

June 30, 2020

Lake Stewardship Report

The following is a summary report of lake stewardship activities conducted by the association on your behalf over the last year.

Water Testing

Water samples are taken annually at ten varying locations on the lake and submitted to Aquatic & Environmental Laboratory Inc. for analysis. An E.coli level of up to 150 CFU per 150mL is acceptable. We are pleased to report that all ten samples from the 2019 collection were at, or below, a level of 10 CFU per 150mL.

The Certificate of Analysis showing these results and the map showing the locations of collections are on the association's website.

Many thanks to Julie Whittlely who did the sample collection in 2019 and has volunteered to do the same in 2020.

Lake Level

At the 2019 AGM, a discussion took place about whether the changes in the levels of the Severn River have any effect on the water level in Tea Lake. The supposition was that there is a direct correlation and that, if supported, we should pursue an agreement with the Trent Severn Waterway to protect the level of Tea Lake from unnecessary and/or excessive swings.

Last summer, with the help of Stu McGill, we initiated an investigation of the variances in the water levels during the summer months. In conjunction with SRAPO, Stu attended a meeting with the Ontario Power Generation officials regarding the water levels and flow from Swift Rapids to Big Chute. He was able to obtain water level and water flow data dating back to 2010. Unfortunately, Parks Canada declined to supply any comparative data for Swift Rapids dam.

OPG officials were asked if there had been a change in the average water levels at the Big Chute dam over the past decade. It was explained that Parks Canada and OPG operate water levels within a minimum and maximum range for reasons of safe navigation and fish habitat. One engineer noted, unofficially, that they try to operate at the lower levels within the range as a buffer in case of a storm surge. He did not indicate if this was a recent objective, but we found this admission to be important to note as the graphs provided show the levels from 2016 forward, for the months of June through August, to be generally in the lower half of the range (see below).

Direct data collection was also performed to examine lake levels and the flow of water in and out at the trickle over the summer of 2019. Stu marked the steel supports at the head of the lake, at the trickle dock and on a rock on the river side of the Upper Big Chute Road bridge. Doug Roberts measured the lake level at his dock and reported the direction of flow and a qualitative description of flow rate in the trickle.

Additional anecdotal information was gathered from cottagers on Pretty Channel and in the Big Chute basin who noted no significant change in water levels over the past decade at their locations. Throughout the summer, the change in water height on the river side of the bridge never exceeded 5 cm (2 inches) between periods of inflow and outflow.

In Stu's report to the executive he concludes there is insufficient information to conclusively determine the causes of water level fluctuations. Based on his observations, he does not feel the changes in the Severn River level adequately explain the variations in the lake and that other mechanisms may also be having an effect. He suggests that other contributors may include the very minor change in the hydraulic resistance resulting from the modification of the trickle, influenced by wind.

Stu's recommendation is to continue to pursue answers and maintain contact with OPG and Parks Canada.

We would like to thank Stu for his extensive efforts.

Additionally, we contacted another life-long cottager on Tea Lake, Mark Schrag, who was the Principal (now retired) of a construction company specializing in water issue mitigation with experience working on filtration plants, sewage treatment plants, dams and the waterproofing of commercial properties.

Mark reviewed many possible causes of lake level fluctuations. In his assessment he explains the possible factors, both natural and man-made, including meteorological (rainfall vs drought), snowmelt, ground water, sediment deposits, evaporation, storm surge, flow into lake, change in topography, groundwater extraction and dams, and accesses the specific impact of each on Tea Lake. He was able to eliminate several as short-term or non-applicable. He provided a detailed calculation of the laminar effect of the removal of the rock from the trickle and concluded the effect on the flow of the river was insignificant. Mark identified the most obvious candidate is the level and flow of the Severn River.

Like Stu, Mark concluded that there is insufficient information to decisively identify the causes. He further notes that "In order to reach a proper conclusion of why the lake fluctuations occur... proper recording of the lake level over a prolonged period of time needs to be done and then compared with the Big Chute Dam records and the Severn river flow records."

As a next step, your executive will investigate the availability and cost to acquire device that can accurately and consistently measure the height of our lake. Once we have this data, we will be better able to establish whether there is any correlation between changes to the Severn River, managed by the Trent Severn Waterway in conjunction with Orillia Power (Swift Rapids) and Ontario Power Generation (Big Chute).

Range between bars is 15cm
from 198.06m to 198.21m above sea level

