The Cataraqui Region Conservation Authority (CRCA) has provided environmental leadership and service to local communities since 1964. It is one of 36 watershed-based agencies within Ontario dedicated to the conservation and protection of the natural environment through a variety of management tools including land ownership, education, monitoring, reporting and regulation.

To learn more about the lakes in our region, the CRCA and partners collect samples, take measurements and compare this information against established standards to identify any significant changes or areas of concern. This Lake Fact Sheet focuses on key parameters to assess the health and resilience of Benson Lake with respect to nutrient loading, invasive species colonization and acidification.
Benson Lake is located within the Cataraqui River watershed off Indian Lake Road and is part of the Rideau Canal System. Nearby lakes include Indian Lake, Mosquito Lake, Loon Lake, Clear Lake, and Newboro Lake.

**County:** United Counties of Leeds Grenville  
**Municipality:** Township of Rideau Lakes  

**Watershed:** Cataraqui River  
**Average Depth (m):** 2.70  
**Coordinates:** 44.571 Lat., -76.353 Long.  
**Volume (m³ x 10⁶):** 52.9

<table>
<thead>
<tr>
<th>SURFACE AREA (HA)</th>
<th>MAX. DEPTH (M)</th>
<th>SHORE LENGTH (KM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>209</td>
<td>12.0</td>
<td>24.6</td>
</tr>
</tbody>
</table>
This map shows water depths and the topography of the lake bottom (bathymetry), as well as the direction of water flow. Benson Lake is directly connected to Mosquito Lake and to Indian Lake via Benson Creek.
Lake Characteristics

Benson Lake is a natural, mid-depth, warmwater lake on the Canadian Shield enhanced by dam construction and including shallow back bays. As with most lakes within the Cataraqui Region, Benson Lake ‘mixes’ in the spring and fall due to the lake water warming and cooling. During this mixing process, nutrients are cycled throughout the lake, giving the water a cloudy appearance, as well as a brown or green hue from algae that feed off the cycling nutrients. Later in the spring, summer, and winter, water temperatures vary by depth (thermal stratification) so multiple fish species are found at different depth and temperature ranges. Refer to the Cataraqui Region Lake Assessment Report for more detail.

Water levels are controlled through dam operations on the Rideau Canal System by Parks Canada. The closest upstream dams are Bedford Mills, Newboro Locks and Buck Lake Dam, while Chaffey’s Locks is the nearest downstream water control structure. With the building of locks, Benson Lake was raised by about 2.0 meters and the lake size was doubled. Many of the flooded areas are now shallow marshland habitat. Indian, Mosquito, Loon, Clear and Newboro Lakes are also managed by the above water control structures. Water levels are maintained within one-meter fluctuation based on seasonal variations in rainfall, snowmelt, and evaporation.

Lake Features

Important Natural Features:
Provincially Significant Wetland

Surrounding Land Use:
Woodlands, Wetlands, Agriculture, Residential (year-round and seasonal)

Primary Water Level Control:
Parks Canada

Water Access:
Indian Lake Marina or Brown’s Marine (fees apply)
Information about Benson Lake has been used to identify whether it is vulnerable to a few common stressors to lake water quality and biodiversity. Stressors include excess nutrient build up (eutrophication), the introduction of invasive species, and pH levels that are too low (acidification). Refer to the scoring card below that grades these risks for Benson Lake.

**EUTROPHICATION:** The process of increasing nutrient levels in a waterbody. It results in excess algal growth, lower oxygen levels, and reduced biodiversity. For more information refer to the Cataraqui Region Lake Assessment Report.

- **Low:** Low nutrient levels (oligotrophic), minimal algae present
- **Medium:** Moderate nutrient levels (mesotrophic), algae present
- **High:** High nutrient levels (eutrophic), algae bloom presence likely

**INVASIVE SPECIES:** Species that are not native to an environment, but are introduced, establish, and reproduce in a new system. For more information about invaders in the region, refer to Appendix 5 of the Cataraqui Region Lake Assessment Report.

- **Absent:** No aquatic invaders reported
- **Present:** Aquatic invaders established
VULNERABILITY

ACIDIFICATION: The process of lake water becoming more acidic, resulting in reduced biodiversity and increased water clarity.

- **Low:** pH 6.5 to >7.5, not impacted, neutral or alkaline conditions
- **Medium:** pH 6 to 6.5, sensitive but acceptable range
- **High:** pH <6 hyper-sensitive, threatened or critically impaired

BENSON LAKE VULNERABILITY SCORES

<table>
<thead>
<tr>
<th>Eutrophication</th>
<th>Invasive Species</th>
<th>Acidification</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIGH</td>
<td>PRESENT</td>
<td>NO DATA</td>
</tr>
</tbody>
</table>

- Based on an average total phosphorus concentration of 0.03 mg/L, nutrient concentrations are in excess with eutrophic conditions suitable for nuisance algae bloom growth
- Zebra mussels have been reported by Parks Canada
The water quality of a lake is affected by many factors including temperature, pH, oxygen, nutrients (trophic status), and transparency (Secchi disk depth). Classifying lakes by these factors can provide a better understanding of lake health. For more information, refer to the Cataraqui Region Lake Assessment Report.

**Water Quality Summary**

**Thermal Regime:** Warmwater

**Dissolved Oxygen (mg/l):** No data

**Trophic Status:** Eutrophic

**Average Secchi Depth (m):** 61.2

**Total Phosphorus (mg/l):** 0.029

**pH:** No data

**Average Calcium(mg/l):** 14.54

Benson Lake is a warm environment and home to a diversity of aquatic species. An average Secchi disk depth of less than 1.2 meters is an indicator that algae blooms may be growing within the lake. This is also the threshold for safe swimming conditions. It should be noted that the Secchi disk depth was recorded in the southwest bay, an area much shallower than the remainder of the lake, which includes wetland habitat that can be expected to have lower light penetration. For comparison, Secchi readings from the deepest point in 2006 showed a transparency of 3.8 meters. Average total phosphorus concentrations have maintained eutrophic conditions since 2009. This may be due to higher nutrient inputs from the surrounding wetlands or as a result of flow from upstream lakes along the Canal system.

Benson Lake has sufficient calcium levels to support the healthy growth and development of shells and skeletons; this also means that invasive mussels can reproduce in the lake. Zebra mussel communities have been reported to be in Benson Lake by Parks Canada.
Benson Lake hosts many sport fish. Bass and pike are the most prevalent and have been managed over the past several years. Fish species previously caught on Benson Lake are listed below. There are also a variety of minnows supplementing the food chain along the shallow shoreline areas that have not been recorded.

<table>
<thead>
<tr>
<th>COMMON FISH FAMILIES</th>
<th>SPECIES PRESENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>North American Catfish</td>
<td>Brown Bullhead</td>
</tr>
<tr>
<td>Pikes</td>
<td>Northern Pike</td>
</tr>
<tr>
<td>Sunfishes &amp; Basses</td>
<td>Largemouth Bass Smallmouth Bass Bluegill Black Crappie</td>
</tr>
<tr>
<td>Carps &amp; Minnows</td>
<td>Variety</td>
</tr>
<tr>
<td>Perches &amp; Darters</td>
<td>Yellow Perch</td>
</tr>
</tbody>
</table>
There are some species at risk in the region that will benefit from good lake care practices. At the time of reporting, the following species at risk have been observed within the last ten years:

- Blanding’s Turtle
- Northern Map Turtle
- Snapping Turtle
- Eastern Musk Turtle
- Bridle Shiner

Additional species may also be present, but have yet to be reported. It is important to conserve shoreline vegetation and woody debris, and reduce pollution to maintain healthy aquatic communities.

For more information, follow the links below:

- Fish ON-Line
- Reptile and Amphibian Atlas
- Zone 18 Fishing Regulations
- Guide to Eating Ontario Fish
- Species at Risk by Region
How to protect your lake

Maintain a natural shoreline:
Create a buffer zone by planting native species to control erosion, increase habitat for wildlife, maintain cooler water temperatures (shade), protect from flooding and improve water quality.

Contact Watersheds Canada to learn more about their Natural Edge shoreline naturalization program.

Build low impact-docks:
Increase habitat and reduce sediment disruption. Examples of low impact docks include cantilever, floating or post styles.

Reduce runoff from pollutants:
Use phosphate-free, biodegradable soaps and detergents at a distance from the lake and limit or eliminate fertilizers to decrease nutrient input. Limit the amount of hard surfaces to control runoff of pollutants entering the lake.

Handle and dispose of chemicals properly:
Fuel motor craft responsibly to avoid spills and bring extra chemicals and storage containers to a hazardous waste depots.

Manage animal waste and grazing areas:
Avoid overgrazing as it can expose soil and increase erosion. Remove animal waste to avoid excess nutrients.

Maintain your septic system:
Septic systems can last 15-25 years if properly maintained; pump out your septic tank every 3-5 years. Keep septic systems far from the shore to reduce risk of water pollution and limit damage.

Prevent the spread of invasive species:
Clean, drain, dry and disinfect any watercraft prior to entering the lake. Do not release live fishing bait or aquarium fish.
Become a citizen scientist:
Citizen science is a great way to learn and engage with nature. Volunteers provide valuable research that allow scientists to track environmental changes to a greater extent than if they were to do it alone. Learn how to get involved by visiting the sites below.

Invading Species Watch Program
Lake Partner Program
Loon Watch
Nature Watch (frog, plant, ice, worm)
Ontario Reptile & Amphibian Atlas
Water Rangers

www.invadingspecies.com
www.desc.ca
www.birdscanada.org
www.naturewatch.ca
www.ontarionature.org
www.waterrangers.ca

To report large blooms of algae:
Leeds, Grenville & Lanark Health Unit 613-345-5685
Blue-Green Algae Bloom Sighting (MOECC) 1-800-268-6060

To report invasive species:
EDD Mapping System App
Invasive Species Hotline (OFAH)

www.eddmaps.org/ontario
1-800-563-7711 or info@invadingspecies.com

For more information:
Cataraqui Region Conservation Authority 1-877-956-2722 or 613-546-4228
Water Level Questions (Parks Canada) 1-888-773-8888

1 Parks Canada - Rideau Canal System
2 Based on average total phosphorus data provided by the Lake Partner Program and PWQO guidelines
3 Average Secchi disk depth provided by the Lake Partner Program (southwest basin)
4 Average data values provided by the Lake Partner Program
5 Ministry of Natural Resources and Forestry Fisheries Data (Fish ON-line and personal communication, 2016)
6 Ontario Nature Reptile and Amphibian Atlas and Fisheries and Oceans Canada (2016)