

## **State of the Lake Report 2019**

This November, for the sixth consecutive year, Otty Lake's Lake Steward, members of the OLA Board and OLA members have produced a State of the Lake Report. The report summarizes the condition of our lake and the environmental activities that have been completed on Otty this summer. These annual reports provide current year information following up from the historical data amalgamated for the 2007 Report on the State of Otty Lake and its Watershed. This State of the Lake report includes sections on physical and chemical monitoring, as well as the Otty fishery, shoreline planting and loon sightings.

### **Overview of Monitoring Work**

Weekly measurements were taken of the following parameters: the flow of Jebbs Creek, Otty Lake surface water levels, surface water temperatures and related meteorological conditions.

Monthly bacteria sampling was conducted at a variety of locations around the lake. A total of 59 Escherichia Coli (E.coli) bacteria samples were taken with a focus on areas where people were swimming as well as locations where bacterial contamination was identified during previous sampling years.

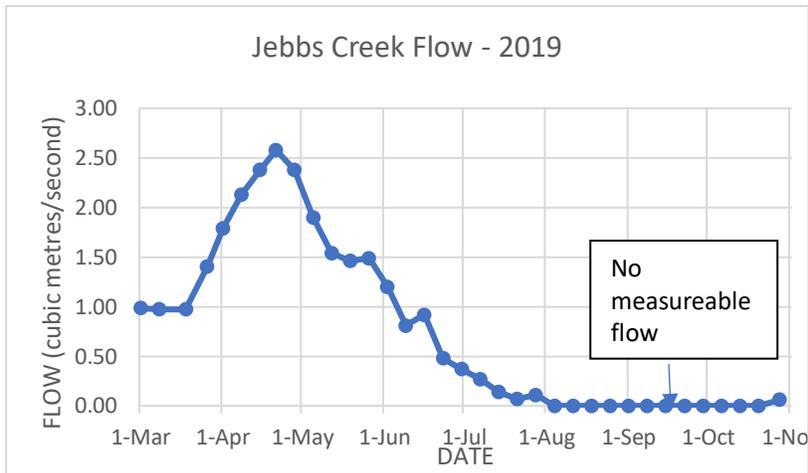
Monthly chemical samples were taken at the Otty mid-lake deep point (half way between Baxter Bay and Camp Shomria) for nutrient analysis. (i.e. Total Phosphorous or TP and Total Kjeldahl Nitrogen or TKN). TKN is the total concentration of organic nitrogen and ammonia in a filtered sample.

Monthly sampling (May to October) and Secchi disk measurements were carried out and submitted to the Lake Partner Program of the Ministry of Environment, Conservation and Parks.

Observations of the aquatic vegetation and algal growth were made on an on-going basis.

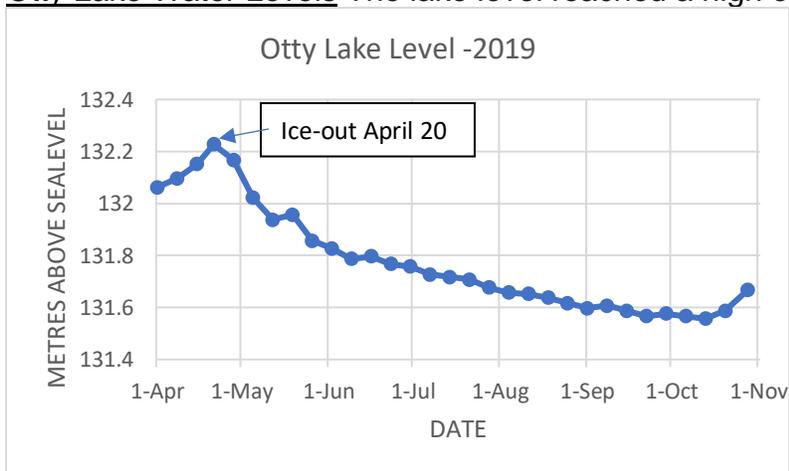
## Physical Limnology

Jebbs Creek Flow Otty Lake drains through Jebbs Creek. The flow out of Jebbs reached a peak of 2.57 m<sup>3</sup>/s (cubic metres per second) on April 21 and declined



subsequently. There was no measureable flow out of the creek from August 4 through to late October. On October 28th (the last day measurements were taken), a flow of .061 m<sup>3</sup>/sec was measured. This was after a day of very heavy rain. Please see graph.

Otty Lake Water Levels The lake level reached a high of 132.23 MASL (metres/above sea level) on April 21. The



complete ice-out occurred on April 20. The lake level had subsided by 67 cm by October 13<sup>th</sup>. The water level increased by 11 cm on October 28<sup>th</sup> after a day of very heavy rain. Please see graph.

Water Clarity Secchi disk depth readings reflect the clarity of the upper lake water level. Secchi disk depths ranged from 6.0 metres in July to 4.5 metres in August. The depth returned to 5.75 metres in September. There has been a slight increase in clarity compared to the last few years.

Lake Water Temperatures Otty Lake surface water temperature (at 1 metre depth) reached a high of 27.5 C on July 21 after a low of 10 C at the first measurement on April 23. The lake temperature was 13 C on October 28<sup>th</sup>.

## **Bacteria Sampling**

Escherichia Coli (E.coli) bacteria samples are measured in cfu/100ml, (where cfu means “colony forming units”). Note that a reading should be 0 cfu’s as a drinking water source and 100 cfu’s for swimming/personal contact.

Fifty-nine samples were taken over the late spring and summer. Twenty seven (or 46%) of the samples were completely clean and 31 other samples had concentrations of less than 10 cfu/100ml. In September, a sample in Carson’s Bay produced a reading of 32 cfu which was the highest level found during the summer. Carson Bay has a history of somewhat elevated E.coli values.

We are unable to sample the entire lake for E.coli at the frequency of a monitored public swimming beach. Nevertheless, these recorded values of E.coli would indicate that Otty can be generally regarded as a safe lake for swimming. Drinking untreated lake water is not advised.

## **Nutrient Sampling**

All samples for Total Phosphorus and Total Kjeldahl Nitrogen met the Provincial Water Quality Objectives (0.02 mg/l for TP and 0.5 mg/l for TKN). The TP sample in August was not included due to a suspected laboratory reporting error.

*Derek Smith*

## **Other Water Quality Sampling**

The data we have at this time are from the OLA sampling. As mentioned earlier, the OLA also participates in the Lake Partner Program of the Ministry of the Environment, Conservation and Parks. Through this program, samples for phosphorus are taken six times a year at Otty Lake and once at McLaren Lake. Calcium levels are also determined and Secchi depths recorded. The 2019 data will be available in February 2020 and can be compared with the data from about 600 other Ontario lakes.

The RVCA also conducts its Watershed Watch program at Otty and McLaren Lakes, four times each year, with the assistance of OLA volunteers providing the boat transportation. The RVCA data provides additional information to the OLA beyond our own monitoring. This includes Dissolved Oxygen/Temperature profiles measured at the mid-lake deep points at Otty and McLaren Lakes. Nutrient samples are also taken at one metre from the bottom and also at twice Secchi depth at these same deep points. Sampling for nutrients is done at some shoreline sites. A program of sampling for macroinvertebrates in near-shore waters is undertaken as another indicator of lake health.

The RVCA also monitors for the presence of various invasive species. Zebra mussels, Eurasian Water Milfoil and the Banded Mystery Snail have previously been identified at Otty. The abundance of invasive species tends to be cyclical.

### **Otty Lake Fishery**

In May and June, members of RVCA and OLA checked the various bass habitat areas on Otty Lake. From the fall of 2014 to 2017, our volunteers have installed 253 smallmouth and largemouth bass nests in Otty Lake.

This year,

- 148 spawning beds were confirmed to be in use, i.e. guarded by males. This translates to 58.5% confirmed nests in use – an excellent result.
- 12 nests had been cleaned and maintained
- 25 were not active
- 68 could not be confirmed due to visibility or wave action.

*Christine Kilburn with input from Jennifer Lamoureux, RVCA*

### **Loon Survey**

For the first time in several years, not only did multiple chicks hatch on Otty, but three chicks survived to the juvenile stage. Five chicks were confirmed hatched this year; three singletons and a pair. Breeding pairs were spread throughout the lake from one end to the other. The chicks of the four breeding pairs hatched June 21st (1 chick), June 26th (1), June 27th (1), and July 6 (2). Unfortunately the pair that hatched July 6th could not be found again after the first sighting.

Three surviving chicks is a wonderful outcome, as in the past two years we have only had one chick survive to the juvenile stage. In addition, expectations for chick survival were low this year as the late cool weather created favourable conditions for a particular type of black fly that causes nesting loons to abandon their nests during incubation. According to Bird Studies Canada, a loon population must produce 0.48 young per pair in order to maintain the population. We estimate that Otty has 5 pairs of territorial pairs, of which we know that 4 pairs produced chicks this year. Three surviving chicks, out of 5 pairs, is a survival rate of 0.6 chicks per pair. This is slightly above the average required to maintain the population, and is definitely a promising outcome for a challenging nesting year.

Early in the season (prior to hatch), Kyla Haley talked with Kathy Jones at Bird Studies Canada. She suggested one option for lakes with historic low chick hatch/survival is to install floating platforms for loons to nest on. The platforms minimize the risk to the eggs due to predation. Perhaps this is something that can be discussed for future years.

Our survey results were possible in large part due to the time invested and commitment shown by Richard and Jay Hendry. Terry Crabe visited the lake and took some

incredible pictures of our loons. The survey results were submitted to Bird Studies Canada by Kyla Haley.

*Kyla Haley*

### **Shoreline Planting Project**

After taking a year off, the OLA once again offered subsidized shoreline plants to Otty Lake residents. Our partner, Rideau Valley Conservation Authority (RVCA) (through their Shoreline Naturalization Program) provided plants to the OLA as part of their program to provide additional support to encourage good lake stewardship in the years of revisions to Subwatershed reports. For 2018/19, as part of the Tay River Subwatershed Target Area, the OLA benefitted from this RVCA offering.

This Shoreline Planting Project promotes community involvement in increasing the ribbon of life along Otty Lake's shoreline. At the same time, it educates our residents on the benefits of plants along the shoreline.

The following 265 plants were purchased by Otty Lake residents:

- 90 wildflowers
- 90 shrubs
- 85 trees

*Christine Kilburn*

### **Summary**

There has been a great deal of lake stewardship and environmental activity on Otty Lake again this summer thanks to our own volunteers and our partners.

Ice-out was recorded on April 20 this year, later than the average ice-out date of April 14. The lake level peaked on April 21 at about 132.23 metres above sea level. However, due to the relatively dry weather conditions the lake level fell by about 67 cm. by October 13. Jebbs Creek flow reached a peak of 2.57 cubic metres per second on April 21 and declined subsequently. There was no measureable flow out of the creek from August 4 through to late October.

Bacteria levels were acceptable again this summer indicating that Otty is safe for swimming.

There was a significant growth of aquatic vegetation in shallow bays, however there were no large algal blooms around the lake.

No significant trends, either or positive or negative, were noticed in the Otty Lake bass fishery in 2019. Smallmouth and largemouth bass populations continue to consist of various year classes/size ranges of fish which is an indicator of a healthy and sustainable resource if managed appropriately.

The loon population was monitored and mapped in detail and last year's concerns were alleviated with the confirmation of 3 chicks.

The shoreline planting program over the years has resulted in over 1800 wildflower, shrubs and trees being planted around Otty Lake.

Our programs indicate that Otty Lake is quite healthy, we hope in part due to our combined efforts to protect and enhance the lake environment. We will continue these programs next summer. The OLA Board is actively searching for and reviewing new initiatives that can be added to our environmental program. We invite your ideas and participation.

The following people contributed sections to this document:

Physical and chemical limnology: Derek Smith

Fisheries: Christine Kilburn with input from Jennifer Lamoureux

Loons: Kyla Haley

Shoreline Planting: Christine Kilburn

Editor: Murray Hunt