

Quagga Mussels

FACT SHEET

Pennsylvania Sea Grant, as part of the National Sea Grant Program, promotes efforts to improve the environmental and economic health of Pennsylvania's coastlines.

Focusing on the Lake Erie and Delaware River watersheds, Pennsylvania Sea Grant works to increase public awareness of coastal environmental and economic issues through extension, communication, applied research, and education activities.

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Background Quagga mussels (*Dreissena bugensis*), a close relative of the zebra mussel, were first discovered in the Great Lakes region in September 1989, when one was spotted near Port Colborne, Lake Erie; however, the recognition of the quagga type as a distinct species did not occur until 1991. Their arrival to the Great Lakes region, like the zebra mussels, appears to be the result of ballast water discharge from transoceanic ships into the Great Lakes. Quagga mussels (Figure 1) are slightly smaller than zebra mussels, have rounder sides, and do not have a ridge. They have dark concentric rings on the shell and are pale in color near the hinge. Quagga mussels are commonly found down to 98 feet; the zebra mussel is rarely found below 50 feet. For more detail on the quagga-zebra mussel comparison refer to Table 1



Figure 1. Quagga mussel: Photo taken by Bill Tate of the USGS - <http://nas.er.usgs.gov/zebra.mussel>

Quagga mussels can now be found in Lake Michigan, Lake Huron, Lake Erie, Lake Ontario, Lake St. Clair, Saginaw Bay, throughout the St. Lawrence River north to Quebec City, and there are also a few inland occurrences in New York, Ohio, Michigan, and Pennsylvania (Figure 2).

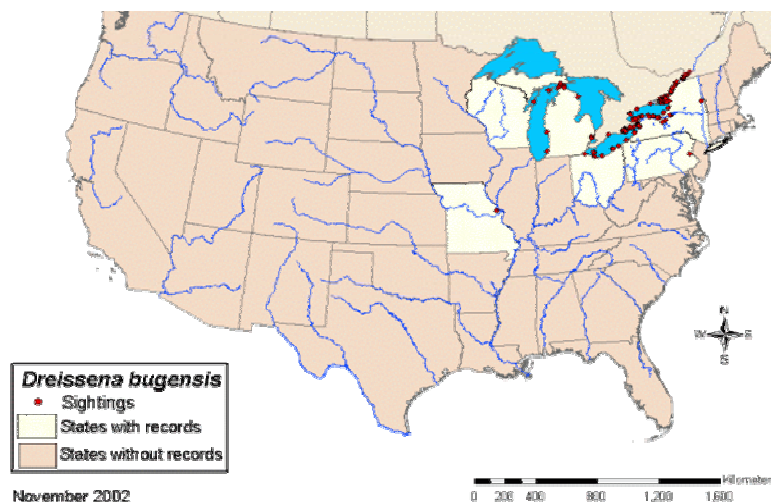


Figure 2. 2002 Distribution of Quagga mussels: Image by Myriah Richerson and Amy Benson of the USGS - <http://nas.er.usgs.gov/zebra.mussel>

Comparison of Zebra and Quagga Mussels Researchers are concerned that the quagga mussel may be able to tolerate a wider range of temperature extremes than the zebra mussel. Zebra mussels can colonize on nearly any hard object or substrate, including colonization of hard objects deposited in or on mud or other soft substrates. Pieces of native mussel shells can serve as a substrate (base) for microscopic, free-floating larvae called settling veligers. As a few mussels begin to grow, they in turn serve as substrate for additional colonization, forming what is known as a druse. In contrast, quagga mussels can live directly on a muddy or sandy bottom, and appear more tolerant of low temperatures and extreme depths than zebra mussels. Quagga mussels are as prolific as zebra mussels; a single mature female mussel can produce more than 1 million eggs in a spawning season.

	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
Reproductive Temperature	Young present at 57 ° to 68°F (14° to 20°C)	Young present as low as 46°F (8°C)

Table 1. Zebra Mussel – Quagga Mussel Comparison Summary

Impact Quagga mussels are extraordinary water filterers, removing large amounts of phytoplankton and suspended particulates from the water. By removing the phytoplankton, quaggas in turn decrease the food source for zooplankton and forage fish, therefore altering the food web. In addition, quagga mussels accumulate contaminants within their tissues to levels greater than concentrations in the environment; therefore, increasing wildlife exposure to contaminants. The quagga mussel can clog water intake structures, such as pipes and screens; therefore, reducing pumping capabilities for power and water treatment plants – costing industries, companies, and communities. Also, recreation-based industries and activities have been impacted by the quagga mussel: docks, breakwalls, buoys, boats, and beaches have all been heavily colonized.

How to stop the spread Microscopic larvae may be carried in live wells or bilge water, bait buckets, and attach themselves to boat hulls and trailers. Drain water from the motor, live well, bilge and transom wells, and any other areas of your boat and equipment while on land before leaving any water body. Quagga mussels cling to vegetation, so great care should be taken to clean off all vegetation from the boat, trailer, and motor before transport to another body of water.

Information for this fact sheet was adapted from a variety of sources, including:

The Great Lakes Information Network - www.great-lakes.net

Sea Grant Nonindigenous Species Site (SGNIS) - www.sgnis.org

Great Lakes Sea Grant Network - www.uaf.edu/seagrant/private/SG-regional/greatlakes/index.html