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 Opinicon Lake with respect to nutrient loading, invasive species colonization and acidification.
Opinicon Lake is located in the Cataraqui River watershed and hosts the Queen’s University Biology Station. Nearby lakes include Buck Lake, Benson Lake, Indian Lake, Lower Rock Lake, Hart Lake, Crow Lake, Sand Lake and Whitefish Lake.

**County:** United Counties of Leeds Grenville  
**Municipality:** Township of Rideau Lake and Township of South Frontenac

**Watershed:** Cataraqui River  
**Average Depth (m):** 2.50  
**Coordinates:** 44.559 Lat., -76.327 Long.  
**Volume (m$^3 \times 10^6$):** 22.4

<table>
<thead>
<tr>
<th>Surface Area (ha)</th>
<th>Max. Depth (m)</th>
<th>Shore Length (km)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>785</strong></td>
<td><strong>10.7</strong></td>
<td><strong>57.0</strong></td>
</tr>
</tbody>
</table>
The map below shows water depths, the topography of the lake bottom (bathymetry), and direction of water flow. Water flows into Lake Opinicon from Indian Lake, Warner Lake, Hart Lake, and Lower Rock Lake, and flows out to Sand Lake. The Queen’s University Biology Station is located on the west side of the Lake off of Opinicon Road.

Legend

- **Boat Launch**
- **Outflow**
- **Inflow**

Lake Depth (m)

- 0-1
- 2-3
- 4-5
- 6-7
- 8-9
- 10+

Disclaimer: This map is not intended for navigational purposes. Bathymetry Data © Navionics © crca.ca/disclaimer
Opinicon Lake is a natural, mid-depth, warmwater lake located on the Canadian Shield and enhanced by the construction of a dam. Like the majority of lakes within the Cataraqui Region, Opinicon Lake mixes in the spring and fall due to lake water warming and cooling. During mixing, nutrients are cycled throughout the lake twice per year and may appear cloudy with a brown or green colour from algae that use the cycled 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 Davis Locks. Water levels are maintained within 0.5 meter fluctuation based on seasonal variations in rainfall, snowmelt, and evaporation.

LAKE FEATURES

IMPORTANT NATURAL FEATURES:
Provincially Significant Wetland, Area of Natural & Scientific Interest

SURROUNDING LAND USE:
Woodlands, Wetlands, Residential (Seasonal & Permanent)

PRIMARY WATER LEVEL CONTROL:
Parks Canada (Rideau Canal System) at Davis Locks

WATER ACCESS:
Off Chaffey’s Lock Road (launch fee)
Information about Opinicon 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 Opinicon 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

**OPINICON 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>
</tr>
</tbody>
</table>

- Based on an average total phosphorus concentration of 0.013 mg/L, nutrient levels are moderate providing for a productive lake with some risk of nuisance algae bloom growth
- Zebra mussels have been observed along the shoreline of the lake¹
- Opinicon Lake maintains a neutral pH with little risk to acidification
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**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal Regime: Warmwater</td>
<td></td>
</tr>
<tr>
<td>Dissolved Oxygen (mg/l): ~7.0</td>
<td></td>
</tr>
<tr>
<td>Trophic Status: Mesotrophic^2</td>
<td></td>
</tr>
<tr>
<td>Average Secchi Depth (m): 4.25^3</td>
<td></td>
</tr>
<tr>
<td>Total Phosphorus (mg/l): 0.013^1</td>
<td></td>
</tr>
<tr>
<td>pH:</td>
<td>8.1^4</td>
</tr>
<tr>
<td>Average Calcium (mg/l): 11.2^5</td>
<td></td>
</tr>
</tbody>
</table>

Opinicon Lake hosts cisco, a coldwater fish species with dissolved oxygen levels at conditions suitable to support a high diversity of aquatic communities. Average total phosphorus and the Secchi disk depth indicate there are sufficient nutrients in the lake, and concentrations have been stable over the last seven years.

Average calcium is crucial for the formation of shells and skeletons. Calcium and pH conditions indicate slightly alkaline conditions with little risk to acidification. Conditions are suitable for maintaining a healthy zebra mussel population. Zebra mussel communities have been observed in Lake Opinicon since the early 1990s.
Opinicon Lake hosts a large diversity of warm and coldwater fish species. There are two fish sanctuaries located at Darlings Bay and Murphy Bay with restricted no fishing policies throughout the year. Fish species previously caught on Opinicon 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>
</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></td>
<td>Central Mudminnow</td>
</tr>
<tr>
<td>Suckers</td>
<td>White Sucker</td>
</tr>
<tr>
<td>Trout &amp; Salmon</td>
<td>Cisco</td>
</tr>
<tr>
<td>Herring</td>
<td>Alewife</td>
</tr>
<tr>
<td>Sunfishes &amp; Basses</td>
<td>Largemouth Bass</td>
</tr>
<tr>
<td></td>
<td>Smallmouth Bass</td>
</tr>
<tr>
<td></td>
<td>Pumpkinseed</td>
</tr>
<tr>
<td></td>
<td>Bluegill</td>
</tr>
<tr>
<td></td>
<td>Rock Bass</td>
</tr>
<tr>
<td></td>
<td>Black Crappie</td>
</tr>
<tr>
<td>Topminnows</td>
<td>Banded Killifish</td>
</tr>
<tr>
<td>Silversides</td>
<td>Brook Silverside</td>
</tr>
<tr>
<td>Carps &amp; Minnows</td>
<td>Blacknose Shiner</td>
</tr>
<tr>
<td></td>
<td>Bluntnose Minnow</td>
</tr>
<tr>
<td></td>
<td>Golden Shiner</td>
</tr>
<tr>
<td>Perches &amp; Darters</td>
<td>Yellow Perch</td>
</tr>
<tr>
<td></td>
<td>Johnny Darter</td>
</tr>
<tr>
<td></td>
<td>Iowa Darter</td>
</tr>
<tr>
<td></td>
<td>Tessellated Darter</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 Cohen, A.N., and A. Weinstein. 2001. Zebra mussel’s calcium threshold and implications for its potential distribution in North America. San Francisco Estuary Institute and Queen's University Biology Station
2 Average total phosphorus data provided by the Lake Partner Program and PWQO
3 Average Secchi disk depth provided by the Lake Partner Program (2009-2015) and Parks Canada (Rideau Canal)
4 Data provided from Queen’s University (2012)
5 Average total calcium concentration provided by the Lake Partner Program
6 Ministry of Natural Resources and Forestry Fisheries Data (Fish ON-line and personal communication, 2016)
7 Ontario Nature Reptile and Amphibian Atlas and Fisheries and Oceans Canada (2016)