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## What's Happened to Lake Ontarios' Fishery?

**Everything that has happened is a logical result of three major changes to Lake Ontario only a few years after the first stocking of Pacific Salmon and Steelhead.**

The Clean Water Act of 1970.

The accidental introduction of shallow water Zebra Mussels in the late 1980's.

The accidental introduction of shallow and deep water Quagga Mussels in the early 1990's.

These three events have dramatically reduced the nutrient load in Lake Ontario water. Phytoplankton have less availability to their life sustaining nutrients because there are less going into the lake. These nutrients we consider "pollutants" the zebra and quagga mussels filter in large quantities. Also, compounding the issue, the mussels filter out phytoplankton as food sources. This phytoplankton feeds zooplankton which feeds baitfish.

One mussel can filter up to a liter of water per day. People living near Lake Ontario back in the late 1960's say that they could see down into the water about 6 inches. In July of 2011 the 158 year old shipwreck of "Queen of the Lakes" was found near Sodus Point, New York. An article about the find states "The water clarity was good allowing about 75 feet of visibility..." From 6 inches of visibility to 75 feet! Nice for Wreck Diving (if you can see through the mussels) but it can mean starvation for fish.

The NYSDEC Lake Ontario Annual Report 2012 (Executive Summary pg. 1) states..."**in recent decades, the Lake Ontario ecosystem has undergone dramatic changes resulting primarily from the introduction of exotic zebra and quagga mussels. In addition, improvements in wastewater treatment have reduced excessive nutrient concentrations to historic, more natural levels, thereby lowering the productive capacity of the Lake Ontario ecosystem. Epilimnetic zooplankton biomass in Lake Ontario's offshore epilimnion declined by 99% over the last 30 years...**" In other words... Lake Ontario water is getting too clean.

Phytoplankton (an edible type of algae) contain chlorophyll and require sunlight, water and carbon dioxide for photosynthesis to create the carbohydrates that they use for food. In addition, nitrogen, phosphorous and iron are needed for survival. Nitrogen and phosphorous are needed for reproduction; when both of these are not present phytoplankton cannot continue to thrive.

Zooplankton and other invertebrates such as the shrimplike Diporeia eat phytoplankton. With less phytoplankton there is less food for baitfish.

In an article published about Lake Michigan and Lake Huron in Jan 2012. Tom Nalepa, an emeritus research biologist at the National Oceanic and Atmospheric Administration's Great Lakes Environmental Research Laboratory in Ann Arbor, found that "the energy density of Lake Huron alewives dropped 23 percent from pre-mussel invasion 1979 to post-invasion 2004, by which time Chinook salmon needed to consume 22% more alewives to attain an ideal size by age 4." The Alewife is also Lake Ontario's primary baitfish. Alewives naturally contain something called "thiaminase". Thiaminase is an enzyme that destroys or inactivates thiamine. Also known as vitamin B1, thiamine is important for the nervous system to function correctly. Thiamine deficiency, most acutely seen by tributary anglers in Steelhead during 2013/2014, can cause nervous system disorders, poor appetite, poor growth, and problems with survival of hatched fry. Mitigation of thiaminase can be achieved by a varied diet. Since Nov 2012 the New York State Department of Environmental Conservation (NYS DEC) has been trying to do this by reintroducing a native species of bait. The Deepwater Cisco or "bloater" is a thiamine rich baitfish. According to 2012 DEC Commissioner Joe Martens "Lake Ontario's sport fisheries are a significant economic driver in New York State, and were valued at more than \$113 million in 2007. Re-establishing bloaters in Lake Ontario will diversify the fish community, adding stability to the lake's ecosystem and sport fisheries." So, why doesn't the DEC stock more bait? A few reasons... First, if every Hatchery in NY State raised nothing but baitfish it would be eaten up in Lake Ontario after only 1 week. Also, the lake is in a delicate state with the amount of zooplankton available. It would be easy to tip the balance further than it already is and have a catastrophic collapse.

What can be done to contain or eradicate zebra and quagga mussels?

Unfortunately, there are no known methods to control or eradicate these mussels in the wild. Some fish (like the Round Goby) eat the mussels. Unfortunately, according to the USGS, "quagga mussels accumulate organic pollutants within their tissues to levels of more than 300,000 times greater than concentrations in the environment and these pollutants are found in their pseudofeces, which can be passed up the food chain, therefore increasing wildlife exposure to organic pollutants."

So, what can we do?

1. The NYS DEC needs to recognize...

**The Lake Ontario fishery is NO LONGER primarily a LAKE fishery.**

According to the NYS DEC Lake Ontario Annual Report 2012... Total fishing effort for Lake Ontario (actually fishing out in the lake) was 848,905 angler hours (Section 2 Page 4). The tributaries of Lake Ontario had 1,582,428 angler hours. The Salmon River accounted for 68% of the tributaries total with 1,077,316 angler hours. (Section 11 Page 3)

**The Salmon River had more angler hours than the whole NYS Lake Ontario boat fishery!** And, according to the NYS 2015 Lake Ontario Fisheries Program Highlights... "Fishing effort directed at trout and salmon (in the lake) has remained relatively stable for more than a decade but was the second lowest on record in 2015."

What does this mean? **Lake Ontario TRIBUTARIES are generating more NYS FISHING TOURISM \$** than ever before.

2. Discontinue supplemental stocking of Chinook salmon. Currently, Lake Ontario's population of **Chinook salmon is comprised of 50% naturally reproduced (wild) fish**. Stocking a fish that grows from an egg to 25-40lbs in approx. 3 years is an inefficient utilization of the bait remaining in Lake Ontario. Stocking more Steelhead, Brown Trout, and Atlantic salmon, fish that grow from an egg to 6-12lbs in approx. 3 years **allows for a greater quantity of fish to be stocked**. The consumption of less bait per predator means more fish to fish for! Also, as a bonus, these fish are a more sought-after sport fish in the tributaries.

3. The most heavily fished tributaries, such as the Salmon River, should be made **NO KILL** for all **Steelhead, Brown trout, and Atlantic salmon**. **NO KILL is NOT for reproduction**. This is purely a way to allow more fishermen to catch fish for an extended period of time. The NYS DEC Lake Ontario Annual Report 2012 shows that tributary fisherman want this! "Higher release rates in recent years (91% in 2011-2012) are due, in part, to increased catch rates and **anglers' desire to conserve steelhead to maintain the quality of the fishery**." (Section 11 Page 33). The same report shows that the Salmon River had 8,608 Steelhead harvested that season and 711 Brown Trout. **That's over 9,300 fish that could have been caught again... just in this one river!** A fish allowed to be caught more than once means **jobs** for... guides, lodges, restaurants, tackle shops, gas stations, and all the people that work in them. **Fishermen want to CATCH FISH!** It doesn't matter what the creel limit is; if a fisherman doesn't catch any fish then he/she probably won't come back. If the creel limit is 0 and a fisherman catches 2, 3 or possibly 10 fish... common sense says... they'll be back.

4. **Educate**. Isn't it ironic; undersized Atlantic Salmon, referred to as "Canadian Coho" by some charter boat captains, are being killed out in the lake because of their competition with the Chinook. If these people only understood what is going on in Lake Ontario they might see that the Atlantic salmon (the native species and, once, top predator for Lake Ontario) might just be a better choice for them. A fish that grows more slowly (and therefore eats less bait), historically achieved 40+ lbs. (these fish are much older than Chinook of the same weight) and are an extremely sought-after game fish!

Educate our politicians in Albany about the fishery and its' potential for collapse like Lakes Huron and Michigan or its' potential for **transformation into a high quality Tributary and Lake fishery**.

Lake Ontario, like all of the other Great Lakes, has many problems that cannot be solved in a short period of time. **What we can do** that many of the other Great Lakes fisheries did not, is to **utilize what we have to its' fullest potential!**

It's time to get our heads out of the sand! These problems are not going away. We can either have a fishery for only a few more years or... **a FISHERY FOR THE FORESEEABLE FUTURE.**

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