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# State of the Lake Report 2022

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## INTRODUCTION

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

As it has since its inception in 2007, the report summarizes the condition of our lake and the environmental activities that have been completed on Otty Lake this summer. The 2022 State of the Lake report includes sections on physical and chemical monitoring, as well as shoreline planting and loon sightings.

### Water Quality Monitoring

Contributed by our Lake Steward, Kevin Terrion

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 was focused on assuring that nearshore areas of the lake were safe for swimming and boating activities. As well, we focus on locations where bacterial contamination was identified during previous sampling years. The nutrient samples were taken to evaluate the nutrient enrichment and the trophic status of the lake.

The first program we participate in is **The Lake Partner Program with the Ministry of the Environment's Dorset Science Center**. This work analyses the lake for nutrient levels and water transparency. This monthly program began in May.

The second is the **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 lake (half way between Baxter Bay and Camp Shomria, approximately 300 metres south of Code Island). This work also began in May.

**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, 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 31 samples were taken for E.coli in 2022 by the OLA. Eleven of these samples had a value of 0 Colony Forming Units per 100 millilitres (cfu/100 mL). All but three of the 31 samples had E.coli values less than 10 cfu/100. All samples taken were within the provincial swimming standard limit of 100 cfu/100mL.

Overall these E.coli values for 2022 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.

Nutrient samples were taken from May to September by the Lake Steward and analyzed for Total Phosphorus (TP) and Total Kjeldahl Nitrogen (TKN) concentrations. TP concentration is used to interpret nutrient status in our lake, since phosphorus is the element that controls the growth of algae in most Ontario lakes. 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. TKN is the total concentration of organic nitrogen and ammonia in a filtered sample.

All samples were within the TP provincial objective of 20 micrograms/Litre ( $\mu\text{g/L}$ ) and the TKN provincial objective of 500  $\mu\text{g/L}$  for a mesotrophic lake (or those lakes that contain moderate amounts of nutrients, and contain healthy, diverse populations of aquatic plants, algae, and fish, such as Otty Lake). These nutrient values indicate that nutrient levels at Otty appear stable.

Water clarity is measured by determining the maximum depth that a Secchi disk is visible. The first Secchi depth measurement on May 9th showed a high water clarity of 9 metres and conditions were favourable with sunny skies and flat water. This clarity gradually reduced through the summer to 4.5 metres by October 15. The variation is an

indicator of the cycle of phytoplankton growth during the warm summer months. The results are typical of the last few years.

## **Physical Limnology**

### ***Ice timing***

The ice thickness was measured at forty-five centimetres on March 13. The main body of Otty Lake was ice free on April 12 this year while the shallow bays around the lake were ice free by April 15.

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

Otty Lake drains through Jebbs Creek. Starting in mid-June at least two beaver dams began to appear on the creek. Discharge volumes were therefore restricted by the beaver dams. Even though we had a very dry fall, and thus lake levels would have been lower, the dams held back 7-10 cm of lake water resulting in slightly elevated lake water levels.

### ***Pine pollen***

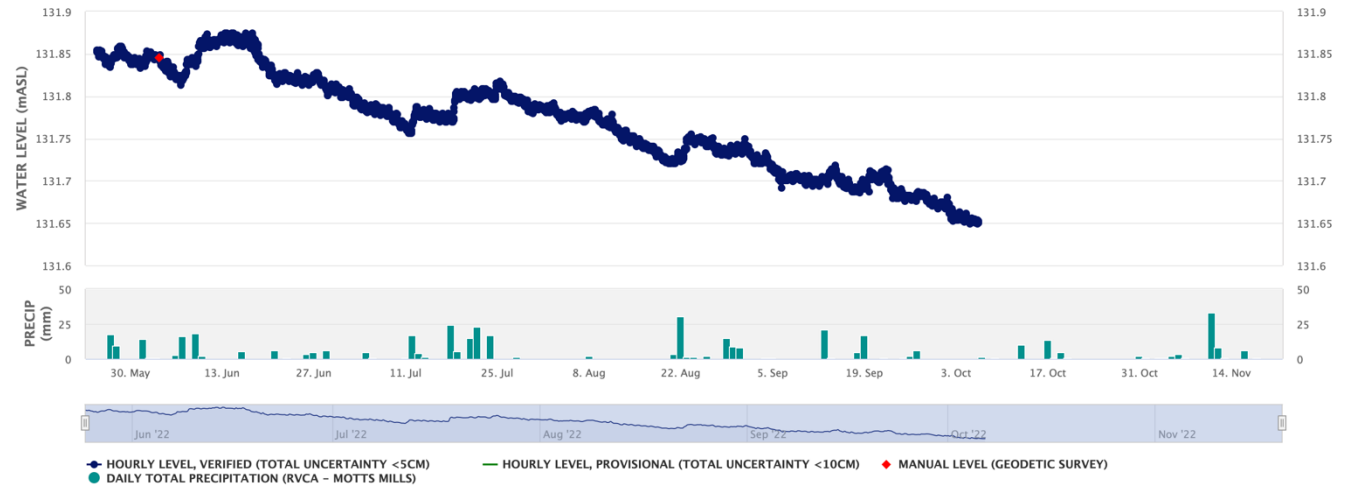
Heavy pine tree pollen was observed on the water in early June. This is a natural phenomenon that occurs in most of Ontario where a forest ecosystem is prevalent resulting from pine pollen from surrounding forests being blown into the water by high winds. Pine pollen is not harmful nor does it pose a health risk. The pine pollen will eventually decompose or become trapped in the sediment along the shoreline.

### ***Water levels***

As can be seen in the graph below, provided by the RVCA, lake water levels gradually drained from the May 25<sup>th</sup> reading to the final reading on October 6<sup>th</sup>. It can be noted that lake levels rose after each rainfall. Interestingly, because precipitation levels were lower than typical in the fall, lake levels were correspondingly lower than normal. In fact, according to the RVCA, this fall in many regions there was a trailing 3-month deficit at 60-70% of normal rainfall over the late summer and early fall months.

## OTTY LAKE – WATER LEVEL [MEASURED, GEODETIC]

HOURLY LEVEL AND PRECIPITATION FOR OTTY LAKE. TIME STAMP ADJUSTED TO LOCAL STANDARD TIME (GMT-5:00). DATA LOGGER OWNED & OPERATED BY THE RVCA.  
NEXT SCHEDULED DATA DOWNLOAD: SPRING 2023



## Algal Blooms

During past summers Otty Lake has occasionally been impacted by mats of floating algae. There were no floating algal masses this summer. As well, there were no reports of blue-green algae outbreaks on Otty Lake this summer.

## 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 can produce 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 Spongy moth (*Lymantria dispar dispar* – formerly known as Gypsy moths) caterpillars did not return to the forests in the Otty lake watershed after the heavy infestations of 2020 and 2021.
- Wetland environments around the lake produced less purple loosestrife and phragmites than during the last few years.

Wild parsnips have been observed and noted along the Rideau Ferry Road near Jebbs creek. Lanark County staff have been active in controlling it.

## The Otty Lake Fishery

Contributed by Wally Robbins

For most of the past decade the Otty Lake fishery has been relatively stable for all resident fish species. This trend is one positive indicator that the overall health of the lake is strong.

Both the smallmouth and largemouth bass populations appear to be in good shape. There are significant numbers of fish in various year classes (size ranges). Of critical importance are healthy populations of large adult fish (over 3 pounds). The majority of these fish are female and are the primary spawners in the lake. Protecting these fish will insure that equally large fish will be produced in the future.

Other species, with the exception of northern pike which have been in decline for numerous years, are abundant. Otty is home to a variety of panfish species (bluegill, pumpkinseed, rock bass, perch). These fish occupy an important rung on the food chain providing forage for larger predator fish, as well as for various water mammals and birds of prey. Panfish also provide exciting, non-stop action for experienced and novice anglers (especially children) and are, by far, the tastiest fish that swim in Otty.

An overlooked species for many is the cisco, also called shad or lake herring. These thin, minnow like fish travel in large schools and spend the majority of their time over deep water. Ciscos are the primary forage of smallmouth bass. Simply said, the health of Otty's cisco population is critical to the future of the smallmouth fishery in Otty.

Otty's reputation as a very good bass fishery is now common knowledge. As such, more non-resident and cottagers are visiting the lake to catch bass. To date, this has increased angling and boat pressure on the lake. Whether this increase in fishing pressure negatively impacts fish populations will not be seen for a number of years. On a positive note, the majority of avid bass anglers practice catch and release so it is hoped that the fishery will not be adversely affected.

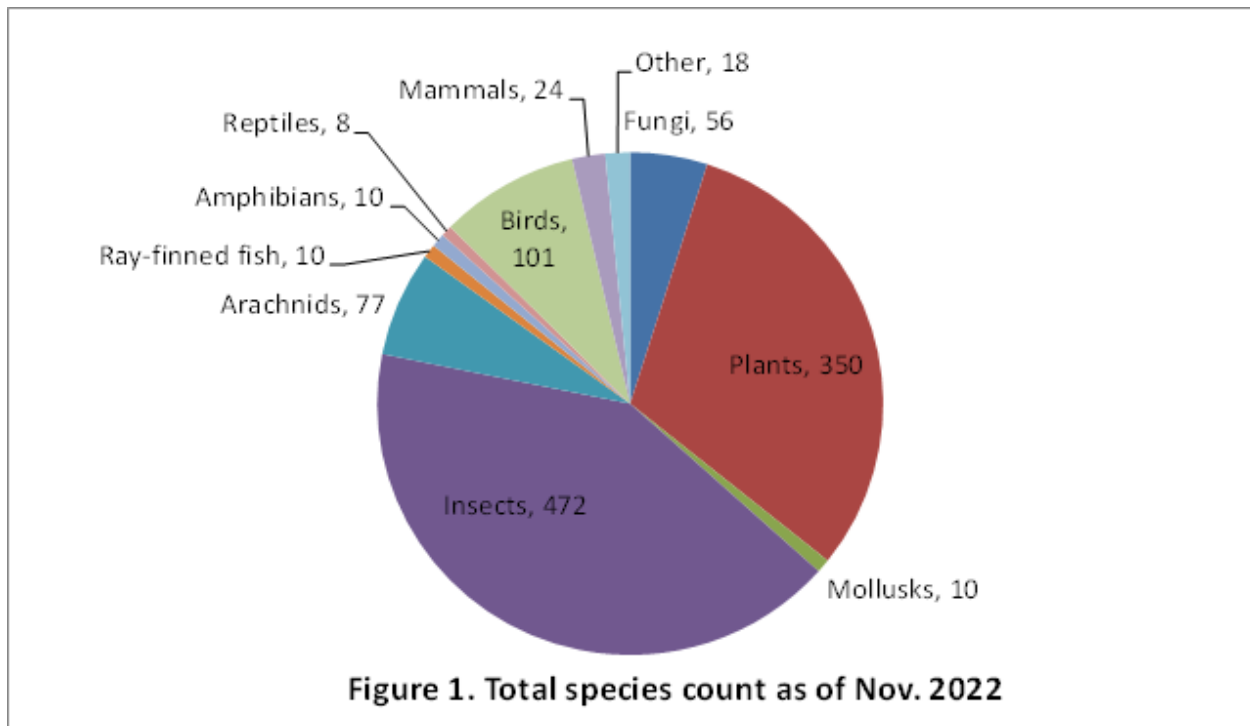
There is nothing wrong with keeping the occasional fish for the table. However, "selective harvesting" should be practiced. This simply means keeping smaller fish for a meal and releasing larger adult fish. the optimum size of bass to keep for a meal is a 1 – 1/2 pound fish.

### **iNaturalist Report 2022**

Contributed by Kit Muma and Bruce Smith

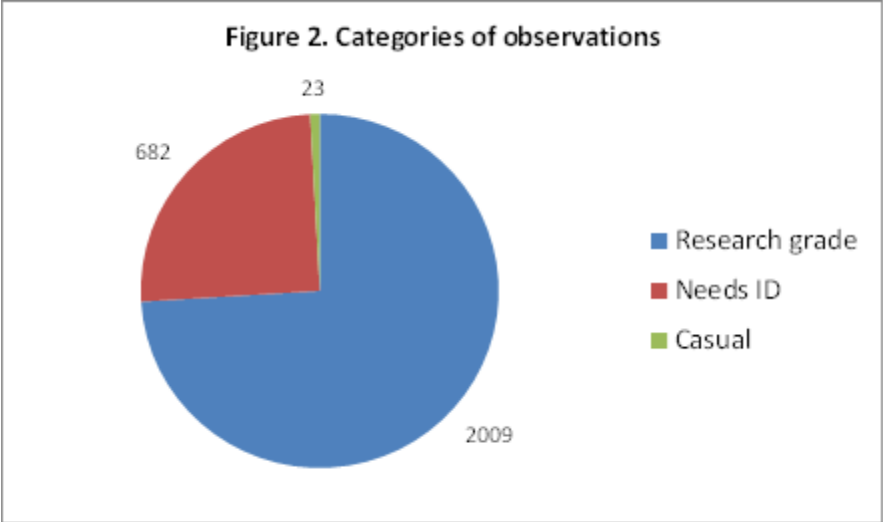
During this past year 14 new observers joined the Otty Lake iNaturalist project for a total of 91 neighbours contributing to the site. The group increased our species count by more than 125 and added over 500 observations in 2022 (as of November 26<sup>th</sup>).

Figure 1 shows the total species count in each major taxonomic group. Not surprisingly, the top 3 organisms observed were insects and plants followed by birds.

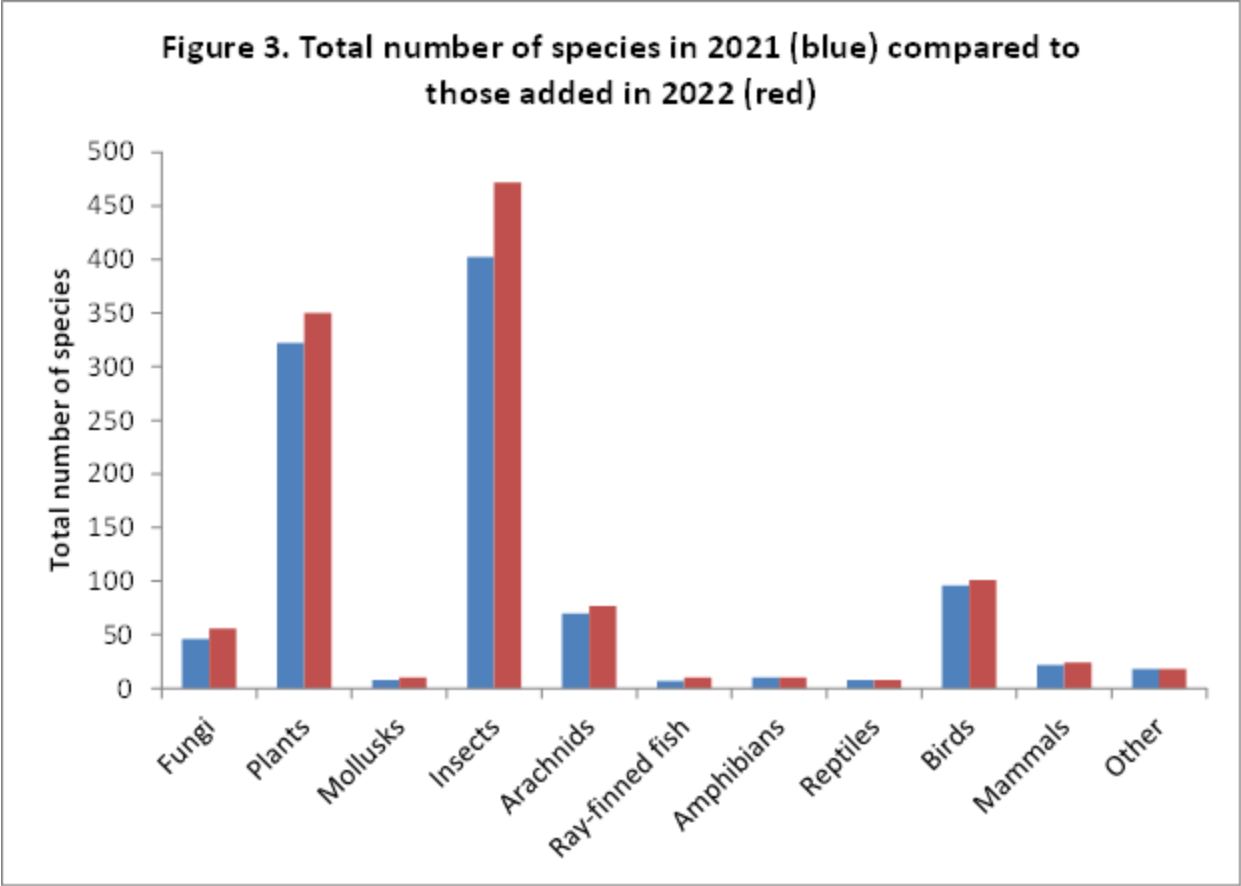


We mostly have quality observations (65%). “Research Grade” means that the community agrees on an identification at the species level. Ideally we want all our observations to meet this criterion since these are the ones of most scientific value. Those that “Need ID” have the date, location and a valid photo or sound file but have not been verified by another iNaturalist community member. Sometimes the photo does not show the diagnostic features needed for an identification. The more you work with a group, the more you will become familiar with what characters distinguish species. The iNaturalist site has guides and you can ask other observers for help. “Casual grade” usually means that a photo or sound file have not been uploaded to support the observation. The date or location may be in question as well or the organism may be captive or cultivated.

There are 682 observations on our page that need identification. If you know a taxonomic group and feel confident in recognizing them, please log on and verify the observations. If you have posted photos that have not been given research grade, you can reach out to experts on the iNaturalist platform to help you. They may ask for more details so it is a good idea to take multiple photos and include notes on habitat and/or behaviour.



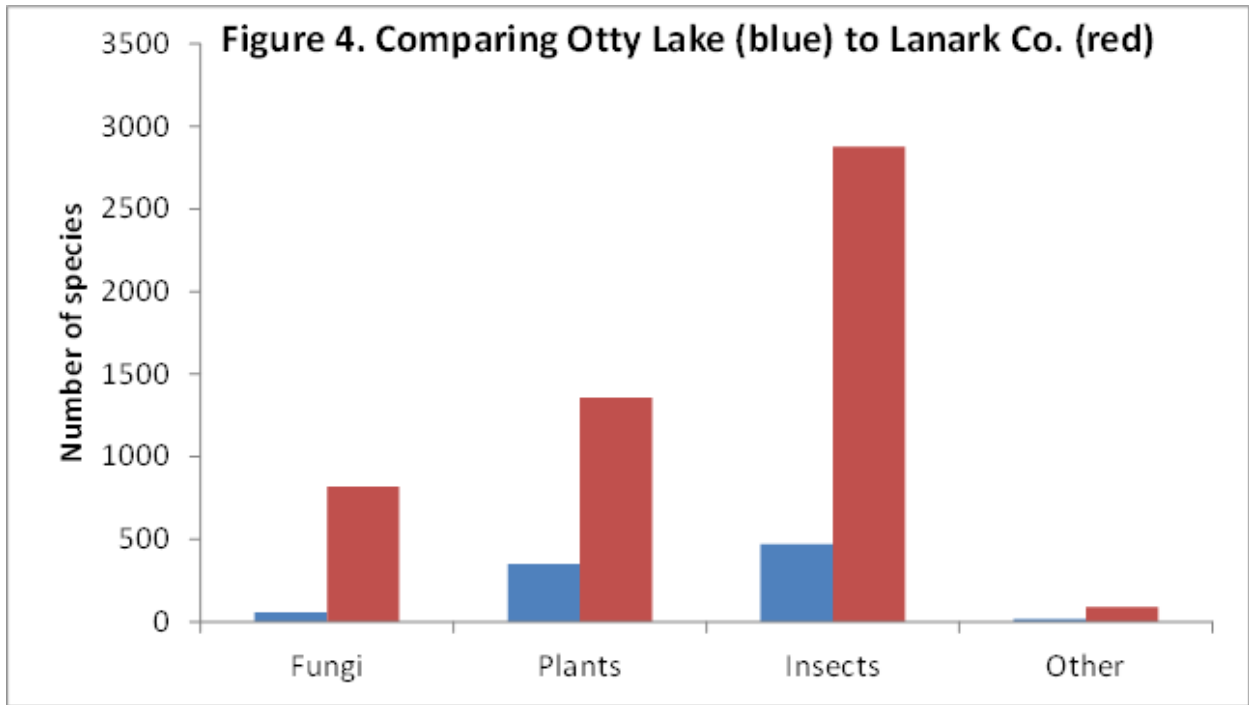
Most of our gains in species were insects (70), plants (28) and fungi (10) (Figure 3). We added new birds including common nighthawk (seen migrating), bank swallow (in with a flock of barn and tree swallows), sharp-shinned hawk and Nashville warbler. Two new mammal species were also added – Northern short-tailed shrew and evening bats (Vespertilionidae – the exact species was not identified). We did not increase our counts of reptiles and amphibians although that likely means we have documented most that are present.



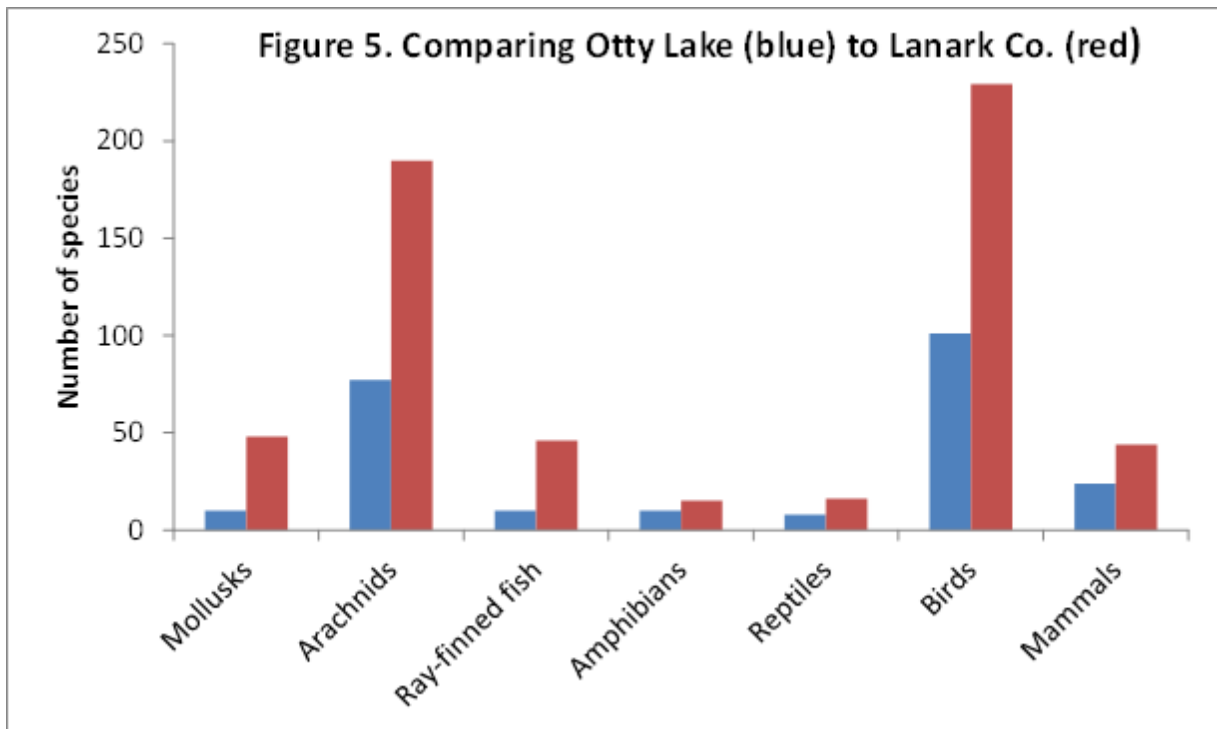
Otty Lake falls within the boundaries of the Lanark County Biodiversity project and our numbers contribute to their counts. Obviously there are many more observers in Lanark County (2145) and the area encompasses a variety of habitats not represented in the Otty Lake watershed. It is still interesting to make a comparison with our observations.

Figures 4 and 5 illustrate the observations from Otty Lake that add to the Lanark County counts. Overall there are 5890 species documented within the county. Otty Lake observers contributed less than 1% of the fungi, 25.7% of the plants, 16.4% of the insects. One of the insect groups we need to improve upon is the moths. Mark Read has done an amazing job sampling the moths of Murphys Point Provincial Park and we encourage folks to set up lights and traps next summer to increase our representation.





We are doing better when it comes to the arachnids (40.5%), birds (44%) and mammals (54.4%). In fact, over 30 species of arachnids from Otty Lake are the only ones of their kind reported in the county. We have recorded 10 species of fish out of the 46 found in the county (only 22%).



The top 10 observations (totals) were:

Common snapping turtle – 25  
American toad – 23  
Wood duck – 20  
Northern leopard frog – 16  
Painted turtle – 15  
Monarch butterfly – 14  
Common loon – 13  
Northern watersnake – 13  
White-tailed deer – 13  
American goldfinch – 13

It is nice to see that some of our declining and threatened species are featured in the common sightings. There were fewer sightings of Spongy Moth (aka LDD/Gypsy) in 2022 and so far no reports the Hemlock wooly adelgid bug or spotted lanternfly – two invasive insects to be watching for.

There are many opportunities to document the biodiversity on and around the lake. Cell phones have made it possible to take photos or record sounds anywhere, anytime. It doesn't have to be something rare and it is just as important to document the seasonal changes as Global Warming becomes more apparent.

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

### **Otty Lake Association Shoreline Planting Project**

Contributed by Rachel Roth

The Otty Lake association partnered with the Rideau Valley Conservation Authority (RVCA). The benefits of this shoreline planting project to Otty Lake are many and include: decreased run off, increased biodiversity and significant shoreline protection.

Plants were picked up by purchasers on June 11, 2022. A total of 175 plants were sold to 37 households. Plants sold were 75 Elderberry, 50 Fly Honeysuckle and 50 Steeplebush, all native to Otty Lake. OLA members paid \$8 per plant and the RVCA contributed \$500. The plants were obtained from the Ferguson Nursery. The OLA made a slight profit on the project.



Elderberry



Steeplebush



Fly Honeysuckle

## Loon Survey Project

Contributed by Kyla Haley

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!

