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 Red Horse Lake with respect to nutrient loading, invasive species colonization and acidification.
Red Horse Lake is part of the Gananoque River watershed and is located east of County Road 3 and southeast of Lyndhurst. Nearby lakes include Grippen Lake, Lyndhurst Lake, Singleton Lake, Gananoque River (Lost Bay), Long Lake, Higley Lake, Killenbeck Lake and Charleston Lake.

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

**Watershed:** Gananoque River  
**Average Depth (m):** 10.4

**Coordinates:** 44.541 Lat., -76.077 Long.  
**Volume (m³ x 10⁶):** 30.8

**SURFACE AREA (HA) | MAX. DEPTH (M) | SHORE LENGTH (KM)**
--- | --- | ---
302 | 36.9 | 27.0
The map below shows water depths and the topography of the lake bottom (bathymetry). It also presents the two distinct basins, names of the bays and islands, as well as the direction of water flow. Water flows into Red Horse Lake from Grippen Creek and Singleton Lake, and flows out to Black Rapids.
Red Horse Lake is a natural, deep, coldwater lake located on the Canadian Shield. As with most lakes within the Cataraqui Region, Red Horse 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.

Although there are no water control structures on the lake, there are two dams upstream at Delta and Lyndhurst, and an additional three downstream at Outlet, Marble Rock, and Gananoque. Weather conditions, and to a lesser extent dam operations, affect the water level of Red Horse Lake. The Delta, Lyndhurst and Outlet Dams are operated by the Ontario Ministry of Natural Resources and Forestry (MNRF), while the other two are controlled by Energy Ottawa.

LAKE FEATURES

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

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

**PRIMARY WATER LEVEL CONTROL:**
Natural

**WATER ACCESS:**
Wilson’s Tent & Trailer Park via Lyndhurst Lake (small craft only; fees apply), Singleton Family Campground (fee applies)
Information about Red Horse 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 Red Horse 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

### RED HORSE 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 0.017 mg/L, nutrient levels are moderate, providing for a productive lake with some risk of nuisance algae bloom growth
- Zebra mussels are established in Red Horse Lake
- Red Horse Lake maintains a neutral pH with little risk of acidification
Red Horse Lake is a coldwater lake. Colder lakes generally have higher oxygen levels which are necessary for the survival of sensitive species such as trout. Although there are no recent dissolved oxygen data available for Red Horse Lake, the presence of lake trout suggests average dissolved oxygen values of 7-10 mg/L.

The trophic status, based on average total phosphorus concentrations, is considered mesotrophic with moderate nutrient levels. Nuisance algal growth is not expected at this level, but care must be taken to ensure that the levels do not increase to exceed the Provincial Standard of 0.02 mg/L or pass the threshold to become eutrophic. An average Secchi disk depth of 4.6 m also supports this trophic status. Refer to the Cataraqui Region Lake Assessment Report for more detail.

The Ontario 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, such that the wide range of species found in Red Horse Lake will be protected from the effects of acidification.

Red Horse 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 mussels have been reported throughout the lake.
Red Horse Lake is a highly sensitive lake trout lake hosting a diversity of fish species. This lake is deep and there are many cold sections providing critical habitat for species such as lake trout. When trout are present, this is a good indication of water quality since these species are highly sensitive to specific habitat conditions. Fish species previously caught on Red Horse 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>Trout &amp; Salmon</td>
<td>Lake Whitefish, Lake Trout, Splake</td>
</tr>
<tr>
<td>Cod</td>
<td>Burbot</td>
</tr>
<tr>
<td>Sunfishes &amp; Basses</td>
<td>Largemouth Bass, Pumpkinseed, Bluegill, Rock Bass, White Crappie</td>
</tr>
<tr>
<td>Carps &amp; Minnows</td>
<td>Blackchin Shiner, Bluntnose Minnow</td>
</tr>
<tr>
<td>Perches &amp; Darters</td>
<td>Yellow Perch</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:

- Eastern Musk Turtle
- Northern Map 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

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) 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 (MNRF) 1-800-667-1940

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1 Average total phosphorus data provided by the Lake Partner Program and PWQO
2 Average Secchi Disk depth provided by the Lake Partner Program (2009-2015)
3 Average total calcium concentration provided by the Lake Partner Program (2009-2015)
4 Ministry of Natural Resources and Forestry (1989) Acid Sensitivity of Lakes in Ontario
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)