

March 2012

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FROM THE PRESIDENT'S DESK

A Message from your President...... Spring is almost upon us! As I am typing this message I can see the geese are flying around looking for open water, which they have apparently found in Otter Creek. The snow is quickly melting in the fields, allowing the geese to feed, and the robins and redwing blackbirds are returning. With the warm temperatures, beavers and muskrats are already at work and the sighting of a groundhog yesterday are all indications that spring is quickly approaching.

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It has been a good winter with not an excessive amount of snow and I anticipate that flooding will be at a minimum because of the reduced precipitation.

We hope to install two loon nest platforms this year; one in Toohey's Bay and another at the South end of the lake. See the article on page 6 of this Newsletter relating to the results of last year's loon survey.

We would like to hear from you as to what topics of interest could be included in future editions of the OLLA newsletter. Please let us know if you have suggestions by sending an email to: <u>olla@otterlake.cyberus.ca</u>.

I anticipate the warm temperatures will result in the ice going out of the lake earlier this year. For many of us who live here year round, spring brings a smile to our faces. For others, it heralds the beginning of "cottage season" as you return to the lake... a place of peace and contentment. Please feel free to contact us anytime. We look forward hearing from you.

Phil Mayhew

LAKE STEWARD'S REPORT - 2011

The quality of water is affected by many things: natural processes of erosion and runoff accelerated by clearing of shorelines, the use of artificial fertilizers and leachate from sewage disposal systems. All result in too many nutrients reaching the lake. Too many nutrients cause profuse weed and algae growth which affect the aquatic animal species makeup by altering habitat and food sources and by reducing oxygen and light penetration.

Water quality testing is an important diagnostic tool to help residents of Otter Lake determine the health of the lake. We need early warnings to predict important changes in the lake's ecological process. By systematic testing and monitoring over time, it is possible to evaluate if water quality is improving or declining. By selective testing at strategic sites, water quality indicators can help determine the source or cause of contamination. The ecological and trophic status of a lake is generally determined by the levels of nutrients it contains.

As in previous years OLLA was once again fortunate to have the assistance of the Rideau Valley Conservation Authority (RVCA) in testing the water quality of Otter Lake. Thanks are due to Sarah MacLeod and her qualified team of technologists. RVCA and OLLA both test at least 3 times per year but at different sites. The combined results give us a good indication of the overall state of health of the lake. The map on the right indicates the location of all the OLLA test sites. These sites have been chosen to be representative of the whole lake. Sites 05A, O5B and 06 represent the 3 deepest water sites (more than 90ft). Sites 04, 07, 08, 11 and 18 are sites where there are known inflows from streams and wetlands into the lake. Other sites are in shallow bays where there is an increased tendency for weed and algae growth. OLLA does not test at all of the sites each year, more often we test at select representative sites usually between May and October.



Nutrients & trophic status

Recreational water quality can be expressed in terms of how clear the water appears. Water clarity is influenced by the amount of soil sediment and phytoplankton, or microscopic algae, present in the water. Clarity is measured by a simple visual test using a Secchi Disk, a 20 centimeter black and white disk attached to a measured line that is lowered into the lake until it is no longer visible. Analysis of water samples for chlorophyll a, which provides the green pigment in phytoplankton, gives a more specific measure of the abundance of small creatures in the water. Another perspective is gained through analysis of samples for nutrients, particularly phosphorus but also nitrogen, which tells how much food is available for the algae and aquatic plants. In the late summer when the algae drops to the bottom of the lake, its decomposition uses oxygen, so to find out how much oxygen is available for fish and other aquatic animals, dissolved oxygen and temperature profiles are done. These tests combine to give an indication of the age of a lake and what can be expected. An old or eutrophic lake will have profuse plant growth and relatively few fish species.

The two key indicators of nutrient load in a lake are phosphorus and nitrogen. These are both principal ingredients of fertilizers. When these two are present in excessive quantities in surface water, they stimulate algae and aquatic plant growth, just as they would stimulate the growth of grass or flowers in a garden. Dissolved oxygen levels can also be used to determine the trophic status as they provide a measure of the impact of eutrophication (due to biological growth and decay). Bacterial pathogens (originating from stormwater runoff and leaking septic systems) can also be introduced into a lake, limiting recreational potential and threatening human health. *Escherichia coli* (bacteria found in the intestines of mammals) is commonly used as an indicator of fecal contamination.

<u>Phosphorous</u> is generally recognized as the limiting nutrient in freshwater ecosystems and the major nutrient contributing to eutrophication in lakes. Since phosphorous is the principal source of energy for all living organisms the amount of phosphorous in the environment will determine how fast an organism grows and proliferates. Phosphorus is therefore the limiting factor in the growth of algae, meaning that algae growth will occur in greater amounts as more phosphorus is added to the lake. Phosphorus levels below 5 μ g/L are typical of **oligotrophic** lakes that generally are clear and deep with few nutrients. Such lakes are typically found in the northern regions of Ontario. Phosphorous levels above 20 μ g/L are typical of **eutrophic** lakes that are laden with nutrients which stimulate algae and plant growth. **Mesotrophic** lakes are in between these two extremes and are typical of the lakes found in our region of Ontario.

<u>Nitrogen</u> is also an important nutrient in aquatic ecosystems. In addition to fertilizers, agricultural waste and wastewater contribute nitrogen into lakes. In large amounts, ammonia and nitrates can be toxic to aquatic organisms. Total Kjeldahl Nitrogen (TKN) is a measure of ammonia + organic nitrogen. While there currently are no guidelines for TKN, according to RVCA, TKN in water bodies not influenced by excessive organic inputs typically range from 100 to 500 μ g/L.

Dissolved oxygen (DO) and temperature profiling is important for lakes because both parameters affect all aquatic organisms and the chemistry of the lake environment. As the life cycle of many fish and other aquatic organisms are dictated by temperature, the relationship between DO and temperature is important. Also, since temperature determines the ability of water to hold DO, temperature and DO are usually measured together. Cold water can hold more DO than warm water. The primary source of oxygen in aquatic systems is the atmosphere with wind action constantly recharging the surface waters with oxygen. Lake waters also gain oxygen as a byproduct of photosynthesis by algae and macrophytes. However, as these die, they settle to the bottom of the lake where bacteria convert the organic material into carbon dioxide, consuming oxygen in the process. Because the lake becomes thermally stratified early in the summer, oxygen cannot be replenished in the water in the hypolimnion, the lower part of the lake, so oxygen levels diminish. As a result, as oxygen levels are lowered, phosphorus in the bottom sediments becomes more readily soluble adding to the loading available for plant growth.

All the tests described above give an indication of the age of a lake and what can be expected. An old or **eutrophic** lake will have profuse plant growth and relatively few fish species because of the lack of open water and the competition for oxygen. A middle-aged or **mesotrophic** lake will support the greatest diversity of fish species with a variety of habitats and sufficient oxygen available. Young or **oligotrophic** lakes have very little or no vegetation and are usually well oxygenated but have relatively few fish species.

<u>Bacteria</u> are naturally present all lakes. They are found in the faeces of the wildlife (fish, waterfowl, beavers, etc.) that inhabit the lake. Coliforms are bacteria found in the large intestine of humans and other mammals and are usually present in soil. While a few strains of coliforms produce serious toxins, most are not harmful. *Escherichia coli* (*E. Coli*) and coliforms are often used as indicators of possible contamination by fecal matter, thus high *E. Coli* levels

in lakes or rivers can be an indication of septic pollution. The recommended safety level of E. Coli in a lake for aquatic life and recreational safety is not more than 100 colony-forming units (cfu) per 100ml of water. E.coli at any level is unacceptable for drinking water, therefore some form of treatment and purification is necessary for anyone who draws water from the lake for drinking purposes.

Results for 2011

The table below indicates the results of all the water quality testing done in 2011 by OLLA and RVCA. E. coli was generally low or not detectable at all sites tested with the only exception being the slightly higher readings at OLLA 07 obtained in July and August. However site 07 is where Barker's Creek flows into the lake and Barker's Creek drains an extensive area South of Highway 15 that includes farmland. Total Kjeldahl Nitrogen levels were in the acceptable range of between 200 - 400 µg/L at all sites tested. Phosphorous levels were again quite low this year. The only readings greater than 10 µg/L were at our 2 deep water sites (OLLA 05A and 06) that were tested by RVCA in June and September. Secchi depth readings were all above 6 metres (a reading of 8.5 metres was obtained at OLLA 05A in May) indicating that the lake remains very clear. Increased water clarity means that sunlight can penetrate deeper and may often result in algae blooms over the summer months. While Otter Lake did experience some algae blooms in 2011, they were not as severe as in previous years. The average phosphorous level of 8 µg/L and an average Secchi depth of almost 7 metres indicates that the lake remains on the borderline between oligotrophic and mesotrophic. The almost undetectable E. coli at all sites except Barker's Creek indicates that the overall health of the lake is excellent.

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RVCA ID	OLLA ID	E. Coli (cfu/100 ml)						Total Kjeldahl nitrogen (µg/l)						Total Phosphorous (µg/l)						Sechi Disk (meters)				
		May	Jun	Jul	Aug	Sep	Oct	May	Jun	Jul	Aug	Sep	Oct	May	Jun	Jul	Aug	Sep	Oct	May	Jun	Jul	Aug	Sep
	OLLA 02	30.01					199	1											1.1.8		1.1	1.1		
RVL-26C	OLLA 03		0	<2					340	330	1			1	9	6								
RVL-26D	OLLA 04	2 1	0		2				370		380				5		7							e.
RVL-26DP1	OLLA 05A	5		1				1	520	320		290			21	3	100	14		8.5		6.5		6.25
	OLLA 05B																							
RVL-26DP2	OLLA 08								340	250		430			9	2	13	18		- 3	6.5	6.0		6.50
	OLLA 07			10	12					730	400					<2	4							
	OLLA 08		0	0.00	2	1					350						5			1				12
RVL-26B	OLLA 09		0	<2					320	310			0		11	6								
	OLLA10																12			- 3				2
	OLLA 11				2						410						8							
RVL-26E	OLLA 12	3 1									Cont.						162							
	OLLA 13				4	1					400		6				5		1					
	OLLA 14			2						550						<2								
	OLLA 15							1			6			÷										
RVL-26A	OLLA 16																							
	OLLA 17			<2	1					490						10	12							1
RVL-26F	OLLA 18		0	4					340	300					7	4								
Aver				2	17		1.5	2		200	9.05			-			11			-		6.71		

As mentioned earlier sufficient DO in a lake is necessary for all aquatic organisms to survive. Dissolved oxygen concentrations are linked to water temperature and depth and will therefore fluctuate with the seasons. Over the winter, water temperature decreases and becomes relatively constant (below 10°C). As a result, DO is also relatively constant. As the lake warms up during the months of June through August DO at the surface remains plentiful since it is constantly being recharged from the atmosphere. However, since warm

water is less dense than cold water, the DO in the warmer surface water is not able to penetrate the hyperlimnion. As a result, the DO below the hyperlimnion cannot be replenished and DO concentrations at depths greater than 10 - 15 metres will begin to decrease. This stratification of DO usually reaches a peak in early fall. Cold water fish such as lake trout, rainbow trout and splake require a minimum of 5-6 mg/L of DO below the hyperlimnion but will not survive if concentrations fall below 4 mg/L.

Otter Lake was stocked with splake by MNR in 1999, however by 2002 DO levels below the hyperlimnion were almost zero by the end of the summer. Hence Otter Lake would not have been able to support these cold water fish. The reason for this rapid drop in oxygen levels over the summer is unknown. However, beginning in 2007 DO levels began to improve. The graphs on the right show the DO data obtained by RVCA for the months of May to October, 2011. The data shown are for the deep water site OLLA 06 which is about 35 metres (120 ft). As can be seen in early May, before any temperature stratification has occurred DO levels were extremely high at 15 mg/L at all depths. By the beginning of June, at which time a shallow hyperlimnion had formed the level of DO had dropped slightly, but was still high and constant throughout. By late July by which time a significant temperature gradient had



formed at between 5 and 10 metres depth, DO levels were beginning to diminish below the hyperlimnion, but still remained at 8 mg/L. Unfortunately, RVCA was not able to measure in August and September, however by early October DO concentrations were still 8 mg/L above the hyperlimnion but had dropped to 4mg/L below it. Depending on how long this level of DO persists it might be stressful for cold water fish since it is below the 5-6 mg/L that these species require. It will be critical to determine if the DO levels recover over the winter as the lake de-stratifies. Therefore the May, 2012 DO levels will be very important to determine if we could once again restock Otter Lake with cold water fish.

Water levels

The graph on the right shows the Otter Lake water level for 2011. The reference line in red shows the empirical "optimal" water level of 34" put forward by OLLA at the AGM in 2007. In 2011, Otter Lake was completely frozen over by January 5, 2011 though the ice thickness would have been extremely variable. Otter Creek remained open and flowed well throughout the winter months and since the ground was frozen, the lake level dropped significantly in January and February. However, our spring thaw occurred in March, hence the high water levels in March and April. According



to RVCA water volumes in the entire Rideau watershed peaked around March 19. Unfortunately for Otter Lake and most lakes in the region, this spring "high" occurred while the ice was still on the lakes. As a result some shoreline erosion and damage to any structures that were left in the lake over the winter could have occurred. With the continued rainfall in April (another record breaking month according to Environment Canada) and May, the lake level remained quite high. The summer months of 2011 were hot and dry and as a result the water level dropped significantly and by September reached a level not seen since 2009. In fact, RVCA issued a level 1 low water advisory in September, 2011 for the entire Rideau River watershed. With the rain we received in October and November and some moderate snowfall in December, there was a slight increase in water level during the months of November and December. RVCA did not lift the Level 1 low water level advisory until November.

As reported at the OLLA AGM in July, RVCA performed a detailed study of water volume, inflow and outflow rates on Otter Lake in early spring and came up with a new 1:100 year flood level for Otter Lake of 125.5 meters above sea level (masl). This level is shown on the graph above by the upper reference line. This level is quite high and represents a hypothetical high water level that could be reached in Otter Lake under extreme conditions. However, this level has never been reached, at least not during the time OLLA has been recording water levels. The highest level recorded was 125.23 masl in March, 2008 and we did reach 125.12 masl in March, 2011. While RVCA's 1:100 year flood level does protect Otter Lake's numerous wetlands, it also means that many low lying properties and several access roads are now considered to lie below the flood plain.

Doug Franks Lake Steward March 2012

OTTER LAKE LOON SURVEY

In 2011 OLLA participated in the Canadian Lakes Loon Survey (CLLS). CLLS was first initiated in Ontario in 1981 to assess the long-term health and productivity of Common Loons, and the lakes they depend on. Loons breed on lakes throughout most of Canada, and as top predators, their survival reflects broader lake health. Each year, hundreds of

volunteer participants spend time observing loons on lakes where they breed: at least once in June (for loon pairs), once in July (for newly hatched chicks), and once in August (for young that survive to fledge). This information is used to monitor loon chick survival over time, and is an important indicator of loon and lake health.

Unfortunately, Otter Lake's loons did not do too well in 2011. Of the 5 loon pairs that spent most of the summer months on Otter Lake, only 2 pairs were successful in producing chicks even though all of the loon pairs appeared to nest in early June. The map of Otter Lake on the right shows the approximate location of our 5 loon pairs. Loon pair 3, that seemed to spend most of their time over by the East shore had one chick and pair 5 that were seen at the North end of the lake had 2 chicks. To the best of our knowledge all of these chicks survived and hopefully made the trip South in the fall. Why the remaining 3 loon pairs were not successful in producing chicks is unknown. It may be the result of our fluctuating water levels since if a loon's nest becomes flooded after they have laid their eggs, the eggs will be lost and loons only nest once a year. By contrast, if water levels drop after loons have nested, they will often abandon the nest because it becomes too difficult for the loons to reach it. The latter may be what happened in 2011. In an attempt to make life easier for our loons, OLLA is still planning to construct some loon nesting platforms. Any OLLA member who would like to be involved in this project should contact the Lake Steward or a member of the Board of Directors.

We would also like more information on where the loons are on Otter Lake, so if there is a loon pair living in your part of the lake please let OLLA know when you



first saw them, where they are and when you think they may have nested. It is not necessary to know the nest location but if you have a good idea where it is, let us know that too.

SUSTAINABLE LAKE PLAN FOR OTTER LAKE

As many of you are aware, we have over the past number of years been trying to produce a Sustainable Lake Plan for Otter Lake. This is an effort that can only be accomplished when the community as a whole is involved. Once a plan is developed it will



provide a guideline for future boards and generations to refer to on how to deal with issues as they arise, as well as background material on the health of the lake over the years. In order to achieve this initiative we need committed volunteers (the more the merrier) to become involved in this project. Below is a brief outline of the purpose of a lake plan and the benefits.

What is the purpose of the lake planning process?

- 1. Identify and protect specific lake values
- 2. Promote community discussion and action
- 3. Educate and communicate with all community members
- 4. Set a future vision for the lake
- 5. Set environmental and social targets
- 6. Recommend stewardship actions
- 7. Recommend land use policy

What are the benefits?

1. Identifies and vocalizes common values and concerns – a unified 'community voice' can be more effective than a mixture of smaller voices.

- 2. Brings lake inhabitants together as a community
- 3. Engages and represents people beyond association members This is an

essential ingredient of a successful community plan. The process must provide opportunities for everyone (residents, businesses, non-association members, and even casual and day users) in the community to participate, if they wish to become involved.

4. Identifies and develops partnerships

5. Fills an information gap by synthesizing existing information

(e.g. history, water quality) and context about the lake – there may be a lot of existing information regarding your lake and its community, and it is best to understand the 'state of the lake' based on a complete review of this existing information to identify gaps so that they can be filled to meet the priority needs.

6. Engages people to think about the future

7. Instills a sense of responsibility and accountability (which promotes stewardship)

8. Engages and harmonizes multi-jurisdictions (e.g. municipalities,

agencies, property owner associations) – there is no other process that brings multiple agencies to the lake community table, in a spirit of co-operation.

- 9. Informs external agencies/organizations about the values and concerns of the lake community
- 10. Builds awareness through communication and education
- **11. Defines existing and future desired character**
- 12. Provides a history of the lake community

We have managed to produce a DRAFT of the "State of the Lake" report noted in item 5

above so we have made some progress. What we need now is a facilitator to come forward that will assist in co-coordinating the committees and the areas of concern as identified in our research. We also need members to come forward to work on the various committees. The existing committees are: Development and Carrying Capacity; Fish and Wildlife Populations & Health; Mining Rights; Wetland Use & Protection; Ground Water Patterns & Surface Flow; Septic & History.

I know many of you have volunteered in the past to work on the various committees and we hope that you will still be in a position to come forward again in an attempt to complete this project. With a facilitator assisting in the coordination of the plan, I believe that we can be successful in completing this undertaking. Many other lakes in our local area have taken on this task and completed it and are achieving their goals outlined in their plans.

If interested in assisting with this project, or would like additional information please contact Marcia Maxwell either by phone or e-mail as indicated below:

613-283-7893 marcia@maxwellenterprises.ca

2011 SEPTIC INSPECTION UPDATE

This past summer, (2011), the Mississippi Rideau Septic System Office, (MRSSO), were hired by Rideau Lakes Township, to perform septic re-inspections on Sand Lake, Bass Lake, Big Rideau Lake, Otter Lake and Opinicon Lake. A total of 355 mailings were sent out to residences and cottagers on these lakes, asking if they wanted to voluntarily participate in the septic re-inspection program. 124 responses were received, from which 101 inspections were conducted. 13 on Sand Lake, 25 on Bass Lake, 6 on Big Rideau Lake, 39 on Otter Lake and 18 on Opinicon Lake. 7 of these were water access properties, 86 were cottages and 15 were year round homes. Owners were present during 72% of the inspections. 29 systems were identified as having no concern, 63 required remedial work, 1 system (not on Otter Lake) needed replacement and more information from property owners was requested for 8 systems.

In 2012, the program will include Big Rideau Lake, Upper Rideau Lake, Troy Lake and Pike Lake. They hope to perform at least 100 inspections. After the 2012 inspection season, the Township of Rideau Lakes Council will decide if they want to fund further inspections in the near future. In the meantime, if you want your septic inspected, contact the township offices at 1-800-928-2250.

For a complete 29 page report on the 2011 project, plus other reports from 2007 on, go to <u>www.twprideaulakes.on.ca</u> website, click on "Notices", then "Septic Reinspection Program", then 2011 "Septic System Inspection Report".

Bob Langstaff 5-07A



BENEFITS OF MEMBERSHIP IN OLLA

OLLA is an association of property owners from all around Otter Lake. We have grown immensely in size and acceptance since we were first formed by Frank Soural in 1992. OLLA's objectives are simple and straightforward - to maintain the health of Otter Lake by working with local and regional governments, existing road associations, and individual landowners with properties on Otter Lake. In order to do this, the Lake Association executive and individual members engage in a variety of projects designed to maintain and improve the quality and health of the Lake for property owners, and for the flora and fauna of the Lake and immediate area. As the Lake Steward's Report indicates, the current overall state of health of Otter Lake is currently excellent.

Studies have shown that recreational lakes that are managed and protected by a strong lake or cottage association support real estate property values that are thirty to forty percent higher than on similar, un-managed recreational lakes. Membership in the Otter Lake Landowners' Association is one of the best investments any of us will ever make. Those of us who live or have lived in the cities know this already. Community associations have been around for a long time to look after our interests as property owners. This has now become particularly important since the province does not implement or run lake improvement projects. It is up to us to look after the lake and the issues ourselves.

The Lake Association has a website (<u>www.otterlake.cyberus.ca.</u>) that contains a wealth of information about Otter Lake and what the Association does. We have established our credibility with the Township of Rideau Lakes and, under the leadership of our Lake Steward, we have undertaken numerous projects that have benefitted the Lake. In Collaboration with RVCA, the Lake Association continually monitors water levels and water quality annually. The results of these tests are published in our Lake Steward's report and are posted on our website. The Lake Association holds an Annual General Meeting (AGM) in July of each year. The AGM for 2012 will be held on July 21st at the South Elmsley Community Hall. We also publish a newsletter three or four times a year. The newsletter and the minutes of the AGM are available on our website. As mentioned in this Newsletter, we are presently working on the development of a Sustainable Lake Plan for Otter Lake which will include a vision for long-term protection and sustainability of the Lake's ecosystem. OLLA is a member of the Federation of Ontario Cottagers' Associations (FOCA), and works closely on lake issues with RVCA. We also have a good working relationship with the Ontario Ministry of Natural Resources, Fisheries and Oceans Canada and the Township of Rideau Lakes.

If you are already a member of OLLA, we urge you to renew your membership for 2012 by completing the OLLA Membership form that is included as the last page of this Newsletter. If you are not currently a member of OLLA please consider joining the Association. With your membership and active participation, the Lake Association will continue its efforts to maintain and improve the sustainability of the Otter Lake environment. Where else can you get such a great return for only an annual membership fee of \$30!





Otter Lake Landowners' Association.

Membership Form 2012

For Otter Lake property owners.

This is an invitation to all landowners on Otter Lake to become members, or to renew their membership in the association. Your membership is important and helps to meet the cost of monitoring the water quality with the associated laboratory fees, as well as other quality – related lake issues. It also contributes to maintaining OLLA's membership in the Federation of Ontario Cottagers' Associations (FOCA) that looks after cottagers and landowner's interests at Queens Park and the scientific Community.

Our annual membership has remained unchanged for several years and is still only \$30.-

A small price to help keep Otter Lake a viable resource for generations to come

This is a New Membership(2012)
Name(s) of Owner(s):
Mailing address:
Road and Cottage number, or civic number
Telephone Numbers: at the lake:Residence
Your e-mail address:
Please Send me the Newsletter by email: Yes No
Amount enclosed: \$ 30. – Please return to: Otter Lake Landowners' Association (OLLA) #30 - O10, R.R. # 1, Lombardy, ON K0G 1L0
Thank you for your support in 2012