Mattatall Lake Stewardship Association Newsletter

NOVEMBER 2016

Update on Mattatall Lake Algae and Water Conditions, and Ongoing Activities

Water Testing

Dr. Tri Nyugen-Quang's Research:

Dr. Tri has been out to sample the Lake water during the summer and fall, his last visit was on November 5th. In the results he has released to date, the nutrient values were sometimes up, sometimes down. **Plans:** We await his full summary and analysis.

Algal Monitoring:

The MLSA has tested the Lake water during the months of July, August, and September for algal taxonomy (the type and concentration of algae) and toxicity level when the cell counts rose. The Cyanobacterial (blue-green) algal counts rose rapidly in July to a high level in all areas by August 8 2016, consistent with a blue-green algal bloom. The lake water was visibly changing color at this time, and was losing clarity. The percentage of Anabaena species went from 1 % in early July to 99 % in the August sample. By September the water samples were showing a lowering of the cyanobacterial numbers, though they were still within the high range. The toxicity level of the Lake was tested in August and September. Three samples were tested on each sampling date. The testing did not detect the presence of toxins (both anatoxin-a and microcystins were checked for). Testing for cell counts and toxins was not carried out in October. The Lake remained green in color and turbid through most of October, but has cleared significantly in November. **Plans:** no further testing of this type is planned for this year. It is costly and it does not appreciably enhance our knowledge nor help our members at this time of year.

Measurements of nutrient input from the watershed:

There are 14 small to medium streams that drain the surrounding watershed and flow into all parts of the Lake. In contrast, there is only one outlet from the Lake on its NE side at the gas pipeline. The MLSA has begun repeat measurements of phosphorus values in streams that flow into the Lake as well as the outflow. The goal is to determine if any of the input streams contain elevated concentrations of phosphorus that could contribute to the growth of the algae. In particular, we hope to identify if recent and/or future logging has or will elevate the runoff of nutrients (as expected from studies of other lakes) and if so, whether any mitigation efforts might help to lower such input.

The unusually dry conditions over the summer meant that there was very little if any drainage into the Lake and little or no runoff until mid-August. Measurements were taken at 4 locations on the NE side on 19 Aug and again at the same locations plus the outlet on 26 Sept. On 12 Oct, a total of 11 samples were taken at these same 5 locations plus an additional 6 locations on the western and southern sides. Phosphorus concentrations are reported in units of micrograms per litre. The US Environmental Protection Agency (EPA) recommends that streams entering lakes have concentration values lower than 50 units. For the 19 Aug measurements, 3 of the 4 measurements exceeded this limit and the values increased systematically from north (21) to south (84). On 26 Sept, a similar north-to-south increase (32 to 49 units) was observed, although the values had all decreased to less than the recommended 50 units. On 12 Oct, 10 of the 11 values were less than or equal to the recommended (50 unit) maximum and no regional trend was observed. One much higher value of 192 units was observed from a small

stream on the western side of the Lake, entering the cove just north of Point Rd. In contrast, we note that the lowest value of 22 units was measured on the largest stream with by far the greatest flow, which drains the largest part of the watershed south of Lake Rd.
Plans: We plan to continue these measurements in Nov & Dec 2016 and again during the spring and summer of 2017. We are encouraged by the recent low values of phosphorus. On the other hand, we are concerned that logging of parcels south of Lake Rd could in future significantly increase the level of nutrients entering the Lake.

Core sample of sediment taken:

We have been most fortunate that Dr. Joshua Kurek from Mount Alison University has been out and taken a core sample of the Lake bottom. His preliminary analysis of comparing recent layers with layers from approximately 100 years ago show changes similar to other NB lakes he has studied. Some of these comparison lakes are pristine, some are having problems. He interprets this as a broad scale pattern that may be attributed to the indirect effects of climate change.
Plans: We have been informed that a student is taking on the analysis of Mattatall Lake next semester. We await more results and interpretation.

Sonic Device Results:

One sonic device was purchased from Algae Control, South Carolina and installed in the southwest end of the Lake on July 29th. The device was expected to have an effective radius of 150m and to noticeably disrupt the growth of algae within 3-7 days. During early August, the whole Lake experienced a significant and quick blue green algae bloom and the device was operating throughout this period. No change to the water condition or any decrease in algae condition was observed within the effective area over the following month. In subsequent conversations with the supplier, we were advised that there were technical problems with several of these devices. They have offered to cover the cost of returning the device, having it reprogrammed and upgraded for retrial next year. If the device does not work, we have been advised we can return it for a refund.

Boating:

Signage was erected in August at the boat launch off Cranberry Lane. The signs are to inform boaters of the invasive nature of the algae in Mattatall Lake, and the need to disinfect boats before and after using them in the Lake. The posting of more detailed signs at additional access points to the Lake is planned for 2017.

Buoys were again placed in shallow weeded areas around the Lake. Most boaters observed these markers and also observed the requirement to reduce boat speeds to 10kph in shallow areas and observe wake zones within 50m of shore.

We are concerned with the disturbance of sediments and the possible impact of releasing built- up nutrients into the water column. As we gain a better understanding of internal loading and the possible negative effects of disturbing the Lake bottom, we may need to further reduce boat speeds and avoid shallow water altogether until our water quality improves.

Forest Harvesting in Watershed:

As reported previously, we were disappointed with the clear cutting earlier this year on three woodlots (totaling some 300 acres) within the watershed and in close proximity to the Lake. Run-offs from some affected streams were heavily silted after the forest harvesting. Some remediation has taken place and we plan to place straw berms to some streams to control further silt (and potential for increased phosphorous) entering the Lake. We remain concerned with the planned harvesting of two additional woodlots within the watershed off the Lake Road – access roads have been constructed in preparation of these possible clear cuts. Some 60% of the watershed forests have been harvested, mostly by clear cutting, in the past 15 years. Senior Environment NS officials and forest research acknowledge that this type of activity adds to the nutrient levels in affected lakes, especially those that are shallow with limited fresh water flow such as Mattatall Lake. We will continue to press Environment NS, Department of Natural Resources and the woodlot owners to defer any further clear cutting in the watershed until we better understand the algae problem.

Lake Outflow:

As a result of anecdotal information provided by residents regarding movement of water in the Lake, the Board engaged the services of a hydrological engineer from Design Point to study the outlet and to advise if it was or was not affecting the flow of water in Mattatall Lake.

The engineer's report found that the construction of the road and outlet on Aqua Vista Drive has restricted the Lake's flow by 70 to 80% since it was constructed in 2002.

We were advised that this restriction of flow severely reduced the velocity (movement) of water in the Lake. This reduced velocity may allow the silt and nutrients to remain and settle in the Lake rather than exit through the outflow. This blockage is evident in the continuing build-up of sediment and weeds in the channel on the Lake side of the roadway.

In order to rectify the outflow problem, the most practical solution may be to

increase the number of culverts and to clean out the overgrown weeds and siltation in this area of the Lake.
It is intended that any change to the number of culverts would not change the current level of the Lake so that the water level will not go any lower than what was experienced this year – it will continue to raise and lower as it rains, it would just flush quicker than it has in the past 15 years.

We have shared this report with Environment NS and will be discussing the outflow improvements with them in the coming weeks. We will be looking for provincial input, regulatory support and hopefully financial contribution.

We will keep residents advised as we gain more information on the cost, benefit and level of provincial support for any improvements to the culverts and outflow area.

Relations with Provincial Government, Environment NS:

Over the past year, we have corresponded and met with the Minister of Environment, Margaret Miller and with several of her staff. We believe the Province is sincere in their concern for the condition of Mattatall Lake. They have encouraged us to continue our efforts including on-going water testing and study of the watershed. A proposal from Dalhousie University to further study phosphorous levels in the watershed may be considered for Environment NS support in 2017. This is at the preliminary discussion stage and funding has not yet been approved. We have also been encouraged by Environment NS to establish a watershed protection advisory committee of various stakeholders and we have drafted terms of reference for a possible start this winter.

Financial:

Forty-two residents paid their 2016 $200 association fees and financial contribution compared to 73 residents in the previous year. Our main expenditures this year include the purchase of the sonic disruptor ($4500), engineer fees for outflow study ($3000), and water testing ($4000). Development of a watershed management plan as budgeted has not yet been started. Our balance of funds is $33,000. Anyone who has not paid their 2016 fees can do so by sending payment to:

Deborah Lusby, Treasurer
Mattatall Lake Stewardship Board
6560 Geldart Street
Halifax, NS B3H2C8

Property Stewardship:

We continue to encourage all residents to adopt good stewardship practices on their properties. We should all be eliminating the use of phosphorous detergents in our cleaning products. Any fertilizer use on lawns and flowerbeds needs to be discontinued. Proper maintenance and regular inspection of our septic systems in critical to ensure no overflow or run-off from septic pipes affects the Lake. Everyone is encouraged to maintain and replant a natural buffer zone between landscaped areas and the Lake waterline. Raked leaves and grass should be piled well away from the water's edge as decomposed materials can add further nutrients to the Lake.

By late October, the algae bloom had dissipated and the lake water had cleared. This would appear to indicate that the algae had completed their life cycle somewhat earlier than in previous years
Perhaps we can be optimistic that this means that the lake will have a clear start in the Spring of 2017.

Stewardship Board

Considerable time and effort have been donated by your Stewardship Board in monthly meetings, in collecting samples, installing and removing buoys, signs and the sonic device, conducting information tours, meeting with government officials and contacting media.

Please contact any of the Board members to further discuss items in this newsletter or provide us with your feedback. We need more residents to become involved in the work of the Stewardship Association. We'll be asking for more specific help in the coming year, so if you see some way that you can contribute by serving on the Board or otherwise, please let us know.

Stewardship Board Members:

Bob MacLean, Chair
Blaine Ogden, Vice Chair
Donna Spracklin, Secretary
Deborah Lusby, Treasurer
Rodger Sorsdahl, Adjudicator
Keith Louden
Gary Jollymore
Rick Parker