

Aquatic Nuisance Species

ZEBRA MUSSEL



Description: The zebra mussel, *Dreissena polymorpha*, is a freshwater bivalve (containing two halves) mollusk, which rarely exceeds 1.5 inches and has a triangular shape like the letter “D”. The mussel resembles a small clam with alternating dark and light bands on the shell, resembling the stripes of a zebra. However, some may be entirely dark or light in color. The most distinguishing characteristic of the zebra mussel is the tuft of fibers called the byssal threads that grows from the foot and through the hinge, it produces a powerful glue for attachment to any hard surface.

History and Distribution: The zebra mussel is native to parts of western Russian near the Caspian Sea. By the 1830’s, the mussels had invaded most of Europe through a series of shipping canals. They entered North America through the release of ballast water from shipping vessels traveling from Europe. By the 1990’s within the United States, they could be found throughout the Great Lakes, the Mississippi River and its major tributaries including the Cumberland and Tennessee Rivers. The expansion of the mussels range has been a function of natural water flow, wildlife activity, and a variety of human pursuits, including boating, fishing and the bait industry.

Life Cycle: Zebra mussels typically live 3 to 5 years and are able to reproduce their second year. A single zebra mussel may produce over 30,000

eggs per reproductive cycle, translating to more than one million eggs per spawning season when the water warms above 54 degrees Fahrenheit. Fertilized eggs develop into swimming microscopic larvae called veligers. These veligers can remain suspended in the water for 3 to 4 weeks before they find a hard surface to attach to, those that don't find a substrate will die. Any hard surface is a suitable place for the zebra mussel to live such as rocks, metal, wood, vinyl, glass, rubber, fiberglass, intake pipes, boats, plants, other mussels and bodies of small moving animals like crustaceans and turtles. Unlike most freshwater mussels, the zebra mussel grows in clusters containing numerous individuals.

Impacts: Zebra mussels are filter feeders and feed on phytoplankton (tiny plants) and suspended particulates in the water column. Plankton is an important food source for young fish, native mussels and other aquatic organisms. A single adult has the ability to filter large amounts of water (1liter/day), which increases water clarity. Increased light penetration allows submerged aquatic plants to grow in deeper water and spread to a larger area, which may cause problems for recreational boaters and anglers.

The economic impact of zebra mussels can be extreme, due to their need to attach to hard surfaces and the ability to layer upon themselves. Industrial water intake structures are prime locations for attachment causing reductions in pumping capabilities and even blockages. They can also damage, cause costly repairs and require frequent maintenance to boat and recreational motors. Even when they die, their sharp shells wash up on beaches; creating foul odors and cutting the feet of swimmers, which may result in reduced recreation.

Prevention: Both movement of adult zebra mussels and the larval form (veligers), can infect other bodies of water. Adults can attach to boats and boating equipment that are moored in infested waters. They frequently attach to aquatic plants, which themselves may hitchhike a ride on boats, trailers and other recreational equipment to new water bodies. Adults are able to close their shells and survive for many days in cool/moist conditions. Veligers can be transported in water being held in bilge areas, live wells, boat motors, bait buckets, and puddles of water on the deck of boats.

Research is ongoing to find ways to eliminate the presence of the mussels in infested water bodies. Winter water body draw downs have had a positive action in drying and killing the mussels. Native fish species such as, sturgeon, yellow perch, freshwater drum, catfish and sunfish are know to consume them. Most management efforts are geared at preventing any further spread of zebra mussels, it is important to take the following steps to prevent their spread.

Before moving your boat from one water body to another

- ✓ **Inspect** and remove aquatic plants, animals, mud from your boat, trailer, and equipment. Scrapping of adult mussels may be necessary to remove them.
- ✓ **Drain** all water from the boat, motor, bilges, live wells, etc.
- ✓ **Dispose** of unwanted bait on land not in the water.
- ✓ **Rinse** your boat and equipment with hot water ($>140^{\circ}\text{F}$), use high pressure particularly if moored in a water body for more than one day.
- ✓ **Dry** your boat and equipment thoroughly (in the sun) for five days. If boats and trailers have been exposed to freezing temperatures for the winter, they are considered decontaminated.

OR

- ✓ **Decontaminate** after cleaning and draining, use one of the following approved cleaning solutions:

Disinfectant	Concentration	Contact Time
Bleach Solution	13 ounces per gallon of water	10 Minutes
Lysol	As sold – 1% solution	10 Minutes
Vinegar	As sold – 100%	20 Minutes
Scalding hot wash	$>140^{\circ}\text{F}$	10 Seconds
Freezing	$<32^{\circ}\text{F}$	24 hours

Where to look for zebra mussels on a boat and trailer:

