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 Killenbeck Lake with respect to nutrient loading, invasive species colonization and acidification.
Killenbeck Lake is located in the Gananoque River watershed off County Road 3. Nearby lakes include Singleton Lake, Gananoque River (Lost Bay), Long Lake, Higley Lake and Charleston Lake.

**County:** United Counties of Leeds Grenville  
**Municipality:** Township of Leeds and the Thousand Islands

**Watershed:** Gananoque River  
**Average Depth (m):** 9.90  
**Coordinates:** 44.500 Lat., -76.053 Long.  
**Volume (m$^3$ x10$^6$):** 3.15

<table>
<thead>
<tr>
<th>Surface Area (ha)</th>
<th>Max. Depth (m)</th>
<th>Shore Length (km)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>50.0</strong></td>
<td><strong>27.7</strong></td>
<td><strong>5.74</strong></td>
</tr>
</tbody>
</table>
The map below shows water depths and the topography of the lake bottom (bathymetry), as well as the direction of water flow. Water flows into Killenbeck Lake from Higley Lake to the north and wetlands to the south, and out into Charleston Lake.
Lake Characteristics

Killenbeck Lake is a natural, deep, lake located on the Canadian Shield. As with most lakes within the Cataraqui Region, Killenbeck 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 naturally through changes in climate, precipitation, evaporation, and surrounding land use.

Lake Features

**Important Natural Features:**
Provincially Significant Wetland

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

**Primary Water Level Control:**
Natural

**Water Access:**
Off of County Road 3 (limited parking)
Information about Killenbeck 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 Killenbeck 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

**KILLENBECK LAKE VULNERABILITY SCORES**

<table>
<thead>
<tr>
<th>Eutrophication</th>
<th>Invasive Species</th>
<th>Acidification</th>
</tr>
</thead>
<tbody>
<tr>
<td>MEDIUM</td>
<td>ABSENT</td>
<td>NO DATA</td>
</tr>
</tbody>
</table>

- Based on an average total phosphorus concentration of 0.020 mg/L, nutrient levels are moderate providing for a productive lake with some risk of nuisance algae bloom growth
- The Invasive Species Watch Program have monitored this lake for zebra mussels and spiny water flea with no observations recorded.
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></th>
<th>No data</th>
<th>Total Phosphorus (mg/l):</th>
<th>0.020³</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal Regime:</td>
<td>No data</td>
<td>pH:</td>
<td>No data</td>
</tr>
<tr>
<td>Dissolved Oxygen (mg/l):</td>
<td>No data</td>
<td>Average Calcium(mg/l):</td>
<td>10.65³</td>
</tr>
<tr>
<td>Trophic Status:</td>
<td>Mesotrophic¹</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average Secchi Depth (m):</td>
<td>3.3²</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Killenbeck Lake nutrient concentration is on the border of eutrophic conditions. As shown on the total phosphorous graph, the lake has maintained a stable concentration of approximately 0.020 mg/L. This relatively stable high concentration could be partially due to natural wetland influences. Secchi disk depth indicates moderate transparency for a mesotrophic condition.

Average calcium is low and should continue to be monitored. Zebra mussels have been found at this calcium concentration threshold in other lakes, however, there are no sightings at Killenbeck Lake.
Killenbeck Lake hosts many sport fish suitable to a wide range of habitats. Fish species previously caught on Killenbeck 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</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>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>
</tr>
</tbody>
</table>
Aquatic Diversity

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
- Grass Pickerel

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  
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  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

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1 Based on total phosphorus data provided by the Lake Partner Program from (2009-2011) and PWQO
2 Average Secchi Disk depth provided by the Lake Partner Program (2009-2010)
3 Averages provided by the Lake Partner Program
4 Ministry of Natural Resources and Forestry Fisheries Data (Fish ON-line and personal communication, 2016)
5 Ontario Nature Reptile and Amphibian Atlas and Fisheries and Oceans Canada (2016)