

Zebra Mussel Alert!



Zebra mussels, small, fingernail-sized mollusks native to the Caspian Sea region of Asia, are regarded as one of the most troublesome invasive species in North America. In spite of their small size, zebra mussels clog pipelines used for water filtration, render beaches unusable, and damage boats. They can dramatically alter water quality, crash fisheries, and disrupt ecosystems. They were first detected in the U.S. in 1988 in the Great Lakes. It is estimated that the U.S. spends more than \$1 billion annually for damages linked to zebra mussels.

Zebra mussels have been detected within a variety of moss ball products designed and sold for use in aquariums. The moss balls are sold under different brands in a variety of packaging, see sample photo of “Betta Buddy Marimo Balls”.

Zebra mussels are named for the striped pattern on their shells; however, color patterns can vary to the point of having only dark or light-colored shells with no stripes.



Zebra mussel in moss ball .

Zebra mussels have three life stages:

Larval: Live freely in the water column and are microscopic, allowing them to be easily transported.

Juvenile: Prefer a hard or rocky substrate, they have been known to attach to vegetation.

Adult: Can live for several days outside of water and are common hitchhikers on boats, fishing equipment and aquarium plants.



Juvenile (top) and adult zebra mussels

North Carolina State Law

15A North Carolina Administrative Code (NCAC) 10C .0211 POSSESSION OF CERTAIN FISHES

(a) It shall be unlawful to transport, purchase, possess, sell, or stock in the public or private waters of North Carolina any live individuals of: (20) zebra mussel (*Dreissena polymorpha*)

United States Federal Law

Zebra mussels (*Dreissena polymorpha*) are listed as an injurious species under federal law. The Lacey Act, 18 USC 42-43, declares importation or shipment of injurious mollusks, including zebra mussels, into the United States is illegal.



**STOP AQUATIC
HITCHHIKERS!**

Be A Good Steward. Clean. Drain. Dry.
StopAquaticHitchhikers.org

MOSS BALLS AND ZEBRA MUSSELS INFORMATION

DESTROY. DISPOSE. DISINFECT.

Moss balls are a species of green algae that forms a dense ball, usually 2-5 inches in diameter. They are often used as an aquarium plant. Recent shipments of moss balls have been found to contain invasive zebra mussels.

The N.C. Wildlife Resources Commission is urging the public to properly destroy and dispose of any moss balls and zebra mussels and disinfect any contaminated water and equipment as outlined below:

1. **DESTROY** moss balls and zebra mussels by using one of the following steps:
 - a. Place moss balls and zebra mussels in a sealable bag and place in freezer for 2 days.
OR
 - b. Boil moss balls and zebra mussels for 5 minutes at a rapid boil.
2. **DISPOSE.** After completing step one, place moss balls and zebra mussels in a sealable bag and throw into trash.
3. **DISINFECT.**
 - a. Moss Ball Packaging and Water: Add ¼ cup of bleach per gallon of water to packaging and water. Let sit for 2 hours, then pour down a household drain or on ground away from any stream or surface water and dispose of treated packaging in trash.
 - b. Aquarium and Equipment:
 - i. Set up a new tank or container using clean water from a different source. **DO NOT use water from the tank or container that held the moss balls.**
 - ii. Net and remove all fish and live animals and transfer them to the newly set-up tank. Leave all plants (live and artificial), rocks, nets, and other structures in the tank. Remove carbon and other media and place in a separate container to be bleached with ¼ cup of bleach per gallon of water for 2 hours, then discard media in the trash.
 - iii. Tank treatments — **Important** — Failure to fully disinfect the tank can result in the zebra mussels overtaking the system.
 1. Option 1 - Bleach
 - Add ¼ cup bleach per gallon of water to tank and let sit for a minimum of 2 hours. Run filter system with carbon and media removed to ensure it is disinfected.
 - Discard live plants in trash after bleaching.
 - After treatment, drain the bleached tank into a household drain or on the ground and rinse tank and all equipment with water.
 - Refill tank with clean water and use a dechlorinating product to remove any bleach.
 - Add fish and live animals back to the tank.
 - Do a 30% water change in 1 week.
 2. Option 2 - Potassium Chloride Treatment
 - **Potassium** chloride can be found as a water softener at local hardware stores. Note that typical table salt is *sodium* chloride. Be sure to use **potassium** chloride.
 - Add 5,000 milligrams (mg) of potassium chloride per gallon of water (½ teaspoon per gallon) and let sit for a minimum of 48 hours. Run filter system with carbon and media removed to ensure it is disinfected.
 - After treatment, drain the treated tank into a household drain or on the ground and rinse tank and all equipment with water.
 - Refill tank with clean water.
 - Add fish and live animals back to tank.
 - Do a 30% water change in 1 week.
4. **CHECK.** Continue to inspect your tank and equipment for possible zebra mussels for 90 days after disinfecting. Zebra mussels will attach to any hard surface, including substrate, plants, snails, and turtles. If zebra mussels are found, repeat steps 1-3.

NEVER pour any water that has been in contact with the moss balls and/or zebra mussels down storm drains, creeks, or local waterways, sinks, toilets, tubs, and other household drains prior to disinfecting!

Thank you for helping to protect our waters from invasive species!
ncwildlife.org/ans