



NOAA FISHERIES SERVICE



Zebra mussels colonize and completely cover a native mussel, leading to its demise. Many native mussels are in danger of becoming extinct due to infestations of zebra mussels. (Photo credit Randy Westbrooks, U.S. Geological Survey, Bugwood.org).



Invasive bivalves can be transported via boat hulls, motors, ballast water, live bait and other gear, including clothing. Thoroughly inspect, clean, and dry all of equipment that contacts the water (Photo credit: University of Nevada)

Zebra and Quagga Mussels

Zebra and quagga mussels are small mollusks native to the waters of Europe and Asia. Both species were most likely discharged into the Great Lakes from the ballast water of ships discharging the species' larval stage. They were discovered in the Great Lakes in late 1980s; since that time, their distribution has expanded across North America.

Both zebra and quagga mussels are filter feeders that consume large portions of the microscopic plants and animals that form the base of the food web. By removing most of the food for microscopic zooplankton and filter feeders (which in turn support larval and juvenile fishes and other animals), these species can effectively starve the native populations of infested lakes and rivers. The colonizing nature of invasive bivalves can also have a serious impact as settlement may interfere with the feeding, growth, movement, respiration, and reproduction of native species. For example, zebra mussels can colonize a clam shell to such an extent that the clam cannot open its shell to eat. Some native bivalves have been found with more than 10,000 zebra mussels attached to them.

Invasive mussels are notorious for their biofouling capabilities as their ability to attach to almost any hard surface often results in the undesirable accumulation of these organisms on submerged structures. These invasive species are capable of colonizing water supply pipes of hydroelectric and nuclear power plants, public water supply plants, and industrial facilities. As pipes are fouled, flow is restricted, thereby reducing the intake in heat exchangers, condensers, firefighting equipment, and cooling systems. Navigational and recreational activities can be negatively affected as invasive bivalve species cause damage to the hulls, engines, and steering components of boats and other recreational equipment. Beaches may become unusable as a result of the sharp shells and pungent odor that are characteristic of bivalve invasions.

Quagga-Zebra Mussel Action Plan

Once established, zebra and quagga mussel populations are very costly to control. For example, Great Lakes officials have estimated that more than \$5 billion dollars will be spent in 10 years on zebra mussel control by manufacturing and municipal water intake facilities alone. The Aquatic Nuisance Species Task Force, co-chaired by NOAA and the U.S. Fish and Wildlife Service, is leading an effort to prevent the spread of invasive mussels. Recently, the Task Force approved the national Quagga-Zebra Mussel Action Plan. The goal of the Plan is to summarize current strategies to address the invasion of zebra and quagga mussels in western waters, and to identify and prioritize the specific actions that are needed to comprehensively prevent the further spread of these mussels, respond to new infestations, and manage existing infestations. The Plan is intended to serve as a common "road map of priorities for any water management or recreational watercraft entity and their partners for the next five years.

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