IRLC Works to Improve Water Quality

by Ed Robertson

The IRLC has initiated the Indian River and Lakes Water Project to help our community understand what is happening with the water in our lakes and river, what the root causes are and what we can do to turn the currently deteriorating situation around.

The insert in our last newsletter explained what we have learned about the severe challenge posed by the soil types around the lakes where cottages and septic systems have been allowed.

Our soil's permeability, shallow depth to bedrock, and the slope around the shore make it highly unlikely our septic systems keep phosphorous and other polluting nutrients that pass through them out of our lake waters.

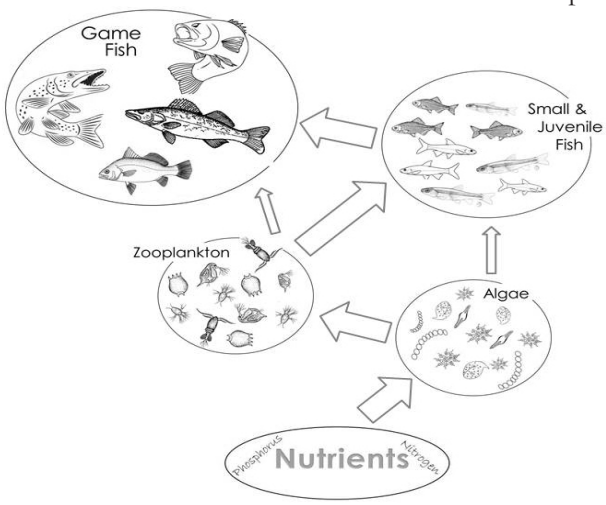
Here on the Frontenac Arch we are not alone in facing these challenges. Across the St. Lawrence River in Ontario, Canada they have a very large lakes area with conditions similar to ours. For many years Ontario has put a lot of effort into dealing with the problems related to development and water based sanitary waste systems degrading lake waters.

Mr. Bev Clark was guest speaker at the recent Friends of the Salmon River Watershed meeting in Erinsville, Ontario. Mr. Clark is retired from the Ontario Ministry of the Environment after 35 years of studying and teaching about water quality issues. His focus was on the effect of nutrients on ecological processes in Ontario's inland lakes. He has continued his mission the last six years by consulting in aquatic science.

The key point Mr. Clark made in his talk was that in the "good old days" the problem was pretty much just phosphorous, but that it is not so simple anymore. Two additional realities are complicating and worsening the situation: invasive species and climate change. His clear explanation of the effects of these two influences was a revelation.

He laid out how invasive species can and are having an effect on the algae in our water with a graphic showing the main links of the food chain in a lake. At the bottom of the chain are thousands of species of algae that feed on available nutrients. The next link in the chain is the many species of zooplankton that eat the algae. Next are the small fish that eat the zooplankton and finally large fish that gobble up the small fish. From the bottom of the food chain to the top are nutrients, algae, zooplankton, small fish and large fish.

Anything that reduces the zooplankton allows the algae to proliferate and this can happen in many different ways.



If an invasive zooplankton comes along that is larger than, and a predator of other zooplankton (as is happening in Ontario now) the result is fewer zooplankton available to eat the algae. That in turn means more algae.

If the large fish population is reduced in a lake then the small fish expand in number and eat more zooplankton leaving fewer zooplankton to eat the algae. Again, the result is more algae. There are many possibilities for invasives to disrupt the food chain balance resulting in higher phosphorous levels in a lake.

According to Mr. Clark, climate change has reduced the average number of days of snow/ice cover on Ontario lakes by 28 days per year since 1970.

Fewer snow and ice days means a longer growing season. Algae and weeds are plants and grow more with a longer season. A longer season also means cottage owners spending more time at the lake (using their toilets and showers).

Warmer temperatures during the growing season enable the weeds and algae to grow faster and trigger hazardous algal blooms.

More frequent gully-washers, another characteristic of climate change, create more peak-flow runoff events. Raindrops that pound directly on the ground on developed sites disturb the soil allowing the heavy runoff flow to pick up the loosened nutrient-rich soil articles and carry that sediment into e lake. That is why a wide verdant id absorbent shoreline buffer is so portant on developed sites.

These peak-flow events also erwhelm septic leach fields and our highly nutrient-rich runoff into e lakes. This is especially true with e soil types around the Indian River akes that are so unsuited for water sed septic systems.

What can be done to stop the omentum of these trends harming ke water quality? That is the question the Indian River and Lakes Water Project is working on.

Ontario, Canada has spent decades studying and adjusting to the problem. Through that process they have created the Lakeshore Capacity Model (LCM). This tool can provide invaluable insights into past and future lake trophic status. This information can then be used to maintain water quality during future development, and to set realistic remediation goals. An LCM is employed by regulation, using a set of criteria to determine where new development will take place by weighing several factors including lake phosphorous and water clarity levels.

The Ontario Lakeshore Capacity Model has been widely and successfully

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used for over 30 years. The LCM is simple and robust, making it an ideal tool to study and test applications in the Indian River Lakes Region.

Do our local soils and leach-fields capture and retain the phosphorous our septic systems are putting into them?

Across the river in Ontario, at sites with detailed monitoring, 25% of those sites showed field evidence of significant, long-term retention of phosphorous. All of the sites showing long-term phosphorous retention have native soil depths of more than 19 feet-6 inches to bedrock.

All of the monitoring sites that had native soil depths of less than 9 feet- 9 inches showed elevated phosphorous levels in the groundwater. Our Indian River Lakes "buildable" soil depths are 0 inches to 3 feet- 4 inches depth to bedrock.

What does this mean for us? If your cottage/home site has 20 feet deep native topsoil your septic system probably will keep the nutrients out of the lake. If you have less than 10 feet depth to bedrock it most probably will not. And, around the Indian River lakes we have 0 to 4 feet to bedrock. Clearly our septic systems function as delivery systems for phosphorous and nitrates into our lake waters.

For Ontario municipalities using their Lakeshore Capacity Model, when the phosphorous level in a lake reaches 0.020 mg/l, the point at which hazardous blue-green algae blooms can occur, no further development is allowed. Then they work to reduce the phosphorous level to 0.010 mg/l, what they consider a very healthy level for human recreation and fish habitat. Please see the reference to the Ontario Lakeshore Capacity Assessment Handbook below and read the handbook.

Upcoming newsletters will look at the phosphorous and water clarity levels of some of the Indian River lakes. We will also consider what steps can be taken, in the face of polluting nutrients flowing into the water, invasive species and climate change, to reduce the damage being caused by excessive weed growth and toxic algae blooms. Our health and the health of our pets, the fishery and the economic viability of the Indian River Lakes Region will depend on it.

IRLC is applying for a New York State Conservation Partnership Program (NYSCPP) catalyst grant to fund the education effort needed to help residents and regulatory authorities understand these issues and to take action to stop the water quality degradation occurring in the lakes.

The NYSCPP grant will require a cash match from IRLC of approximately $8,000.00. We are asking for donations for this necessary cost. Your donations will be leveraged to enable the two-year approximately $60,000 project that will lead to cleaner water for the Indian River and all of the Indian River Lakes. Please consider this challenging and very important effort in your year end giving.

Lakeshore capacity assessment handbook reference: *http://www.ontario.ca/environment-and-energy/lakeshore-capacity-assessment-handbook-protecting-water-quality-inland-lakes*