

WHITE LAKE

PROPERTY OWNERS ASSOCIATION
ENVIRONMENT VOLUNTEERS



2022 Water Quality Monitoring Program and Research Activities

Summary and Highlights

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1.1 Introduction

2022 marked the 9th year that we have been monitoring water quality in White Lake. In our work, we keep track of changes in phosphorus concentrations, water clarity, algal blooms and much more in order to accurately assess water quality. The interpretation of this data is validated by research reports in the scientific literature. This approach forms the basis of annual [water quality reports](#). Data obtained over a period of years is valuable in detecting long and short-term trends. The more data we have the more realistic is our assessment of the changing state of White Lake.

Water quality is a term which can mean different things to different people. Depending on your interest, it could refer to clear water, good fishing, or water suitable for drinking free of toxic chemicals or pathogens. In fact, it is all of these and more. Wikipedia defines it as “the chemical, physical, and biological characteristics of water based on the standards of its usage. The most common standards used to monitor and assess water quality convey the health of ecosystems, safety of human contact, and condition of drinking water”.

In this Summary Report we provide highlights of our findings for 2022. For a complete referenced account of our work, we ask that you access the [White Lake Science and Information Website](#) for full-length Water Quality Monitoring Reports as well as Special Reports on individual topics.

1.2 The State of White Lake Report

In 2022, we published [The State of the Lake Report; White Lake and the Environment](#). The state of White Lake is constantly changing over time. However, over the years since the arrival of settlers, certain events have made dramatic changes to lake water quality over just a few years. Among these are logging operations during the 1800s, the construction of the dam at Waba Creek in 1845 (reconstructed 1948 and 1968), and the arrival of invasive species such as the Zebra Mussel in 2015.

This State of the Lake report is a snapshot of the condition of the lake today. It explains why and how the lake is changing and what we can do to help preserve the lake.

This report along with the extensive information available on the [White Lake Science and Information website](#) (www.wlpp.ca) provides the reader with a comprehensive source of virtually all available data collected and reports written on the lake by government and independent sources.

The annual collection of chemical and biological data allows us to detect when significant changes to the lake occur, and guides us in our research on White Lake water quality. More changes are coming with possible invasions of more aquatic invasive species, and the increasing effects of climate change and lake overuse. At some point, a new State of the Lake report may then have to be written.

1.3 Algal Blooms - 2022

The first algal bloom of the year was a green algal bloom which started in mid-June and continued until the end of summer. This bloom was green filamentous algae, which grew in large patches along the shoreline. Nutrients, such as phosphorus, supporting this alga comes from sediments, shoreline runoff where shorelines are disturbed, as well as nutrients dissolved in lake water from sources like septic systems and zebra mussels.

Blue-green algal blooms are not benign and so warrant our special attention. When these blooms occur, they can create a public health hazard and anyone using the lake should be apprised of the seriousness of this issue. In 2022, there was one blue-green algal bloom located partly in Three Mile Bay and extending into the main water body northwards past Pickerel Bay. This bloom of *Anabaena* blue-green algae was relatively mild and dissipated over a period of 5 days.

1.4 Total Phosphorus, Water Clarity, Water Levels and Temperature

Total Phosphorus

Total phosphorus levels in White Lake changed dramatically when zebra mussels infested White Lake. Prior to this event, total phosphorus concentrations reached levels of about 22 parts per billion. These concentrations were above the Provincial Water Quality Objective. Once zebra mussels were established, total phosphorus levels decreased by about 50% and have not changed greatly since that time.

Since 2018, total phosphorus levels have remained low and virtually constant

Unfortunately, lower total phosphorus levels were not achieved by any improvement in lake usage, but rather because of a side effect of the presence of zebra mussels. Now, algal blooms occur annually when the total phosphorus level is about 10 parts per billion, which is below the Provincial Objective. The MOECP is now using a different measure in setting its new objective, which for White Lake is now 11 parts per billion. Total phosphorus levels in White Lake currently peak at about 14 parts per billion. It may be that the measured levels of total phosphorus are more of an indicator of the impact zebra mussels are having on the measurement of lake water quality parameters.

Water Clarity

Water clarity, as expressed as the Secchi depth, doubled after zebra mussels arrived in 2015. Since that time, water clarity has remained relatively stable from year to year. Any variations are likely due to weather conditions and changes in the number and size of active zebra mussels in the lake. One of the reasons why there has been an increase in aquatic plant growth and spread to deeper waters, is the greater intensity of sunlight now available at any given depth.

Water clarity for 2022 increased by 0.5 metres over values recorded in 2021 reversing a downward trend lasting 3 years.

Temperature

For most of the summer, water temperatures in 2022 were lower than last year and lower than for most of the previous nine years. Air temperatures were relatively cool and rainfall high which may have contributed to lower lake water temperatures.

Water Levels

Contrasting with 2021 when water levels were lower than the regulated planned levels for the summer months, 2022 water levels were high. Water levels were generally higher than planned by about 5 to 10 cm, mainly due to the heavier rainfall during summer.

1.5 Loon and Cormorant Counts

In 2022, there were a total of 10 confirmed loon nests, each with two adults. These nests produced a total of 15 chicks. These results are very encouraging and signal a turnaround for Common Loon populations on White Lake. In 2021 and 2022 only 5 chicks were produced. Prior to these years, on average about 18 chicks were hatched annually. Typically, only about 50% of chicks survive to join their parents on the annual migration south.

For the past four years, we have been observing the number of double-crested cormorants using White Lake. So far, our observations indicate that the population is growing but at a very small rate. In 2021, we estimated that there are about 4 to 5 nesting pairs on the lake. The 2022 data suggests that there are about 10 to 12 cormorants making White Lake their home. This translates to a minimum of 5 to 6 nesting pairs producing less than 10 offspring, as reflected in the total cormorant count taken in mid-August.

1.6 White Lake Water Quality is in Decline: What can we do?

Over the last nine years, we have completed many studies on White Lake in addition to monitoring changes in water quality. During this time, we have published over 1300 pages of annual and special reports. All of these are available on the White Lake Science and Information [Website](#). We have also co-authored an academic research [paper](#) in collaboration with Carleton University, published in an international journal, which supports all of our findings with more hard evidence.

Our special reports on the History of [White Lake Water Quality](#) and on [White Lake Algal Blooms: 1860 to 2021](#) unambiguously demonstrate that White Lake water quality is in decline. A cursory reading of personal accounts on White Lake water quality in *White Lake, The Early Years*¹ (available on the members only section of the White Lake Property Owners Association [website](#)) reinforce our findings.

¹ White Lake, The early Years, White Lake Property Owners Association, 2000, 64 pages.

Our goal is to collect and interpret data and to persuade property owners around White Lake to act responsibly. At times, this may require a change in mindset and a re-evaluation of how we are treating the lake.

Many people are not aware that septic systems do not prevent nutrients from entering the lake. The purpose of septic systems is to render human waste free of dangerous pathogens. In fact, the Ontario Ministry of the Environment clearly states that all nutrients, such as phosphorus, entering a septic system located within 300m of the lakeshore, will eventually reach and be discharged into the lake environment. The same assertion also applies to any fertilizers, pesticides, and herbicides.

White Lake water quality is being affected by climate change, invasive species, and lake overuse. We can make a difference by following the well-developed guidelines for reducing our impact on the lake.

One of the most important actions a property owner can take is to restore their shoreline to a natural state using native plants. Maintaining fully-treed lots as much as possible interrupts and/or delays movement of nutrients from septic systems to the lake. Using native plants will improve water quality, reduce shoreline erosion, enhance wildlife habitat and increase resilience to the effects of climate change and severe weather events.

Two recently published reports from [Watersheds Canada](#) both explain the [importance of vegetated shoreline buffers](#) and offer a [guide to preparing a shoreline naturalization planting plan](#). We recommend that you access and read these documents if you want to know more about how to best preserve and improve White Lake water quality.

As in any society, there is always a fraction of property owners who will not fully understand the impact that they are having on the lake. It could also be that they are not interested in knowing, and/or just want to enjoy the lake.

This is when governments can intervene and take action to preserve White Lake. The people who are charged with managing the lake (with the assistance of the Ministry of the Environment Conservation and Parks), are the Councils of the [four municipalities](#) sharing White Lake. It is difficult to find evidence that White Lake is being effectively managed by any level of government.

Since the Township of Lanark Highlands has both the greatest number of taxpayers of any municipality and a large percentage of its own taxpayers located on White Lake, it has both the most to lose as well as the most to gain when it comes to the health of White Lake.

One suggestion is for LH to take the lead and establish a 4-municipal committee which could effectively manage White Lake. This committee would provide a forum for local taxpayers to bring forward concerns related to the management of the lake.

Individually and as a group, we should be contacting our Councillors (Wards 1 & 2) and urging them to bring to Council our concerns and request the formulation of an action plan to preserve White Lake for future generations.