

The Northern Reflection

Lake Steward Report

Celebrating our Accomplishments – Addressing the Challenges

Submitted by Fred McConnell



Its a Celebration! - Wollaston Lake is honored to have been selected as one of a select group of Blue Lakes pilot lakes. This important "Ecolabel" recognizes leadership in Ontario lake stewardship. Look for additional information about our community celebration event this summer.

Wollaston Lake has and continues to be blessed by very good water quality thanks in no small part to the very special natural environment we inherited, monitored for many years by water quality testing supported by the Federation of Ontario Cottage Associations (FOCA) and the Wollaston Lake Home and Cottage Association (WLHCA).

Pioneers in the area of lake stewardship, FOCA and the Ontario Ministry of Natural Resources (MNR) piloted, in 1993, one of the first programs for lake stewardship in Ontario. This eventually lead to the formalization of the partnership with the Ontario Ministry of Environment (MOE) in the Lake Partner Program (LPP) and a database of testing results dating back to 2008.

The WLHCA has been an active participant in the LPP since its inception with a database of 10 years of water quality data. We have an active and engaged association with membership consistently in excess of 50% of the Wollaston lake front property owners. We also have a tradition of education/awareness programs such as the young stewards environmental camp and the shoreline garden design and Invasive milfoil workshop.

Blue Lakes Ecolabel Overview

Blue Lakes is an ecolabel promoting a code of conduct to encourage stewardship of Ontario lakes. Everyone plays a role in Blue Lakes! Watch for the kick off survey and more information coming throughout the summer.

An Ecolabel:

is a "seal" or label that assists the market to identify products or services as being less harmful to the environment than others. It requires certain indicators of sustainability or ecotourism

Ecolabels help consumers make environmentally responsible choices and encourage improvements and set standards

The Business case (based on the experience of the Blue Flag ecolabel for marinas):

It is known that a clean safe environment drives the local economy, and the Blue Flag has been shown to safeguard a prosperous economy presently and for future generations

A survey of Blue Flag marinas showed that 82% of respondents preferred an intact environment

Tourists are increasingly choosing environmentally friendly resorts

The Blue Lakes ecolabel promotes a code of conduct in environmental stewardship in the following areas:

1. Shoreline Health

Clearing/restoring/evaluating. A net improvement towards achieving a target percentage of the basin in a natural state

2. Citizen Science Monitoring

Lake Partner Program at minimum, angler diaries, breeding birds, loon watch, turtle tallies, etc.

3. Nutrient and Input Management

E.coli, septic health/pump outs and up to date systems, reduced hardening of surfaces, responsible lawn care, reduced road salt near lakes

4. Communications and Social Outreach

Provide *Best Management Practices* and *State of the Resource* reports to waterfront property owners, and educational content

5. Habitat Management

Promote better boating practices to protect loon and fish habitat, responsible levels of noise and fireworks, reduced night lighting for wildlife and human health, habitat enhancement projects

6. Invasive Species Management

Management plan, education and projects

Wollaston Lake is Funded for the Love Your Lake Program – Summer 2020

One of the programs to promote shoreline health within the Blue Lake ecolabel is the "Love Your Lake" program from Watersheds Canada. This program builds on the healthy shoreline workshop of 2018 by conducting an assessment the Wollaston Lake shoreline. Shoreline properties are assessed by students from a boat using GIS and GPS technology. A report is provided of the lake shoreline relative to a 75% naturalization target and opportunities for improvement are identified. The following link provides additional information:

<https://watersheds.ca/our-work/love-your-lake/>

Addressing the Challenges

While we have good reason to celebrate, we are faced with a number of challenges that potentially threaten the medium and long term health of Wollaston Lake so we can't afford to rest on our past accomplishments.

The Northern Reflection

These include but are not limited to negative pressure on the Lake Trout population and Water quality, invasive species, increase in algae, and changing water temperature due to climate change.

The following is the 2018 Water quality report which has been reviewed and approved by the MOECP.

In Summary:

- Water testing of Phosphorus, Water Clarity, Calcium and Dissolved Oxygen
 - o Phosphorus – While Satisfactory according to MOECC Guidelines there appears to be a change in the traditional pattern
 - Actions – Continue the detailed water quality lab analysis started with the MOECP in 2018, continue to test Phosphorus monthly through the LPP
 - o Water Clarity – Less Than Satisfactory for the second consecutive year compared to previous years
 - Action(s) – Form a Partnership with the UOIT (now the University of Ontario Institute of Technology) and/or Trent University faculty of Environmental studies specializing in Algae research.
 - o Calcium – Satisfactory according to MOECC Guidelines
 - o Dissolved Oxygen – Continued Potential Cause for Concern According to MOECC Guidelines
 - Action(s) – Conduct a Lake Trout Population study in partnership with the MNRF

2018 Water Quality Testing Results

For 2018, the WLHCA tested four water quality parameters: Total Phosphorus, Water Clarity, Calcium, and Dissolved Oxygen. The Lake Steward requested that the MOE conduct Dissolved Oxygen and detailed water quality testing to ensure calibration of WLHCA test data. Despite not being funded to do so the MOE completed the requested testing in July and September.

A) Phosphorus (Lake Partner Program & WLHCA)

Prior to 2015, under the Lake Partner Program (LPP), we sampled for phosphorus once a year in early May in the main

part of the lake. For Canadian Shield lakes, this is the best way to consistently assess year-to-year trends, since the water is unstratified (i.e. uniformly mixed) due to the “spring turnover.” For 2015 and 2016, with the agreement of the MOECC, we sampled phosphorus monthly during the summer season to assess whether the lake behaves more like a non-Canadian Shield lake i.e. exhibits more seasonal variation in phosphorus. In 2018, again with the agreement of the MOECP, we returned to a monthly sampling.

For our own additional sampling program (“WLHCA Program”) we also measure phosphorus levels in the three main lake basins in midsummer (July) and in the fall (September): the Main Lake, Second Lake, and Third Lake. Since 2015, we had been using an analytical lab (Trent University at Dorset) which had allowed us to measure down to much lower levels of Phosphorus. The Dorset lab ceased operating in 2018 so we moved our additional testing to the Caduceon lab in Ottawa at the recommendation of Watersheds Canada. At the same time, we added another sampling point at the inlet of the Deer river to Wollaston lake. The Caduceon results in 2018 were for control purposes to ensure alignment of procedures and results with the LPP labs.

Total Phosphorus (filtered - all in micrograms per litre - ug/L)					
Date (2018)	Lake Partner Program (MOECC)	WLHCA Program (Caduceon)			
		Main Lake: Deep spot	Main Lake: Deep spot	Second Lake	Third Lake
May 30	11.0*				
July 3	5.4				
July 26 (MOE)	8.8				
Aug 11	6.8	7	7	N/A	8
Sept 23	8.6	8	7	5	6
Sept 27 (MOE)	6.5				
Average	7.2	7.5	7.0	N/A	7.0
Historical average: 1997 to 2016**	6.7		N/A	N/A	

* May 30 result is an outlier suspected to be inaccurate and is not included in the average.

** Historical averages for WLHCA program could not be calculated since most results prior to 2015 were less than the detection limit of the lab. Wollaston program for 2018 is for control purpose of establishing a new lab (Caduceon) as Trent U Dorset lab ceased operations.

Interpretation of results

This year's Lake Partner and MOE phosphorus result was satisfactory, 7.2 ug/L. (micrograms per litre), although above the historical average of 6.7 ug/L but better than the 2017 average of 7.6 ug/L. The 2018 results are not typical of a Canadian Shield lake which typically start and end the

The Significance of Phosphorus

Phosphorus is a vital nutrient for the growth of plants and algae and is a critical measure of the nutrient status of the lake. Excessive levels have the potential to trigger unwanted growth of plants and algae blooms.

To prevent such problems, it is important to keep the phosphorus below 10 micrograms per litre (ug/L), which is the Ministry objective for our lake.

The Northern Reflection

season somewhat higher (usually around 6 ug/L and this year 8.8 ug/l in July), but settling down from June to September to relatively consistent lower levels (around 7 ug/L). The phosphorus levels in Wollaston lake have consistently ranged from 6.0 to 8.5 in the 15 years since 2003, when the program started to use filtered samples.

Main Lake was higher in July, at 8.8 ug/L. but recovered to a satisfactory level of 6.5 in September. Historically, the Third Lake has tended to show higher phosphorus levels which may be due to the shallower depth.

Conclusion:

Phosphorus levels at the spring turnover and through the summer season continue to be satisfactory according to MOECC guidelines but are trending above the historical average until 2016.

B) Water Clarity (Lake Partner Program)

For the Lake Partner Program, we measure water clarity about every 2-3 weeks from May to October, using a Secchi disk. Clarity, measured in meters, can reflect changing phosphorus levels: increased phosphorus stimulates more algae growth which in turn decreases clarity. Typically, oligotrophic – or unproductive - lakes (like Wollaston) have phosphorus at less than 10 ug/L and Secchi readings of greater than 5 meters. The MOE attended on site on July 26, 2018 and September 27, 2018 with Secchi readings of 3.5 m and 5.2 m, in line with the WLHCA readings. In 2018 there were a higher than usual number of reports of filamentous algae.

Results

	Date (2018)	Clarity - Secchi Disc depth (metres - higher is better)
First reading	May 30	4.2
Last reading	Oct 7	3.3
Low (least clear)	Aug.11	3.25
High (most clear)	Sept 27	5.2
Average (of 11 samples)	May 30 - Oct 7	4.1
Prior year's annual average (2001 - 2017)		5.6

Interpretation of Results

As anticipated, water clarity reflected phosphorus levels, starting off with relatively low clarity in May, and improving in early July only to fall in August as the summer progressed. The annual average was slightly less than satisfactory (i.e. less than 5 meters) and below the historical average.

Conclusion:

Clarity was less than satisfactory overall for the second year in a row. It was average at the beginning of the season, reflecting higher phosphorus levels and then dropped in August – possibly due to the higher than average rainfall per single occurrence which probably caused additional runoff into the lake.

Note: Historical results available on MOECC's web site at <http://www.desc.ca/programs/LPP>

C) Calcium (Lake Partner Program)

Calcium is measured in early May as part of the Lake Partner Program. We are looking for high levels of calcium to maintain a healthy population of zooplankton organisms (such as Daphnia - water fleas), as well as other animals with shells or exoskeletons (such as snails and crayfish). These are all important food sources for fish and larger aquatic animals. According to MOECC, the critical lowest survival threshold is 1.5 mg/L and "Many lakes on the Pre-cambrian Shield in Ontario are nearing or have recently crossed (below) this important threshold.... 35% of 770 Ontario lakes are below it." (MOECC)

Our historical readings for Wollaston show that we have been fortunate to have abundant calcium levels – averaging 27.2 mg/L from 2008 to 2016. The lake is therefore unlikely to suffer from depletion of daphnia or other crustaceans due to lack of Calcium.

Results

Calcium (mg/L)	
Location	Lake Partner Program (MOECC)
Main Lake - deep spot	27.5
Historical average (2008-17)	26.7

Interpretation of results

At 27.5 mg/L, the 2018 calcium result for Wollaston Lake was consistent with the 9-year prior average of 26.7 mg/L (8 samples); none was below 25 mg/L. These levels are well above the critical threshold and therefore very satisfactory.

Conclusion

Calcium levels in Wollaston Lake continue to be satisfactory according to MOECC guidelines.

D) Dissolved Oxygen (WLHCA Program)

Adequate dissolved oxygen is important for the survival of lake trout population present in the deeper, colder layer of the main lake. The MOECC guideline for lake trout lakes is

The Northern Reflection

an average of 7mg/l in the cold layer known as the hypolimnion. The average is calculated from a complete depth profile dataset as the “mean volume-weighted hypolimnetic dissolved oxygen” (MVWHDO).

Using an electronic probe rented from Hoskins Scientific and calibrated by the MOECP, the MOECP measured dissolved oxygen and temperature every meter from the surface down to the lake bottom, at the deepest part of the Main Lake (about 30 meters). The measurements were

Organic matter decay leads to:

“excessive plant and algae growth, resulting in a loss of water clarity, depletion of dissolved oxygen and a loss of habitat for species of cold water fish such as lake trout.”

Source: MOECC Lakeshore Capacity Assessment Handbook

taken in September 2018, when dissolved oxygen tends to reach its lowest levels in a stratified lake. The fall profile is shown in the graph below.

Given the potentially concerning readings of 2017 the WLHCA requested (April 22, 2018) the MOECP to conduct the dissolved oxygen testing in Wollaston lake for 2018.

They agreed, and conducted the testing in September 2018.

For September 2018 the average level (MVWHDO) based on the MOECP test was calculated as 6.2 mg/L, which is below the Ministry standard of 7mg/L, below the previous 2015 WLHCA average of 6.7 mg/L and the 2013 average of 6.6 mg/L when the MOECC previously tested. While all three of these averages are below the Ministry standard, the average in

2018 is at a level where lake trout populations become stressed.

While this is the second test in two consecutive years indicating a decline, it is important to note that this is not enough to be able to determine if this is the start of a sustained downward trend.

While it is not possible, at this time, to conclude the cause of the lower readings in 2017 and 2018 there are a number of possible explanations. These include a net increase in the total algae and plant matter in the lake (possibly due to the increase in Eurasian milfoil), climate change effects (2016 and 2018 were warmer than normal summers with 2017 being a wetter than normal summer), or other reasons.

Conclusion

Readings for dissolved oxygen are lower than the MOECC guidelines for deep cold lake trout lakes. The Ministry conducted the testing in Wollaston Lake in 2018, and 2013. For 2019 the WLHCA will rent from Hoskins Scientific and conduct the dissolved oxygen tests with the same model of meter and probe utilized by the MOECP.

Invasive Species

Eurasian Watermilfoil is a plant first introduced to the Great Lakes in the 1970's that grows in water approximately 0-10 metres deep. It spreads rapidly, choking out other native plants and can in extreme cases make swimming, boating, fishing nearly impossible in infested areas of the lake.

Based on a first confirmed sighting of Eurasian watermilfoil in 2016, the WLHCA, through the Federation of Ontario Cottagers Associations (FOCA) 2017 Aquatic Invasive Species Program, arranged for a consultant to visit Wollaston lake on August 18, 2017 to conduct a thorough review of the waterfront. The Full report is available on our web site.

Of 51 identified locations in Wollaston Lake, 73% contained Eurasian Milfoil and it will undoubtedly continue to spread.

The WLHCA will be marking three beds which are located in high boat traffic areas (9, 50, & 51 from the report) with yellow markers this summer. Please do not drive your boat inside the markers to avoid further spreading the milfoil from these beds.

- Last summer had MNR junior rangers in to remove milfoil
- Special rakes are available for borrowing, and guidelines on how to remove milfoil in front of your property

Zebra Mussels

Zebra mussels were also introduced to the Great Lakes likely through ships, and are now recognized as an invasive species that can out-compete native mussels and other filter feeding invertebrates for food putting their survival at risk. In addition, they can clog water intake pipes and make swim-



The Northern Reflection

Zebra Mussels, continued from page 11

ming quite unpleasant due to their very sharp edges. They were found in the second and third lakes in 2016. The invasive species testing conducted in August of 2016 produced positive results for the zebra mussel veligers (larvae) in all 5 locations tested. 2017 appears to be the year that zebra mussels have established a full presence in all parts of Wollaston lake with numerous sightings being reported in the main lake in addition to the second and third lakes. Unlike the Eurasian watermilfoil there is nothing currently known that can be done to remove/slow the spread of this invasive species.

“Rules of the Road” for Canoe Operators

Submitted by Peggy Stewart

An article by Jaclyn Law and printed in Cottage Life December 11, 2018, has come to my attention that highlights changes to laws governing the use of canoes.

On Nov. 15, 2018, an Ontario judge ruled that canoes are “vessels” under the Criminal Code of Canada, making them subject to the country’s impaired driving laws. Previously, the Criminal Code had only applied these laws to motorized road vehicles. The Code also had no clear definition for the term “vessel.”

The historic ruling is related to the tragic death of an eight-year-old Huntsville boy. On April 7, 2017, Thomas Rancourt drowned after the canoe he was riding in overturned in the Muskoka River. The man he was with, David Sillars, was charged with impaired operation of a vessel causing death, operating a vessel with a blood-alcohol level over 80 milligrams causing death, dangerous operation causing death and criminal negligence causing death. At the start of his trial, the court first had to settle the question of whether the Criminal Code applies to canoes. Had the judge ruled that a canoe is not a vessel, only the charge of criminal negligence causing death would have been upheld. (Sillars has pleaded not guilty to all four charges; his case is ongoing.)

Rancourt’s death has brought renewed attention to the risks of drinking and boating. We asked Sgt. Paul Csanyi, an officer with the Marine & Search Incident Response Team at Halton Regional Police Service, about this and other safety issues.

What are the dangers of drinking and boating?

Any intoxicant, whether it be drugs or alcohol, can impair your ability to operate a vehicle safely and effectively. For recreational boating, the weather is a compounding factor, with the sun and the swaying of the vessel. They all contribute to impairing your ability.

What’s the legal blood alcohol limit for operating a boat?

The same rules that apply on land apply on water: the legal limit across Canada is 80 milligrams per 100 millilitres of blood.

Is alcohol allowed on canoes?

Transporting sealed bottles, cans, or containers of alcohol or liquor would be permissible – an individual transporting alcohol to a neighbour’s cottage across the bay, for example. The general rule for consuming alcohol on vessels is that the vessel requires three elements: it must have sleeping accommodations, it must have permanent cooking facilities, and it must be at anchor or moored at a dock. With a canoe, it’s next to impossible to satisfy the first two requirements.

What happens if you’re caught impaired in a canoe?

You’d be looking at the same fines and statutory requirements as you would if stopped in your car, except impound-

