Pennsylvania Sea Grant 2008

AQUATIC INVASIVE SPECIES OF PENNSYLVANIA

ZEBRA/QUAGGA MUSSEL

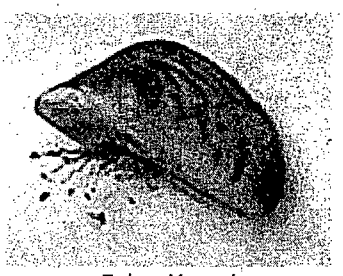
(Dreissena polymorpha)
(Dreissena bugensis)

Zebra and quagga mussels are small fingernail-sized bivalves that occur in very dense colonies throughout the Great Lakes region.

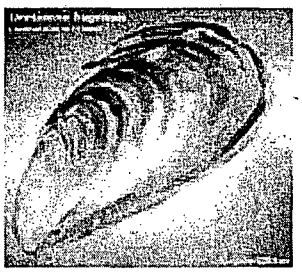
ORIGIN
These invasive mussels are native to the Ponto-Caspian basin of Eurasia (Eastern Europe and Western Asia).

HABITAT
Zebra and quagga mussels can colonize the surface of many things, such as docks, nets, water pipes, and native mollusks. They attach to these surfaces using their byssal threads, tiny threads that they extrude from their bodies.

IDENTIFICATION
Zebra and quagga mussels can be easily identified by the striping and coloring of their shells. Zebra mussels have triangular shaped shells, while the quagga has a rounder shell. See the table for more comparisons between species.



Zebra Mussel

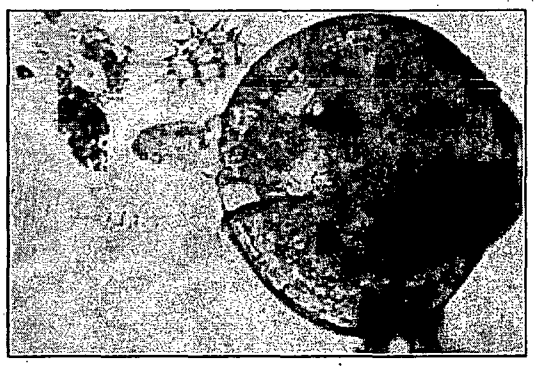


Quagga Mussel

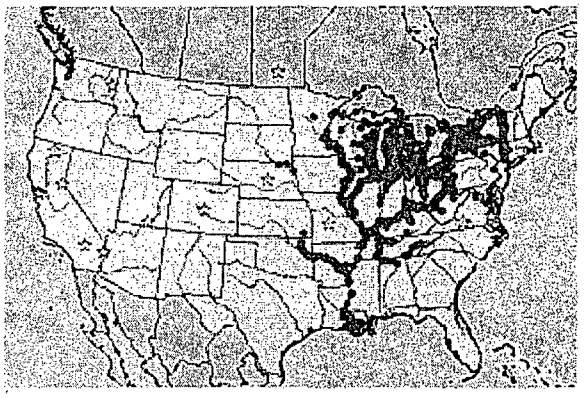
	ZEBRA MUSSELS	QUAGGA MUSSELS

Shell	Triangular shape, byssal (ventral) side flat. Obvious ridge between side and bottom	Rounder sides, byssal side rounded. ridge lacking
Color	Variable colors and patterns, usually dark	Pale near hinge, dark concentric rings on the shell
Byssal	Large groove in middle of flat side; allows tight hold on rocks	Small byssal groove near the hinge
Depth in Lake	3 to 98 feet (1-30 m), rarely found below 50 feet (15 m)	3 to 351 feet (1-107 m), commonly found down to 98 feet (30 m)
Temperature	32° to 86°F (0° to 30°C)	32° to 86°F (0° to 30°C)
Tolerance	54° to 68°F (12° to 20°C) preferred	39° to 68°F (4° to 20°C) preferred
Reproductivity Temperature	Young present at 57 ° to 68°F (14° to 20°C)	Young present as low as 46°F (8°C)

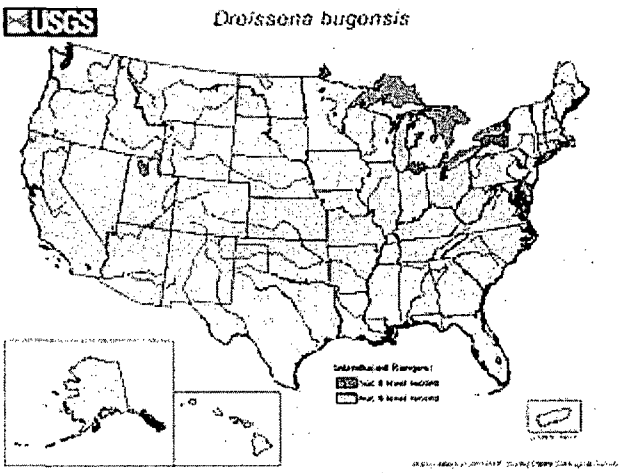
SPREAD



Zebra mussels were introduced to North America from the ballast water of a ship that traveled to the Great Lakes from the Ponto-Caspian area. Since their discovery in Lake St. Clair in the mid 1980s they spread quickly to all of the Great Lakes, and many other waterways including the St. Lawrence Seaway and the Hudson, Illinois, Mississippi, Ohio, Arkansas, and Tennessee rivers. The mobility of their veligers (plankton stage) has enabled the zebra and quagga mussel to invade the Great Lakes as well as the entire stretch of the Mississippi River. During this stage, they can float in the water for up to four weeks before they settle and attach to a solid surface. In addition, zebra mussels and quagga mussels can hitchhike on boat hulls and trailers to other lakes if boaters are not vigilant about cleaning.



2002 Distribution of Zebra Mussels



2005 Distribution of Quagga Mussels

IMPACTS

Zebra and quagga mussels are excellent filter feeders, removing large amounts of plankton and suspended particles from the water. By removing plankton, the mussels decrease the food available for fish and other consumers. This food web disruption, in turn, can cause great change to aquatic communities. Zebra and quagga mussels can also accumulate high levels of contaminants within their tissues, increasing wildlife exposure to contaminants through the food chain. The zebra and quagga mussel can clog water intake structures, such as pipes and screens, disrupting supplies of drinking, cooling, processing, and irrigation water. Recreation-based industries become heavily impacted by the mussels when docks, break walls, buoys, boats, and beaches become heavily colonized.

PREVENTION AND CONTROL

Veligers may be carried in livewells, bilge water, or bait buckets. Adult mussels can easily attach themselves to boat hulls and trailers. To prevent chances of introducing these species, boaters should drain water from the motor, live well, bilge and transom wells, and any other water from the boat and equipment while on land before leaving any water body. Zebra and quagga mussels also cling to vegetation, so great care should be taken to clean off all vegetation from the boat, trailer, and motor before transporting it to another body of water.

The European community, after two centuries of infestation, and the Great Lakes community, after years of infestation, haven't been able to develop a chemical toxicant for lake wide control that is not deadly to other aquatic life forms.

FOR MORE INFORMATION ON THE ZEBRA AND QUAGGA MUSSEL

- Zebra Mussel Watch
- Zebra Mussels in the Great Lakes
- Spread of Zebra Mussels; Protect Your Boat
- Safe Use of Zebra Mussels in Classroom and Laboratories
- Zebra mussels in North America, the invasion and its implications
- Boaters: Take Action Against Zebra Mussels
- Zebra mussels in the Great Lakes: the invasion and its implications

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