

Invasive Mussels in the Great Lakes and Inland Lakes of Michigan

The zebra mussel problem in the Great Lakes is well documented. The zebra mussel is one of, if not the single most recognizable invasive species in the Great Lakes region. In the years after the discovery of zebra mussels in the Great Lakes, zebra mussels and other invasive species were often in the headlines of mainstream publications. More recently, the issues surrounding zebra mussels have not garnered the same media attention. This has led some to believe that the issue has been solved and zebra mussels are no longer a problem in the Great Lakes, but that is not the case. Invasive species like zebra mussels and other invasive mussels are still very much a problem in the Great Lakes, as well as the inland lakes of Michigan.

The history of invasive mussels dates back twenty five years to when zebra mussels were first discovered in the Great Lakes. An article in *State Legislatures* magazine states “The zebra mussel traveled from the Mediterranean to the Great Lakes in 1988. Quagga mussels followed in 1993. Both entered through the ballast water of ships... these dime-sized organisms cost the region an estimated \$100 million to \$400 million a year to control, and are spreading across the country.”¹ The amount of money spent combating these invasive species is indicative of their negative impact on the environment. The government is willing to spend millions of dollars to control these invasive species because the negative impacts of these species are so widespread.

An invasive species can often have disastrous effects on the species that are native to the host area. The native species are often impacted through predation, competition, and habitat alteration, as the invasive species simultaneously experiences a rapid population growth.² This is the case with the zebra mussel (*Dreissena polymorpha*) and quagga mussel (*Dreissena rostriformis bugensis*) and their impact on the native amphipod *Diporeia*. Studies have shown that native species of *Diporeia* are being replaced by invasive mussels. This change has led to drastic changes in the ecosystem of the Great Lakes. One study states “The replacement of *Diporeia* by *D. r. bugensis* can be viewed as a process that has caused a major disruption in the energy flow through the benthic community,” and goes on to say “Recent studies suggest that the disappearance of *Diporeia*, an energy-rich, readily-available food source, is having a negative impact on fish communities in Lake Michigan and other Great Lakes.”³ The replacement of a native species by an invasive mussel has disrupted the whole flow of energy through the Great Lakes ecosystem. Studies have suggested that this change has also had an effect on the fish communities, which could have an immediate impact the people living near the Great Lakes.

¹ Farquhar, Doug, and Scott Hendrick. "Unwanted guests: invasive species, ranging from mussels to weeds, are costing the country billions." *State Legislatures* 35.9 (2009): 28+. *Academic OneFile*. Web. 17 Feb. 2014.

² Fanslow, David L., Gregory A. Lang, and Thomas F. Nalepa. "Transformation of the offshore benthic community in Lake Michigan: recent shift from the native amphipod *Diporeia* spp. to the invasive mussel *Dreissena rostriformis bugensis*." *Freshwater Biology* 54.3 (2009): 466+. *Academic OneFile*. Web. 17 Feb. 2014.

³ Fanslow, Lang, and Nalepa. "Transformation"

The invasive mussels are not just a problem in the Great Lakes. These invasive species have also been introduced to smaller inland lakes. Some inland lakes have a high density of zebra mussels, while others have been completely unaffected. Studies have suggested that the calcium density of the water has a direct correlation to the success of zebra mussel colonization. According to a recent study by the University of Notre Dame, "In five softwater lakes (lakes with calcium concentrations <28.3 mg/L), zebra mussels were not found. Zebra mussels had colonized three of four lakes where calcium concentrations were >28.3 mg/L."⁴ Assuming the study is correct when it states that zebra mussels are unable to colonize softwater lakes, this data could be used to calculate the contamination risk of lakes that have not yet been introduced to zebra mussels.

Bibliography

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