

## **REPORT AND RECOMMENDATIONS WITH RESPECT TO WATER QUALITY TESTING**

### **WHY TESTING IS IMPORTANT**

The health of Lake Temagami is a high priority for members of our Association. Clear and clean water is essential not only to the quality of life on Lake Temagami but also is a considerable factor in protecting the value of water front properties on the lake.

Testing the lake water allows us to form base line points. Further testing allows us to monitor and identify trends of concern. If there are trends of concern we can then take steps. It will be much easier to obtain cottagers' compliance with existing regulations and also to encourage good stewardship by each land owner if problems or trends in lake quality water can be clearly identified. Information about phosphorus levels, for example, can be used to motivate cottagers to be active in taking steps to combat phosphorus overloading in the lake: not washing anything in the lake, not using fertilizers in lawns and gardens and preserving natural shore lines.

In order for the TLA as advocate for our membership, it is important that we have solid data, obtained in accordance with high standards and properly analysed. This type of information will be essential if we are going to be persuasive in discussions with the town and the MNR with respect to issues such as the viability of the cold water fishery on this lake and the affects of future development on that cold water fishery. We should not be at the mercy of someone else's data and interpretation of that data. In order to advocate we have to know the biology of our lake. For example, although we may presently have very good oxygen level readings and very low phosphorus readings, it may be that our lake is particularly fragile and susceptible to damage from even a small amount of new development. All lakes have a certain susceptibility factor and it is important that we know ours and establish it on our own data and science.

It is recommended that water quality testing be a major focus of the TLA and further that the water quality committee devote a majority of its efforts towards monitoring the health of the lake and to identify trends and threats to the water quality health of the lake.

### **OPTIONS**

There are several possible approaches to water testing involving different levels of financial commitment:

1. The simplest, least expensive and most basic form of testing would be to use the existing Lake Partners Program out of Dorset, Ontario which receives and tabulates phosphorus readings and Secchi depth readings from cottage groups and individual cottagers. The Temagami Stewardship Counsel organized volunteer base testing with the Lake Partners Program as late as 2007. This is minimal and basic testing: only phosphorus and water clarity. The results, somewhat haphazardly obtained from Lake Temagami, can be found

on the Lake Partners program website run by the Minister of the Environment ([www.ene.gov.on.ca/en/water/lakepartner](http://www.ene.gov.on.ca/en/water/lakepartner) or you can just google Lake Partner Program.) Under this Lake Partner program volunteers receive a sampling kit for each upcoming season. In most cases the samples will be collected in the few weeks after the ice comes off the lake. The quality of the sampling, the location of the sampling is largely dependent upon the volunteers. There are issues of false readings and inconsistency.

2. We can organize a testing program by partnering with other groups. The advantages here may be increased credibility and cost savings.
3. We can form a stand alone water testing program run and administered by the TLA. There are precedents for this with cottagers' associations in the Muskoka area who independently run their own water testing programs.

The downside to going at it alone is that there is a lot of technical information that we are going to have to learn in order to set up an appropriate water testing program. It will be more time, require more resources.

## RECOMMENDATIONS

My recommendation is that we start an independent testing program.

We could start by forming an alliance with those at Muskoka Lake Associations who have gone down this path. But to do this properly, keeping our goals in mind, may require that we retain some professional help in setting up the program (what we test, when the testing is done, where the testing is done, at what levels, who compiles the data.) An independent program can possibly run with volunteers doing the testing (following strict rules) or it can be done by hiring testers for the summer.

I suggest we start simply with phosphorus and oxygen level testing at a large number of properly selected locations on the lake. Further, my recommendation is that we do not hire staff to conduct the testing but rather use volunteers to conduct the testing. Unlike some other lake activities I am confident that we will have a sufficient level of volunteers for this type of work.

Where we may have to spend some of our monetary resources is with respect to the technical side. We lack much of the technical and interpretive expertise. While we can get in contact with other associations that have set up their own water quality testing programs as a first step I believe that to properly set up the program and clearly interpret the results we do need some professional and technical consultation.

As indicated above it is recommended that water quality testing be both the primary function of the water quality committee and also one of the main programs of the TLA as a whole. It is vitally important that we make the results available in a format that is intelligible to our members.

### STEPS TO BE TAKEN

1. Regardless of what options we choose it is essential that we consolidate and put into a readable narrative form the available past test results. This consolidation and narrative should be part of our web site with appropriate commentary about the sources of the information and what our future intentions are. It is hoped that the past test results will provide us with some base line information.
2. Assuming we elect to do independent testing, whether internally or with the assistance of a consultant, we (water quality committee) should structure a program for water testing for the next year (spring is the important time). The program would determine what testing we are going to do, when, on what locations, by whom, who will do the analysis and who will structure the data into a form that we can publish. To develop a program we can start by speaking to some of the Muskoka Cottagers Associations about their experience. This may lead to us hiring a consultant (I believe that most of those associations at least initially did have a consultant either private, governmental or an academic, to assist.

With respect to what testing to do, we may want to start small.

Depending on cost we may limit our first year of testing simply to what I believe are the most important areas of testing, phosphorus and oxygen levels. These are inexpensive and easy tests to carry out but will provide us with the basic information we need to accomplish our goals. I appreciate this is very similar to the ad hoc testing done with Lake Partners, however, the difference will be that we will know where we should be testing and when. Also, the quality and year to year consistency of the testing would be enhanced through our supervision and organization. We can expand testing with each new season.

4. Set a budget.

### BACKGROUND INFORMATION AND DISCUSSION

What has been set out above are the essential issues that the board should consider. Below is some background information that may be useful to the board members in determining the appropriate course of action. The information has been cobbled together from several sources on the internet including the MOE, the web sites of various cottager's area associations, the Muskoka area municipalities as well as web sites of general information about water testing and lake health.

Phosphorus levels and oxygen levels, as I have indicated above, would appear to be the most essential measurements most useful to us in our discussions and decision making concerning future developments on the lake. Well organized testing in this area is important.

Oxygen measurements and the related phosphorus measurements are significant because adequate concentrations of dissolved oxygen are necessary for the survival of fish and other

aquatic organisms. For cold water species such as lake trout a minimum oxygen level of 6 mg/litre is needed along with a temperature below 10 degrees centigrade.

One of the main influences on oxygen levels is phosphorus. Each lake has a sensitivity rating with respect to the lake's responsiveness to phosphorus inputs. A lake can have either a low, moderate or high sensitivity to phosphorus.

Phosphorus samples should be collected in the spring during a period called the spring turn over. This is the best time to sample the phosphorus because the lake is completely mixed and a water sample represents the phosphorus concentration throughout the whole lake. By sampling spring phosphorus each year it is possible to detect a change in the nutrient status of the lake. Several years of data must be collected to first observe the normal, between year differences before a trend can be identified. Phosphorus enters a lake naturally through precipitation. Human input of phosphorus enters a lake primarily through surface run off from sources such as septic systems, lawn fertilizer, agricultural fertilizer and municipal waste water.

Trends in phosphorus levels can be used in discussing how much growth the lake can accommodate without "pressuring" the lake. Another potentially useful testing would be of the benthic zone of the lake. The benthic zone is the lowest level of a body of water. This testing would include the sediment and organisms found on the lake bottom. From my research this testing gives valuable information and indications with respect to a lake's overall health.

All fish are affected by environmental stresses but lake trout have been identified as an indicator species. They are a sensitive fish that require cold, oxygenated waters, which are generally associated with lakes that deteriorate quickly as a result of human activity such as shoreline development or increased nutrient loads.

Other than oxygen and phosphorus another common and simple testing is the measurement of water clarity. This is known as a secchi depth test (while it is a simple measure of water clarity it also indicates indirectly phosphorus concentration and a measurement of nutrient enrichments.)

Water clarity can change weekly or yearly as a result of weather, length of winter ice cover, shoreline development, natural seasonal trends or other impacts. A long-term trend of nutrient enrichment is a reduction of water clarity.

Temperature measurements are also important and fairly easy to carry out so long as it is done in an organized fashion and with consistency from year to year. Temperature influences the affects of pollution on aquatic life.

There are several chemical and biological indicators that could also be monitored. These would include testing the PH levels, conductivity, dissolved organic carbon, alkalinity, nitrates, sulphuric acid, iron and chlorine.

Accumulations of toxic substances in fish is a result of inputs of persistent toxic substances. These contaminants can be air borne or resulting from surface run offs of pesticides, nutrient loading from septic systems or hazard leach aids from septic systems. Habitat changes are also factors.

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Habitat changes result from such things as nutrient loading, shoreline habitat alteration, siltation, acidification and water level fluctuations.

There are also some interesting and informal measurements such as an annual frog count, loon count, some of which our members have been engaged with in the past but it may be useful in the longer term to carry out these samplings on a more formal and organized basis.

### SUMMARY

As our goal is to sustain and enhance the quality of the lake water the testing results should be used in a manner so that we can motivate and educate both water front land owners, house boat users and operators and day use campers with respect to their affect upon the lake. We want to move to reducing nutrient loading to the water body.

Lastly, the testing should lead to informed decisions about limiting development areas where the studies indicate that additional development will significantly impact natural fishing.

If the TLA is going to champion the health of the lake then independent testing conducted by the TLA is going to be essential to that purpose. It may be one of the most important programs the TLA carries out.