



# State of the Lake Report 2021

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## INTRODUCTION

For the eighth consecutive year, the Otty Lake Association is pleased to release this State of the Lake Report.

As it has since its inception, the report summarizes the condition of our lake and the environmental activities that have been completed on Otty Lake this summer. The 2021 State of the Lake report includes sections on physical and chemical monitoring, as well as shoreline planting and loon sightings.

## WATER QUALITY MONITORING

Otty Lake's water testing through the Lake Partner Program of the Ministry of the Environment, Conservation and Parks (MOECP) was cancelled in 2020 due to COVID-19, and was re-instated in May 2021. Otty Lake's lake steward led the following testing throughout the summer:

- Weekly measurements of the flow out of Jebbs Creek, Otty Lake surface water levels, surface water temperatures and related meteorological conditions.
- Monthly bacteria sampling, with a focus on locations where people swim as well as locations where bacterial contamination was identified during previous sampling years. Due to the coronavirus, the May sampling was cancelled. However, monthly sampling resumed from June to late September.

- Monthly chemical samples and Secchi disk measurements (water clarity measure) at the lake's deep point (half way between Baxter Bay and Camp Shomria, approximately 300 metres south of Code Island) for nutrient analysis.
- The Lake Partners sampling program (Dorset Laboratory of MOECP) was conducted on a monthly basis from May to September. The program analyzes nutrient and calcium concentrations. Results should be available in early 2022.

## **Physical Limnology**

### ***Ice timing***

The main body of Otty Lake was ice free on March 31 this year while the shallow bays around the lake were ice free by April 4.

### ***Flow at Jebbs Creek***

Otty Lake drains through Jebbs Creek. Discharge volumes are measured weekly at the Rideau Ferry Road bridge, where a staff gauge is located. Flow volumes are calculated by measuring flow velocities and water depths under the bridge, using a formula developed by Murray Hunt. A maximum flow of 2.07 cubic meters per second was measured on May 7 and flows decreased from that date.

### ***Water levels***

Otty Lake levels were higher this summer than in 2020. In fact, the lake was 13cm higher in May, 14cm higher in June and 18cm higher in July. At the end of August, the lake was still higher than August 2020, even after several weeks of intense heat and drought.

One of the reasons that the levels were high was the construction of a beaver dam at the southern side of the Rideau Ferry Road bridge which eliminated all flow down Jebbs Creek after June 13<sup>th</sup>. The dam was partially breached by the County on July 2<sup>nd</sup>, but there was no flow out of Otty Lake after July 18<sup>th</sup> as the channel became choked with aquatic vegetation. This situation persisted until at least October 20<sup>th</sup>.

### ***Water temperature***

The surface water temperature at a 1 metre depth measured at the lake's deep point was 5 degrees Centigrade on April 4<sup>th</sup>. It warmed to 28 C on August 22<sup>nd</sup> after several weeks of intense heat and drought.

## **Water Testing**

### ***Bacteria Sampling - E.coli***

The presence of Escherichia coliform (E.coli) bacteria indicates contamination from fecal material produced by warm blooded animals such as humans, beaver and geese. E.coli bacteria concentrations are measured in cfu/100 mL, (where cfu means the number of "colony forming units" that can be incubated in a laboratory in a petri dish).

A total of 46 E.coli samples were taken this summer. E.coli bacteria were not present in 11 of the samples and 41 samples had less than 15 colonies/100mL. The standard for safe swimming in Ontario is 200 cfu/100mL (Measured as a geometric mean of 5 sample concentrations). This tells us that Otty Lake is safe for swimming at all locations. The highest reading obtained was 128 cfu/100mL in Carson's Bay on August 20, a location which has a history of low level E.coli contamination.

### ***Nutrient sampling***

Total Kjeldahl Nitrogen (TKN) and Total Phosphorous (TP) samples were taken at the deep point on a monthly basis from June to October. TKN is the total concentration of organic nitrogen and ammonia in a filtered sample. All samples each month met the Provincial Water Quality Objectives of T.P 0.02 milligrams per liter (mg/l) and TKN 0.5 mg/l with one exception. A shoreline construction project (which included the installation of a sod lawn to the shoreline) in July caused nutrient exceedances during the July and August sampling periods. This undoubtedly caused an excess of aquatic vegetation growth in that area. This is an excellent example of the benefits of naturally vegetated buffer strips along waterfronts.

Note that the Lake Partner program of MOECP (Dorset laboratory), in which Otty participates, was cancelled for 2020 due to covid. The program was reinstated in May of 2021. This program measures calcium as well as nutrient (TP) concentrations. Data will be available in early 2022.

### **Algal Blooms**

During past summers Otty Lake has been plagued by mats of floating algae. A short-lived growth of green filamentous algae occurred this year between June 6th and 13th<sup>th</sup> primarily occurring as submerged amorphous masses trapped on milfoil stems. By July 11 there was a very significant decrease in algal concentrations and by late July green algal species had essentially disappeared. There were no floating algal masses this summer.

There were two reports of blue-green algae outbreaks along shorelines this summer. The one in Parks Bay was analyzed for its toxicology and was found to be a species that does not produce phytotoxins. In general, these occurrences are short lived and localized in scope.

### **Water clarity measurements**

Secchi readings are an indicator of lake water clarity. Readings varied from a 6.0 metre depth in May and June to a 5.0 metre depth in August and a 6.0 metre reading in October. The variation is an indicator of the cycle of phytoplankton growth during the warm summer months. The results are almost identical to the 2019 and 2020 results.

## **Invasive species**

Otty Lake's lake steward made the following informal and unquantified observations regarding a number of invasive species this summer:

- The shallow bays around the lake produced dense growths of Eurasian water milfoil. However, aquatic green algal blooms were largely absent this summer, a very positive indicator of low nutrient levels and good water quality.
- The zebra mussel population is cyclical, with this summer showing large mussel concentrations on submerged rocks, boats and docks.
- The forests in the Otty lake watershed had a heavy infestation of gypsy moth caterpillars. The presence of abundant egg masses this fall suggests that deforestation of hardwood species (oak, maple, birch etc.) will be a problem again next summer. Information on how to eliminate egg masses has been circulated to lake residents and is available on the [OLA website](#).
- Wetland environments around the lake produced less purple loosestrife and phragmites than during 2019 and 2020.

## **OTTY LAKE FISHERY**

Based on many hours of observation during 2021, it appears that the smallmouth bass population is in reasonably good health. Positive results were seen that can be attributed to the five year Smallmouth Bass Spawning Habitat Enhancement Program. More fish in the 1 3/4 to 2 pound range were captured (caught by angling and released) than in a number of previous years. A large percentage of these fish were captured relatively close to where new or upgraded spawning habitat was created. Smallmouth bass tend to live in close proximity to where they were born. It is therefore reasonable to assume that the Habitat Enhancement Project has paid dividends.

Fewer largemouth bass were captured during the past three years, including in 2021. Whether this reflects a decline in the largemouth population is unknown. The underwater topography of Otty Lake is changing particularly with respect to weed growth. After two decades of declining weed growth, new vegetation is appearing often in deeper water than the norm. This is significantly positive news for all fish species. Healthy vegetation in inland lakes is absolutely critical for the long-term sustainability of fish populations. It is possible, but unproven, that a percentage of largemouth bass are relocating to new natural habitat. However, a study on the largemouth bass population may be warranted.

Pan fish species (rock bass, bluegill, pumpkinseed) are prolific in Otty Lake. These species are important forage for predator fish as well as for various water birds (ospreys, loons, herons) and mammals (mink, otters).

Four factors determine the short and long term health of any fishery: clean water,

abundant forage, responsible harvesting, and protection during the annual spawn. Three of the four factors can be directly influenced by humans. The decline or absence of even one of these factors will jeopardize the sustainability of a fish species. It is incumbent on Otty Lake residents and visitors, as well as the Otty Lake Association to ensure that the lake retains a variety of healthy fish populations

## LOON SURVEY

High water levels seemed to impact nests this year, as several hatchings occurred much later than usual. One pair was also observed to choose an alternate location for their nest, abandoning a site that had been used for years (and used successfully last year). Despite the delay, Otty Lake welcomed a bumper crop of baby loons this year, with four pairs nesting successfully! Three pairs produced single babies, and one adult pair welcomed a pair of babies. This year there was a wide range in birthdates – from early June until mid-July.

At the time of writing, all babies are believed to have survived. One chick of the pair has thrived more than the other - one chick has been observed to be much more independent while the other has been relying more on parents. This pair was born quite late in the season, and hopefully there is enough time with open water for both chicks to get strong enough to make the migration!

Last year’s crop of four babies was the most successful in years. With five babies this year, it has been a year to remember!

## SHORELINE PLANTING PROJECT

On Saturday, June 12th, 2021 the Rideau Valley Conservation Authority and the OLA came together once again to offer OLA members the Shoreline Plant Sale. Like last year COVID-19 safety protocols were in place and sold out early. The following 230 plants were purchased this year.

	<b>Species</b>	<b>Size</b>	<b>Number</b>
<b>Shrubs</b>	Nannyberry	1-gallon pot (3 per pot)	120
	Purple Flowering Raspberry	1 gallon pot	20
	Highbush Cranberry	1-gallon pot	40
<b>Trees</b>	Sugar Maple	1-gallon pot	30
	Pin Cherry	1-gallon pot	20
<b>TOTAL</b>			<b>230</b>

While adding a few additional native plants to your shoreline through our shoreline planting program is a good start, allowing large sections of your shoreline to remain natural - or return to a natural state - will have the largest positive impact on the health of the lake. If you are interested in re-naturalizing your shoreline, the Rideau Valley Conservation Authority has a program to support you in doing this, and you will be making a big contribution to the health of our lake!

## OTTY LAKE iNATURALIST PROJECT

We have made great progress this year: over 1,100 new observations, bringing our total to 2,211. We now have records for over 1,000 species contributed by 77 observers around the lake. The breakdown of species is as follows:

Insects	402	Plants	322	Birds	96	Arachnids	70	Fungi	46
Mammals	22	Amphibians	10	Reptiles	8	Molluscs	8	Fish	7
Crustaceans	11	Millipedes	2	Bryozoans	1	Leeches	1		

Over 70% of the observations were research grade, in other words were identified to species-level and the identification was verified by at least one other member of iNaturalist. In terms of frequency of observations, the top five species in descending order were American Toad, Common Snapping Turtle, Wood Duck, Painted Turtle, White-Tailed Deer. This doesn't necessarily make these the most abundant organisms on the lake this year, LDD (formerly called Gypsy) moths for one would have beat out at least some of these. Some of our observations represent invasive species, some are for species at risk, and some observations represent the only record on iNaturalist for that given species. While our project is specifically for species found in and around Otty Lake, our records are also included in the project for the Biodiversity of Lanark County, and the project for Biodiversity of Canada, Provinces and Territories. These records are also extremely valuable for tracking introduced and invasive species as well as rare species and species at risk. Thanks to everyone who has contributed to this endeavour, and we encourage anyone who is interested to join in!

<https://inaturalist.ca/projects/otty-lake>

## CONCLUSION

Overall, our monitoring programs indicate that Otty Lake is quite healthy. We hope this is in part due to our combined efforts to protect and enhance the lake environment by keeping the shoreline as natural as possible, enhancing wildlife habitats, and minimizing boat wake. With the help of dedicated volunteers, 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. Lake monitoring activities will re-commence in March of 2022.

**Join us!** If you're interested in volunteering for any of the OLA programs outlined in this report, please write to [ola@ottylakeassociation.ca](mailto:ola@ottylakeassociation.ca).

Thanks to the following volunteers who contributed sections to this document:

Physical and chemical limnology, invasive species: Derek Smith

Loons: Kyla Haley

Shoreline Planting: Rachel Roth

iNaturalist: Kit Muma, Bruce Smith

Otty Lake Fishery: Wally Robins

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