

# Otty Lake State of the Lake Report 2018

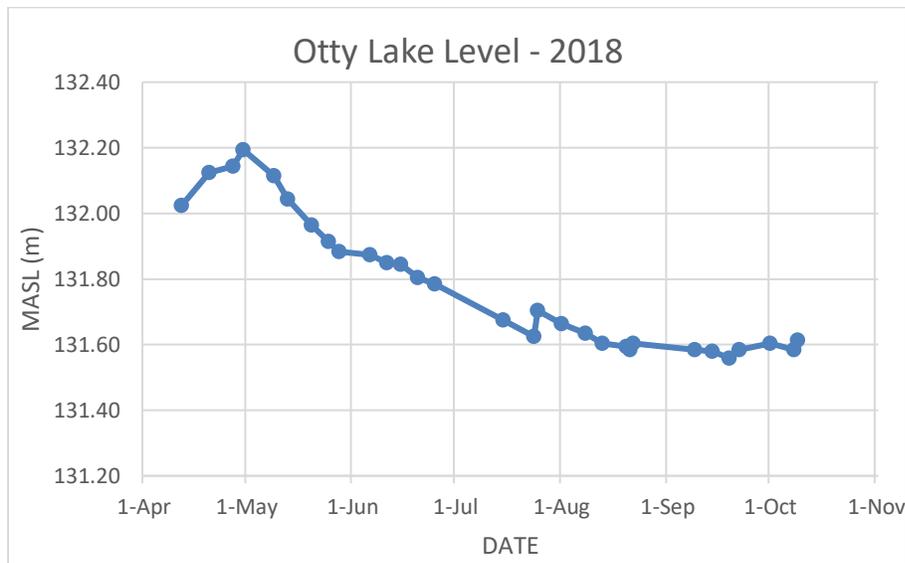


This October, for the fifth consecutive year, members of the OLA board have produced a short "State of the Lake Report". The report summarizes the condition of our lake and the environmental activities that have been completed on Otty this summer. The report includes sections on physical and chemical monitoring, the Otty fishery, loon sightings, zebra mussels and algae conditions, site investigations, and the Jebbs Creek embayment project. Five OLA board members have contributed to the report this year.

## Lake Water Levels

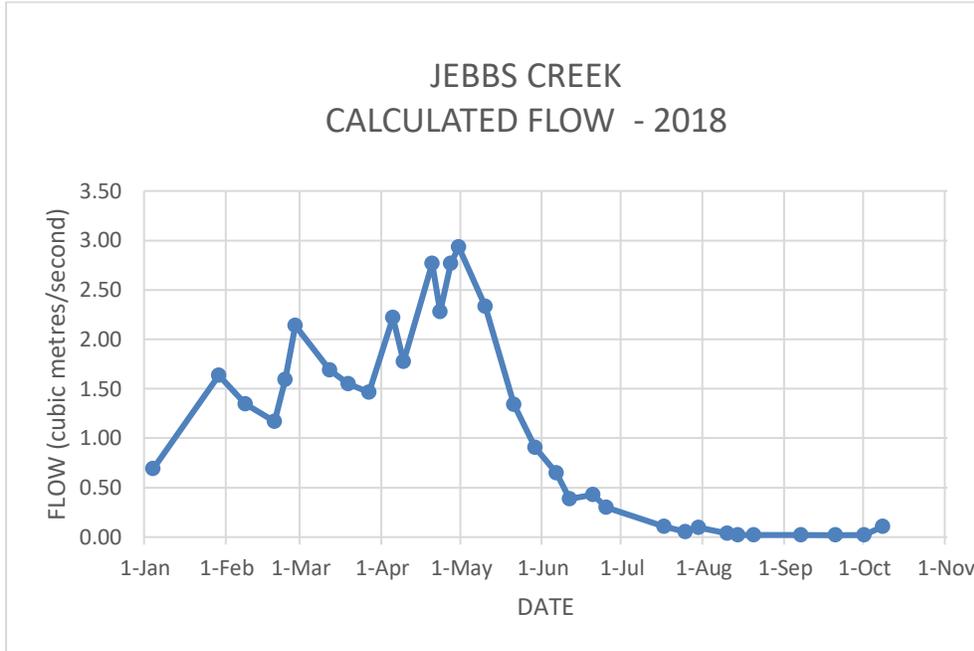
Recent years have brought varying Otty Lake water levels. Ice-out was recorded on April 24 this year, later than the average ice-out date of April 14. The lake level peaked near the end of April at about 132.2 metres above sea level, a very high value. However, due to the relatively dry weather conditions the lake level fell by about 60 cm. by mid-August.

In comparison lake water levels in 2017 were much higher due to above average rainfall amounts. On the other hand the very dry weather in 2016 resulted in the Rideau Valley Conservation Authority (RVCA) placing a "severe drought" condition on the watershed by August 2016. By October of 2016 Otty Lake levels were about 15 cm below the values for 2018. Please see the chart for the 2018 Otty Lake levels.



## Jebbs Creek Flow

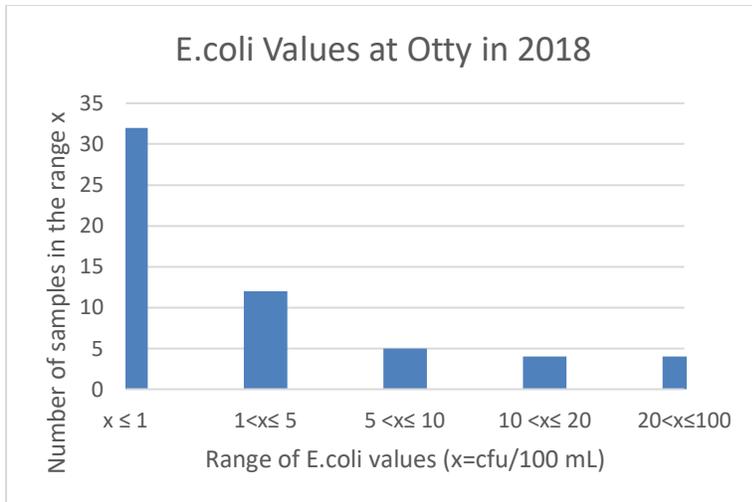
Jebbs Creek is the outlet stream from Otty Lake. The late spring delayed the peak of the Jebbs Creek flow until the beginning of May. A large estimated flow of 3 cubic metres/second was observed at that time. However, the dry weather in late spring and summer resulted in a very low flow in August and September. Please see the chart.



## Bacteria Sampling

The forerunner to the current lake association began sampling for bacteria levels by measuring fecal counts in Otty Lake in 1971. In 2001, sampling for fecal counts was replaced by E.coli sampling as it is a more specific indicator of the bacteria that affect human health. In 2018, 58 E.coli samples were taken by the OLA. All E.coli samples were within the Ontario Provincial Standard for swimming (100 colony forming Units per 100 millilitres). Of the 58 samples taken, 32 had a value of 0 or 1. However, we did note somewhat elevated values of E.coli in September in one area of the lake. We will place an emphasis on sampling for E.coli in that area next spring.

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. Please see the chart for a breakdown of the values of the E.coli sampling.



### Nutrient Sampling and Water Clarity

Nutrient samples were taken at the mid-lake, deep point from May through to September by the OLA and analyzed for Total Phosphorus (TP) and Total Kjeldahl Nitrogen (TKN) concentrations. There were no exceedences of the provincial objective for TP and one exceedance for TKN in June. This was better than the results for nutrients in 2017.

Water clarity is measured by determining the maximum depth that a Secchi disk is visible. The average water clarity at Otty Lake in 2018 was 4.7 metres. This is less than the average clarity over the past 10 years.

### Other Water Quality Sampling

The data we have at this time are from the OLA sampling. The OLA also participates in the Lake Partner Program of the Ministry of the Environment, Conservation and Parks. Samples for phosphorus are taken six times a year at Otty Lake and once at McLaren Lake. Calcium levels are also determined. The 2018 data will be available in February 2019.

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, Banded Mystery Snail, Rusty Crayfish and European Frogbit have been identified at Otty. The Otty Lake Shoreline Handbook is a source of information on invasive species. Pages 48 – 51 contain a list and description of “selected invasive species that may be found in this area.”

## **Otty Lake Fishery**

No significant trends, either or positive or negative, were noticed in the Otty Lake bass fishery in 2018. Both the smallmouth and largemouth bass populations consist of various year classes/size ranges of fish, an indicator of a healthy and sustainable resource if managed appropriately. This entails releasing all bass that are 2 pounds and over as they are physically spawning capable. Removal of bass of this size can devastate a small water system like Otty extremely quickly. Respecting the open season for bass is another pivotal consideration for the longer term health of the bass fishery.

Critical to the sustainability of any species in any body of water is a vibrant, healthy forage base. In Otty Lake, one such forage component is lake herring, commonly called shad. These pelagic bait fish are extremely high in protein enabling predators to gain weight quickly. This is important as bass only have roughly a 6 month window of optimum feeding before winter and very cold water reduces their metabolism to a subsistence feeding level. Without acquiring sufficient body mass by late November, fish will perish during the winter months.

Lake herring school in massive numbers and are nomadic. Their preferred locations are dependent on water temperatures. Like most pelagic species, lake herring best tolerate colder temperatures in the water column. As the summer progresses, lake herring gradually migrate to the main basin of Otty and suspend and travel close to the thermocline. All predators follow their prey so smallmouth bass in particular also relocate to deeper areas of Otty as June becomes July, August and beyond. While there are numerous other forage options for bass in Otty, it can be said that as goes the lake herring population, so goes the smallmouth fishery.

An untapped fishery in Otty has been and remains the panfish population. Panfish include bluegills, pumpkinseeds (or sunfish), rock bass, and perch. On light tackle, these fish are a great deal of fun to catch and an excellent way to introduce kids to fishing. Panfish are always eager to do battle so very young anglers catch a lot of fish and don't get bored. Additionally, panfish are superb table fare. Otty's panfish populations is extremely strong and can be harvested without negative repercussions to the fishery.

In the summer of 2018, Wally Robins, Director, OLA and Jennifer Lamoureux, Aquatic and Fish habitat Biologist, RVCA provided consultative advice and guidance to the Fisheries Director of Wolf Lake. This individual and a number of Wolf Lake property owners want to rehabilitate their water system's walleye population. Lessons learned from the Otty Lake Smallmouth Bass Spawning Habitat Enhancement Project were of strong value to the Wolf Lake project team and will be a significant part of their work.

## **Loon Survey**

It was a disappointing year again for anyone hoping for some Otty Lake loon chicks. This year there were no confirmed chicks. (Last year's estimated 5 mating pairs produced only one chick that survived to maturity).

Of this year's estimated 5 mated pairs, two pairs were known to have nested. Both pairs began to nest at the beginning of June, with early July being the estimated "due date". One pair left the

nest halfway through the incubation period. The second pair officially left the nest on the estimated “due date” of July 6th, and there was much anticipation that there may be chicks. Unfortunately, no chicks were ever spotted—whether the eggs failed to hatch, or the chick(s) fell victim to predation before or immediately after hatching we’ll never know.

The 1980-2012 Canadian Lakes Loon Survey by Bird Studies Canada states that “at least 1 young every other year (equivalent to at least 0.48 six-week-old young per pair each year) is considered good” (<https://www.birdscanada.org/volunteer/clls/resources/CLLSsummary.pdf>). By this measure, our loons are producing significantly fewer young than might be expected. The National Audubon Society has released a report suggesting that the range of many birds may shift over the next few decades due to global warming. (<https://ottawacitizen.com/news/local-news/last-call-climate-change-may-someday-force-loons-from-ottawa-area-analysis-suggests>, <http://climate.audubon.org/birds/comloo/common-loon>). Whether this trend is a factor in the low reproduction of loons on our lake is unknown.

Our lake continues to be a popular fishing lake for loons, and up to 17 loons were spotted on a single round-trip of the lake this summer. There were several reports of early gatherings this year, but it was unconfirmed whether this was out of the ordinary.

The OLA would like to thank everyone who reported loon sightings this year, and a special mention goes out to Richard and Jay Hendry, and Linda Davies, for their consistent and thorough reports.

### **Zebra Mussel population survey**

Veligers of zebra mussels were first detected at Otty in 2001. Adult mussel populations multiplied in the next few years. The zebra mussel population in Otty has been systematically observed and measured since the summer of 2014.

There was a significant increase in the density of zebra mussels on our samplers in 2015 compared to our 2014 results. The maximum density on any of the samplers was 2,300 individuals (or a density of approximately 3,500 mussels per square metre) and the lowest density was 360 mussels per square metre. A high percentage of the mussels were juveniles on each sampler. We concluded that the zebra mussel population was thriving in Otty Lake.

Our 2016 measurements of zebra mussel populations revealed a significant decrease in population densities compared to 2015 although the results remain very slightly higher than our 2014 observations.

During the summer of 2017 observations of zebra mussel populations were made by 11 residents around Otty. All observers report no or very few mussels on their boats or docks, indicating a further reduction from previous levels.

Six samplers were installed in Otty in May of 2018 and results were analyzed in late September. Our observations revealed a strong increase in zebra mussel populations. One sampler recorded a

density of over 9000 mussels per cubic meter. At least 90% of these individuals were juvenile mussels with a length of less than 5 mm. This evidence was corroborated by Gail Reid. Her boat was removed from Otty, cleaned and re-introduced in mid-August. She reports that by the end of September her boat bottom was “completely covered in juvenile mussels”.

The Zebra mussel populations are cyclical but are thriving in Otty Lake. We can expect further fluctuations in future years and will continue to monitor mussel populations in Otty. We are also monitoring the scientific literature for possible methods to control and eradicate this invasive species.

## **Algae**

Floating mats of green filamentous algae are an unsightly nuisance that reduce our enjoyment of our lake environment. Algal blooms occur when excess nutrients (phosphorus and nitrogen compounds) are available which permits algal species to flourish. The winter of 2015-2016 was warmer than the previous two years, and Otty was ice free by late January. Floating algal mats began developing in late April triggered by the availability of sunlight even though the water temperature was still only 6 C. The predominant species, *Spirogyra* sp., a green filamentous algae, proliferated through May and June. The algae mats died off in July and the algal problem did not reappear.

The summer of 2017 produced a positive change. Algal mats appeared in several restricted areas of the lake during in June but they died off in early July. Once again *Spirogyra* was the predominant algal type observed.

Aquatic vegetation (milfoil, lily pads, duckweed etc.) has flourished in the shallow bays around Otty Lake this summer, but floating algal mats have been noticeably absent. Very small patches of green filamentous algae (*Mougeotia* sp.) were sampled in Little Otty in July. However, algal growth has been insignificant compared to previous years. Perhaps the Milfoil can out compete green algae for the available nutrients in our lake ecosystem.

There is no clear answer in the scientific literature to explain why algal blooms die off. The reasons given include lack of nutrients, lower temperatures, lack of sunlight and depleted oxygen levels.

## **Jebbs Creek Embayment Project**

Rideau Valley Conservation Authority (RVCA) began work on this project on Sep 18, 2018. The purpose of the project is to:

- create new spawning, nursery, rearing and feeding habitat for the fish community of Jebbs Creek (target species northern pike)
- create a quiet backwater area adjacent to the main current of Jebbs Creek and provide winter and summer refuge areas for fish

- protect water quality and enhance wildlife habitat by establishing a naturalized buffer with native species of trees and shrubs
- alter elevations to create conditions more suitable for more diverse submergent and emergent aquatic vegetation
- enhance recreational and educational opportunities at the site by installing educational signage.

### **Jebbs Creek Project Description**

The RVCA team is carrying out the following work items:

- The removal of fill from the existing shoreline to create a series of small embayment's with a variety of slope conditions
- In-water planting of aquatic sedges and grasses known to be favorable for northern pike spawning
- Installation of wooden structures to enhance nursery habitat
- Maintenance of the pathway system adjacent to the embayment features to continue access for recreational use
- Depositing the excess fill in the adjacent field outside of the regulatory floodplain area and seed these areas with a native wildflower seed mix to support pollinator habitat

On Oct 3rd, 9 volunteers from the Otty Lake community and 3 from Augusta helped the RVCA team with placing of environmental mats to protect the seeds, and the re-vegetation of the riparian area by planting native trees, shrubs and wetland vegetation. On Oct 29th, volunteers will once again be joining the RVCA staff to finalize the work required.

### **Site Investigations**

Three site investigations were conducted by OLA Board members this summer. One was to investigate a water quality complaint along the shoreline in front of a cottage at the south end of Otty. The other two were site/environmental evaluations of properties where applications for major cottage renovations were received.

The water quality issue was temporary. Sampling and microscope evaluation confirmed it was related to nearshore green algal growth. The problem dissipated quickly.

The site investigations included a hydrogeological investigation and discussions with the homeowners relate to issues of septic tank locations, effluent and runoff movements, erosion and shoreline buffer zones. Both properties agree to install Tertiary septic tank systems. Both applications will not cause impacts to Otty Lake and the OLA supports both applications fully.

In the past, the OLA has organized drinking water quality investigations for numerous residents. There was no demand for this service during 2018, but we are available to organize and interpret water chemistry results on an on-going basis.

## Summary

There has been a great deal of lake stewardship and environmental activity on Otty Lake again this summer.

Ice-out was recorded on April 24 this year, later than the average ice-out date of April 14. The lake level peaked near the end of April at about 132.2 metres above sea level, a very high value. However, due to the relatively dry weather conditions the lake level fell by about 60 cm. by mid-August. The late spring delayed the peak of the Jebbs Creek flow until the beginning of May. A large flow of 3 cubic metres/second was observed at that time. However, the dry weather in late spring and summer resulted in a very low flow in August and September.

Bacteria were acceptable again this summer indicating that Otty is safe for swimming. Water chemistry sampling produced only one small exceedance from TKN and TP guidelines.

No significant trends, either or positive or negative, were noticed in the Otty Lake bass fishery in 2018. Both the smallmouth and largemouth bass populations consist of various year classes/size ranges of fish, an indicator of a healthy and sustainable resource if managed appropriately.

There was a significant growth of aquatic vegetation in shallow bays, however there were no large algal blooms around the lake. A significant increase in the zebra mussel population was noted, starting in mid-August.

The loon population was monitored and mapped in detail and there is concern about the lack of loon chicks on Otty.

An important habitat enhancement project is on-going on Jebb's Creek in partnership with the Rideau Valley Conservation Authority (RVCA).

The Rideau Valley Conservation authority published the Tay River Subwatershed report 2017 this spring. They rate Otty Lake as having "fair/good" water quality. Note that this is a significant improvement over the 2011 report which rated Otty Lake water quality as "poor".

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. However, we should not become complacent. 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: Murray Hunt

Fisheries: Wally Robins

Algae, Zebra Mussels, site monitoring: Derek Smith

Loons: Kyla Haley

Jebbs Creek Project: Christine Kilburn