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Clare Nelligan PhD student preparing a core sample taken from the bottom of Lake Manitou for analysis at Queen's University in Kingston.

Clare Nelligan was the featured speaker at the 2016 LMAA Information Night that was held at the Sandfield School House in August. Clare made a wonderful presentation to a captivated audience. Below is a summary of the presentation that Clare very kindly drafted for this Edition of Wind Swept. The topic of her presentation is very central to the health and well being of our lake. It ties in perfectly with our moto "Lets Keep Our Lake Great"

Special thanks to the LMAA education committee especially Dave Anderson for organizing the 2016 Information Night.

Secrets from the Depths of Lake Manitou - Continued

There is more to a lake than meets the eye because a lake is continually recording information about its surroundings. Material from the land, air, and within the lake itself accumulates in lake sediment, archiving what the lake and the surrounding area were like at different times in the past. This allows scientists to use lake sediments as records of past environments – allowing them to understand how water quality has changed over time and, in some cases, identify the cause(s) of the change(s). The Paleoecological Environmental Assessment and Research Laboratory (PEARL) at Queen's University is a group of about 40 researchers who use lake sediments to understand past environmental change. A current project at PEARL investigates Ontario lakes that sustain lake trout, and one of the lakes of interest is Lake Manitou!

Lake trout are an important and relatively rare natural resource. Only 1% of Ontario's approximately 250,000 lakes sustain a lake trout population. However, on a global scale, this small fraction of Ontario lakes represents 20-25% of all lake trout lakes worldwide. Lake trout are long-lived, late-maturing fish that require cold, oxygen-rich water to survive. These characteristics make lake trout particularly sensitive to environmental stressors such as over-fishing and habitat degradation. Currently, many lake trout populations are threatened by prolonged periods of low oxygen in the cool bottom waters, where lake trout spend most of their time in the summer. This phenomenon has been observed in lakes across Ontario and has prompted concern regarding the future health of lake trout populations.

Low oxygen conditions are often a result of two distinct stressors, nutrient inputs and/or climate warming. Nutrients, from fertilizers, septic systems or exposed soils, are often responsible for causing low-oxygen conditions in lakes. Nutrients promote algal growth; however, oxygen is consumed when the algae decomposes at the bottom of the lake. Climate warming can also influence lake oxygen levels. In the summer time, when the warm surface waters of a lake are isolated from the cool waters below (i.e. the lake stratifies thermally), the oxygen supply to the deep waters is cut-off, and oxygen gradually declines over the summer months. Although this oxygen depletion occurs naturally in deeper lakes, recent climate warming has led to longer summers that can exacerbate this phenomenon. As a result, climate warming can lead to longer periods of low-oxygen in lake bottom waters, further stressing lake trout populations.

Lake Manitou sustains a provincially significant lake trout fishery. However, between 2007 and 2011, Lake Manitou had end-of-summer deep-water oxygen levels below the requirement needed to support lake trout. Due to a lack of long-term monitoring, historical oxygen conditions of Lake Manitou are unclear. Our project aims to answer the questions: How has water quality changed in Lake Manitou over the past 200 years? Is end-of-summer low-oxygen a persistent feature of Lake Manitou? Or is the low-oxygen a result of a particular event or environmental stressor, such as nutrient inputs or climate warming? In the absence of direct monitoring records, we can use lake sediments to answer these questions.

In the summer of 2015, we travelled to Lake Manitou to collect sediment cores with assistance from MOECC and MNRF staff from the Blue Jay Creek Fish Hatchery. We were only able to obtain a core from

the east basin because conditions became too rough to sample the west basin. Back at Queen's, we dated the core and examined fossilized algae within the sediments to determine past changes in nutrients and climate warming. Our preliminary results from the east basin suggest there was a change in lake water quality around the 1950s characteristic of an increase in nutrients. Additionally, changes in the fossilized algae and inferred chlorophyll-*a* (a pigment needed for photosynthesis) suggest that the lake experienced changes related to climate warming after the 1990s. We plan to also look at insect remains within the sediments to reconstruct past oxygen conditions (this analysis is currently underway).

In August 2016, I was invited to present our preliminary results at the Lake Manitou Area Association meeting in Sandfield. It was an engaging evening, full of great questions and fresh honey! The following day was calm and we finally succeeded in sampling the west basin. The next part of this project will examine the sediment record from the west basin to assess if changes in both basins suggest a common stressor.

The goal of this project is to provide resource managers with a better understanding of what stressors are influencing lake trout habitat in Ontario. By understanding long-term environmental trends in Lake Manitou, decision makers can adapt their strategies to better protect lake trout habitat. We are excited to see what other secrets Lake Manitou has to share, and look forward to reporting our results in a future article!

Clare Nelligan

PhD Candidate

Paleoecological Environmental Assessment and Research Lab (PEARL)

Dept. Biology, Queen's University



Clare Nelligan and Dave Anderson answering questions at the LMAA 2016 Information Night

Thanks to Pat Costigan for this photograph and the one below

It should be noted that Manitoulin Streams project coordinator Seija Deschenes also made a presentation at the LMAA

2016 Information Night. Keep an eye out for a summary of her presentation in the Spring 2017 Wind Swept.



Seija Deschenes giving an account of her proposed lake Manitou project at the information night

CULINARY DELIGHTS

LAKE MANITOU SLOW COOKER BEEF STEW

INGREDIENTS

- ½ lb. (4 medium) carrots
- ½ sleeve celery
- 1 medium onion
- 2 lbs. red potatoes
- 2 Tbsp olive oil
- 4 cloves garlic, minced
- 1½ lbs. beef stew meat
- Salt and pepper
- ¼ cup all-purpose flour
- 2 cups beef broth
- 2 Tbsp Dijon mustard
- 1 Tbsp Worcestershire sauce
- 1 Tbsp soy sauce
- ½ Tbsp brown sugar
- ½ Tbsp dried rosemary
- ½ tsp thyme

INSTRUCTIONS

1. Dice the onion and slice the carrots and celery. Wash the potatoes well and cut them into one inch cubes. Place the onion, carrots, celery, and potatoes into a large slow cooker.
2. Place the stew meat in a large bowl and season liberally with salt and pepper. Add the flour and toss the meat until it is coated. Set the floured meat aside.

3. Heat the olive oil in a large heavy skillet over medium heat. Sauté the garlic in the hot oil for about one minute, or until soft and fragrant. Add the floured meat and all the flour from the bottom of the bowl to the skillet. Let the beef cook without stirring for a few minutes to allow it to brown on one side. Stir and repeat until most or all sides of the beef pieces are browned. Add the browned beef to the slow cooker and stir to combine with the vegetables.
4. Return the skillet to the burner and turn the heat down to low. Add the beef broth, Dijon, Worcestershire sauce, soy sauce, brown sugar, rosemary, and thyme to the skillet. Stir to combine the ingredients and dissolve the browned bits from the bottom of the skillet. Once everything is dissolved off the bottom of the skillet, pour the sauce over the ingredients in the slow cooker. The sauce will not cover the contents of the slow cooker, but it's okay. More moisture will be released as it cooks.
5. Place the lid on the slow cooker and cook on high for four hours. After four hours, remove the lid and stir the stew, breaking the beef into smaller pieces as you stir. Taste the stew and adjust the salt if needed. Serve hot as is, or over a bowl of rice or pasta.

OMNRF /LMAA meeting to discuss the operation of the Sandfield Dam

This last August several of the LMAA board members met with Brian Riche of the OMNRF in Sudbury. The meeting was to allow our organization to learn more about how the dam is operated and to forward LMAA concerns about its operation to the OMNRF. Don Payne treasurer of the LMAA submitted his impressions of what he feels resulted from the meeting.

The Sandfield Dam An inquiry into the operation of the dam in Sandfield lead to a meeting of Directors of the Lake Manitou Area Association (LMAA) with local officials of the Ministry of Natural Resources and Forestry (MNRF). The information below is a summary of that given at the meeting.

The current dam has been in place since 1960 and is the key control structure of the Lake Manitou Watershed. It is operated by the MNRF who follow a set of guidelines that were developed at some expense and instituted in 1991. The guidelines provide monthly targets (water levels on the lake side of the dam) that will not only provide sufficient water on the lake

side but also in the Manitou River below the dam. The twenty-five-year-old guidelines have not been reviewed.

There are many variables that make the operation of any dam a challenge. Flooding in lake areas can be caused by an abundance of snow quickly melting in the Spring as well as heavy and continuing rain in the Summer months. To quickly reduce the lake-side flooding, water has to be allowed to pass through the dam into the Manitou River at a rate that may cause downstream damage. The large surface area of the lake (108 sq. K.) can store 10.5 million cubic metres of water in 0.1 meters (4 inches) which would require approximately 9 days to lower if only 2 logs were removed from each of the 4 gates. Alternatively, Winters with little snow and Summers with little rain and high temperatures that cause much evaporation can cause unfavourable lake-side water levels and much less than optimal water release into the Manitou River where fish come up to spawn in the Fall. The variables in weather possibly caused by climate change could also add to the challenges in the operation of any dam.

There were no conclusions drawn from the meeting.

Don Payne Treasurer LMAA 2016

Let's Make Our Lake Great Challenge Summer 2016

This summer long time LMAA **Mary Lohead** wrote a very good article supporting the health and well being of our lake. It was then published in the Manitoulin Expositor.

A portion of that letter is shown below. Thanks to Mary for providing this as an incentive to all lake residence to help ensure we all do our part to **"Let's Keep Our Lake Great"**

The Wonder of Water

Dear Friends,

Have you considered what a privileged people we are to live on Manitoulin with what seems to be an abundance of fresh water all around us?

Do you appreciate the beautiful, clean, pure water we enjoy and use daily? It is indeed a treasure to which many people in the world do not have access. Do you realize that this gift, as it is now, may not always be available to us?

Fresh clean water is a scarce resource in the world. More than 97% of the water on earth is saline, and occurs in seas and oceans. About 2/3 of the available fresh water is trapped in glaciers and ice caps. The remainder, or less than 1 % of the total fresh water on earth, includes water in our atmosphere, lakes, rivers and streams, wetlands and the ground. (Health Canada 1997)

While bread may be the staff of life, water is the stuff of life. Without water, there can be no life.

We realize that we must do more than just enjoy water and consume it; we must become its caretakers as well. The “quality” of water is a very fragile thing and sometimes a very small contaminant or a careless practice can greatly affect a large volume of water. It is generally easiest to prevent problems than try to remedy them after the damage has been done.

Pollution Prevention occurs when people change their plans, practices, and habits in order to reduce the generation of pollution and waste at the source. It also includes making smart choices both in what we buy and in how we use the products.

Because we strongly believe that “The Solution to Pollution is Education”, we are sending this information to you and asking you to read it and consider what you can do to protect the water quality of Lake Manitou.

If we follow the guidelines, listed below, we will greatly reduce the amount of phosphorous that enters the lake and we will avoid fuelling the algae growth, which depletes the available oxygen in the water.

We urge you to begin to adopt at least some of these practices into your lifestyle at your cottage or home this summer. Also, please share this information with your neighbours, because Healthy Shoreline Practices benefit everybody.

It’s all about looking after the environment. If each one of us does his or her part to respect, protect and conserve the environment, then the environment will do its part and look after us. Then we will continue to enjoy living on the waterfront that is so special to each one of us and we will protect it for our children and our grandchildren.

The Healthy Shore List

How does your waterfront check out?

- **PLANT A BUFFER ZONE OF NATIVE VEGETATION CLOSE TO SHOR**
The tangle of roots filters impure runoff from your cottage & slows erosion of the soil
- **SWEAR OFF PESTICIDES AND HERBICIDES**
They end up in the water and are bad news for aquatic life
- **OPT FOR A FLOATING OR PIPE DOCK**
It causes the least disturbance to the shoreline lakebed
- **“SOFTEN” HARD WALKWAYS AND DRIVES**
Unlike asphalt, pea gravel or wood chips soak up runoff
- **PRESERVE YOUR PROPERTY’S MATURE TREES**
Their deep roots stabilize the slope down to the water
- **FORGO FERTILIZERS/UPGRADE YOUR LEAKY SPETIC SYSTEM**
Both send phosphorus into the lake, fuelling algae growth and depleting the oxygen
- **LEAVE FALLEN TREES AND BRANCHES IN THE SHALLOWS**
Wood nourishes all sorts of underwater critters and provides cover for fish
- **KEEP OIL AND GAS WELL AWAY FROM THE WATER’S EDGE**
Even a minor oil spill has big consequences for vulnerable lake dwellers
- **USE UNTREATED WOOD FOR SHORELINE STRUCTURES LIKE DOCKS**
Preservative-free materials, such as cedar, are pricier but much safer for aquatic inhabitants
- **KICK THE COTTAGE LAWN HABIT**
Turf lets up to 55 percent of rainfall wash away
- **SHARE YOUR WATERFRONT WISDOM WITH NEIGHBOURS**
Healthy-shore practices benefit everybody, from cottagers to fish

* Taken from FOCA (Federation of Cottagers’ Associations)

Has one of your grandparents or parents ever called you a 'loon?' Chances are you were making funny faces, walking in a silly manner, or just being goofy. Indeed, you may have even been unknowingly mimicking the walking style of a bird that shares the same name, the loon. Indeed, loons were named for their awkward walking style and acrobatic takeoffs. In fact, loons tend to avoid land altogether!

Where they may be ungainly on land, loons excel in the air and in the water. The same webbed feet that make walking difficult help loons to swim swiftly underwater to catch their prey. Loons mainly feed on small fish, but will eat all sorts of similar-sized animals like snails, frogs, crayfish and salamanders.

Loons have a characteristic silhouette and plumage which most Canadians recognize. It is, after all, the bird on the back of our one-dollar coin! Loons have black heads and white breasts, with speckled or striped white and black feathers along their backs. Perhaps most striking about loons is their red eyes. The average loon weighs about five kilograms and can grow up to three feet in length. Even more remarkable than their appearance is the loon's distinctive call. When you first hear a loon's cry it is a sound you will never forget. Their cries can be heard at great distances (especially across open lakes), and writers all over the world have written poetic lines about the loon's unique song.

Though it is commonly believed that loons mate for life, in reality loons can and will switch partners from season to season. They build their nests on land but often in the shallows where they can easily make their escape to the water should predators attack. Loons often lay two eggs and the parents share incubation duties for about a month before the eggs hatch. Parents care for and feed their hatchlings until the young loons are ready to fly, usually around 11 or 12 weeks of age.

It's estimated that loons can live up to 25 or even 30 years, but few do. Loons face a number of obstacles in reaching old age, including a plethora of predators: skunks, raccoons, weasels eat loons, as well as larger birds such as eagles or even crows. Loons are also extremely susceptible to habitat loss and pollution caused by humans.

Despite these threats, loon populations in North America are largely stable. One can only hope that we hear the loon's unique cry around Lake Manitou—and all of Canada's lakes—for generations to come.

Chris Sailus



Mom, Dad and Baby Loon

Member's Notice Board

- **Founding Member gives many years of service to the LMAA** Alex Lothead has after many, many years retired from his position as LMAA director. Alex was not only a director and founding LMAA member, he also served as the treasurer and a lake steward collecting water samples. He was instrumental in writing the association constitution, and in the application for the incorporation of the association. He also looked after the purchase and sale of LMAA apparel such as shirts and hats. On behalf of the association a great big thanks to Alex for his huge contribution to the association. Alex and his wife Mary intend to be back this summer at their Sandfield cottage and we look forward to seeing both of them on the island and whenever there is a LMAA function.
- It is with a heavy heart that we acknowledge the passing of Thora Harvey in June 2016. Thora was a long time LMAA member. She is sorely missed by her family and friends, many who made the yearly trip to visit with her on the shores of Lake Manitou. Her husband John and children, grand children and great grandchildren have fond memories of home baking and fun filled games of Big Bertha.

Sunrise Over Lake Manitou



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Many, many thanks to out going LMAA Secretary **Effie Williamson** for years of dedication and service. Welcome to Brenda Hoyt, our new secretary.



A fine summer day on Lake Manitou

"Let's Keep Our Lake Great"