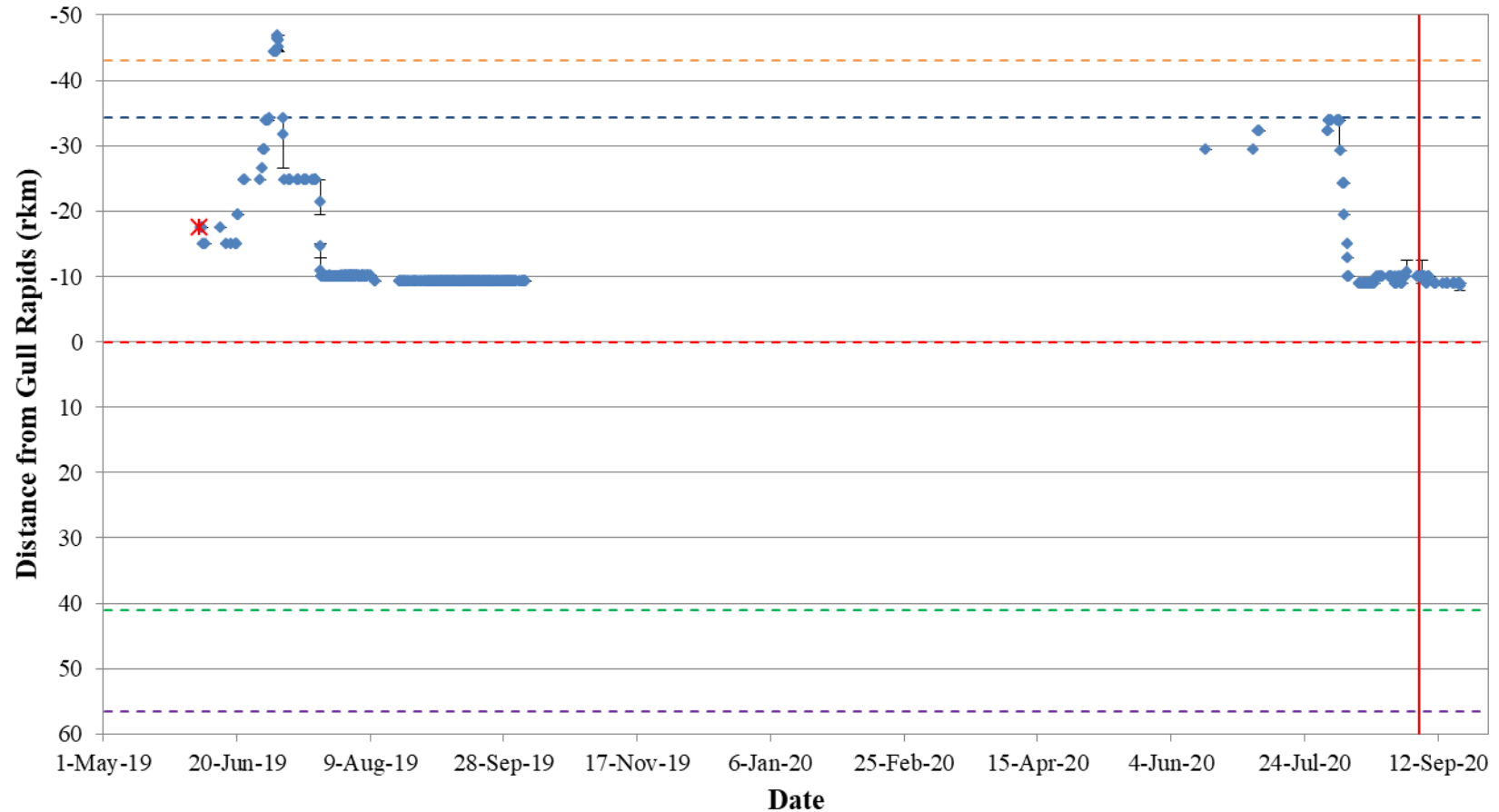


Figure A4-19: Position of a Walleye tagged with an acoustic transmitter (code #20170) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

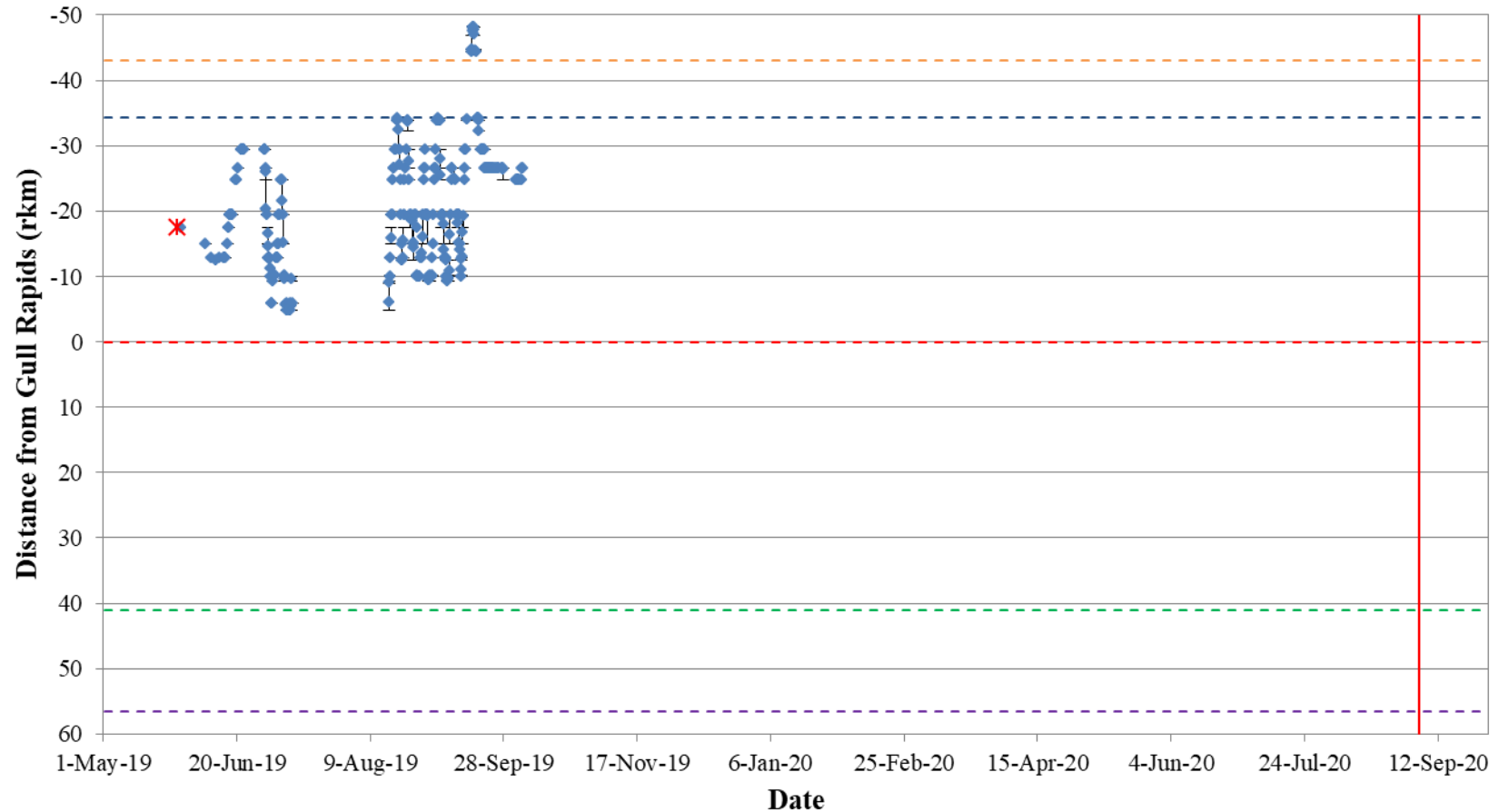


Figure A4-20: Position of a Walleye tagged with an acoustic transmitter (code #20175) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

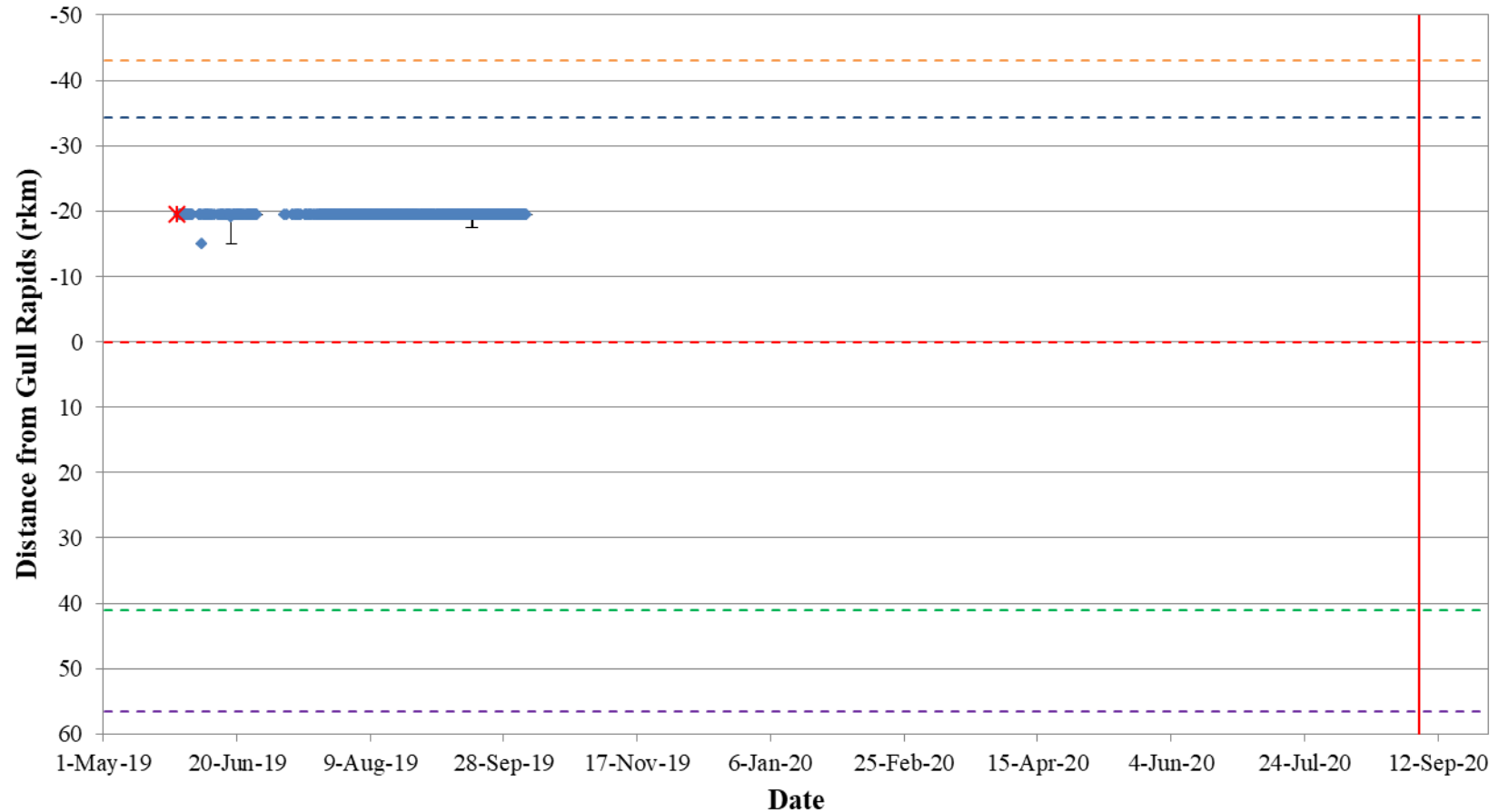


Figure A4-21: Position of a Walleye tagged with an acoustic transmitter (code #20176) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

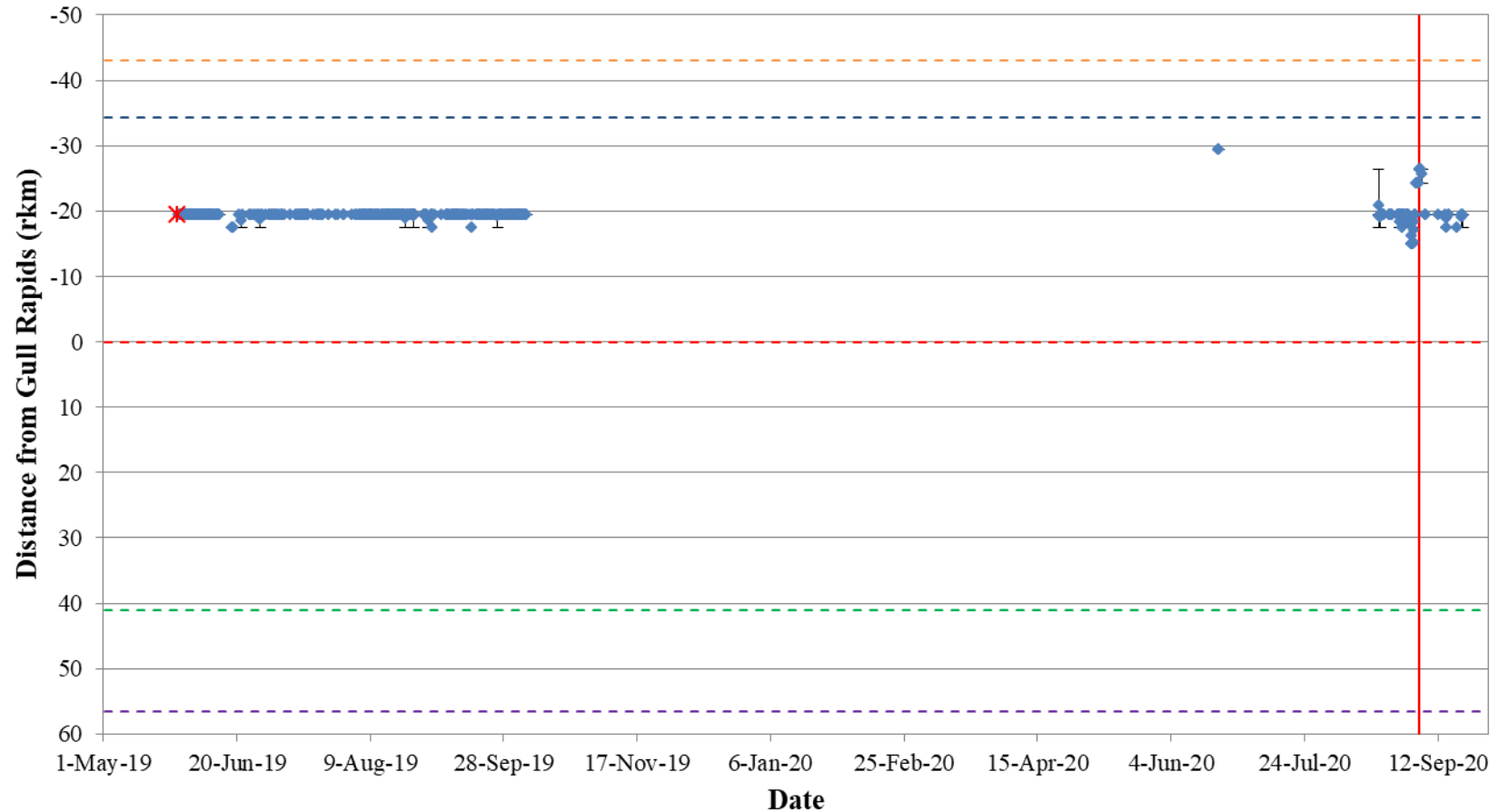


Figure A4-22: Position of a Walleye tagged with an acoustic transmitter (code #20181) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

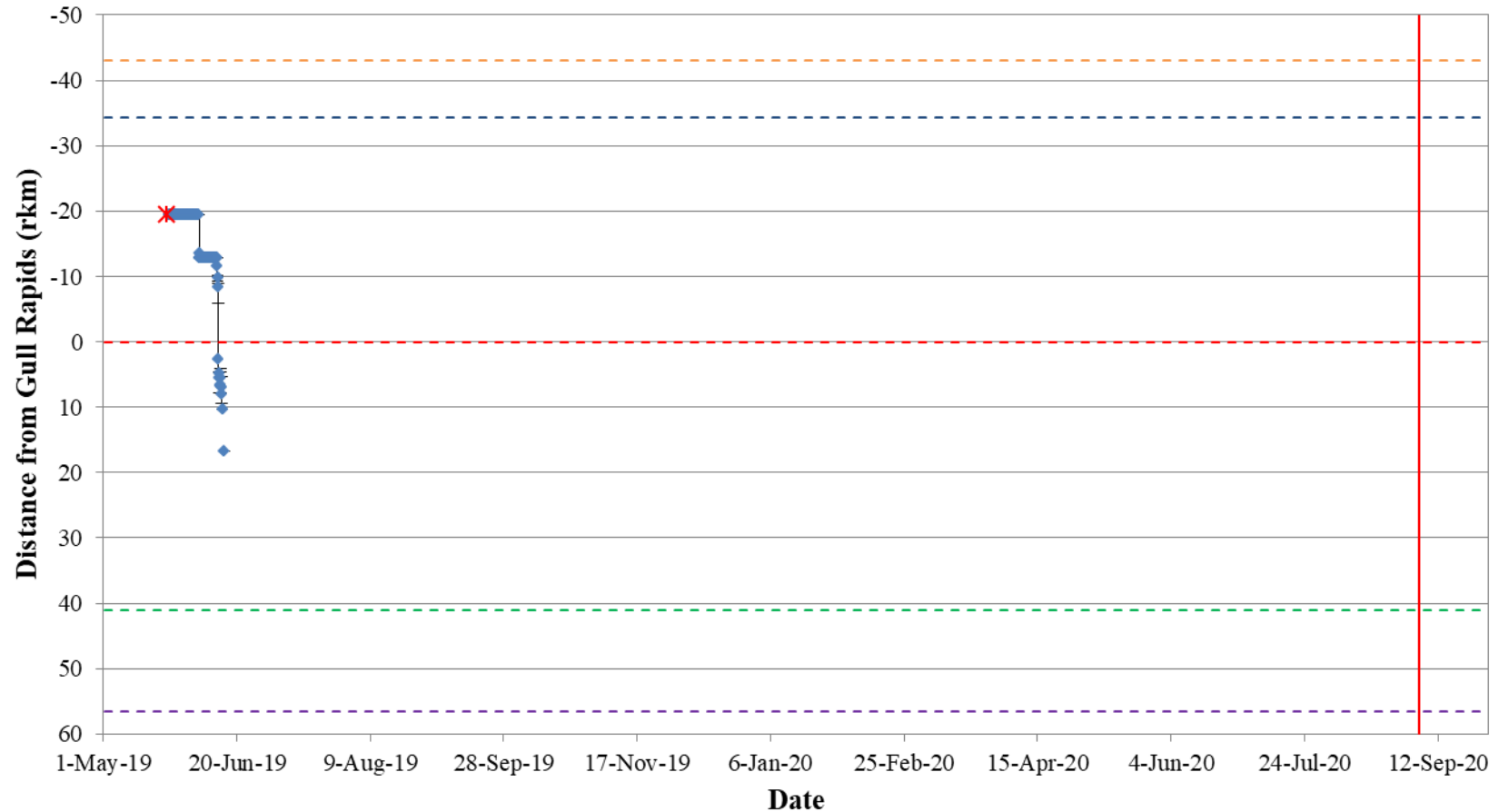


Figure A4-23: Position of a Walleye tagged with an acoustic transmitter (code #20182) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

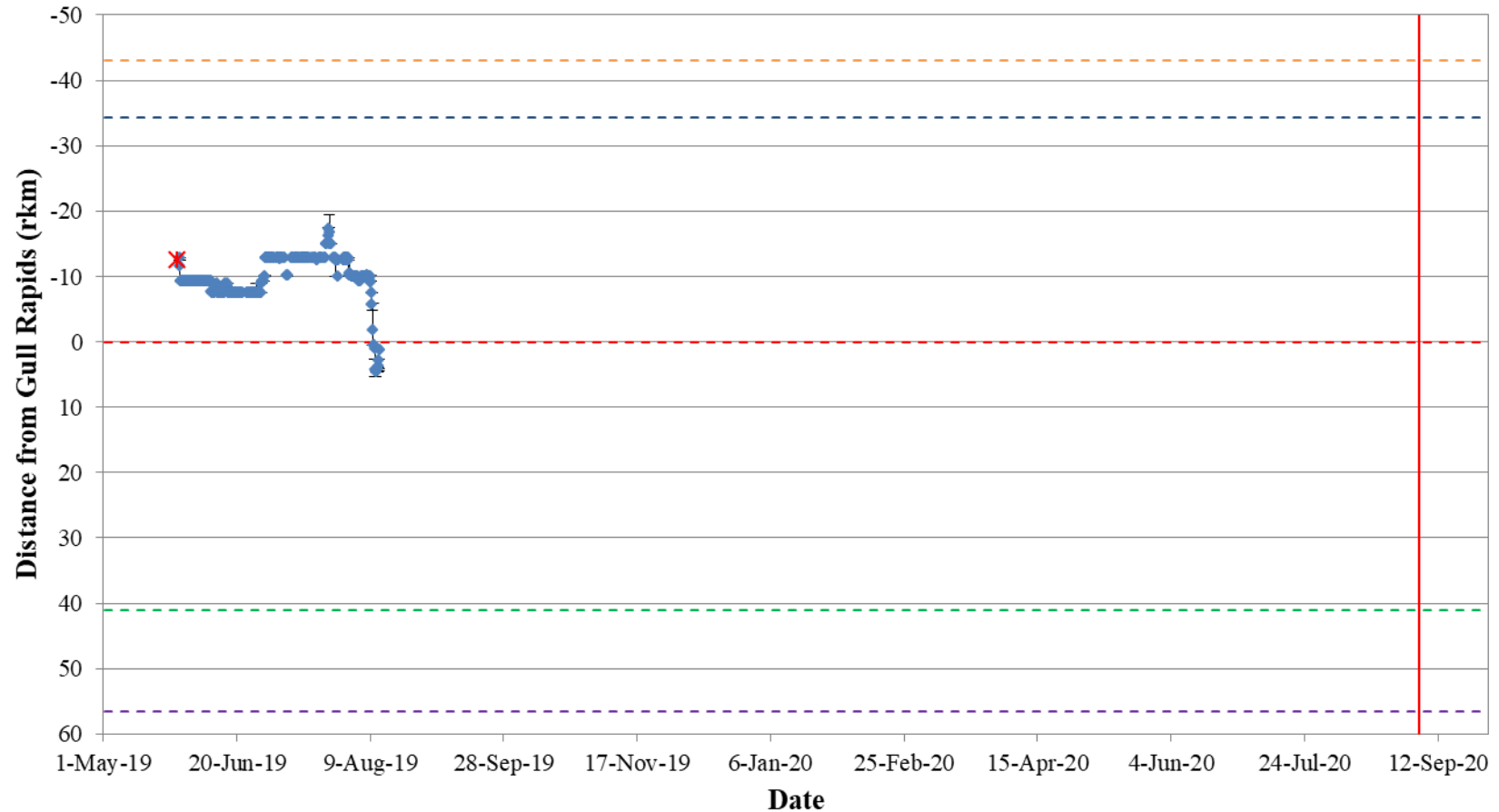


Figure A4-24: Position of a Walleye tagged with an acoustic transmitter (code #20186) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

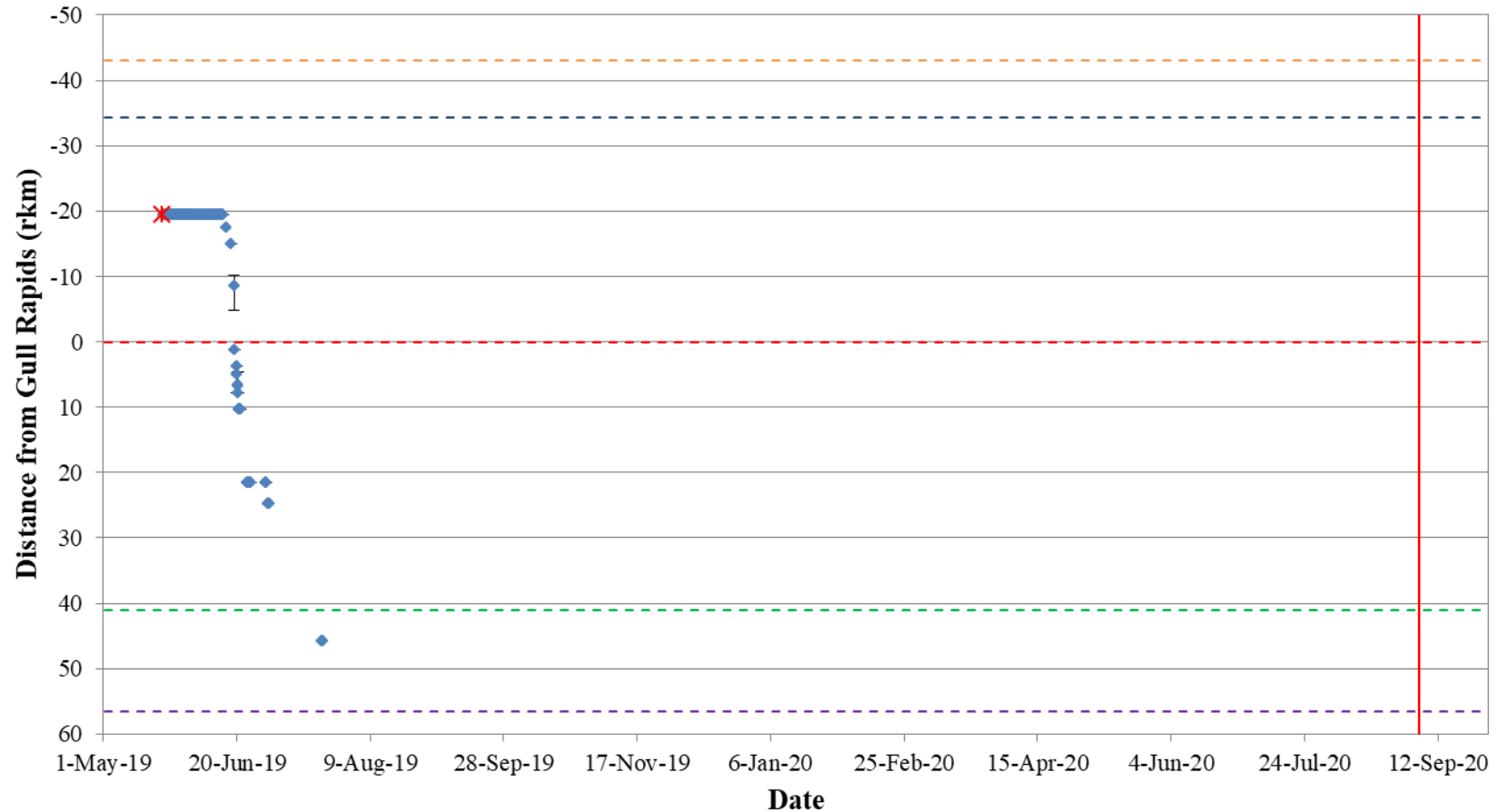


Figure A4-25: Position of a Walleye tagged with an acoustic transmitter (code #20187) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

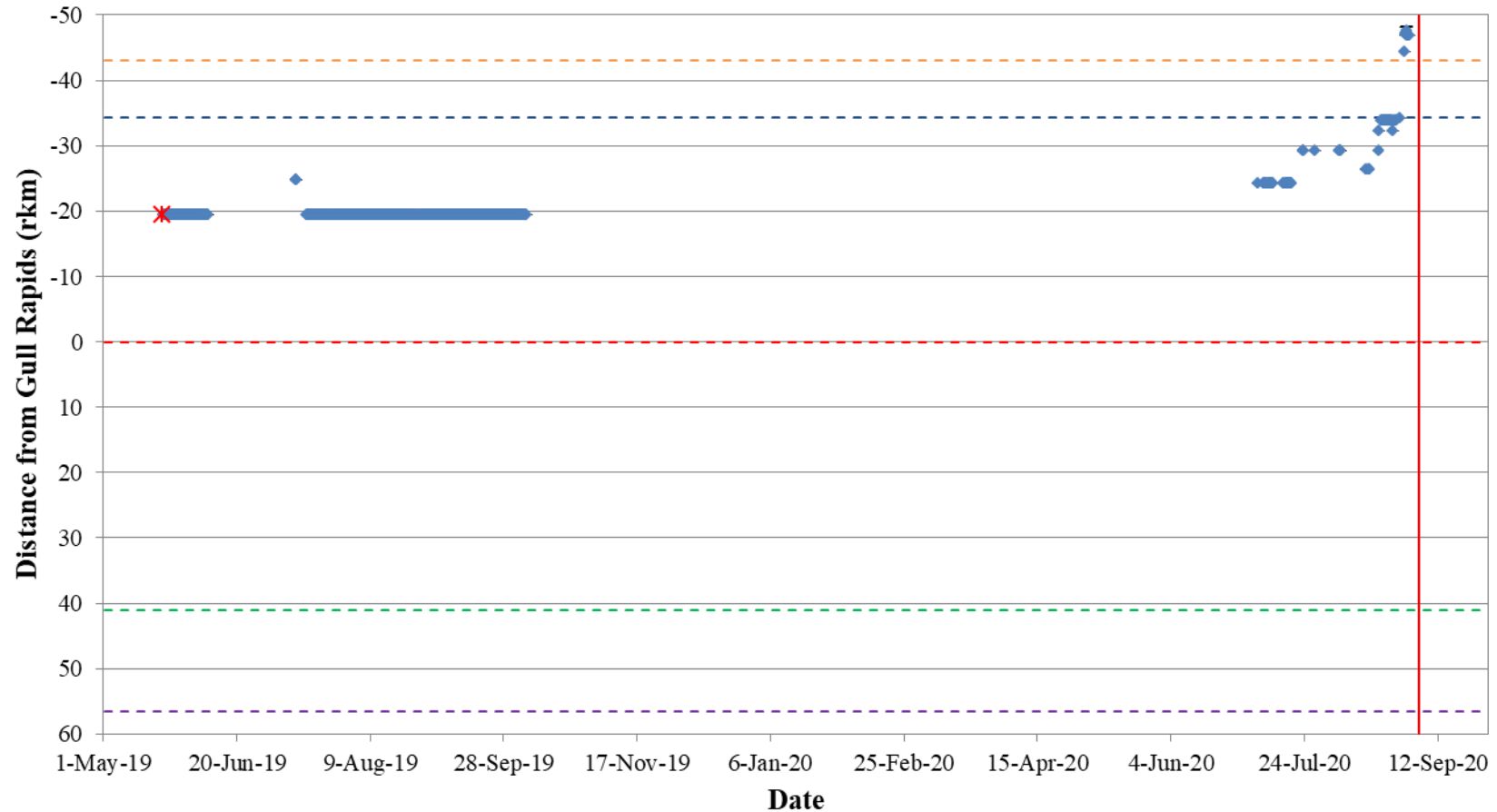


Figure A4-26: Position of a Walleye tagged with an acoustic transmitter (code #20188) in the Nelson River between Clark Lake and the Keeyask GS in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

APPENDIX 5:

LOCATION SUMMARY FOR INDIVIDUAL ACOUSTIC TAGGED WALLEYE IN STEPHENS LAKE JUNE 2016 TO SEPTEMBER 2020

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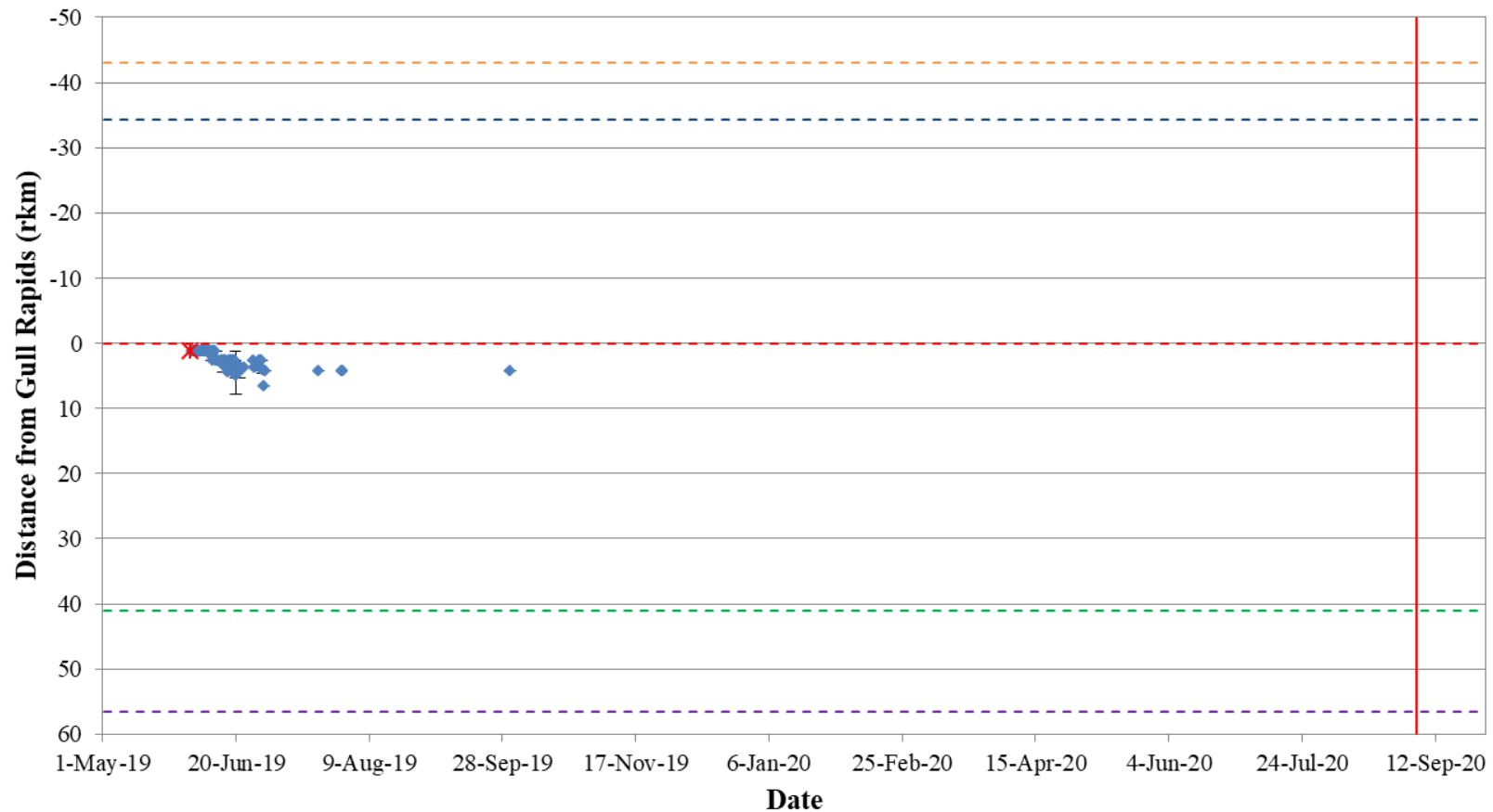


Figure A5-1: Position of a Walleye tagged with an acoustic transmitter (code #20129) in the Nelson River in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

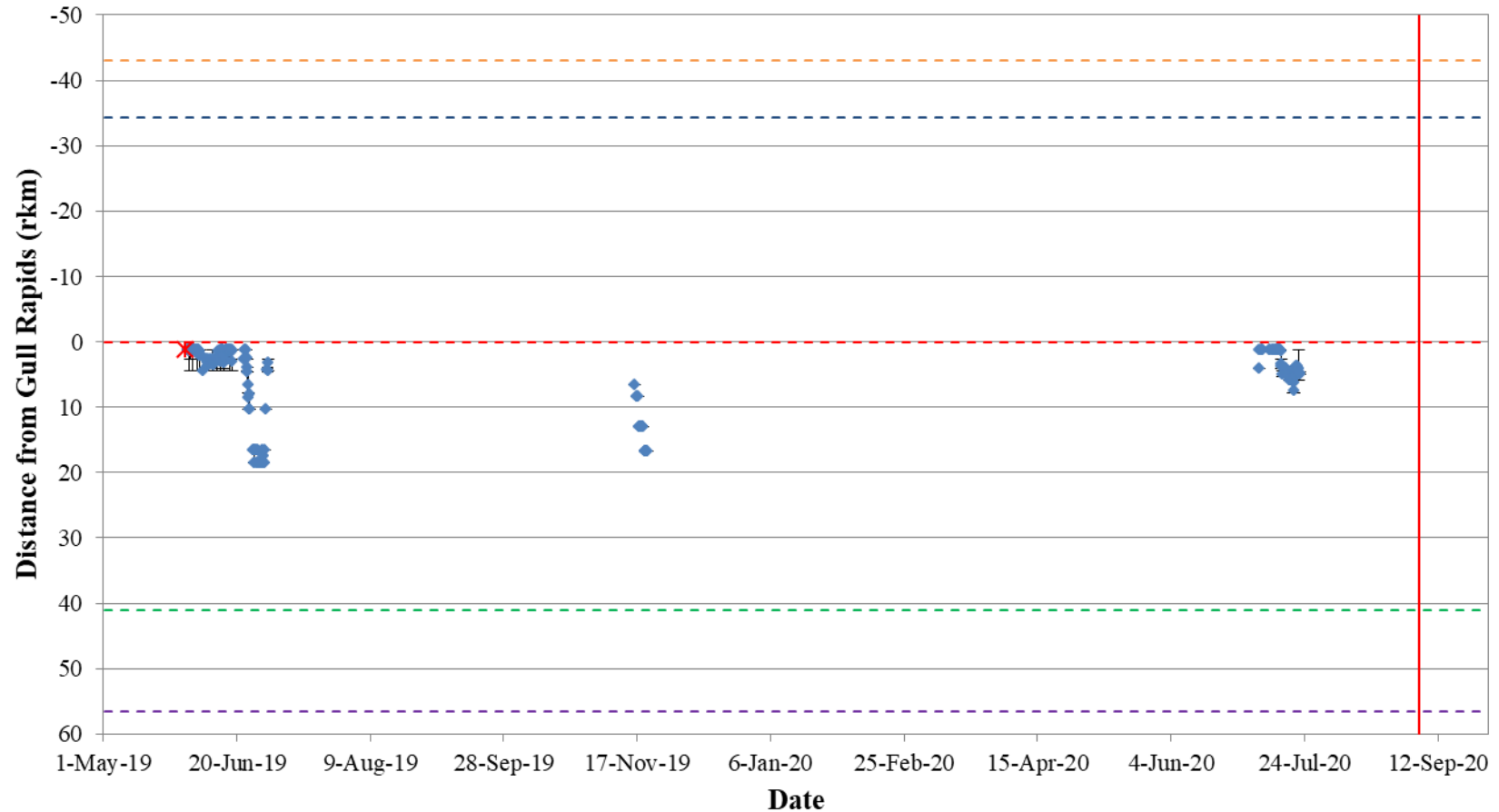


Figure A5-2: Position of a Walleye tagged with an acoustic transmitter (code #20130) in the Nelson River in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

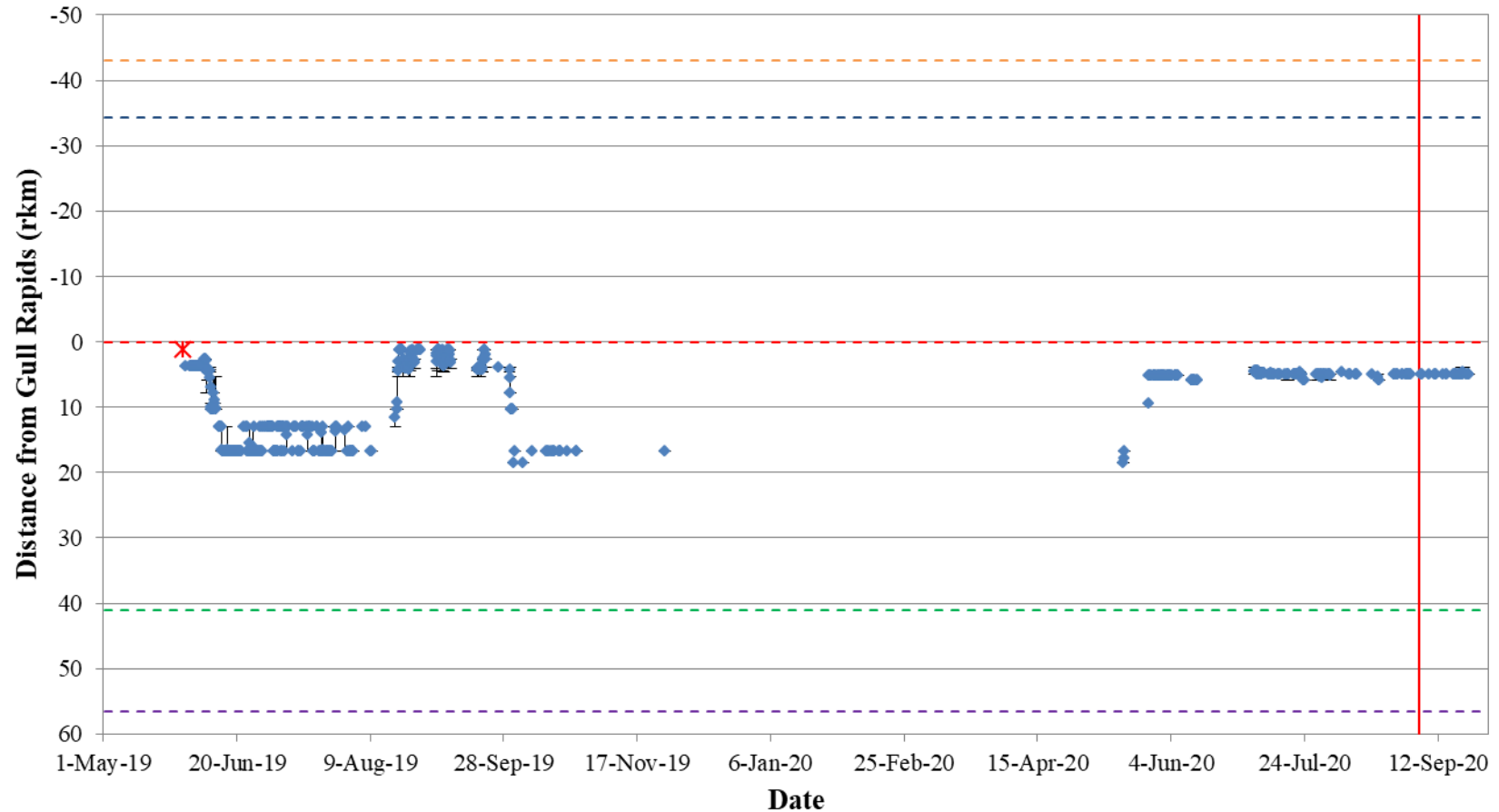


Figure A5-3: Position of a Walleye tagged with an acoustic transmitter (code #20131) in the Nelson River in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

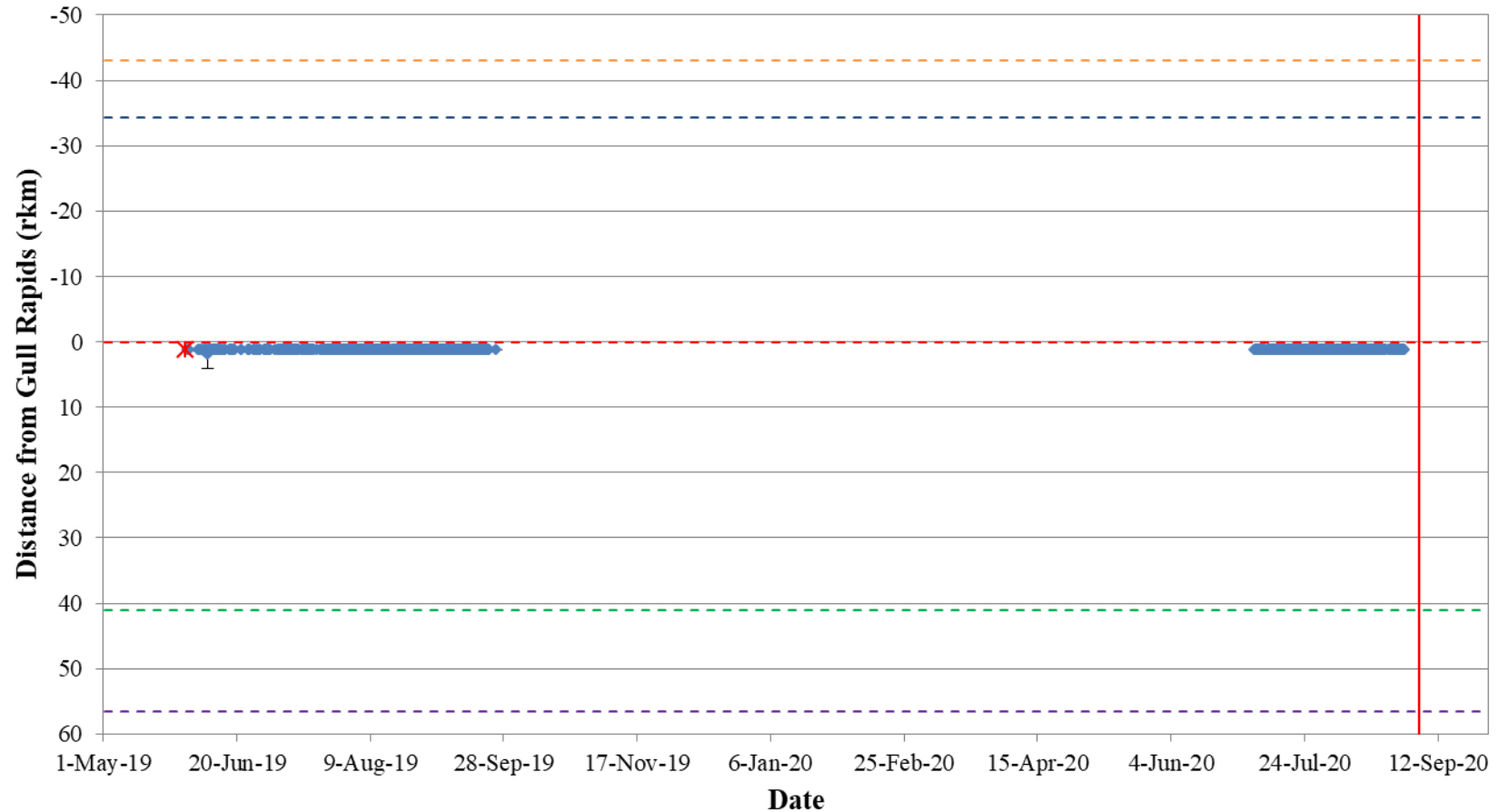


Figure A5-4: Position of a Walleye tagged with an acoustic transmitter (code #20132) in the Nelson River in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

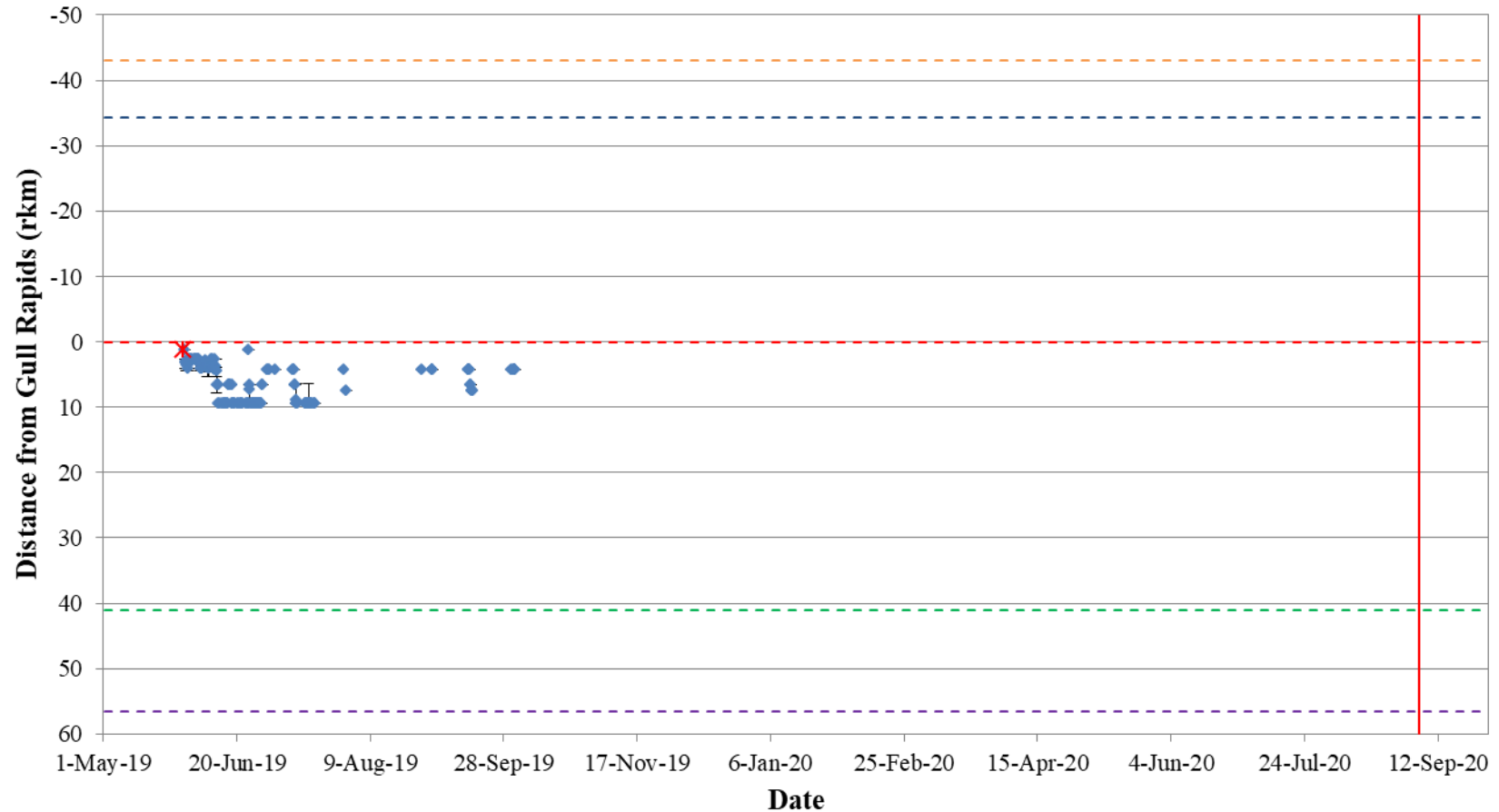


Figure A5-5: Position of a Walleye tagged with an acoustic transmitter (code #20133) in the Nelson River in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

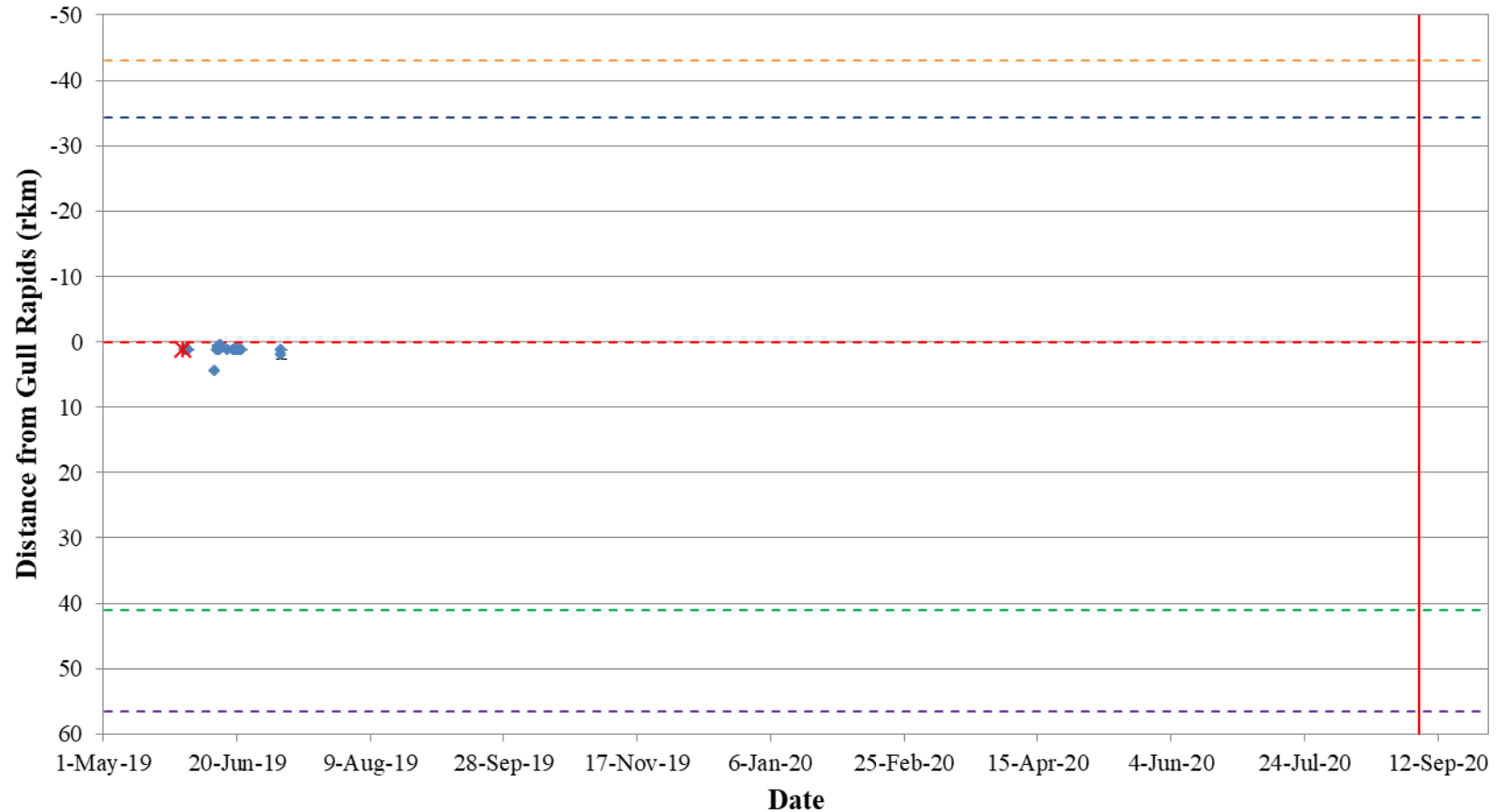


Figure A5-6: Position of a Walleye tagged with an acoustic transmitter (code #20134) in the Nelson River in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

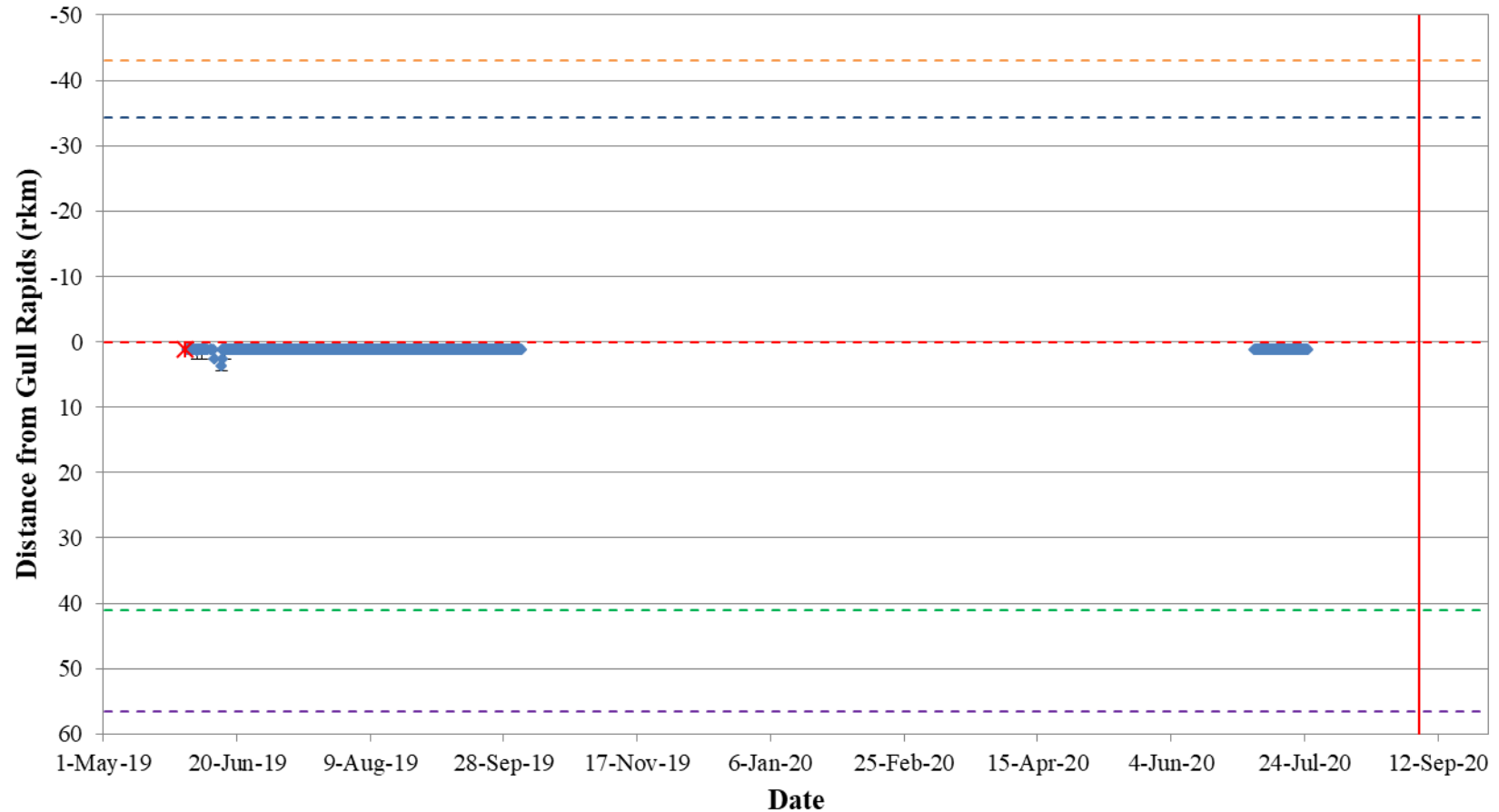


Figure A5-7: Position of a Walleye tagged with an acoustic transmitter (code #20135) in the Nelson River in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

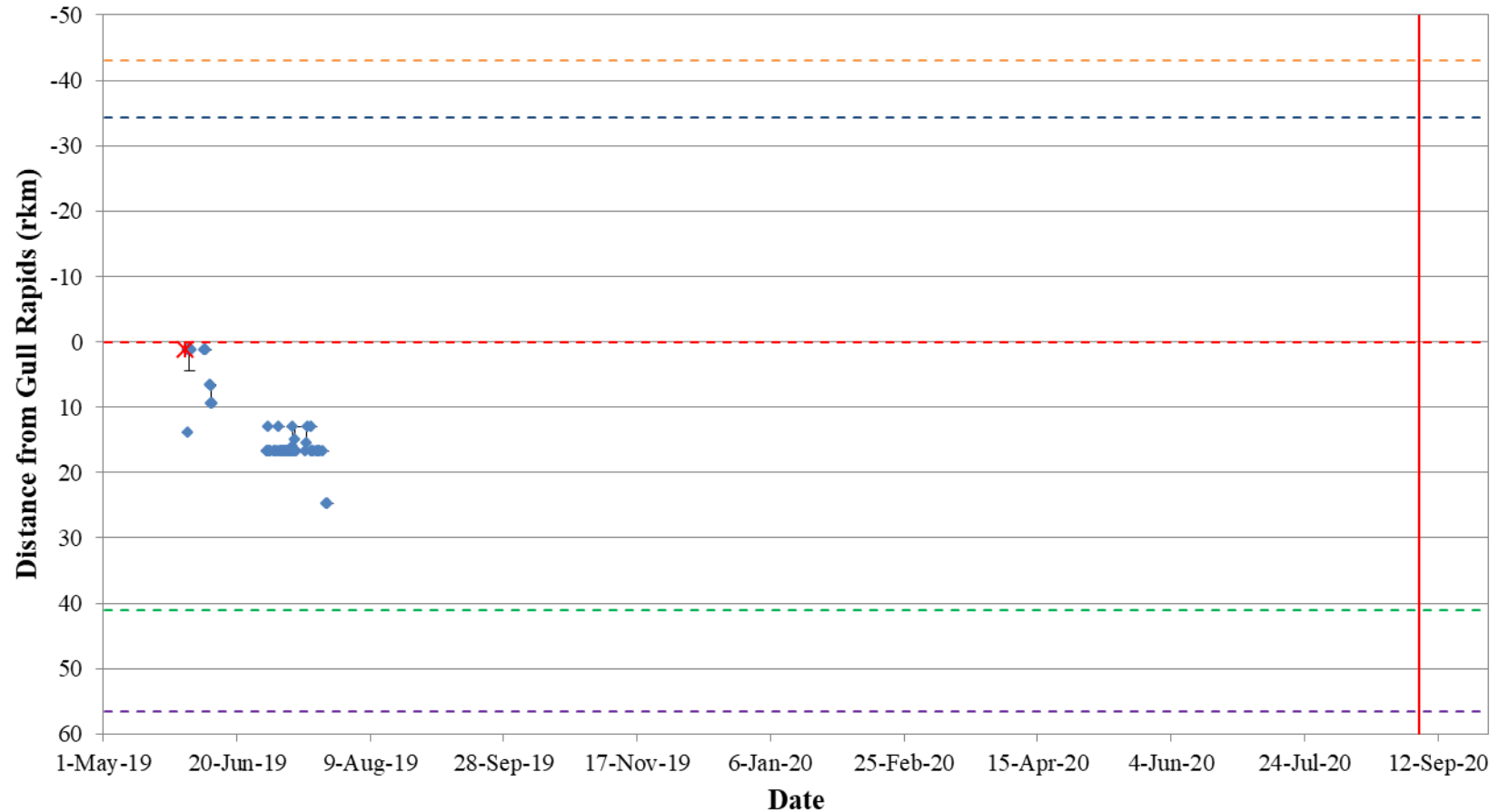


Figure A5-8: Position of a Walleye tagged with an acoustic transmitter (code #20136) in the Nelson River in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

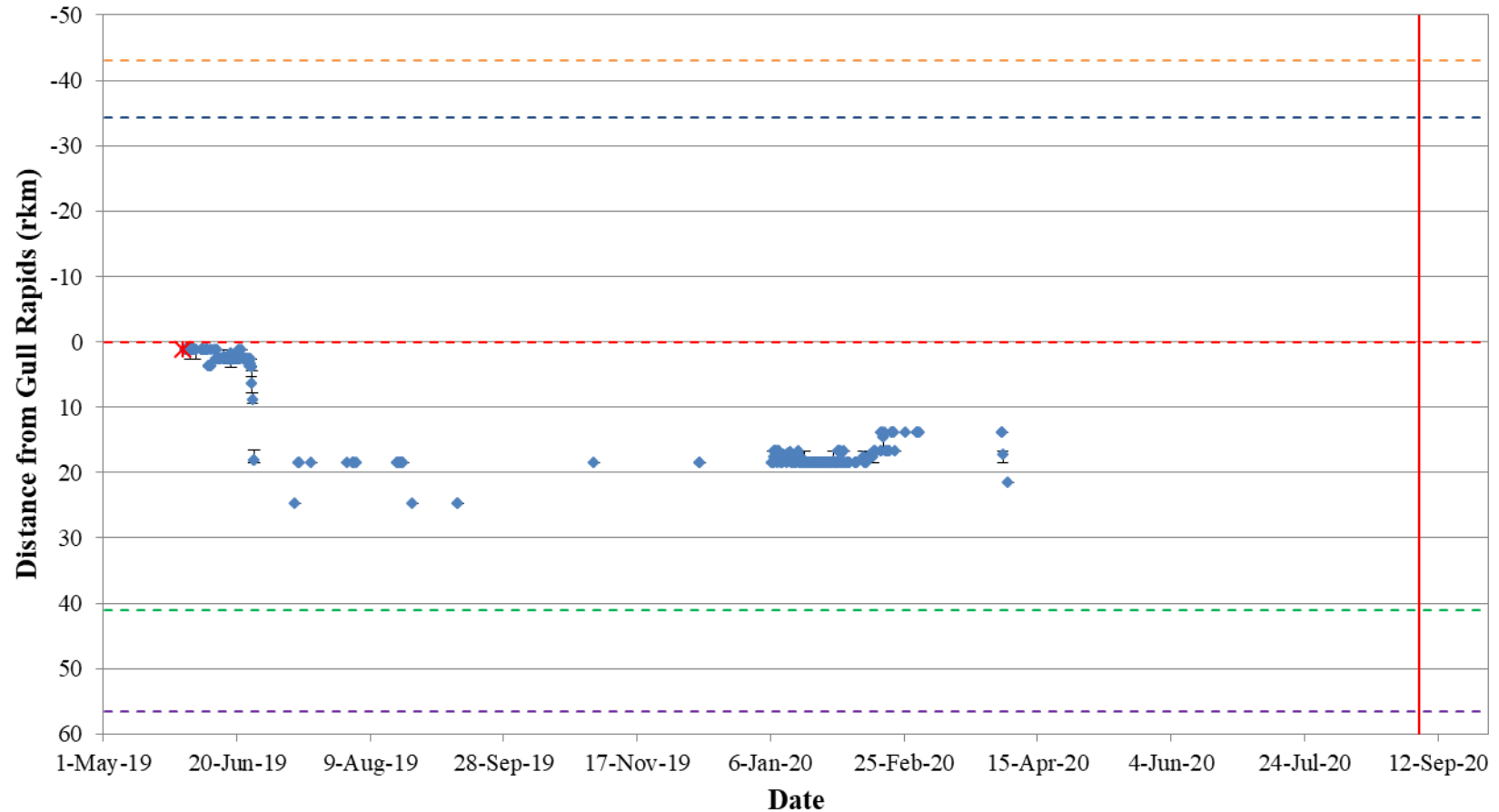


Figure A5-9: Position of a Walleye tagged with an acoustic transmitter (code #20137) in the Nelson River in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

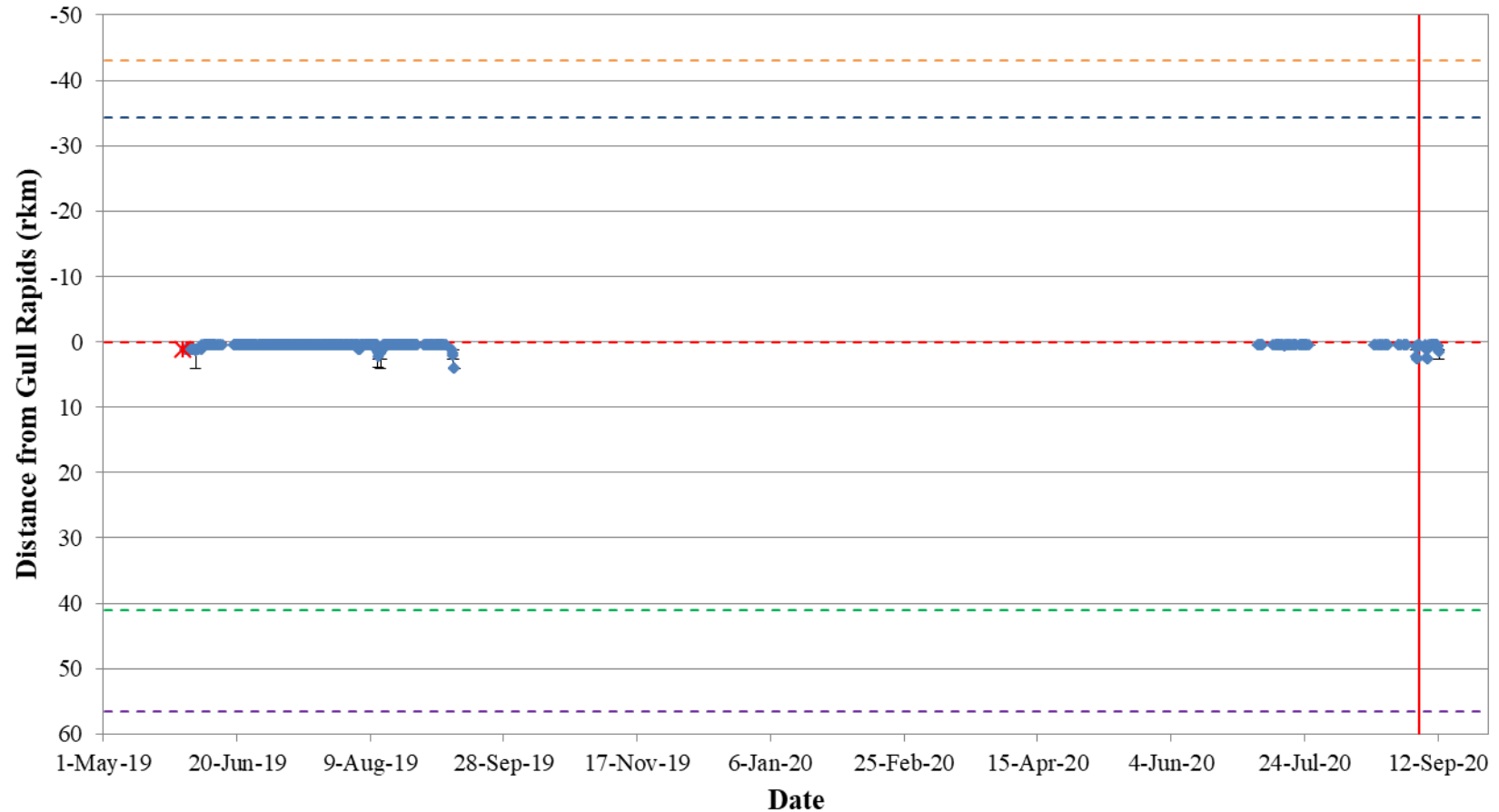


Figure A5-10: Position of a Walleye tagged with an acoustic transmitter (code #20138) in the Nelson River in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

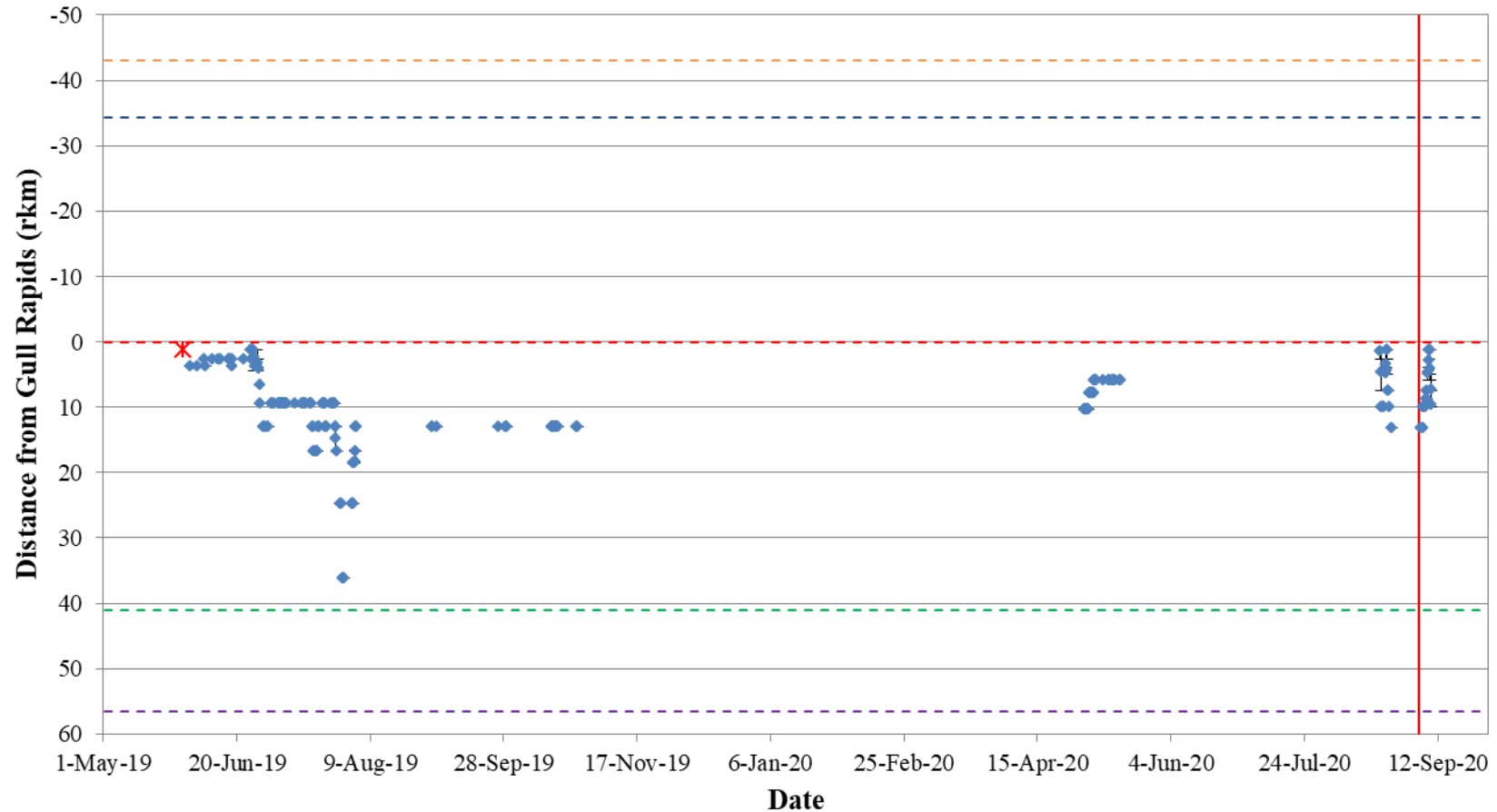


Figure A5-11: Position of a Walleye tagged with an acoustic transmitter (code #20139) in the Nelson River in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

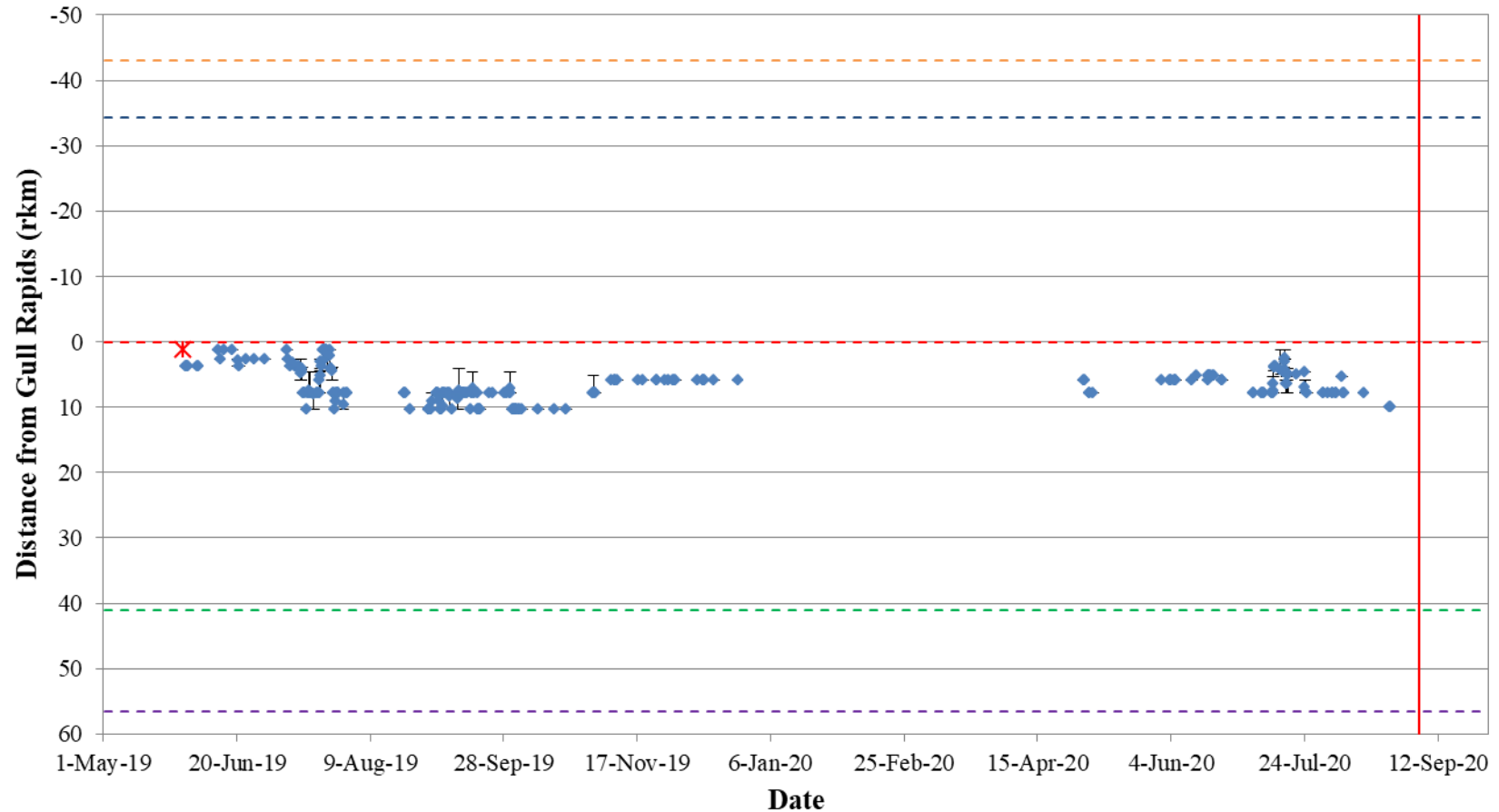


Figure A5-12: Position of a Walleye tagged with an acoustic transmitter (code #20140) in the Nelson River in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

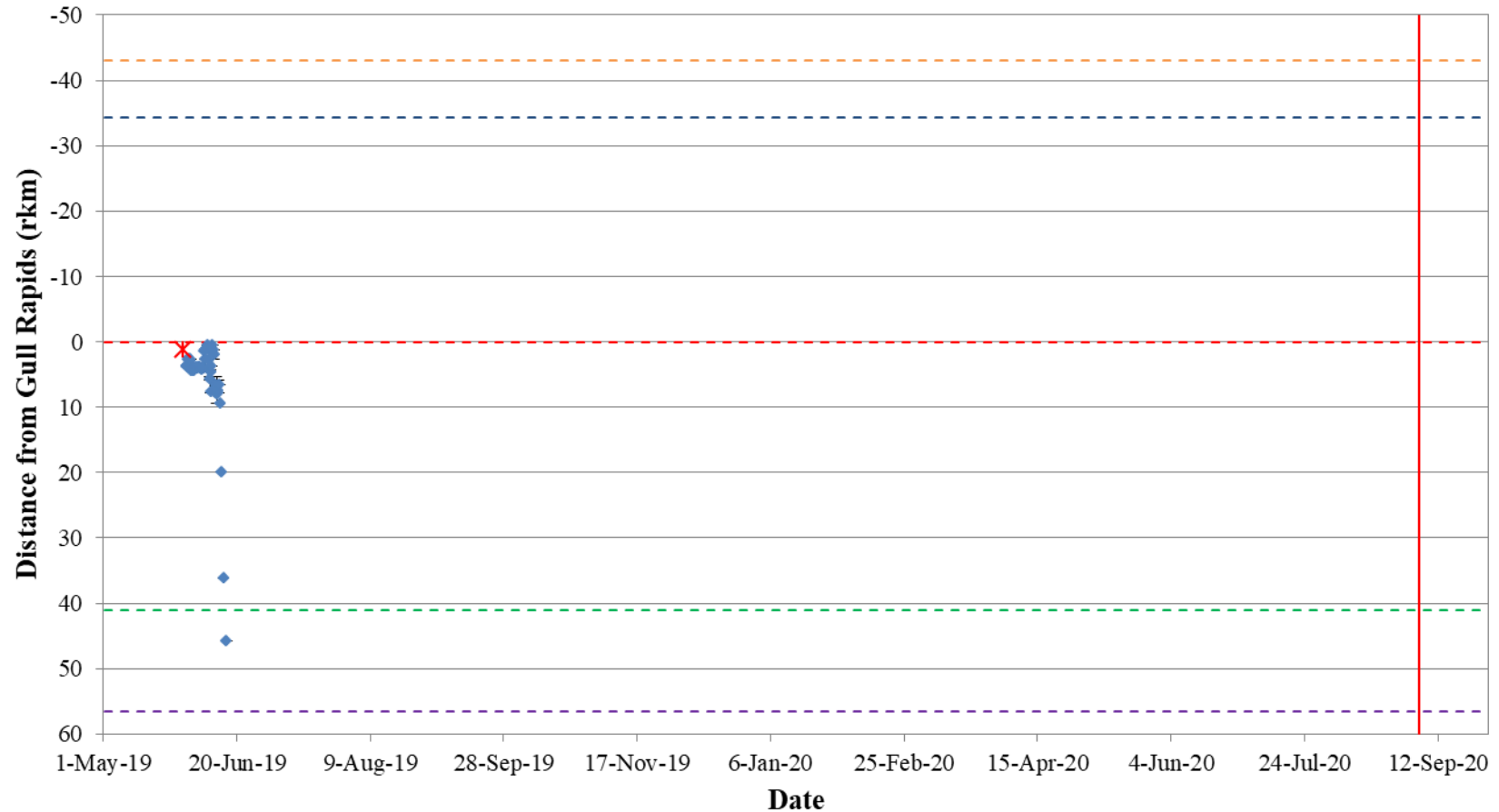


Figure A5-13: Position of a Walleye tagged with an acoustic transmitter (code #20141) in the Nelson River in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

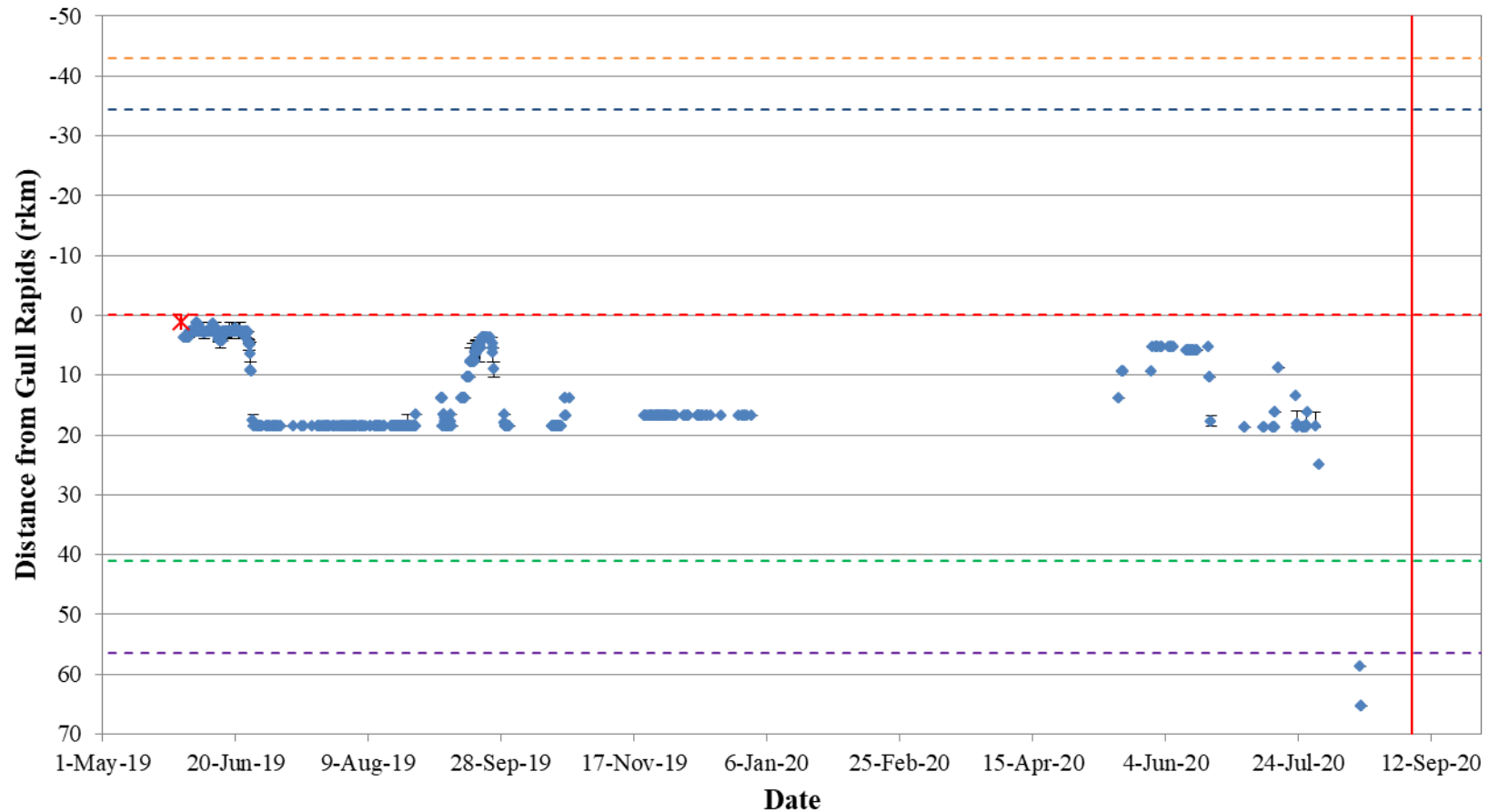


Figure A5-14: Position of a Walleye tagged with an acoustic transmitter (code #20142) in the Nelson River in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

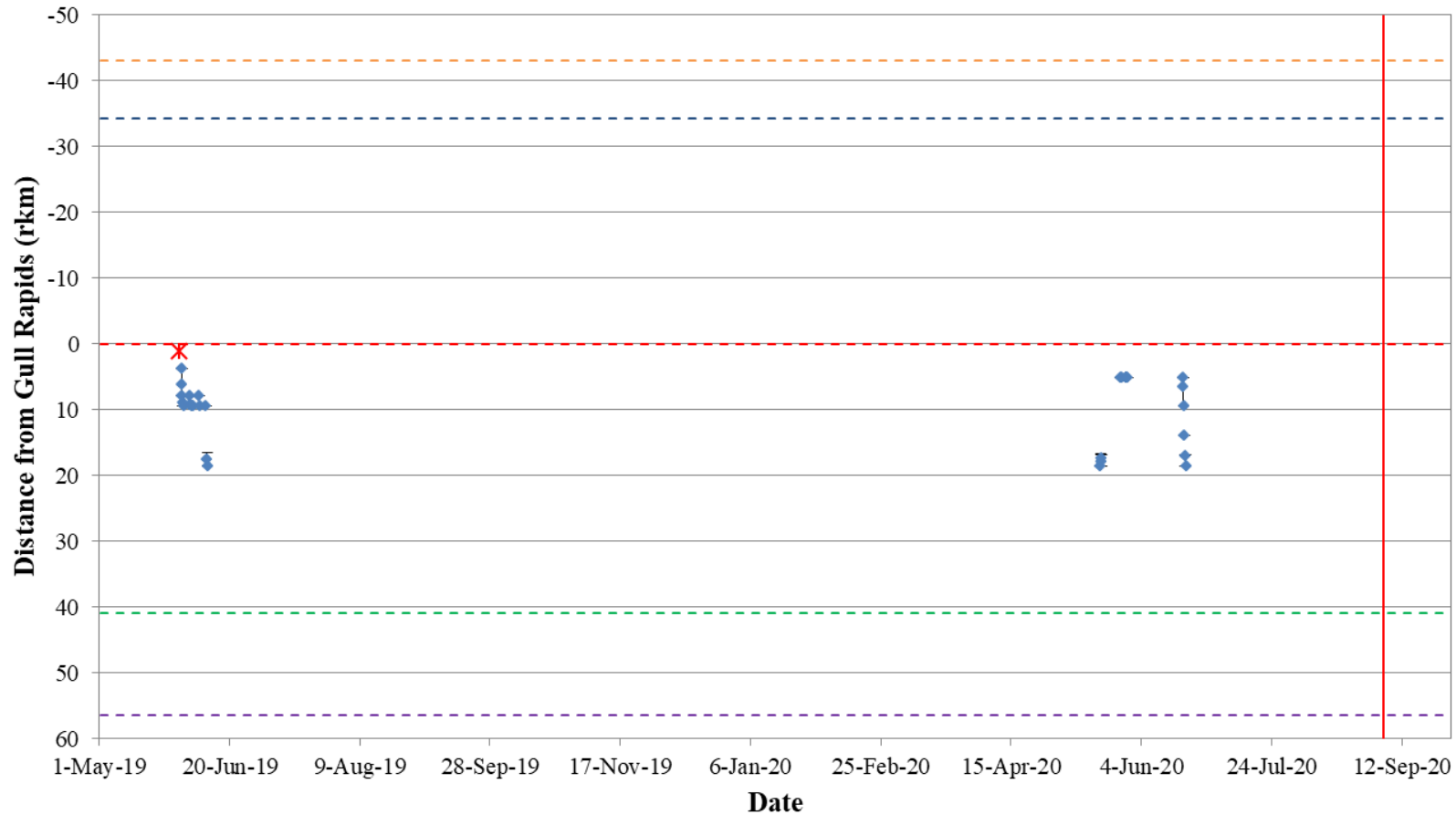


Figure A5-15: Position of a Walleye tagged with an acoustic transmitter (code #20143) in the Nelson River in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

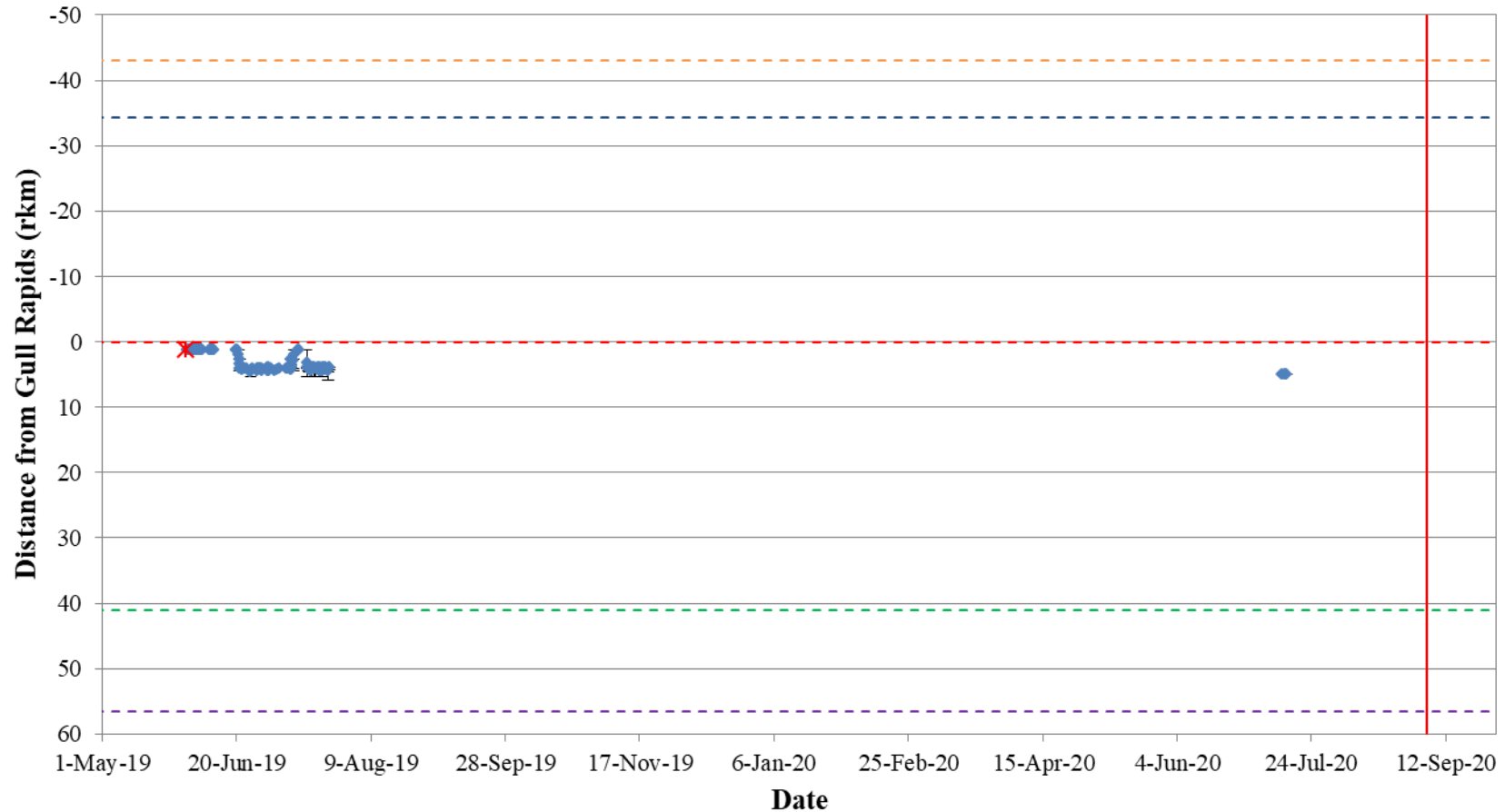


Figure A5-16: Position of a Walleye tagged with an acoustic transmitter (code #20144) in the Nelson River in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

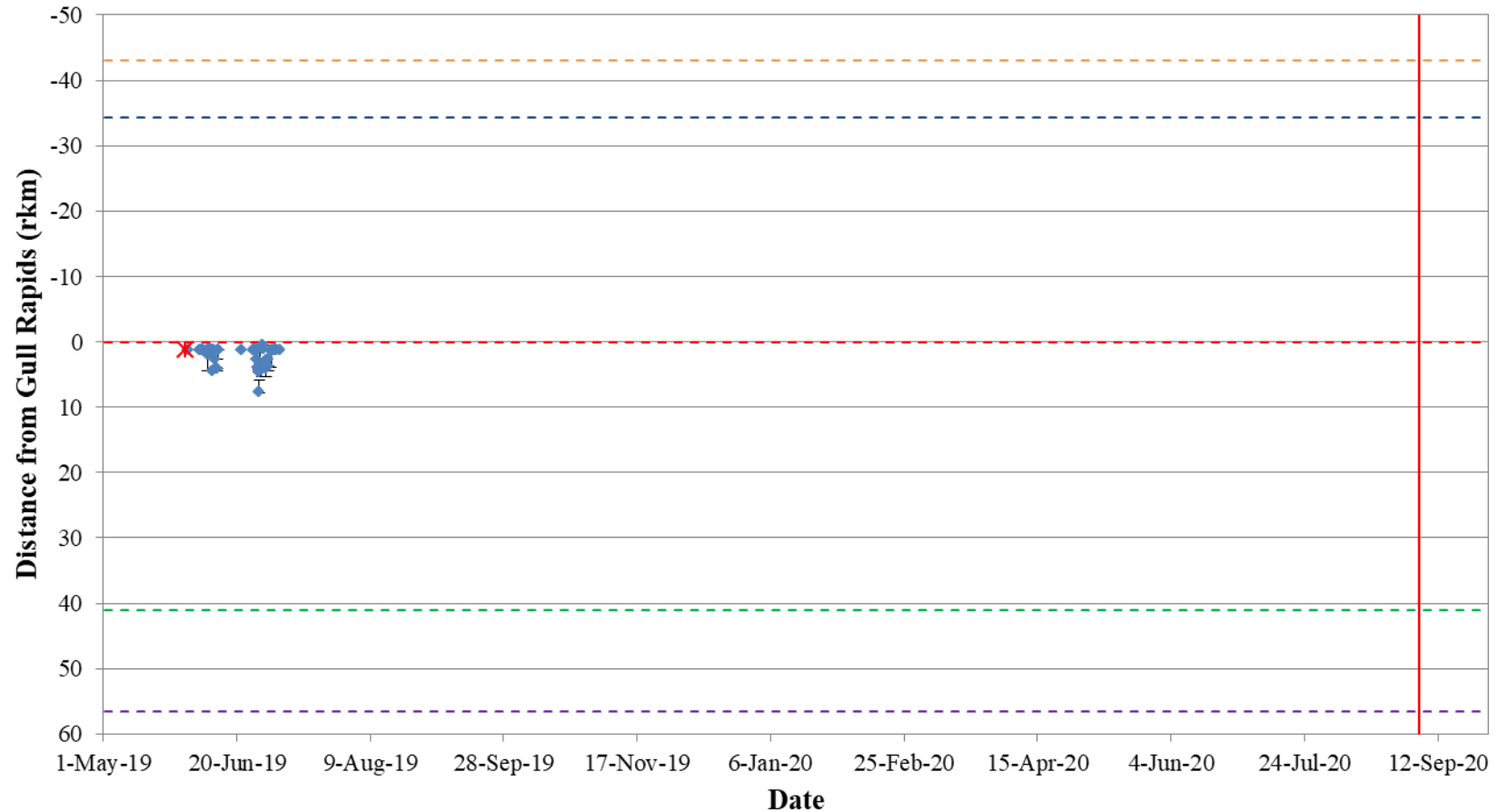


Figure A5-17: Position of a Walleye tagged with an acoustic transmitter (code #20145) in the Nelson River in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

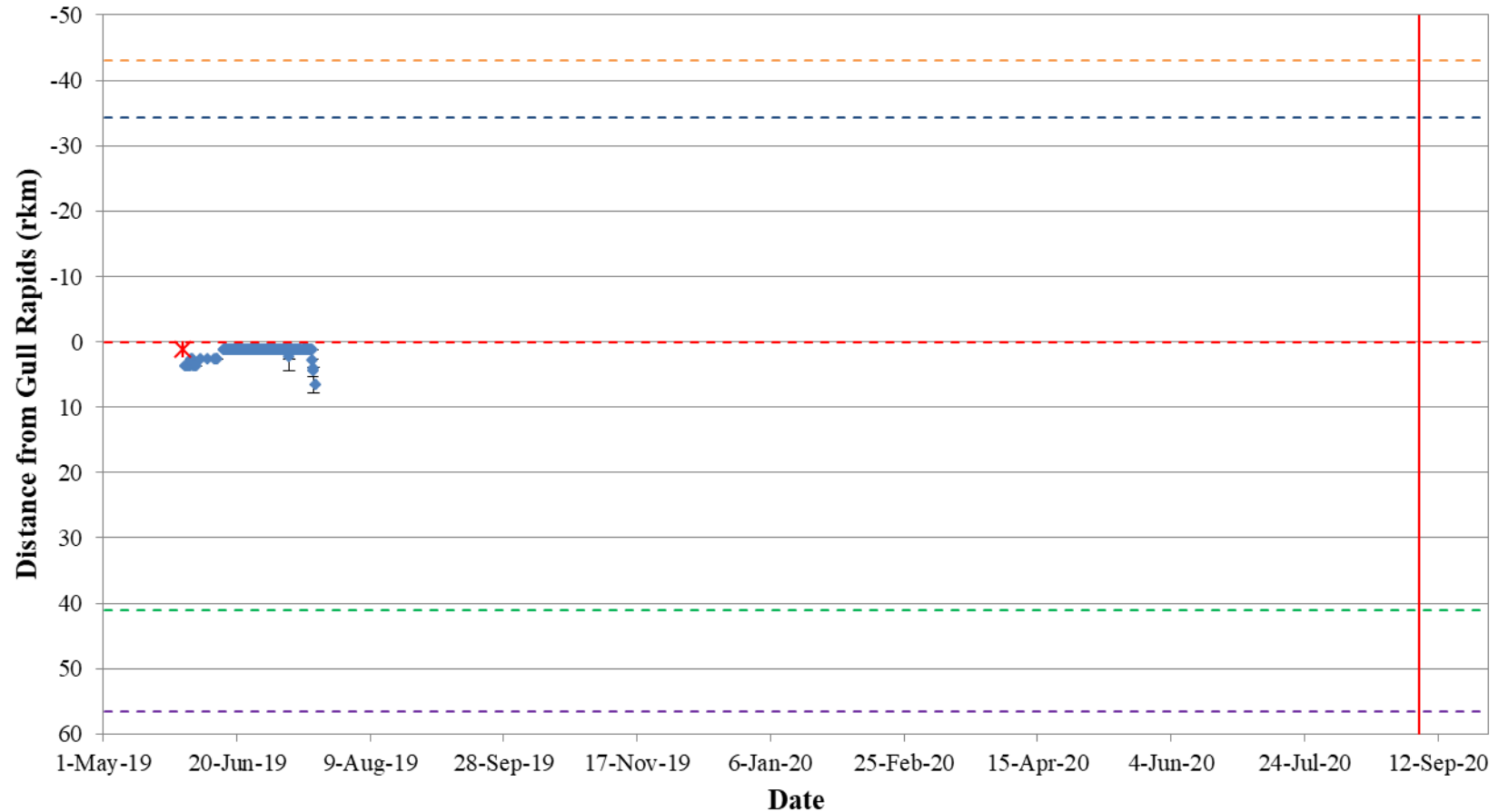


Figure A5-18: Position of a Walleye tagged with an acoustic transmitter (code #20152) in the Nelson River in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

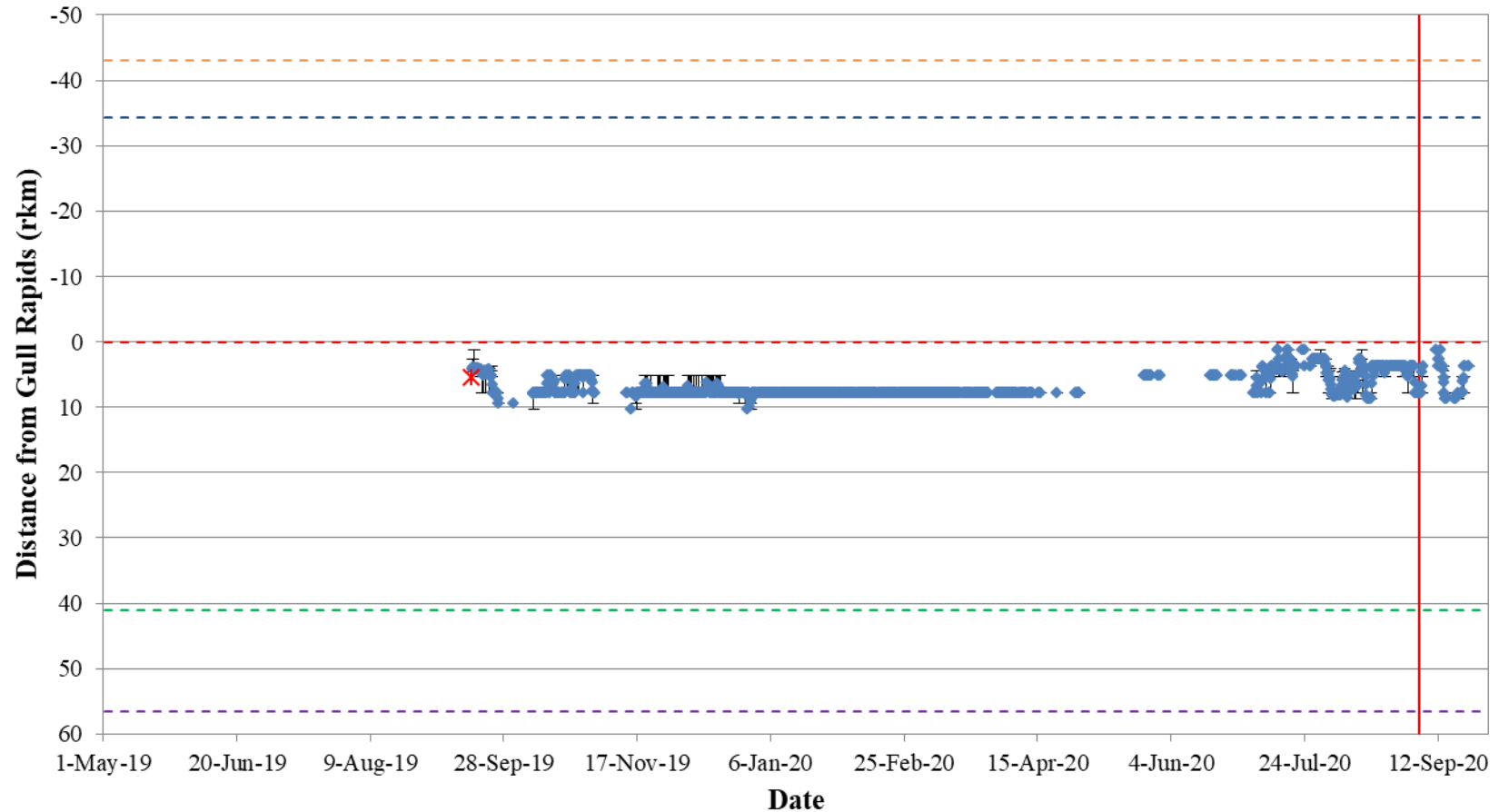


Figure A5-19: Position of a Walleye tagged with an acoustic transmitter (code #20165) in the Nelson River in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

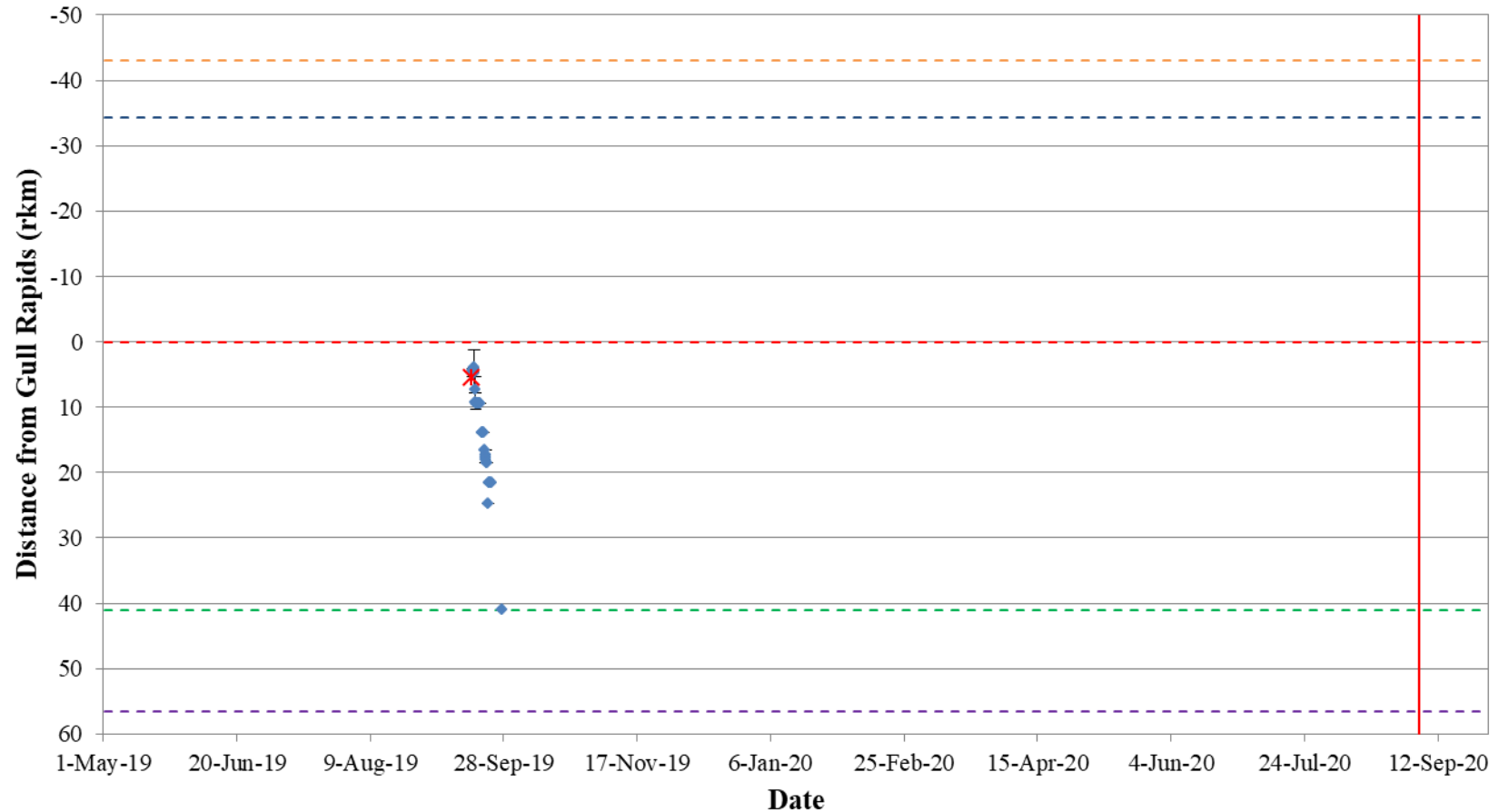


Figure A5-20: Position of a Walleye tagged with an acoustic transmitter (code #20167) in the Nelson River in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

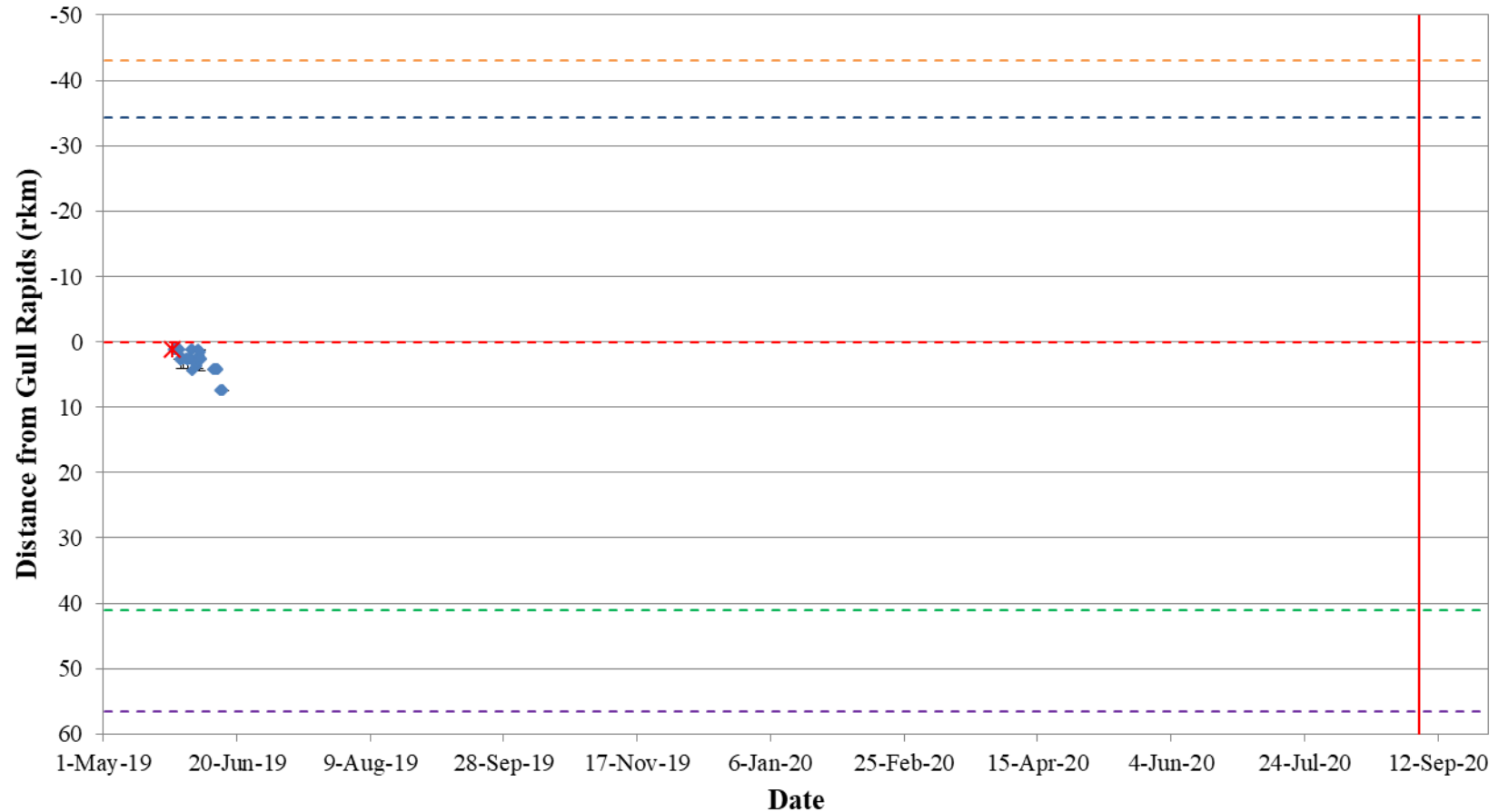


Figure A5-21: Position of a Walleye tagged with an acoustic transmitter (code #20171) in the Nelson River in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

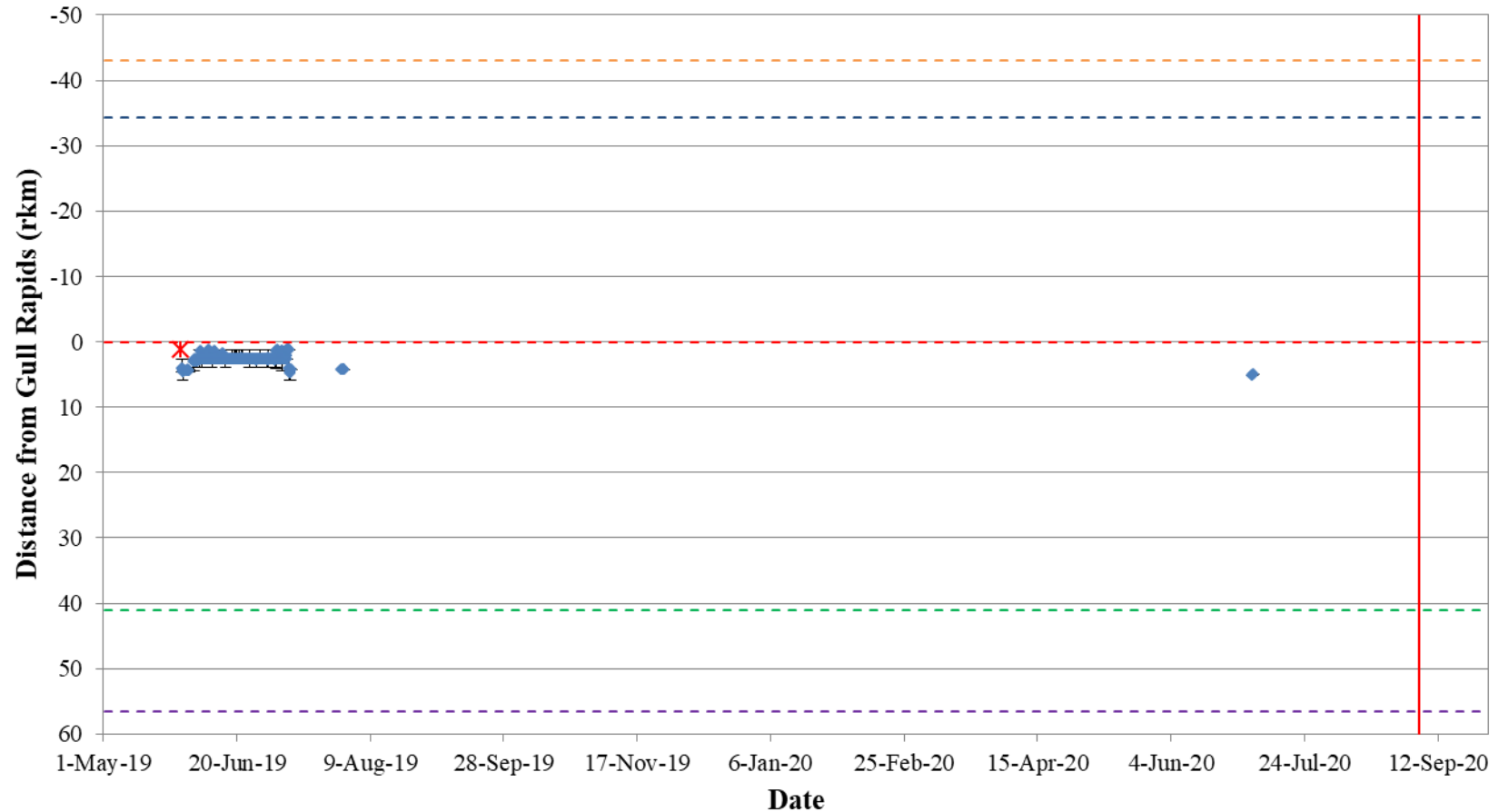


Figure A5-22: Position of a Walleye tagged with an acoustic transmitter (code #20172) in the Nelson River in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

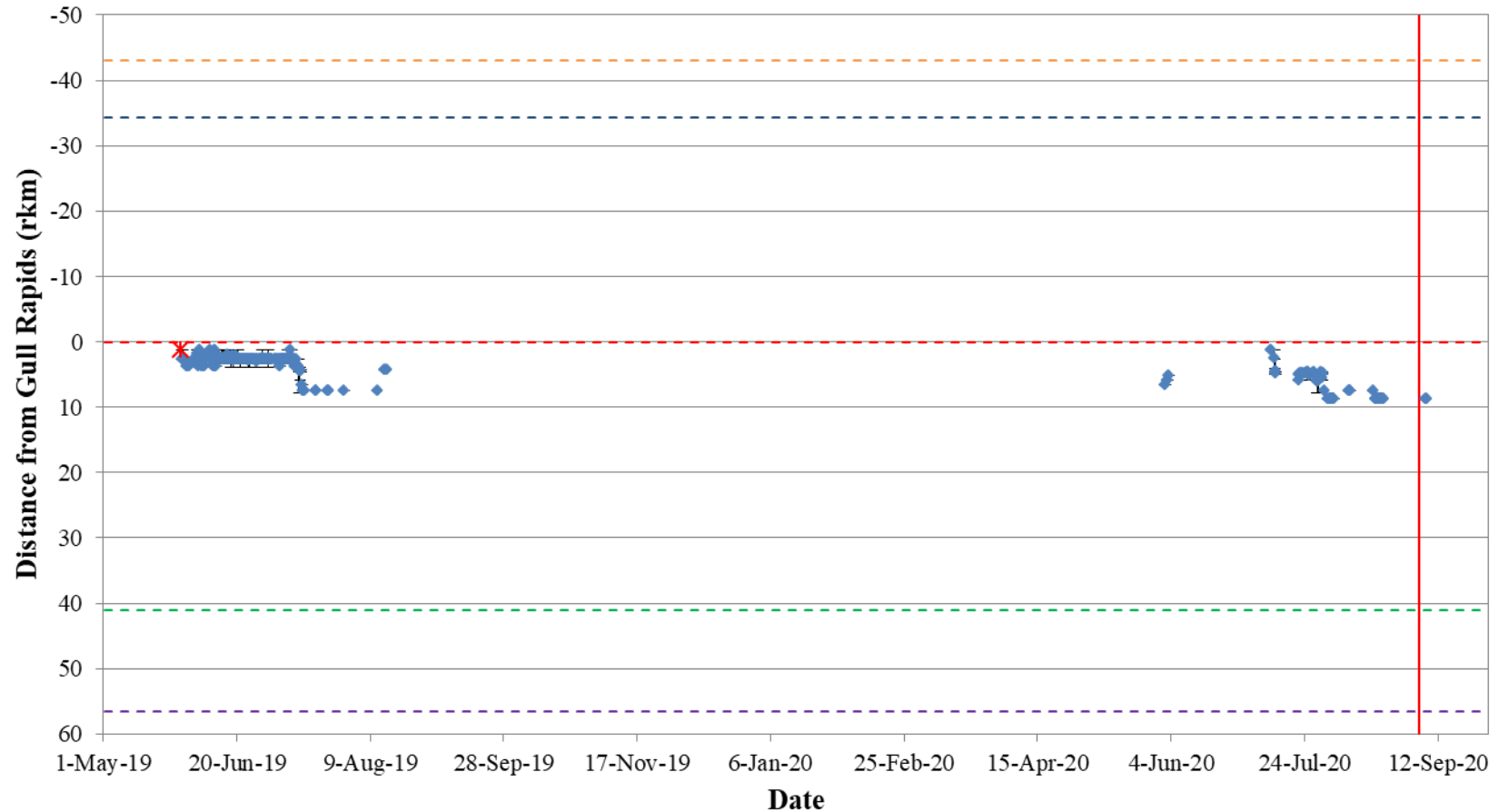


Figure A5-23: Position of a Walleye tagged with an acoustic transmitter (code #20173) in the Nelson River in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

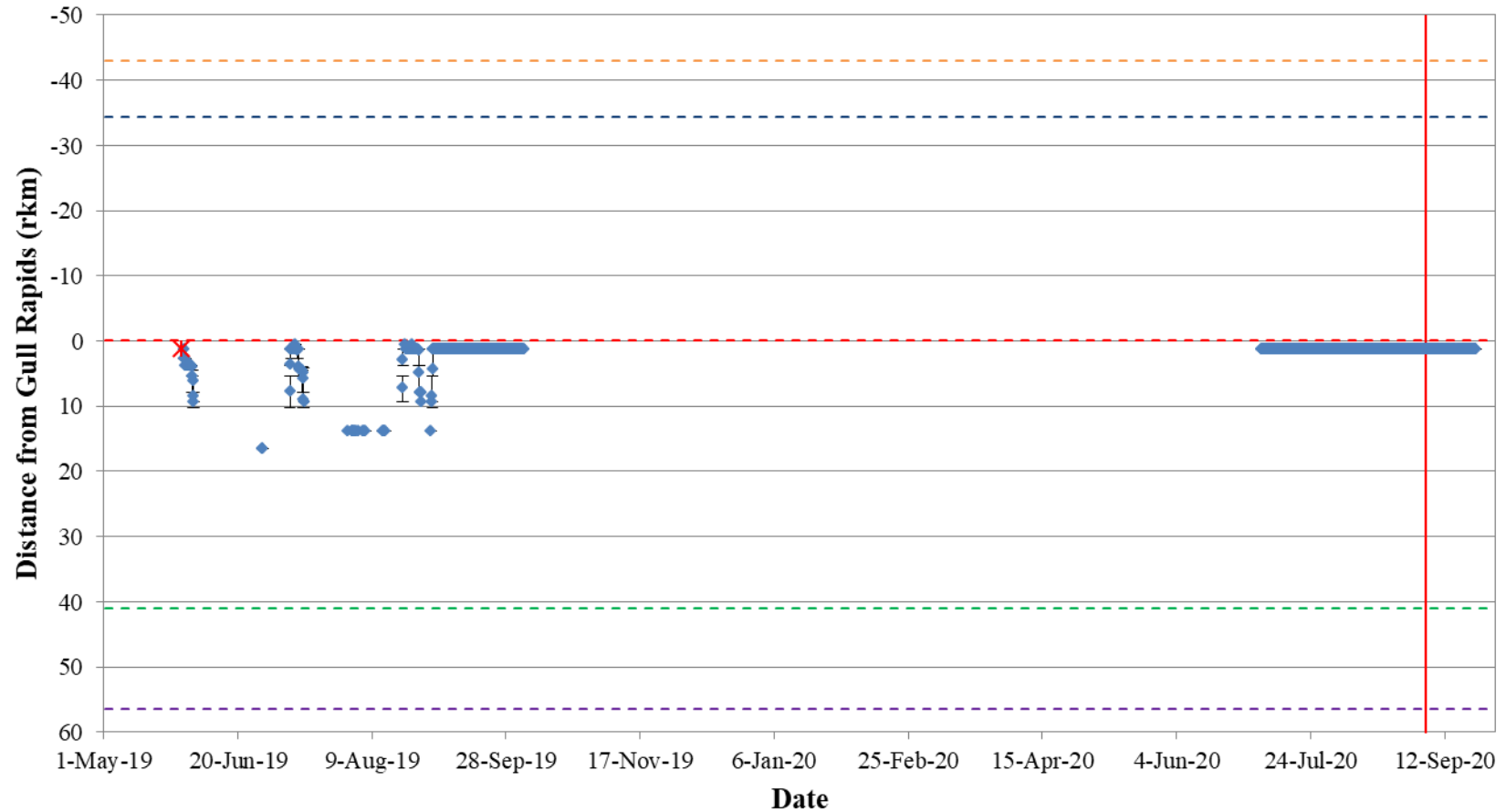
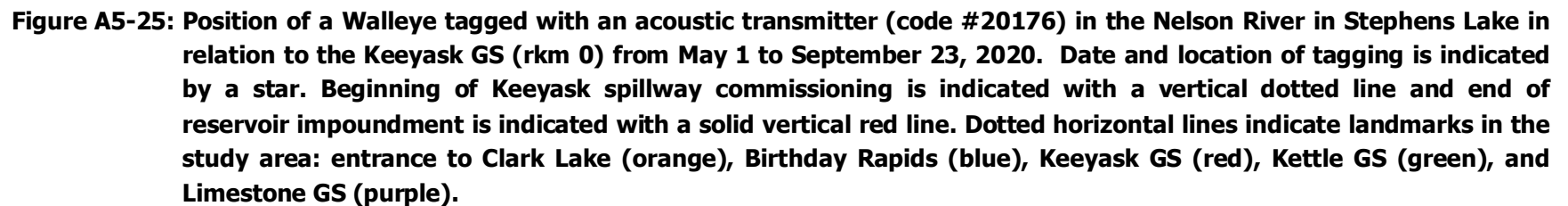


Figure A5-24: Position of a Walleye tagged with an acoustic transmitter (code #20174) in the Nelson River in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).



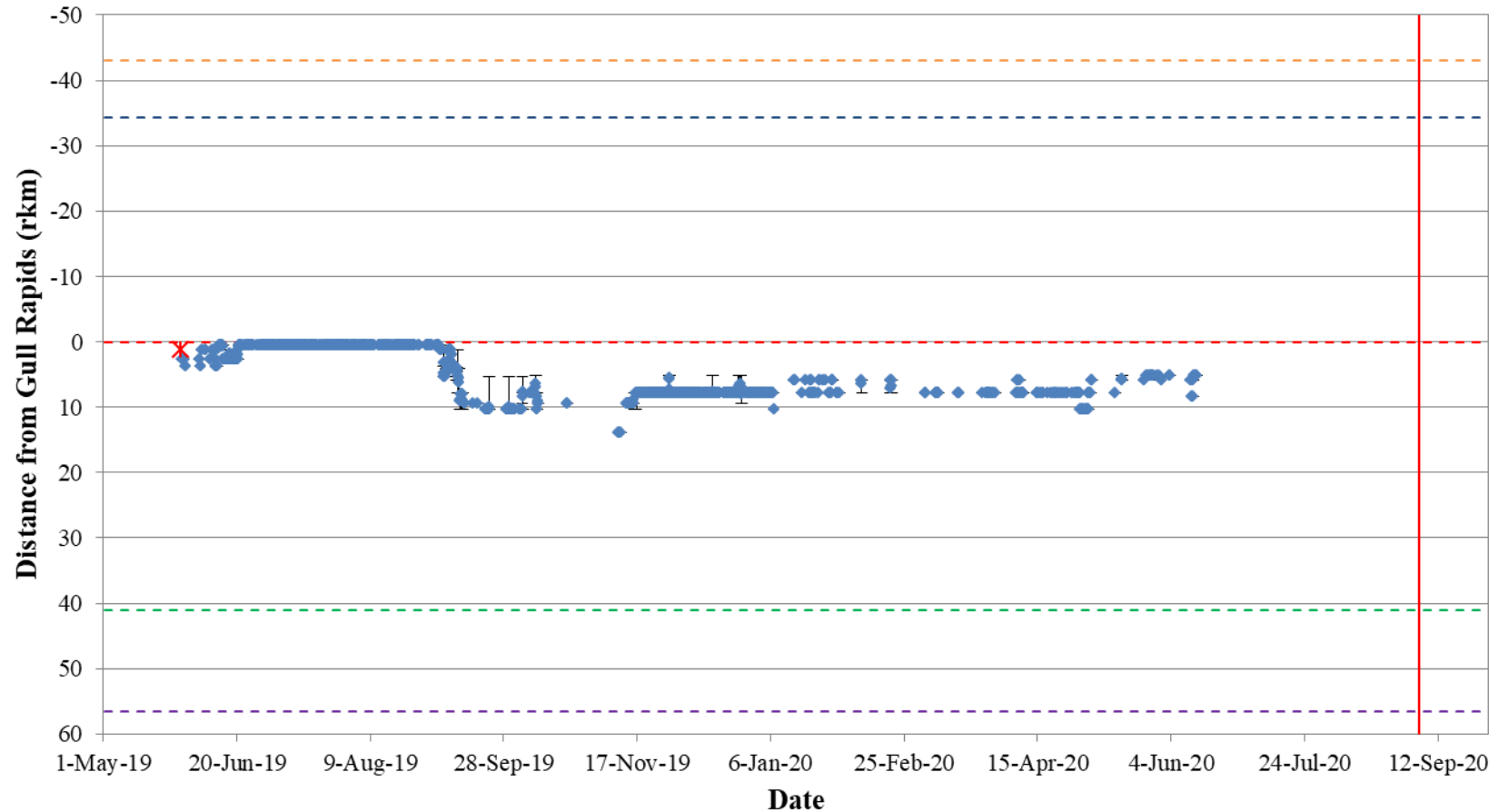


Figure A5-26: Position of a Walleye tagged with an acoustic transmitter (code #20177) in the Nelson River in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

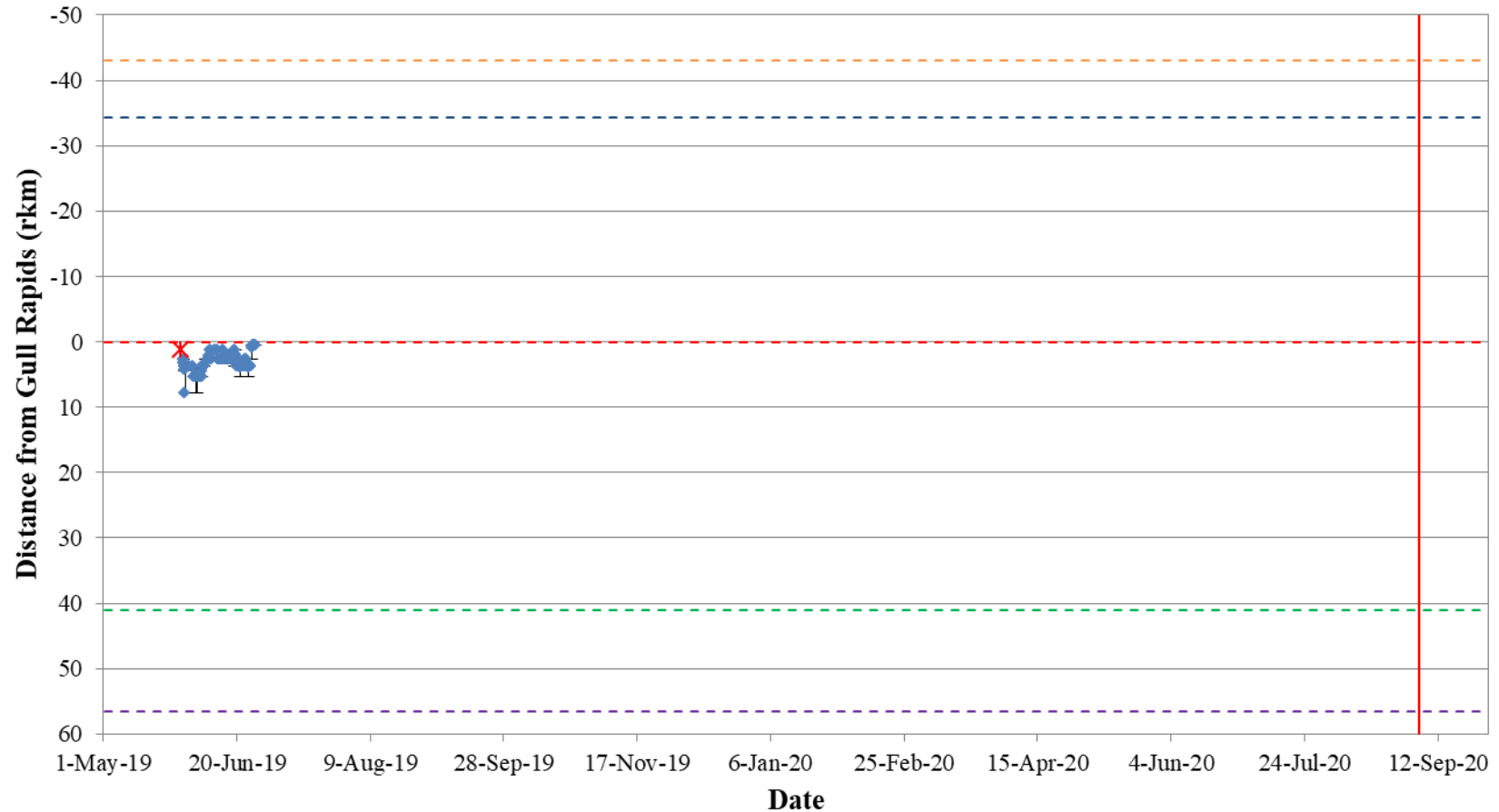


Figure A5-27: Position of a Walleye tagged with an acoustic transmitter (code #20178) in the Nelson River in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

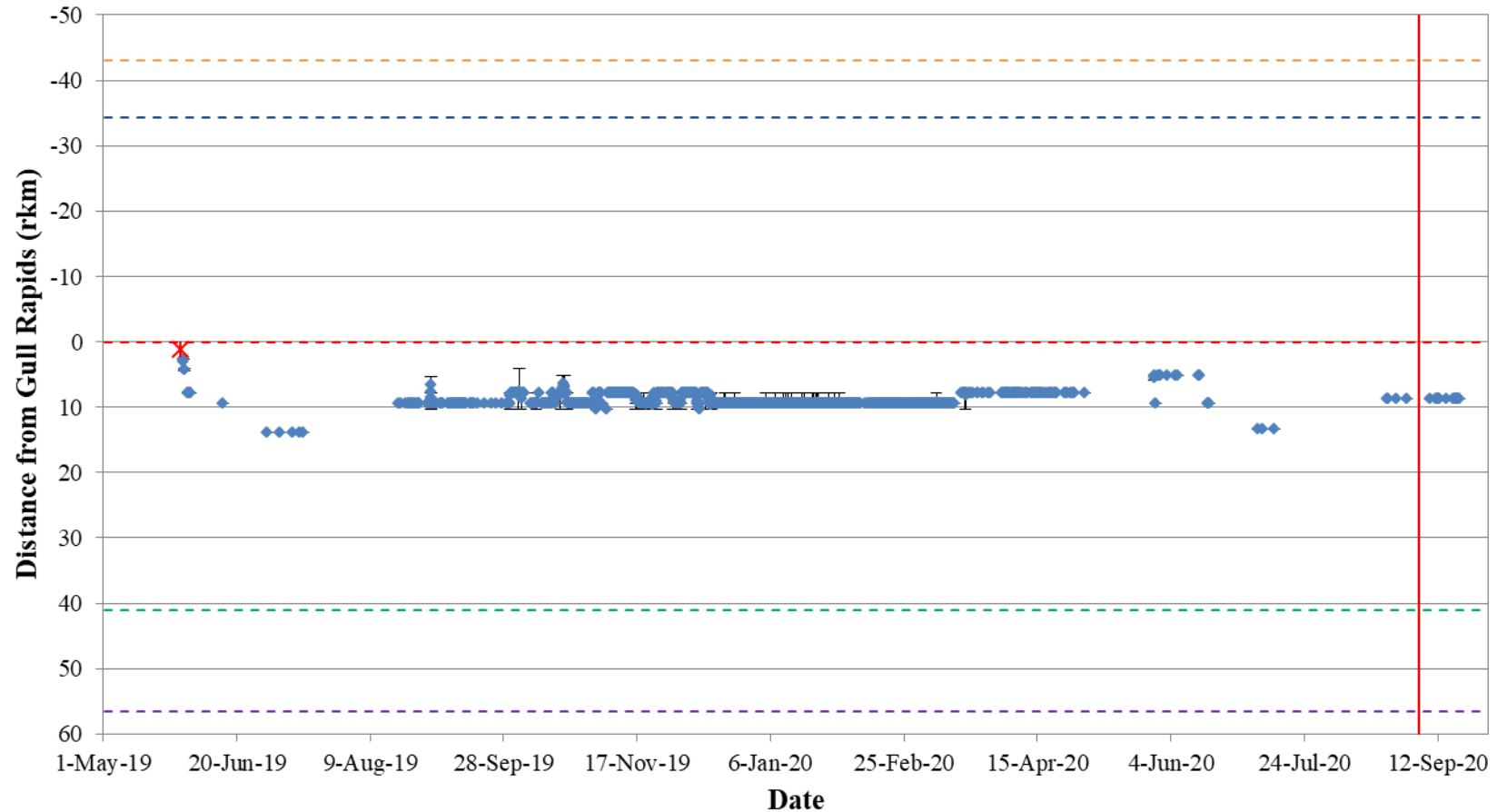


Figure A5-28: Position of a Walleye tagged with an acoustic transmitter (code #20179) in the Nelson River in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

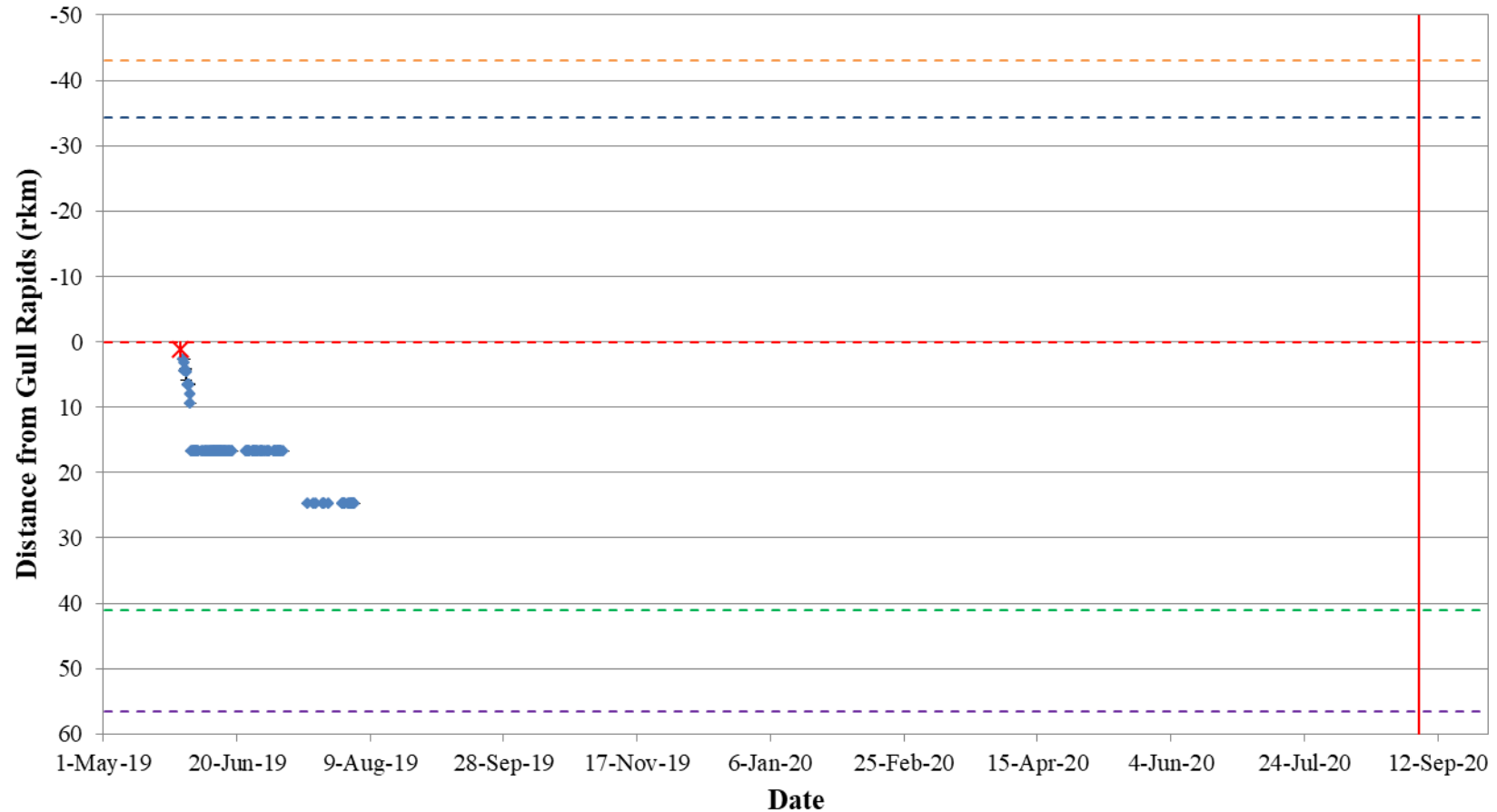


Figure A5-29: Position of a Walleye tagged with an acoustic transmitter (code #20180) in the Nelson River in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

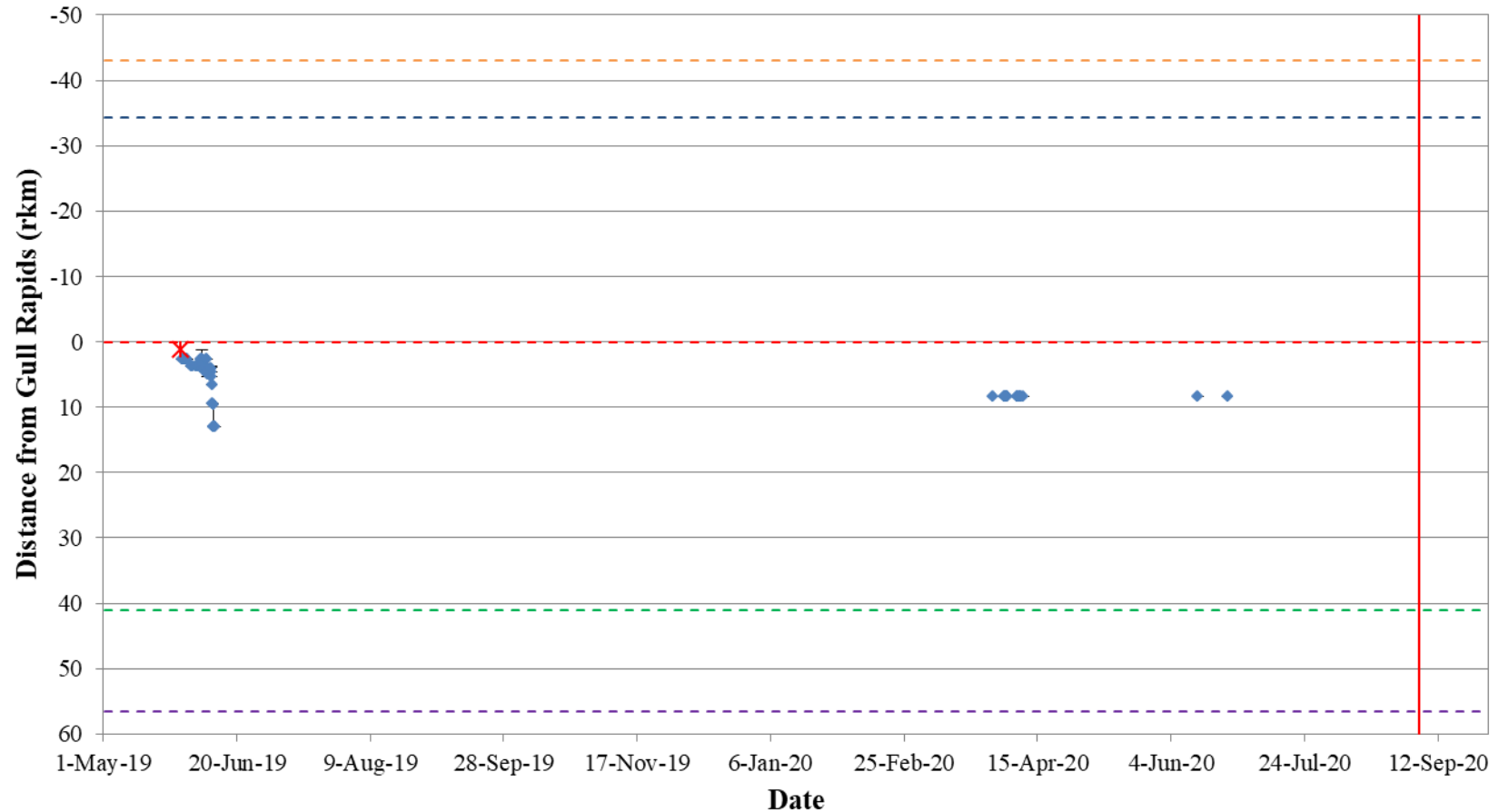


Figure A5-30: Position of a Walleye tagged with an acoustic transmitter (code #20183) in the Nelson River in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

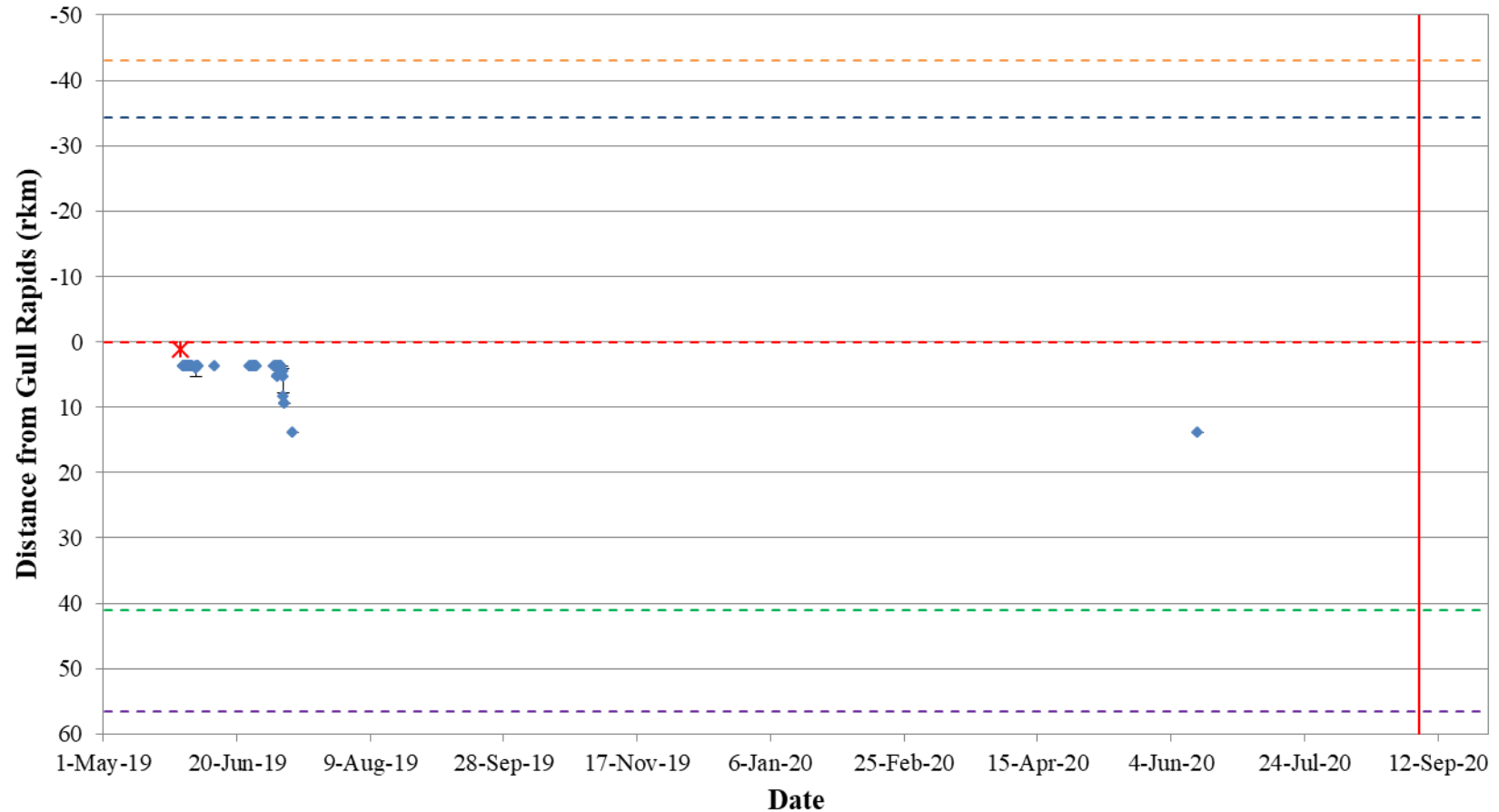


Figure A5-31: Position of a Walleye tagged with an acoustic transmitter (code #20184) in the Nelson River in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

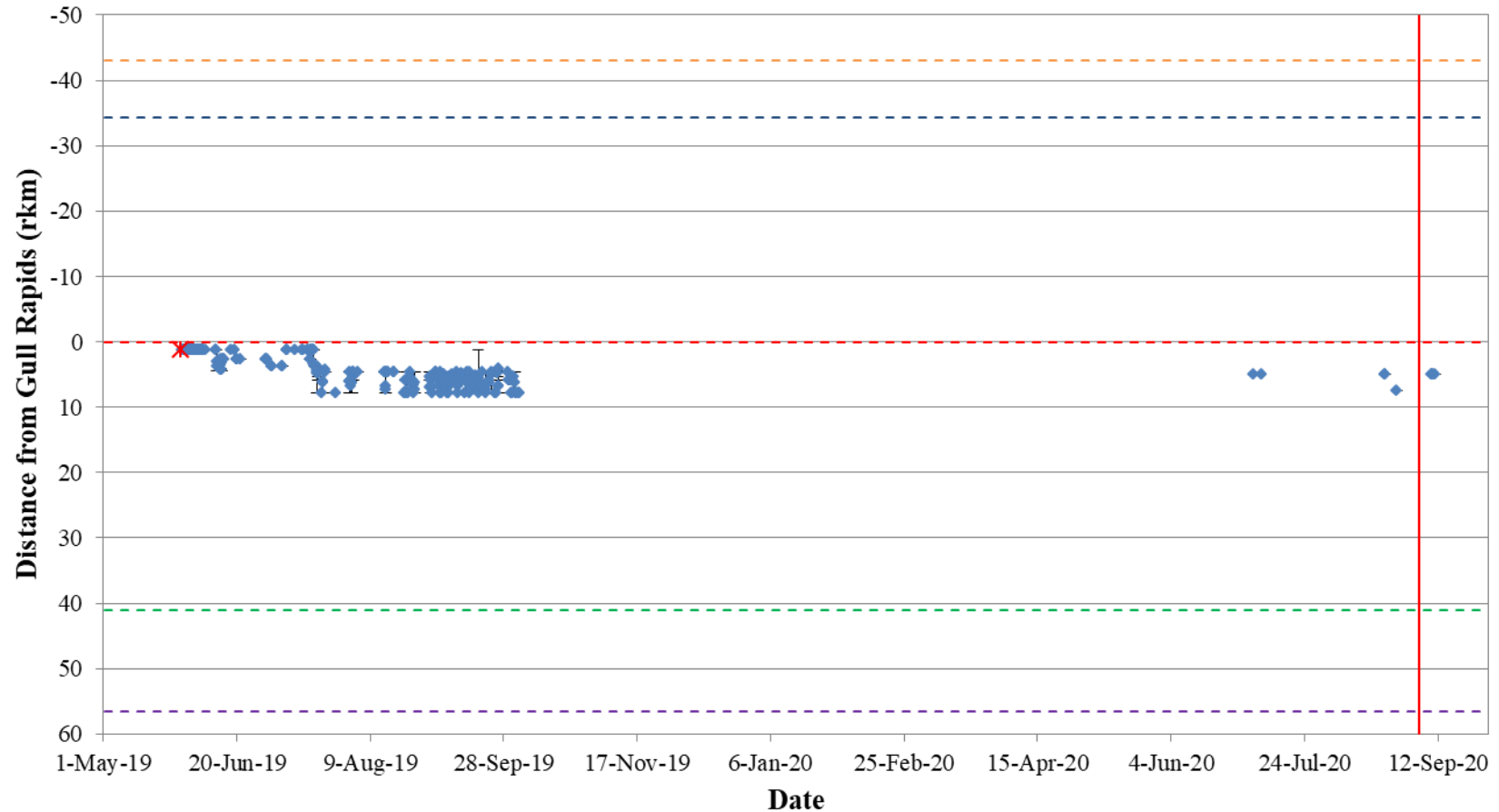


Figure A5-32: Position of a Walleye tagged with an acoustic transmitter (code #20185) in the Nelson River in Stephens Lake in relation to the Keeyask GS (rkm 0) from May 1 to September 23, 2020. Date and location of tagging is indicated by a star. Beginning of Keeyask spillway commissioning is indicated with a vertical dotted line and end of reservoir impoundment is indicated with a solid vertical red line. Dotted horizontal lines indicate landmarks in the study area: entrance to Clark Lake (orange), Birthday Rapids (blue), Keeyask GS (red), Kettle GS (green), and Limestone GS (purple).

APPENDIX 6: BIOLOGICAL AND TAG INFORMATION FOR WALLEYE TAGGED UPSTREAM AND DOWNSTREAM OF THE KEEYASK GS

| | | |
|-------------|--|-----|
| Table A6-1: | Tag and biological information for each Walleye acoustically tagged upstream of the Keeyask GS between 2016 and 2020. | 281 |
| Table A6-2: | Tag and biological information for each Walleye acoustically tagged upstream of the Keeyask GS between 2016 and 2020. | 284 |

Table A6-1: Tag and biological information for each Walleye acoustically tagged upstream of the Keeyask GS between 2016 and 2020.

| Acoustic Tag # | Floy Tag # | Tagging Date | Tag Life (days) | Expiry Date | Fork Length (mm) | Weight (g) |
|----------------|------------|--------------|-----------------|-------------|------------------|------------|
| 53763 | 107147 | 5-Jun-16 | 1735 | 6-Mar-21 | 510 | - |
| 53764 | 107146 | 5-Jun-16 | 1735 | 6-Mar-21 | 560 | - |
| 53768 | 110340 | 5-Jun-16 | 1735 | 6-Mar-21 | 520 | - |
| 53769 | 110341 | 5-Jun-16 | 1735 | 6-Mar-21 | 393 | - |
| 53770 | 107150 | 5-Jun-16 | 1735 | 6-Mar-21 | 350 | - |
| 53771 | 107149 | 5-Jun-16 | 1735 | 6-Mar-21 | 353 | - |
| 53772 | 107145 | 5-Jun-16 | 1735 | 6-Mar-21 | 400 | - |
| 53773 | 110339 | 5-Jun-16 | 1735 | 6-Mar-21 | 405 | - |
| 53774 | 110338 | 5-Jun-16 | 1735 | 6-Mar-21 | 522 | - |
| 53775 | 110337 | 5-Jun-16 | 1735 | 6-Mar-21 | 514 | - |
| 53776 | 107205 | 30-May-16 | 1735 | 28-Feb-21 | 535 | - |
| 53777 | 107241 | 29-May-16 | 1735 | 27-Feb-21 | 404 | 1050 |
| 53778 | 100336 | 3-Jun-16 | 1735 | 4-Mar-21 | 523 | - |
| 53779 | 110335 | 3-Jun-16 | 1735 | 4-Mar-21 | 400 | - |
| 53780 | 110334 | 3-Jun-16 | 1735 | 4-Mar-21 | 660 | - |
| 53781 | 110333 | 2-Jun-16 | 1735 | 3-Mar-21 | 525 | - |
| 53782 | 110332 | 31-May-16 | 1735 | 1-Mar-21 | 509 | 1550 |
| 53783 | 110331 | 31-May-16 | 1735 | 1-Mar-21 | 388 | 850 |
| 53784 | 107208 | 30-May-16 | 1735 | 28-Feb-21 | 510 | - |
| 53785 | 107207 | 30-May-16 | 1735 | 28-Feb-21 | 526 | - |
| 53786 | 107203 | 30-May-16 | 1735 | 28-Feb-21 | 400 | - |
| 53787 | 107202 | 30-May-16 | 1735 | 28-Feb-21 | 360 | - |
| 53788 | 107201 | 30-May-16 | 1735 | 28-Feb-21 | 603 | - |
| 53789 | 107235 | 30-May-16 | 1735 | 28-Feb-21 | 577 | - |
| 53790 | 107240 | 29-May-16 | 1735 | 27-Feb-21 | 533 | 2000 |
| 53791 | 107242 | 29-May-16 | 1735 | 27-Feb-21 | 400 | 725 |
| 53792 | - | 28-May-16 | 1735 | 26-Feb-21 | 559 | - |
| 53793 | 110520 | 7-Jun-16 | 1735 | 8-Mar-21 | 560 | 2125 |
| 53794 | 110519 | 7-Jun-16 | 1735 | 8-Mar-21 | 440 | 1200 |
| 53795 | 110518 | 7-Jun-16 | 1735 | 8-Mar-21 | 410 | 900 |
| 53796 | 110517 | 7-Jun-16 | 1735 | 8-Mar-21 | 441 | 1150 |
| 53797 | 110516 | 7-Jun-16 | 1735 | 8-Mar-21 | 520 | 1700 |
| 53798 | 110525 | 7-Jun-16 | 1735 | 8-Mar-21 | 495 | 1500 |
| 53799 | 110524 | 7-Jun-16 | 1735 | 8-Mar-21 | 511 | 1650 |
| 53800 | 110523 | 7-Jun-16 | 1735 | 8-Mar-21 | 530 | 1750 |
| 53801 | 110522 | 7-Jun-16 | 1735 | 8-Mar-21 | 360 | 600 |
| 53802 | 110521 | 7-Jun-16 | 1735 | 8-Mar-21 | 468 | 1300 |

Table A6-1: Tag and biological information for each Walleye acoustically tagged upstream of the Keeyask GS between 2016 and 2020 (continued).

| Acoustic Tag # | Floy Tag # | Tagging Date | Tag Life (days) | Expiry Date | Fork Length (mm) | Weight (g) |
|----------------|------------|--------------|-----------------|-------------|------------------|------------|
| 53805 | 107225 | 6-Jun-16 | 1735 | 7-Mar-21 | 532 | - |
| 53806 | 107142 | 6-Jun-16 | 1735 | 7-Mar-21 | 405 | - |
| 53807 | 107126 | 6-Jun-16 | 1735 | 7-Mar-21 | 451 | - |
| 53767 | 111527 | 24-Sep-16 | 1735 | 25-Jun-21 | 508 | 1450 |
| 53766 | 111528 | 24-Sep-16 | 1735 | 25-Jun-21 | 484 | 1250 |
| 53765 | 111530 | 24-Sep-16 | 1735 | 25-Jun-21 | 491 | 1300 |
| 53804 | 111531 | 24-Sep-16 | 1735 | 25-Jun-21 | 410 | 700 |
| 53803 | 111532 | 24-Sep-16 | 1735 | 25-Jun-21 | 484 | 1550 |
| 53758 | 111533 | 24-Sep-16 | 1735 | 25-Jun-21 | 423 | 750 |
| 53759 | 111535 | 24-Sep-16 | 1735 | 25-Jun-21 | 362 | 500 |
| 53760 | 111536 | 24-Sep-16 | 1735 | 25-Jun-21 | 412 | 1825 |
| 25739 | 109719 | 5-Jun-18 | 1735 | 6-Mar-23 | 410 | 800 |
| 25740 | 109718 | 5-Jun-18 | 1735 | 6-Mar-23 | 388 | 550 |
| 25742 | 109712 | 5-Jun-18 | 1735 | 6-Mar-23 | 320 | 400 |
| 25743 | 109713 | 5-Jun-18 | 1735 | 6-Mar-23 | 442 | 925 |
| 25744 | 109715 | 5-Jun-18 | 1735 | 6-Mar-23 | 525 | 1575 |
| 25745 | 109716 | 5-Jun-18 | 1735 | 6-Mar-23 | 438 | 850 |
| 25746 | 109717 | 5-Jun-18 | 1735 | 6-Mar-23 | 504 | 1750 |
| 25747 | 109704 | 28-May-18 | 1735 | 26-Feb-23 | 374 | 575 |
| 25748 | 109706 | 28-May-18 | 1735 | 26-Feb-23 | 398 | 525 |
| 25749 | 109705 | 28-May-18 | 1735 | 26-Feb-23 | 393 | 550 |
| 25750 | 109710 | 1-Jun-18 | 1735 | 2-Mar-23 | 403 | 725 |
| 25751 | 109711 | 5-Jun-18 | 1735 | 6-Mar-23 | 343 | 450 |
| 25752 | 109701 | 27-May-18 | 1735 | 25-Feb-23 | 404 | 700 |
| 25753 | 109702 | 27-May-18 | 1735 | 25-Feb-23 | 356 | 425 |
| 25754 | 109703 | 27-May-18 | 1735 | 25-Feb-23 | 367 | 550 |
| 25755 | 109708 | 1-Jun-18 | 1735 | 2-Mar-23 | 396 | 775 |
| 25756 | 109709 | 1-Jun-18 | 1735 | 2-Mar-23 | 452 | 1050 |
| 20147 | 114247 | 5-Jun-19 | 1492 | 6-Jul-23 | 523 | 1769 |
| 20148 | 114246 | 5-Jun-19 | 1492 | 6-Jul-23 | 383 | 590 |
| 20149 | 114245 | 6-Jun-19 | 1492 | 7-Jul-23 | 335 | 450 |
| 20150 | 114249 | 5-Jun-19 | 1492 | 6-Jul-23 | 500 | 1300 |
| 20151 | 114250 | 5-Jun-19 | 1492 | 6-Jul-23 | 485 | 1400 |
| 20153 | 114239 | 6-Jun-19 | 1492 | 7-Jul-23 | 498 | 1450 |
| 20154 | 114240 | 6-Jun-19 | 1492 | 7-Jul-23 | 415 | 800 |
| 20155 | 114241 | 6-Jun-19 | 1492 | 7-Jul-23 | 417 | 800 |
| 20156 | 114242 | 6-Jun-19 | 1492 | 7-Jul-23 | 299 | 300 |

Table A6-1: Tag and biological information for each Walleye acoustically tagged upstream of the Keeyask GS between 2016 and 2020 (continued).

| Acoustic Tag # | Floy Tag # | Tagging Date | Tag Life (days) | Expiry Date | Fork Length (mm) | Weight (g) |
|-----------------------|-------------------|---------------------|------------------------|--------------------|-------------------------|-------------------|
| 20157 | 114243 | 6-Jun-19 | 1492 | 7-Jul-23 | 447 | 1000 |
| 20158 | 114244 | 6-Jun-19 | 1492 | 7-Jul-23 | 288 | 300 |
| 20159 | 114231 | 7-Jun-19 | 1492 | 8-Jul-23 | 500 | 1500 |
| 20160 | 114232 | 7-Jun-19 | 1492 | 8-Jul-23 | 415 | 800 |
| 20161 | 114226 | 7-Jun-19 | 1492 | 8-Jul-23 | 446 | 950 |
| 20162 | 114236 | 6-Jun-19 | 1492 | 7-Jul-23 | 300 | 300 |
| 20163 | 114237 | 6-Jun-19 | 1492 | 7-Jul-23 | 363 | 600 |
| 20164 | 114238 | 6-Jun-19 | 1492 | 7-Jul-23 | 343 | 500 |
| 20168 | 114775 | 7-Jun-19 | 1492 | 8-Jul-23 | 429 | 850 |
| 20169 | 114233 | 7-Jun-19 | 1492 | 8-Jul-23 | 391 | 550 |
| 20170 | 114235 | 6-Jun-19 | 1492 | 7-Jul-23 | 365 | 400 |
| 20175 | 114642 | 29-May-19 | 1492 | 29-Jun-23 | 374 | 580 |
| 20176 | 114645 | 29-May-19 | 1492 | 29-Jun-23 | 419 | 900 |
| 20181 | 114644 | 29-May-19 | 1492 | 29-Jun-23 | 345 | 500 |
| 20182 | - | 25-May-19 | 1492 | 25-Jun-23 | 311 | 350 |
| 20186 | 114641 | 29-May-19 | 1492 | 29-Jun-23 | 350 | 450 |
| 20187 | 114649 | 23-May-19 | 1492 | 23-Jun-23 | 320 | - |
| 20188 | 114650 | 23-May-19 | 1492 | 23-Jun-23 | 380 | - |

Table A6-2: Tag and biological information for each Walleye acoustically tagged upstream of the Keeyask GS between 2016 and 2020.

| Acoustic Tag # | Floy Tag # | Tagging Date | Tag Life (days) | Expiry Date | Fork Length (mm) | Weight (g) |
|-----------------------|-------------------|---------------------|------------------------|--------------------|-------------------------|-------------------|
| 53723 | 110348 | 28-May-16 | 1735 | 26-Feb-21 | 510 | 1500 |
| 53724 | 110538 | 28-May-16 | 1735 | 26-Feb-21 | 433 | 1050 |
| 53725 | 110532 | 27-May-16 | 1735 | 25-Feb-21 | 480 | 1200 |
| 53726 | 110544 | 27-May-16 | 1735 | 25-Feb-21 | 412 | 800 |
| 53727 | 110537 | 28-May-16 | 1735 | 26-Feb-21 | 486 | - |
| 53728 | 110347 | 28-May-16 | 1735 | 26-Feb-21 | 507 | 1650 |
| 53729 | 110350 | 28-May-16 | 1735 | 26-Feb-21 | 375 | 560 |
| 53730 | 110349 | 28-May-16 | 1735 | 26-Feb-21 | 491 | 1700 |
| 53731 | 110534 | 28-May-16 | 1735 | 26-Feb-21 | 442 | 950 |
| 53732 | 110536 | 28-May-16 | 1735 | 26-Feb-21 | 530 | 1825 |
| 53733 | 110326 | 30-May-16 | 1735 | 28-Feb-21 | 322 | 500 |
| 53734 | 110343 | 30-May-16 | 1735 | 28-Feb-21 | 460 | 1325 |
| 53735 | 110344 | 30-May-16 | 1735 | 28-Feb-21 | 374 | 600 |
| 53736 | 110345 | 30-May-16 | 1735 | 28-Feb-21 | 398 | 900 |
| 53737 | 110346 | 29-May-16 | 1735 | 27-Feb-21 | 508 | 1625 |
| 53738 | 110542 | 31-May-16 | 1735 | 1-Mar-21 | 522 | 1875 |
| 53739 | 110540 | 31-May-16 | 1735 | 1-Mar-21 | 480 | 1300 |
| 53740 | 110543 | 31-May-16 | 1735 | 1-Mar-21 | 482 | 1400 |
| 53741 | 110330 | 30-May-16 | 1735 | 28-Feb-21 | 404 | 975 |
| 53742 | 110327 | 30-May-16 | 1735 | 28-Feb-21 | 452 | 1250 |
| 53743 | 110422 | 31-May-16 | 1735 | 1-Mar-21 | 469 | 1450 |
| 53744 | 110421 | 31-May-16 | 1735 | 1-Mar-21 | 405 | 750 |
| 53745 | 110417 | 31-May-16 | 1735 | 1-Mar-21 | 453 | 1200 |
| 53746 | 110541 | 31-May-16 | 1735 | 1-Mar-21 | 467 | 1380 |
| 53747 | 110418 | 31-May-16 | 1735 | 1-Mar-21 | 520 | 1600 |
| 53748 | 110951 | 31-May-16 | 1735 | 1-Mar-21 | 442 | 975 |
| 53749 | 110425 | 31-May-16 | 1735 | 1-Mar-21 | 411 | 750 |
| 53750 | 110424 | 31-May-16 | 1735 | 1-Mar-21 | 531 | 1800 |
| 53751 | 110423 | 31-May-16 | 1735 | 1-Mar-21 | 422 | 825 |
| 53752 | 110419 | 31-May-16 | 1735 | 1-Mar-21 | 468 | 1400 |
| 53753 | 110952 | 31-May-16 | 1735 | 1-Mar-21 | 488 | 1325 |
| 53754 | 110953 | 31-May-16 | 1735 | 1-Mar-21 | 475 | 1375 |
| 53755 | 110954 | 31-May-16 | 1735 | 1-Mar-21 | 506 | 1475 |
| 53756 | 110957 | 1-Jun-16 | 1735 | 2-Mar-21 | 495 | 1800 |
| 53757 | 110958 | 1-Jun-16 | 1735 | 2-Mar-21 | 534 | 2200 |
| 53808 | 110963 | 1-Jun-16 | 1735 | 2-Mar-21 | 503 | 1725 |

Table A6-2: Tag and biological information for each Walleye acoustically tagged upstream of the Keeyask GS between 2016 and 2020 (continued).

| Acoustic Tag # | Floy Tag # | Tagging Date | Tag Life (days) | Expiry Date | Fork Length (mm) | Weight (g) |
|-----------------------|-------------------|---------------------|------------------------|--------------------|-------------------------|-------------------|
| 53809 | 110961 | 1-Jun-16 | 1735 | 2-Mar-21 | 440 | 1225 |
| 53810 | 110962 | 1-Jun-16 | 1735 | 2-Mar-21 | 466 | 1250 |
| 53811 | 110964 | 1-Jun-16 | 1735 | 2-Mar-21 | 456 | 1175 |
| 53812 | 110959 | 1-Jun-16 | 1735 | 2-Mar-21 | 427 | 975 |
| 25732 | 90279 | 9-Jun-18 | 1735 | 10-Mar-23 | 415 | 525 |
| 25734 | 90277 | 7-Jun-18 | 1735 | 8-Mar-23 | 395 | 600 |
| 25735 | 109725 | 6-Jun-18 | 1735 | 7-Mar-23 | 468 | 1250 |
| 25736 | 90276 | 7-Jun-18 | 1735 | 8-Mar-23 | 482 | 1400 |
| 25737 | 109722 | 6-Jun-18 | 1735 | 7-Mar-23 | 390 | 650 |
| 25738 | 109721 | 6-Jun-18 | 1735 | 7-Mar-23 | 569 | 1725 |
| 25741 | 109720 | 6-Jun-18 | 1735 | 7-Mar-23 | 409 | 625 |
| 20129 | 114779 | 3-Jun-19 | 1492 | 4-Jul-23 | 363 | 500 |
| 20130 | 114785 | 1-Jun-19 | 1493 | 3-Jul-23 | 340 | 450 |
| 20131 | 114646 | 31-May-19 | 1494 | 3-Jul-23 | 530 | 1500 |
| 20132 | 114786 | 1-Jun-19 | 1495 | 5-Jul-23 | 320 | 400 |
| 20133 | 114796 | 31-May-19 | 1496 | 5-Jul-23 | 477 | 1200 |
| 20134 | 114795 | 31-May-19 | 1497 | 6-Jul-23 | 500 | 1450 |
| 20135 | 114783 | 1-Jun-19 | 1498 | 8-Jul-23 | 330 | 400 |
| 20136 | 114787 | 1-Jun-19 | 1499 | 9-Jul-23 | 472 | 1100 |
| 20137 | 114797 | 31-May-19 | 1500 | 9-Jul-23 | 482 | 1450 |
| 20138 | 114794 | 31-May-19 | 1501 | 10-Jul-23 | 451 | 1350 |
| 20139 | 114800 | 31-May-19 | 1502 | 11-Jul-23 | 439 | 900 |
| 20140 | 114799 | 31-May-19 | 1503 | 12-Jul-23 | 367 | 600 |
| 20141 | 114639 | 31-May-19 | 1504 | 13-Jul-23 | 433 | 850 |
| 20142 | 114798 | 31-May-19 | 1505 | 14-Jul-23 | 471 | 1300 |
| 20143 | 114792 | 1-Jun-19 | 1506 | 16-Jul-23 | 415 | 900 |
| 20144 | 114784 | 1-Jun-19 | 1507 | 17-Jul-23 | 367 | 550 |
| 20145 | 114782 | 1-Jun-19 | 1508 | 18-Jul-23 | 426 | 850 |
| 20152 | 114636 | 31-May-19 | 1509 | 18-Jul-23 | 479 | 1150 |
| 20165 | 117592 | 16-Sep-19 | 1510 | 4-Nov-23 | 465 | 1200 |
| 20167 | 117590 | 16-Sep-19 | 1511 | 5-Nov-23 | 420 | 800 |
| 20171 | 114647 | 27-May-19 | 1492 | 27-Jun-23 | 386 | 600 |
| 20172 | 114632 | 30-May-19 | 1512 | 20-Jul-23 | 470 | 1200 |
| 20173 | 114633 | 30-May-19 | 1513 | 21-Jul-23 | 470 | 1350 |
| 20174 | 114634 | 30-May-19 | 1514 | 22-Jul-23 | 502 | 1350 |
| 20177 | 114630 | 30-May-19 | 1515 | 23-Jul-23 | 460 | 1300 |
| 20178 | 114631 | 30-May-19 | 1516 | 24-Jul-23 | 499 | 1600 |

Table A6-2: Tag and biological information for each Walleye acoustically tagged upstream of the Keeyask GS between 2016 and 2020 (continued).

| Acoustic Tag # | Floy Tag # | Tagging Date | Tag Life (days) | Expiry Date | Fork Length (mm) | Weight (g) |
|-----------------------|-------------------|---------------------|------------------------|--------------------|-------------------------|-------------------|
| 20179 | 114637 | 30-May-19 | 1517 | 25-Jul-23 | 453 | 1000 |
| 20180 | 114638 | 30-May-19 | 1518 | 26-Jul-23 | 520 | 1500 |
| 20183 | 114635 | 30-May-19 | 1519 | 27-Jul-23 | 455 | 850 |
| 20184 | 114628 | 30-May-19 | 1520 | 28-Jul-23 | 392 | 700 |
| 20185 | 114629 | 30-May-19 | 1521 | 29-Jul-23 | 390 | 650 |