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 Lower Beverley Lake with respect to nutrient loading, invasive species colonization and acidification.
Lower Beverley Lake is located near the headwaters of the Gananoque River watershed. Nearby lakes include Sand Lake, Upper Beverley Lake, Green Lake and Lyndhurst Lake.

**County:** United Counties of Leeds Grenville  
**Municipality:** Township of Rideau Lakes (small portion in the Township of Leeds and the Thousand Islands)  
**Watershed:** Gananoque River  
**Coordinates:** 44.592 Lat., -76.142 Long.  
**Average Depth (m):** 9.1  
**Volume (m³x10⁶):** 70.2

<table>
<thead>
<tr>
<th>SURFACE AREA (HA)</th>
<th>MAX. DEPTH (M)</th>
<th>SHORE LENGTH (KM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>766</td>
<td>28.7</td>
<td>43.9</td>
</tr>
</tbody>
</table>
The map below shows water depths and the topography of the lake bottom (bathymetry). It also presents the two distinct basins and direction of water flow. Water flow enters Lower Beverley Lake from Upper Beverley Lake through Delta Creek, and flows into Lyndhurst Creek towards Lyndhurst Lake.

Disclaimer: This map is not intended for navigational purposes. Bathymetry Data © MNRF © crca.ca/disclaimer
Lower Beverley Lake is a natural, deep, warmwater lake enhanced by the construction of a dam located on the Canadian Shield. Like the majority of lakes within the Cataraqui Region, Lower Beverley 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. For the purposes of water quality assessment, the lake is split into three main basins (Black Jack Island, Kendrick’s Bay, and Oak Bay). Oak Bay is the western arm and is very shallow with dense aquatic vegetation and higher turbidity. Black Jack and Kendrick’s Bays are deeper and clearer.

Water levels are controlled by the Ministry of Natural Resources and Forestry (MNRF) at Lyndhurst Dam directly on the lake and via Delta Creek at Delta Dam. Levels are maintained within a one meter fluctuation based on changes in precipitation, snowmelt, water usage, and rate of evaporation.

**LAKE FEATURES**

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

**SURROUNDING LAND USE:**
Woodlands, Wetlands, Agriculture, Residential (seasonal and permanent)

**PRIMARY WATER LEVEL CONTROL:**
Ministry of Natural Resources and Forestry at Lyndhurst Dam

**WATER ACCESS:**
Off Lower Beverley Lake Road
Information about Lower Beverley 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 Lower Beverley 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](#).

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Low nutrient levels (oligotrophic), minimal algae present</td>
</tr>
<tr>
<td>Medium</td>
<td>Moderate nutrient levels (mesotrophic), algae present</td>
</tr>
<tr>
<td>High</td>
<td>High nutrient levels (eutrophic), algae bloom presence likely</td>
</tr>
</tbody>
</table>

**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.

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absent</td>
<td>No aquatic invaders reported</td>
</tr>
<tr>
<td>Present</td>
<td>Aquatic invaders established</td>
</tr>
</tbody>
</table>
**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

**Lower Beverley 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 0.020 mg/L, nutrient levels are moderate providing for a productive lake with some risk of nuisance algae bloom growth
- There have been sightings of zebra mussels by the Lower Beverley Lake Association
- Lower Beverley Lake maintains a neutral pH with little risk of 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](#). The lake has three main bays with differing features such as depths, sediments, and shoreline and land use therefore sampling occurs and is recorded for each separate basin.

**Water Quality Summary**

- **Thermal Regime:** Coldwater
- **Dissolved Oxygen (mg/l):** 7.63
- **Trophic Status:** Mesotrophic
- **pH:** 8.3

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\(^1\) Measured as dissolved oxygen
\(^2\) Based on average phosphorus concentrations
\(^3\) Measured as pH
Lower Beverley Lake is host to splake, a coldwater fish that lives in the deep habitats of coldwater areas throughout the lake. Dissolved oxygen is at optimal concentrations to provide good habitat for young fish growth. The Secchi disk depth is bordering eutrophic conditions in Oak Bay suggesting clarity is reduced and turbidity may be high due to algae growth as a common stressor. Average total phosphorus concentrations indicate eutrophic conditions for Oak Bay; however, a decreasing trend was identified and is shown on the graph. The other bays are maintaining a mesotrophic status with moderate nutrient concentrations that can sustain a high biological diversity.

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 concentration within the lakes. This means that the wide range of species found in Lower Beverley Lake will be protected from the effects of acidification. Average calcium is crucial for the formation of shells and skeletons. In Lower Beverley Lake, average calcium concentrations are moderate suggesting good conditions for biotic growth. pH in 2008 was recorded at an average of 8.3 indicated slightly alkaline conditions to buffer against minerals from weathering rocks and acidity over time. The majority of the lake has concentrations suitable for invasive mussels. Zebra mussels have been reported within the lake.
Lower Beverley Lake is host to a high diversity of fish ranging from warmwater to coldwater species. When coldwater species such as trout are present, this is a good indication of water quality since these species are highly sensitive to specific habitat conditions. Fish species previously found in Lower Beverley Lake are listed below. American Eel, an endangered fish in Ontario, was historically present within the lake but is no longer found due to stressors such as zebra mussels, shoreline development, and changes in nutrient concentrations. There are also a variety of minnows supplementing the food chain along the shallow shoreline areas that have not been recorded. Lower Beverley Lake is a popular fishing spot for largemouth bass, smallmouth bass and northern pike.

<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></td>
<td>Yellow Bullhead</td>
</tr>
<tr>
<td>Pikes</td>
<td>Northern Pike</td>
</tr>
<tr>
<td></td>
<td>Grass Pickerel</td>
</tr>
<tr>
<td></td>
<td>Central Mudminnow</td>
</tr>
<tr>
<td>Trout &amp; Slamon</td>
<td>Splake</td>
</tr>
<tr>
<td>Suckers</td>
<td>White Sucker</td>
</tr>
<tr>
<td>Sticklebacks</td>
<td>Brook Stickleback</td>
</tr>
<tr>
<td>Cods</td>
<td>Bowfin</td>
</tr>
<tr>
<td>Topminnows</td>
<td>Banded Killifish</td>
</tr>
<tr>
<td>Silversides</td>
<td>Brook Silverside</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>Common Carp</td>
</tr>
<tr>
<td></td>
<td>Bluntnose Minnow</td>
</tr>
<tr>
<td></td>
<td>Emerald Shiner</td>
</tr>
<tr>
<td></td>
<td>Spottail Shiner</td>
</tr>
<tr>
<td>Perches &amp; Darters</td>
<td>Yellow Perch</td>
</tr>
<tr>
<td></td>
<td>Johnny Darter</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
- 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 spe-
cies 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 natural-
ization 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 sur-
faces 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 pollu-
tion 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
Lower Beverley Lake Association  http://lbla.net

2 Average total phosphorus data from the Lake Partner Program (2009-2015)
3 Gananoque River Watershed Community Stewardship Project: Phase 1 (2008)
4 Averages 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