LAKE FACT SHEET (2017)
INDIAN LAKE

CATARAQUI REGION CONSERVATION AUTHORITY
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 Indian Lake with respect to nutrient loading, invasive species colonization and acidification.
Indian Lake is located in the upper reaches of the Cataraqui River watershed at Chaffey’s Lock. Nearby lakes include Devil Lake, Loon Lake, Newboro Lake, Mosquito Lake, Benson Lake, Clear Lake, Opinicon Lake and Sand Lake.

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

**Watershed:** Cataraqui River  
**Average Depth (m):** 10.0  
**Coordinates:** 44.592 Lat., -76.327 Long.  
**Volume (m³ x10⁶ ):** 26.8

<table>
<thead>
<tr>
<th>Surface Area (ha)</th>
<th>Max. Depth (m)</th>
<th>Shore Length (km)</th>
</tr>
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<tbody>
<tr>
<td>266</td>
<td>26.0</td>
<td>18.2</td>
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</table>
The map below shows water depths the topography of the lake bottom (bathymetry) and direction of water flow. Water flows into Indian Lake from Mosquito Lake, Clear Lake and Benson Lake, and out into Lake Opinicon.
Indian Lake is a natural, mid-depth, coldwater lake located on the Canadian Shield and enhanced by the construction of a dam. As with most lakes within the Cataraqui Region, Indian 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 regulated through the Rideau Canal System by Parks Canada at Chaffey’s Locks. As a result of the lock construction, Indian Lake water level was raised by about 1.2 meters\(^1\). Indian, Mosquito, Newboro, Clear and, Benson Lakes are also managed at this lock station. Water levels are maintained within one-meter fluctuation based on spring/summer and fall/winter variations in rainfall, snowmelt, and evaporation. The majority of the shoreline has been developed for residential use (seasonal and permanent), however, an expanse of undeveloped area remains along the northern shoreline.

**LAKE FEATURES**

**IMPORTANT NATURAL FEATURES:**
Provincially Significant Wetland

**SURROUNDING LAND USE:**
Woodlands, Wetlands, Residential (year-round and seasonal)

**PRIMARY WATER LEVEL CONTROL:**
Parks Canada (Rideau Canal System) at Chaffey’s Locks

**WATER ACCESS:**
Past Brown’s Marine on Chaffey’s Lock Road (no fee); Marina Road to Indian Lake Marina (fee)
Information about Indian 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 Indian 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
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

INDIAN LAKE VULNERABILITY SCORES

<table>
<thead>
<tr>
<th>Eutrophication</th>
<th>Invasive Species</th>
<th>Acidification</th>
</tr>
</thead>
<tbody>
<tr>
<td>MEDIUM</td>
<td>PRESENT</td>
<td>LOW</td>
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- Based on an average total phosphorus concentration of 0.012 mg/L, nutrient levels are moderate providing for a productive lake with some risk of nuisance algae bloom growth
- Zebra mussels have been reported in Indian Lake by Parks Canada
- Indian Lake maintains a neutral pH with little risk to acidification
Indian Lake is host to splake communities suggesting the environment is coldwater habitat. Although dissolved oxygen concentration data are not available, it can be inferred that levels are within a healthy range since young trout species require a minimum of seven mg/L of dissolved oxygen to ensure proper growth. Indian Lake is on the border between mesotrophic and oligotrophic conditions. The relatively deep Secchi disk depth can indicate low nutrient levels. However, the average total phosphorus concentrations are a more accurate measure of nutrient levels and show that higher nutrient concentrations are cycling within the lake. As shown on the phosphorus graph, total phosphorous levels are stable.

The Ministry of Natural Resources and Forestry (1989) has predicted that low pH (acidic) conditions are unlikely based on a high buffering capacity due to high carbonate and calcium concentrations within the lake. This means that the wide range of species found in Indian Lake will be protected from the effects of acidification. Average calcium is crucial for the formation of shells and skeletons. Indian Lake’s average calcium and pH results indicate slightly alkaline conditions for healthy growth and development and for the successful reproduction of invasive mussels. Zebra mussels have been reported along the Rideau Canal System, including Indian Lake.
Indian Lake hosts a large diversity of warm and coldwater fish species indicating good water quality and habitat availability for sensitive species with little able to adapt to changes in chemistry and temperatures. Fish species previously caught on Indian Lake are listed below. There are also a variety of minnows supplementing the food chain along the shallow shoreline areas that have not been listed.

<table>
<thead>
<tr>
<th>COMMON FISH FAMILIES</th>
<th>SPECIES PRESENT</th>
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<tbody>
<tr>
<td>North American Catfish</td>
<td>Brown Bullhead</td>
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<tr>
<td></td>
<td>Yellow Bullhead</td>
</tr>
<tr>
<td>Pikes</td>
<td>Northern Pike</td>
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<tr>
<td>Trout &amp; Salmon</td>
<td>Splake</td>
</tr>
<tr>
<td>Sunfishes &amp; Basses</td>
<td>Largemouth Bass</td>
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<tr>
<td></td>
<td>Pumpkinseed</td>
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<tr>
<td></td>
<td>Bluegill</td>
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<tr>
<td></td>
<td>Rock Bass</td>
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<tr>
<td></td>
<td>Black Crappie</td>
</tr>
<tr>
<td>Topminnows</td>
<td>Banded Killifish</td>
</tr>
<tr>
<td>Carps &amp; Minnows</td>
<td>Variety</td>
</tr>
<tr>
<td>Perches &amp; Darters</td>
<td>Yellow Perch</td>
</tr>
<tr>
<td></td>
<td>Walleye</td>
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</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
- Eastern Musk Turtle
- Northern Map Turtle
- Snapping 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
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  www.invadingspecies.com
Lake Partner Program  www.desc.ca
Loon Watch  www.birdscanada.org
Nature Watch (frog, plant, ice, worm)  www.naturewatch.ca
Ontario Reptile & Amphibian Atlas  www.ontarionature.org
Water Rangers  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  www.eddmaps.org/ontario
Invasive Species Hotline (OFAH)  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 or information@pc.gc.ca

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1 Parks Canada – Rideau Canal System
2 Average total phosphorus data provided by the Lake Partner Program and PWQO
3 Average Secchi disk depth provided by the Lake Partner Program and Parks Canada (Rideau Canal) (2009-2015)
4 Data provided from Queen’s University (2012)
5 Average calcium concentration provided by Queen’s University (2012) and the Lake Partner Program
6 Ministry of Natural Resources and Forestry (1989) Acid Sensitivity of Lakes in Ontario
7 Ministry of Natural Resources and Forestry Fisheries Data (Fish ON-line and personal communication, 2016)
8 Ontario Nature Reptile and Amphibian Atlas and Fisheries and Oceans Canada (2016)