WHITE LAKE PRESERVATION PROJECT

Zebra Mussels in White Lake: *Their arrival, growth, proliferation and impact.*

Introduction

Zebra mussels are native to Southern Russia and were first documented in 1769. They were believed to have been introduced into the Great Lakes in the late 1980's in ballast water from transoceanic ships carrying veligers (larvae), juvenile or adult mussels. Since then they have spread into the Eastern US and up into Canada through interconnected waterways and by hitchhiking on boat surfaces or in engine cooling systems. Note that they can live up to 7 to 9 days out of the water. Adults average 2 to 3 cm in length, but can grow up to 5 cm. Now they have arrived in White Lake! Last fall, the White Lake Preservation Project's Science committee first documented their presence.

A zebra mussel: Note the Zebra stripes giving it the name

Facts about Zebra Mussels

Zebra mussels live for about 4 to 5 years. One female can produce 20 to 40 thousand eggs each reproductive cycle which can be repeated 30 to 40 times a year. During the five-year lifetime, a single zebra mussel will produce about five million eggs, and about 50,000 of these will reach adulthood. The offspring of a single mussel can in turn produce a total of half a billion adult offspring. It's easy to see why there may be over a billion of them right now in White Lake.

Diet

Zebra mussels feed on small organisms called plankton (which includes algae) that drifts in the water. The zebra mussels blanketing the bottom of our lakes filter water as they eat plankton. White Lake is very rich in plankton and provides an ideal feeding ground for zebra mussels. An adult mussel can filter 1 to 1.5 litres of water a day so just imagine how quickly they may filter the water in White Lake if there are a billion in the lake.

The White Lake Situation

In 2016 the WLPP Science Committee did an extensive assessment of zebra mussel distribution. Samplings were done on the NW shore behind Hardwood Island, Three Mile Bay, Pickerel Bay, The Canal, The Narrows and in the White Lake Village Basin. All sites had zebra mussels. Most were found to be attached to the smooth surfaces of docks,

Zebra mussels on the pontoon of a dock: Northwest shore, White Lake

boats, etc., and on all aquatic-plant species. So far few if any were found on rocks but some were found on the exposed underside of rocks. On one 4-ft long milfoil (common aquatic plant in White Lake), 172 zebra mussels were counted. Using average numbers for such counts, a very crude estimate of zebra mussel numbers was done assuming that they are on all water plant species. The calculation showed that about one billion mussels are now in the lake. Most of them are small indicating that these are mostly the new generation of 2016.

Zebra Mussel covering milfoil stems.

Impact of zebra mussels on White Lake

What we can expect for the coming year:

•Clearer water caused by the filtration of the lake. Note, this has already been observed using Secchi disk water clarity measurements.
•Zebra mussels will be more visible on shoreline substrates such as rocks logs etc.
•Larger sized zebra mussels will become common and some will be over 5 cm in length.
•There will be a reduction or loss of our native clam population. These may become extinct within a couple of years. Otters that feed on clams may also be reduced in numbers.
•There is going to be pressure on larval insects like dragonflies by restricting their emergence.
•There will be direct competition for algal resources that microscopic aquatic crustaceans require, which in turn support species of fish that eat plankton.

Five zebra mussels attached to a clam

•Faster and thicker weed growth will occur which is the result of the greater penetration of sunlight in the water column. This was already observed in 2016.
•There will be increased decomposition of organic matter forming oxygen depleted zones in the lake which can affect fish and also change water chemistry.
•Certain types of blue green algae (a cyanobacteria) blooms may occur which could also produce microcystin (toxic to the liver). These blooms could appear in greater frequency and intensity than at present. ***Note that we cannot be certain of the extent of the above effects and must wait and measure these over time as the zebra mussel population in White Lake reaches an equilibrium state.***

Impact of zebra mussels on boats and water intake devices

Zebra mussels adhere to flat surfaces such as the lower unit of boat motors. This causes clogging up of the motor cooling systems and overheating can result. Clogging of cottage water intakes also occurs. This can result in loss of water pressure and it can also cause damage to pump systems. Zebra mussels on dock ladders can cause cuts to feet and hands.

Zebra mussels covering the lower unit of a motor.

Property Owner Responsibility

Property owners need to advise visitors that White Lake is now a source for further contamination of waters not yet experiencing the impact of zebra mussels.

How to stop the spread of zebra mussels:

- Drain water from bilge, live wells, bait buckets, trailer and wheels.
- Wash bait wells with hot water.
- Do not transport bait from an infested area!
- Rinse the hull with hot water, high-pressure washer or dry in the sun for 5 days.
- Flush the engine cooling system with hot water (60 C, 140F) or tip down the motor and
- Discharge the water from the cooling system.
- Carefully inspect screens and water intakes and drain pipes for zebra mussels.
- Remove all aquatic plants and animals from the boat, motor, trailer and equipment since aquatic plants will carry juvenile mussels.
- Townships and Municipalities should have the proper signage at public and private boat launches warning of zebra mussels.
- Resort owners need to ensure that boats coming in and out are clear of zebra mussels.

Conclusions

The presence of zebra mussels in lakes inevitably and irreversibly changes the chemistry of the lake. White Lake right now is in a transition period with rapid changes which will take place over the next several years. The published literature on the effects of zebra mussels in lakes indicate that although their effects will increase dramatically over the short term, the situation may improve somewhat over the longer term as White Lake reaches a new equilibrium. Only time will tell what the actual affects of the presence of zebra mussels will be on White Lake, in particular the occurrence of blue-green algae and the presence of toxins.

The White Lake Preservation Project will continue to monitor White Lake water quality and document the changes taking place. We will also be making an effort to update and inform all individuals on this and other invasive species. Please check our website at www.WLPP.ca for updates and the upcoming 2016 Science Report for a more detailed analysis.

Science Committee, White Lake Preservation Project: *Conrad Gregoire, Stephanie Medwenitsch, David Overholt, Adam Pugh, Peter Raaphorst*

October, 2016