

Invasive Zebra Mussels on Moss Balls

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Watch out for Invasive Zebra Mussels on Moss Balls

Moss balls are beloved, velvety algal plants that decorate aquariums. Unfortunately, they may be aiding the movement of a destructive invasive. The zebra mussel (*Dreissena polymorpha*) is a fresh-water mollusk native to Eurasia that disrupts aquatic ecosystems and water infrastructure. In early March 2021, it was discovered in moss balls sold at aquarium and pet supply stores in Canada and the U.S. (including Utah) (USGS 2021). The U.S. Fish and Wildlife Service and Utah DWR urged these stores and aquarium owners to destroy moss balls to mitigate the risk of introduction (see next page). The message was that all moss balls should be treated as though they are infested with zebra mussels.

In North America, zebra mussels were first identified in the Great Lakes in 1988 in discharged ballast water from large ships arriving from Europe. The mussels spread to all five Great Lakes and New York's Hudson River within five years of their arrival. Currently, zebra mussels occur in all large navigable rivers in the eastern U.S. and hundreds of inland lakes in 28 states (Benson et al. 2021). In Utah, immature zebra mussels (veligers) were found in Emery County in 2008 in Electric Lake and Red Fleet Reservoirs, but subsequent sampling efforts have yielded no zebra mussels (R. Gibbs, Utah DWR Aquatic Invasive Species Biologist, pers. comm.).

Mature zebra mussels are 1 to 1.5 inches in length. The two shells are symmetrical with a straight midventral line,

and are black or brown with variable white to yellow zebra-like stripes or zigzag patterns. The zebra mussel is closely related to the invasive and more competitive quagga mussel (*Dreissena bugensis*) which currently occurs in Utah in Lake Powell. Immature quagga mussels were previously found in Sand Hollow (2012) and Deer Creek (2015) Reservoirs but have not been found since (R.

Gibbs, Utah DWR Aquatic Invasive Species Biologist, pers. comm.). Zebra mussels can be distinguished from quagga mussels by having a flattened underside that enables them to remain upright when placed on a flat surface.

Adult zebra mussels release eggs into fresh water (lakes, reservoirs, rivers, ponds, and quarries). After the eggs hatch, they develop into microscopic free-swimming larvae that move passively downstream on flowing water. Eventually they attach to surfaces such as rocks, pipes, docks, cement, wood, and boat hulls where they feed primarily on algae and phytoplankton. Adult mussels are sessile and can live for up to 5 years; each female can produce over one million eggs per spawning season. Zebra mussels filter and clean the water at unprecedented rates, resulting in decreased food for native fish and invertebrates, and increased light penetration into the water that can allow explosive growth of bottom algae and nuisance weeds. They can suffocate native mussels by anchoring onto them by the thousands, and have caused a severe decline of native mussels in some areas. They can rapidly clog pipes and other water inlets and outlets, and can cost the water industry up to \$1 billion annually for management, which typically entails physically dislodging them from surfaces.

Once a water body becomes infested with invasive mussels, eradication is unlikely. They have few natural predators in North America, and current control methods involve inspections and mussel removal. In some areas, potassium chloride has been used to successfully eradicate zebra mussel in localized settings.

To prevent their spread, stop at mandatory inspection stations if you are transporting watercraft. Inspect all watercraft, as well as fishing and SCUBA gear. For boats, remove debris, remove drain plugs to drain completely, allow the boat to dry, and leave drain plugs removed during your trip home. Keep in mind that zebra mussels are excellent hitchhikers and can live several days outside of water.

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