

State of the Lake Report 2023

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Introduction

The Otty Lake Association is pleased to release this State of the Lake Report.

This report summarizes the condition of our lake and the environmental activities that have been completed on Otty Lake this year. The 2023 State of the Lake report includes sections on physical and chemical monitoring, invasive species, the fishery, loons, shoreline planting and iNaturalist.

Water Quality

Contributed by Kevin Terrion

Water Quality Monitoring

The Otty Lake Steward participates in three water quality sampling programs from early May to late September. Our aim is to measure and track important indicators of the health of the lake such as the concentration of *E. coli* bacteria, nutrient levels (phosphorus and nitrogen) and water clarity. The bacteria work focuses on assuring that near shore areas of the lake are safe for swimming and boating activities. As well, we focus on locations where bacterial contamination was identified during previous sampling years. The nutrient samples are taken to evaluate the nutrient enrichment and the trophic status of the lake.

The first program we participate in is the **Lake Partners Program with the Ministry of the Environment's Dorset Science Center**. Sampling was conducted on a monthly basis from May to September. The program analyzes the water for nutrients and calcium concentrations. Results for this summer will be available in early 2024. For more on the program, see the [OLA website](#).

The second is the **RVCA sampling and profiling program**. This program includes monthly nutrient sampling of temperature/dissolved oxygen vertical profiles and Secchi disk measurements (to assess water clarity) at the deepest point in the



Water testing with RVCA staff.

lake (half-way between Baxter Bay and Camp Shomria, approximately 300 metres south of Code Island). (Maximum depth of Otty Lake is 90 metres.) This work also began in May, 2023. [View the RVCA results up to 2017 here.](#)

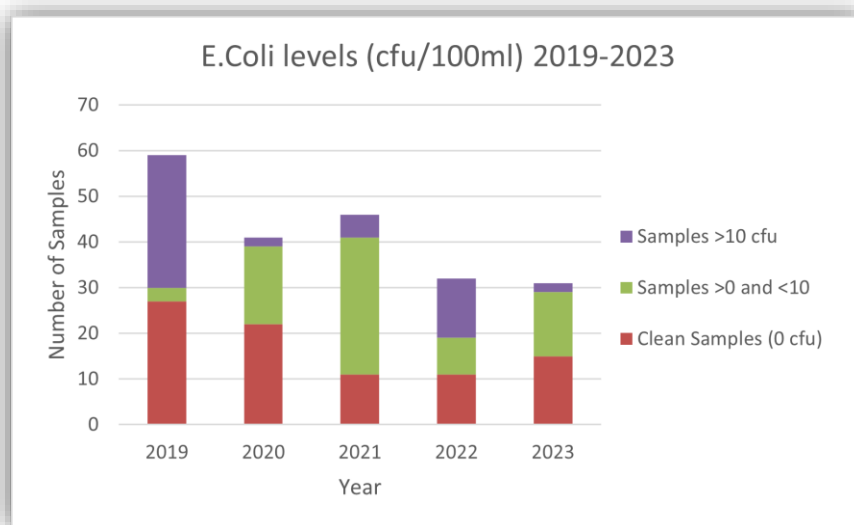
The third program is an **OLA funded bacteria/nutrient sampling program**. Bacteria samples are taken during the summer months and the sampling is focused on places where people swim.

Results of Water Quality Monitoring

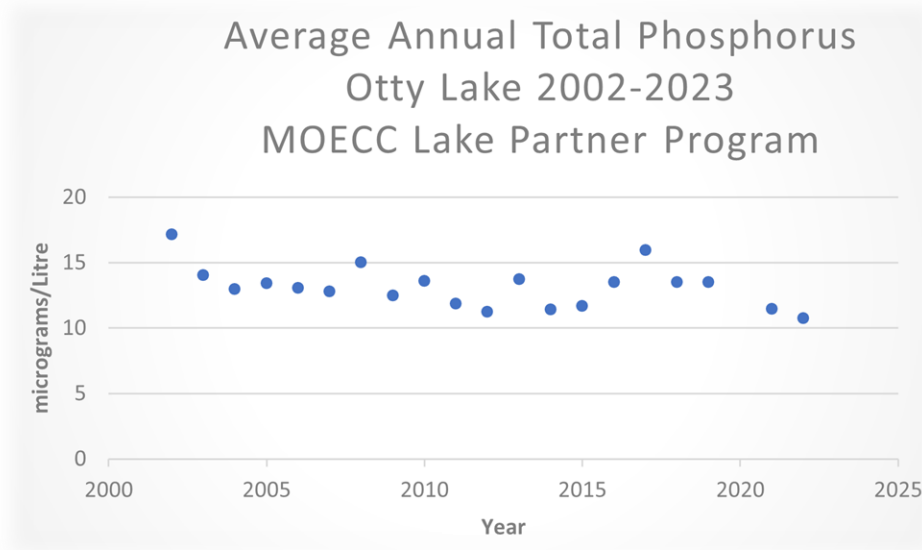
The presence of *Escherichia coliform* (*E. coli*) bacteria indicates contamination from fecal material produced by warm blooded animals such as humans, beavers and geese. *E. coli* bacteria concentrations are measured in cfu/100 mL, (where cfu means the number of “colony forming units” that can be incubated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

A total of 31 *E. coli* samples were taken in 2023. *E. coli* bacteria were not present in 14 of the samples and 15 other samples produced less than 10 cfu/100ml. The highest sample taken on the lake was 41cfu/100ml. The standard for safe swimming in Ontario is 200 cfu/100 ml. (measured as the geometric mean of 5 sample concentrations). All sites sampled were well within the provincial safe swimming limits.

Overall these *E. coli* values for 2023 were good. Although we are unable to sample the entire lake for *E. coli* at the frequency of a monitored public swimming beach, these recorded values of *E. coli* would indicate that Otty can be generally regarded as a safe lake for swimming. It is noteworthy that warm water temperature and low flow conditions are more favourable for bacterial growth along with an excess of fecal matter. In any case, drinking untreated lake water is not advised.

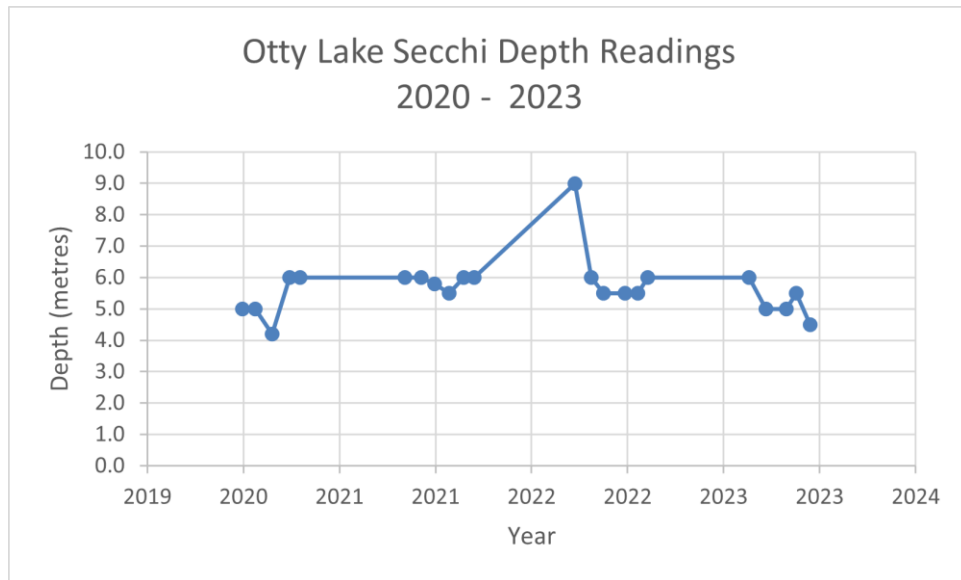


Total Kjeldahl Nitrogen (TKN) and Total Phosphorous (TP) samples were taken at the deep point in August and September. TKN is the total concentration of organic nitrogen and ammonia in a filtered sample. Increases in phosphorus will decrease water clarity by stimulating algal growth. In extreme cases, algal blooms will affect the aesthetics of the lake and/or cause taste and odour problems in the water.



Both samples met the Provincial Water Quality Objectives of T.P less than 0.02 milligrams per liter (mg/l) and TKN less than 0.5 mg/l for a mesotrophic lake (or a lake that contains moderate amounts of nutrients, and contains healthy, diverse populations of aquatic plants, algae, and fish, such as Otty Lake).

Water clarity is measured by determining the maximum depth that a Secchi disk is visible. Secchi readings are an indicator of lake water clarity. Readings varied from a 6.0 metre depth in May and June to a 4.5 metre depth in September. The variation is an indicator of the cycle of phytoplankton growth during the warm summer months.



Water Quality Index

The RVCA determines a Water Quality Index (WQI) as a rough indicator of water quality. It summarizes large amounts of water quality data in a single “score” from 1-100. Higher scores reflect cleaner water. The data are compared to provincial and federal water quality objectives. The WQI does not account for the natural condition of the lake and as a result may unfairly represent some lakes (i.e., headwater and wetland dominated lakes may present as poor when they could be considered “pristine” in many ways).

A sub-watershed report will be released early in 2024 indicating Otty Lake and McLaren Lake scores.

Physical Limnology

Ice Timing and Thickness

The ice over date this year was January 11, 2023. The ice thickness measured in early March was 29 cm compared to winter 2022 where the ice was measured at 45cm also in early March.

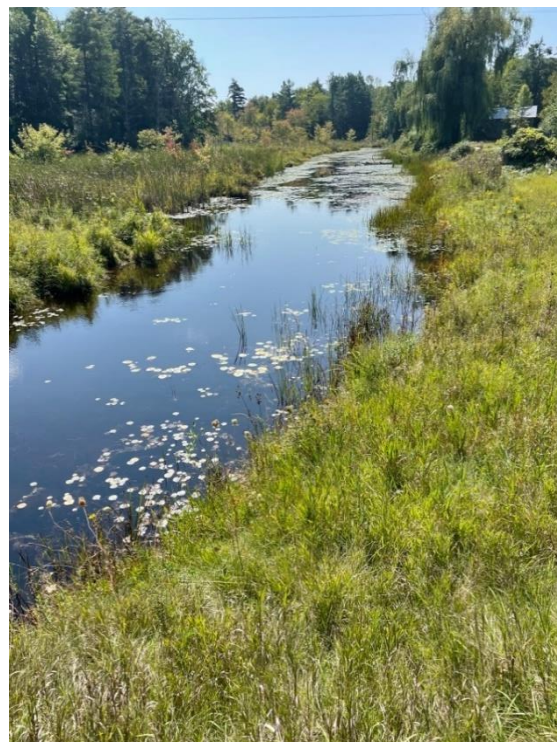
The ice out date for this year was April 13 after a record-breaking day of 28 C temperature. The median ice out date for the period 1986 to 2016 is coincidentally also April 13.

Lake Levels and Jebbs Creek Water Flow

Otty Lake drains through Jebbs Creek and down into the Tay River. Lake levels have been historically affected by beaver dams reported by residents along Jebbs Creek and observed by members of the OLA. This year, up to the time of writing this report, there have been no beaver dams reported or observed from the Rideau Ferry bridge up to the lake. However, it has been suggested but not observed that there may be beaver dams on the Tay River side of the bridge that may be slowing and holding lake levels higher than they would be if there were no obstructions.

As of early November, lake levels have declined by 51.5 cm from the highest reading on April 9th.

Jebbs Creek from the Rideau Ferry bridge facing towards Otty Lake



Algal Blooms

Algae (a group that includes phytoplankton) are a very diverse group of photosynthetic organisms that are vital components of lake food webs. These microscopic plants grow suspended in the water column and can exist as single cells or as groups of cells in colonies and filaments (see https://www.ottylakeassociation.ca/wp-content/uploads/2023/03/blue_green_slides_LNG_-Sep14.pdf for more about algae).

It is not uncommon to see mats of floating algae below and on the surface of Otty Lake. These are caused by a short-lived growth of *Green Filamentous algae* which occurs in mid-June as submerged amorphous masses are trapped on milfoil stems. As is typical, by late July these mats had essentially disappeared. While in themselves Green Filamentous algae are not harmful, they can be the result of too many nutrients in the lake.

Blue Green Cyanobacteria, or blue-green algae, are naturally occurring microscopic organisms found in freshwater. Under favourable conditions, which generally include warm water temperatures, an excess of nutrients (e.g. after a storm), high light levels and calm wind conditions, cyanobacteria can multiply quickly and form algal blooms. These can be harmful to both humans, pets and wildlife. (Source: https://www.ottylakeassociation.ca/wp-content/uploads/2023/03/blue_green_slides_LNG_-Sep14.pdf).

There were no reports of blue-green algae in 2023.



Example of Green Filamentous Algae

(Source: <https://www.severnsound.ca/resources/fact-sheets/all-about-algae/>).

Invasive Species

Living organisms – plants, animals, insects -- that are not native to an area (or those that were introduced to an area by humans) can be detrimental to the health of an ecosystem. Some non-native species can become so well established in the new environment that they disrupt the native species, at which point they are classified as invasive species. Invasive species can out-compete native species for resources, such as food and habitat, and introduce new diseases and parasites. Invasive species will often take over, or invade an area upon introduction, often because they have no known enemies in their new environments. For more about Invasive species, see <https://www.nwf.org/Educational-Resources/Wildlife-Guide/Threats-to-Wildlife/Invasive-Species>

Here are some of the invasive species observed in and around Otty Lake:

- *Eurasian water-milfoil* is an invasive aquatic plant native to Europe, Asia, and northern Africa. Introduced to North America in the 19th century, it is now one of the most widely distributed invasive aquatic plants on the continent. Eurasian water-milfoil prefers shallow water 1-3 m deep, but can root in up to 10 m of water. Being a fast-growing perennial, it forms dense underwater mats that shade out other aquatic plants. When large stands begin to die off in the fall, the decaying plants can reduce oxygen levels in the immediate vicinity, causing fish to relocate. The exact year this aquatic plant appeared at Otty Lake is not known, although it was regarded as a major problem in the 2003-2007 timeframe. (<https://www.invadingspecies.com/invaders/aquatic-plants/eurasian-water-milfoil-2/>).

- The *zebra mussel* population is cyclical, with this summer showing large mussel concentrations on submerged rocks, boats and docks. Zebra mussels can have a negative impact on the lake ecosystem because they remove sediment and suspended particles from the water, which increases water clarity. Increased water clarity will mean that sunlight will penetrate deeper into the water, increasing vegetation growth in the lake. But most importantly, zebra mussels filter out the phytoplankton, so the nutrients normally used by the phytoplankton become available to the filamentous algae. Zebra mussels first appeared in Otty Lake in 2002.

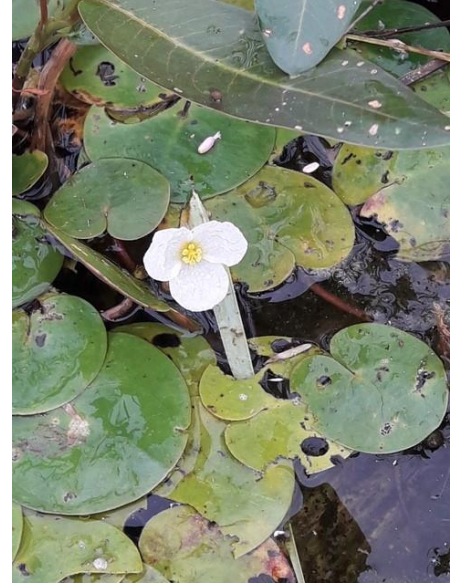
- The European common reed or invasive *Phragmites* is an aggressive grass that spreads quickly and chokes out native species and damages ecosystems. This plant species grows well in areas of standing water and releases toxins from its roots to hinder the growth of and kill surrounding plants (Ontario Invading Species Awareness Program, 2016). Recognized as Canada's worst invasive plant in 2005 by Agriculture and Agri-food Canada, it grows in tall, dense stands and can reach up to 15 feet in height. They have been in Lanark County at least since 2017.



Phragmites australis. Source: Ontario's Invading Species Awareness Program

- *Wild parsnips* have been observed and noted along the Rideau Ferry Road near Jebbs creek. Lanark County staff have been active in controlling it. Wild parsnip, which is also known as poison parsnip, is a member of the carrot/parsley family. It typically grows a low, spindly rosette of leaves in the first year while the root develops. In the second year it flowers on a tall stalk and then dies. The plant can form dense stands and spreads quickly in disturbed areas such as abandoned yards, waste dumps, meadows, open fields, roadsides and railway embankments. Its seeds are easily dispersed by wind and water, and on mowing or other equipment. Like giant hogweed and other members of the carrot family, it produces sap containing chemicals that can cause human skin to react to sunlight, resulting in intense burns, rashes or blisters (<https://www.ontario.ca/page/wild-parsnip>). Note that wild parsnip can also cause burns to dogs and cats.

- *European frogbit* is an invasive aquatic plant brought from Europe to Ottawa in 1932 as an ornamental plant. It has been at Otty Lake since at least 2009. The plant likes slow-moving water, where it forms dense, floating mats, crowding out native plants, and preventing sunlight from reaching submergent plants. It produces a small white flower with rounded petals and a yellow centre. It looks similar to several native plants, including white water lily. Reduce speed near infested areas, as boat wake can dislodge plants, and it can easily spread and reproduce from small fragments.
- The *Banded Mystery Snail* is one of four types of snails that are considered invasive in Ontario. This particular snail is native to the United States. RVCA reports they have reached Otty Lake. They do well in lakes and slow moving rivers. They are a problem because they reproduce and spread rapidly, may prey on fish eggs and reduce survival rates, and out-compete for food and habitat and effect the abundance of native snails.
- *Rusty Crayfish* are large, freshwater crayfish, native to the Ohio Valley, first seen in Ontario in the early 1960s. The RVCA reports they have been found in Otty Lake. They likely were introduced to Ontario by anglers from other areas discarding crayfish they were using as bait. Their aggressive eating habits lead them to consume large amounts of aquatic vegetation, causing the decline of native crayfish, and reducing the spawning and nursery habitat for native fish. Because the females can carry up 200 fertilized eggs under their tails, they can spread rapidly.



European Frog-Bit (Hydrocharis morsus-ranae), Photo by Kit Muma

There are a number of invasive species that have arrived in the area but have not been seen in and around Otty Lake. Be on the lookout for quagga mussels, the hemlock wooly adelgid, spiny water flea, and the spotted lantern fly.



Quagga Mussels



Hemlock Woolly Adelgid (aphid-like insect)



Spotted Lantern Fly



Spiny Water Flea

Photos from invasivespeciescentre.ca

Otty Lake Fishery

Contributed by Wally Robins

The past decade has been the golden age for bass throughout Ontario. Climate change has resulted in earlier springs and subsequently, earlier spawns. Ice up occurs later than in the past. Being a warm water species, bass are thriving. Young of the year fish as well as adults, currently have an elongated feeding season. For fry born in May or early June, this allows them to attain a body size and weight that enhances their survival rate over the winter. For spawning females and nest guarding males, the same is true as they too, need to recover body mass after the rigors of the spawn.

In Otty Lake, the smallmouth and largemouth populations have been relatively stable for a number of years. There appears to be a balanced distribution of fish of varying sizes, a key indicator of a healthy fishery. Forage bases in the lake are plentiful. It should be noted that some fisheries scientists have expressed concern about the long-term health of the cisco base in Ontario, primarily because of rising water temperatures. One of Otty Lake's main food sources for smallmouth bass is the cisco, more commonly referred to as shad or lake herring.

There has been no noticeable change in the panfish populations in Otty. Bluegills, sunfish (pumpkinseeds) and rock bass are abundant. They too, are an important forage bass for predator fish, as well as for loons, herons, otters, mink and other fish-eating bird and animal species.

There is a population of northern pike in Otty Lake but it can best be described as a below average fishery. Pike are a cold-water species and climate change has done them no favours. Additionally, the pike population has never recovered from an outbreak of lymphosarcoma, a deadly skin cancer, that occurred in the 1980s/1990s.

In Eastern Ontario, bass are the most sought after fish to catch. Otty Lake is known as a very good bass fishery and, as a result, more anglers are visiting the lake to fish for bass. For the majority of bass anglers, catch and release is the norm and has been for the past two decades. Seeing more fishing boats on Otty is now common but this is not an indication that the fishery is being overly utilized.

However, there is growing concern that some individuals are knowingly targeting bass during the spawn when they are most vulnerable. This is illegal. Catching spawning bass, even if they are released, will decimate a small fishery like Otty very quickly. When a guarding male is removed from a nest for more than roughly two minutes, the entire egg deposit or recently hatched fry will be destroyed due to predation by panfish. Even if released in under this time, many guarding males will abandon the nest and a 100% mortality rate of eggs or fry will ensue.

In the spring issue of Captain Otty's Log, there will be a piece outlining what cottagers/ residents of Otty can do to curb out of season fishing. In the meantime, it would be prudent for OLA to express concern about illegal fishing to local MNRF officials and work cooperatively to mitigate an activity that is extremely detrimental to sustaining a healthy bass fishery.

Loon Report

Contributed by Kyla Haley



Photo credit: Linda Davies (August 13, 2023)

The nesting season got off to a promising start, with 4 pairs confirmed to have nested (including one in a new location at the southwest end of the lake). Unfortunately, only one pair successfully hatched and raised a chick. For two of these pairs, nesting failed prior to chicks hatching. Another pair hatched a chick, however this chick sadly disappeared shortly after hatching. The fourth pair hatched a chick which has survived into the fall season and is now nearly as large as its parents. The parents will head south before the baby, which will stay around until nearly ice in as it gains strength and stamina to make the big flight south.

Shoreline Planting

Contributed by Rachel Roth

Each year, the OLA, in partnership with the RVCA's Shoreline Naturalization Program, has offered members of the community subsidized native trees and shrubs to be planted on the shores of Otty Lake.

Benefits to shoreline planting include:

- Reduces water run-off that causes algal blooms and excessive weed growth;
- Reduces shoreline erosion and making shorelines more resilient;
- Much cheaper and more eco-friendly than rock-based "rip rap" shorelines;
- Discourages geese;
- Is more inviting to wildlife.

In 2023, 169 plants were distributed to 30 households on May 20: fly honeysuckle, smooth rose, black maple and white cedar.

Over the last 5 years (2019 – 2023), 1044 plants have been distributed to residents around Otty Lake. On average 40 households received and planted the plants each year. The 1044 plants have included 344 trees, 610 shrubs and 90 native flowers.

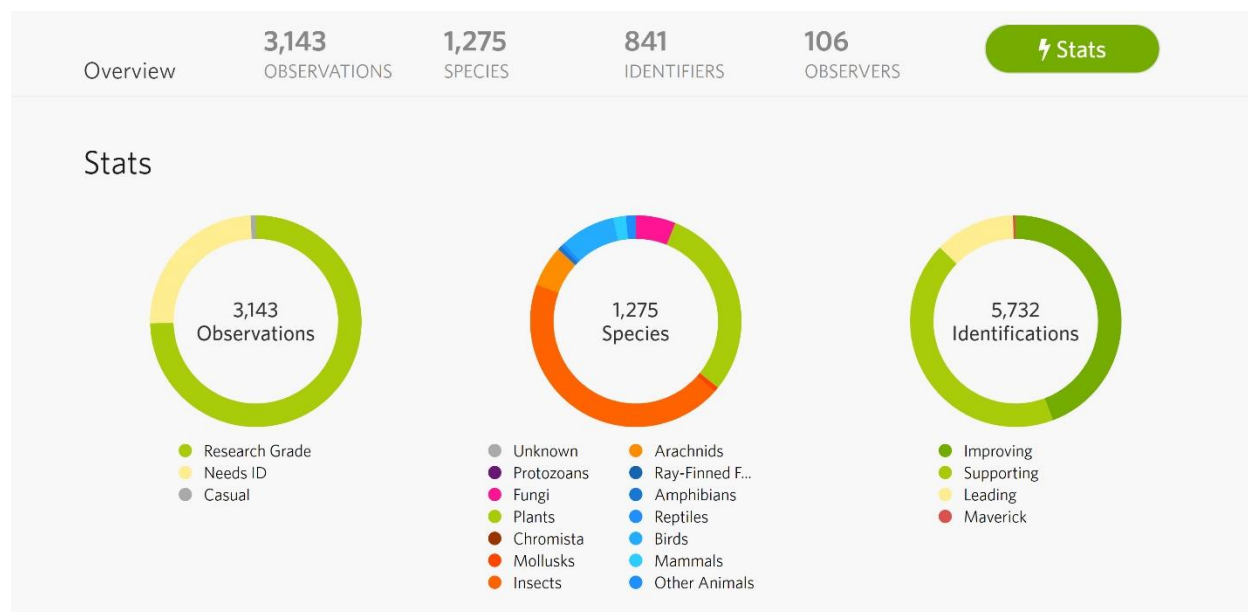
iNaturalist

Contributed by Kit Muma & Bruce Smith

Otty Lake residents are encouraged to submit their observations to the iNaturalist site at <https://inaturalist.ca/projects/otty-lake>.

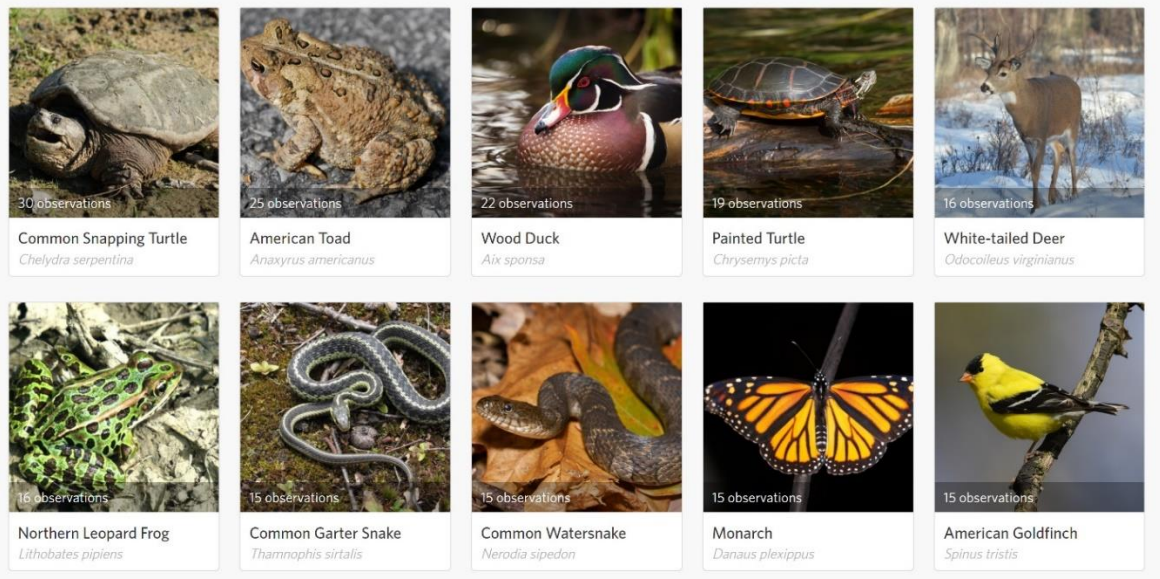
The data presented here were compiled on Sept. 17th, 2023, and new observations were being added as we worked. Thank you to everyone who has participated: 106 observers in total, with

15 new participants this year. There have been a total of 3,143 observations made, 477 in 2023. Three hundred and sixty-three species were recorded in 2023 of which 154 were new for Otty Lake, bringing our total species count to 1,275. Of our 10 most-recorded organisms (across all time), the Common Loon got bumped down to a 3-way tie for 11th, edged out by the garter snake. Clearly these numbers don't represent the relative abundance of these species, simply how often people recorded observations on our iNaturalist project site. We've added a fair number of species of insects and fungi, however we are still lacking in moth species (given how many are known for Lanark County, and more locally, Murphy's Point Provincial Park). There were no recorded observations for the Spongy Moth (*Lymantria dispar*, formerly known as the Gypsy Moth), in 2023.



iNaturalist cumulative stats to Sept. 17th 2023

We encourage everyone to participate! It doesn't have to be a new species for the region, it is also important to document seasonality for common species, especially if we want to test whether species are appearing earlier with climate change. You need to document your observation with a photo and/or audio recording, the location, date and time. If you are unsure of the species, no problem. As you upload your observation, the program will make suggestions. Observations need to be verified, and the people involved may offer better suggestions for the identity of your specimen – it is a community effort. It is also not too late to add observations from the summer, as long as you can document the location, date, etc. Most digital cameras and cell phones record the date and time automatically, so those data may be entered automatically when you upload your observation.



Ten most commonly reported species to Sept 17, 2023

Conclusion

Thanks to all who contributed to this State of the Lake report. Overall, our monitoring programs indicate that Otty Lake is quite healthy. Whether we live here year-round or seasonally, we all love our lake. Gathering data and producing this report is one way of monitoring and taking care of our lake, but we all contribute by caring for our lake, boating and fishing responsibly, doing what we can to protect wildlife habitat and respecting our neighbours, whether they be human or non-human.

The OLA Board is actively searching for new initiatives that can be added to our environmental program. We invite your ideas and participation. If you have ideas to share or are interested in volunteering for any of the OLA programs outlined in this report, please write to ola@ottylakeassociation.ca.