The Introduction of Exotic Species in the Great Lakes

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by

Leah Parosky

7365 State Route 3, Pulaski NY 13142

Since the 1880s, an estimated 139 non-native species have been established in the Great Lakes. A few of the more well-known of these are the sea lamprey, alewife, smelt, carp, brown trout, rainbow trout, and Pacific salmon. A non-fish exotic, the zebra mussel, has caused some dramatic changes in the lakes. Other non-fish exotics that give nightmares to fisheries biologists and hatchery managers are bacteria and parasites like Bacterial Kidney Disease and whirling disease. Needless to say, the Great Lakes have gone through some significant changes since the 1880s, and exotics have only been a part of them.

Lake Ontario is the smallest of the Great Lakes, and along with the introduction of exotics, has been subject to the pollution and overfishing that the other lakes have. Once an exotic species gets into one of the lakes, it's only a matter of time before they spread to the rest. Perhaps the most well know example of this is the sea lamprey, *Petromyzon marinus*, originally a North Atlantic resident that bred in fresh water streams. With the opening of shipping canals, the lamprey quickly spread into the lakes and by 1940 had made it to Lake Superior and was breeding in many of its tributaries.

The alewife, *Alosa pseudoharengus*, a stowaway in the bilge waters of a ship from the Atlantic, found Lake Ontario waters to be a great new home. Native predators had declined, from over fishing and pollution and many were near extinction Without controls, the alewife quickly became so numerous that lake shore residents needed trucks to haul away the seasonal dieoffs of this herring-like fish. Area residents wanted something done to control this fish, as no one wanted tons of dead fish rotting in their backyard. A predator stocking program was believed to be the only way to get them under control, and so Pacific salmon were soon introduced. Chinook, coho and pink salmon were stocked by the millions and quickly filled the place of the native Atlantic salmon and lake trout. Stocking these voracious predators led to an economic boom in some lake shore communities. And then the zebra mussels arrived.

Zebra mussels are highly efficient filter feeders, which remove nearly all small particles from the water. One result of their filtering is that lake waters are becoming increasingly clear. The pollutants, mainly phosphates, which kept the lake waters cloudy with algae and plankton blooms, were removed. As a result,the alewife population, which thrived in the murky waters, began to decline. When the alewife declined, there was an increase in the numbers of young native species whose larval forms were preyed upon by the alewife.

For those who live on the lake and use and fish its water, this change is obvious. But just how much more the lake environment will change is just not known. Many groups who are concerned about the lake have different goals and different ideas for its future. Some want to see it as it was, with no pollution and no non-native species. Unfortunately, there is no way to accomplish this.

However, efforts to bring back native lake trout and Atlantic salmon have met with some success. The progeny of hatchery reared lake trout began to survive in a detectable number in 1993. Although the native ecosystem will never be the same as it was, at least things seem to be improving.
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