INVASIVE SPECIES: ZEBRA MUSSELS

Introduction

In Louisiana, these little mollusks have moved into the Mississippi River through migration from the Great Lakes. Native to the Caspian Sea area of Eastern Europe, they were accidentally transported into Lake St. Clair in 1986 by ocean-going cargo vessels. By 1989, they had established populations in several of the Great Lakes, and eventually they changed the ecosystems in some of them.

Zebra mussels, about the size of a thumbnail, are filter feeders. During their juvenile stage, they attach to hard surfaces such as pilings, boat hulls, rocks, pipes or even each other and settle down to consume nutrients from the water for the rest of their lives. Attachment is made with an extremely strong substance called a byssal thread.

They are too small for humans to eat and have only one natural predator in Louisiana (freshwater drum). Diving ducks are also known to eat them.

Zebra mussels are small bivalves that cause big problems in our rivers and lakes.

A Little-Known Problem in Louisiana

Along the Mississippi River, the huge raw water intake pipes servicing power and chemical plants attract zebra mussels seeking a hard surface for settlement. Up-side-down and right-side-up mean nothing to them – they settle on all areas of the inside of the pipe in order to get nutrition from the flowing water. They also settle on each other, and eventually, the stacked-up mussels narrow the pipe opening so that the water's flow is slowed or stopped. This phenomenon actually closed down a water plant in Michigan in the late 1980s, but it has never closed a plant in Louisiana. Those Louisiana industries along the river with zebra mussel infestations control the animals by periodically treating the intake pipes and other infested equipment with chemicals or scraping them to remove the zebra mussel buildup. These maintenance costs, like other production expenses, are passed on to the consumer.

Zebra mussels are a lesser problem in Louisiana than in Great Lakes states because their growth is limited by two natural factors. Each spring's spawning period coincides with the time when Mississippi flow is high and swift due to the melting snow on the upper river and upper tributaries. This flow carries a portion of each zebra mussel's approximately 30,000 larvae out to sea, where they die because they cannot live in saltwater. Each summer, the river level decreases and the river temperature becomes very high, stressing the zebra mussels, which are not heat tolerant. The largest mussels, under the greatest stress, die. Thus, in Louisiana, zebra mussels don't live as many years and don't grow as large.

Problems & Control

Some of the serious problems these little clams are responsible for include:

- plugging up industry water intakes

- interfering with navigation and accelerating corrosion by attaching to pilings, docks and buoys
- decreasing fuel efficiency and damaging engines by growing on boat hulls and inside intake pipes
- weakening or killing native freshwater mussels by interfering with the native mussels' ability to open and close their shell, as well as by competing with them for food
- filtering large amounts of phytoplankton from the water, reducing the food available for other filter-feeding organisms and fish.

Zebra mussels can be controlled by:

- High temperature or steam
- Chlorination
- Molluscicides
- Scraping

Zebra mussels can be discouraged from attaching or excluded by:

- Sand filters
- Antifoulants
- Copper pipes
- Nonstick coatings

Online Resources

- Great Lakes Invasive Species website: www.great-lakes.net/envt/flora-fauna/invasive/zebra.html

Print Resources

- Barrett, M. 1995, **Exotic Nuisances**, *Coast and Sea*, Louisiana Sea Grant College Program, p. 9-11.
- Coleman, E. 1993, **Musseling into Southern Waters**, *Coast and Sea*, Louisiana Sea Grant College Program, p. 7-9.
- Invasion of the Zebra Mussel, **Seafact**, Louisiana Sea Grant College Program, brochure.

Educational Resources

- Clark, V. P. and T. J. Miller, *Invasion of an Exotic Species: Stop the Zebra Mussel!* Activities and Resources for Grades 8-12. Virginia Sea Grant Marine Advisory Program, VIMS Educational Series No. 41, VSG 94-03