

Overview:

On March 5th, 2021 PIJAC issued an alert on zebra mussels in aquarium moss balls. The alert was to inform our membership of the invasive species threat that was recently discovered in the U.S. Zebra mussels (*Dreissena polymorpha*), which are regarded as one of the most troublesome invasive species in North America, have been discovered within a variety of moss ball products designed for aquarium use, including products being sold and used in aquariums in stores in multiple states, including Oregon, Washington and Florida.

Since that time PIJAC has been engaging on this threat with state and federal regulatory bodies led by the U.S. Fish and Wildlife Service (USFWS). These regulatory bodies have identified a need for more comprehensive guidance for use by the aquarium trade. This document is provided by PIJAC as a guide for dealing with invasive zebra mussels across the supply chain and for the aquarium hobbyist.

Background:

Zebra mussels are small, fingernail-sized mollusks native to the Caspian Sea region of Asia. They have three life stages: larval, juvenile, and adult. In the larval stage, the mussels live freely in the water column, where they can be easily transported. Adult zebra mussels can stay alive for several days outside of water and commonly attach to boats, fishing equipment and aquarium plants.

In spite of their small size, zebra mussels clog pipelines used for water filtration, render beaches unusable, and damage boats. **They also negatively impact aquatic ecosystems by harming native organisms.**

Specifically identified in a [report from the U.S. Geological Survey Nonindigenous Aquatic Species](#) a [release from the Oregon Department of Fish and Wildlife](#) and a press [release from Montana Fish, Wildlife and Parks](#), PIJAC urges you to take immediate action to inspect your fish tanks and take action as necessary.

You should also share this information with your aquatic product customers immediately.

For more information on invasive species prevention and making wise pet choices to protect the environment, go to:

- StopAquaticHitchhikers.org
- Habitattitude.net

Take Immediate Action:

If you see any visible signs of zebra mussels, follow the below guidance immediately and euthanize any zebra mussels present in accordance with your state's humane euthanasia laws.

Guidance to customers/hobbyists:

We recommend that you **take the following steps with all moss ball aquatic plant products:**

- 1) Decontaminate the moss ball using ONE of the following methods, ensuring that the disposal method you choose is in compliance with state laws and animal welfare regulations:
 - Place the moss ball into a sealable plastic bag and freeze for at least 24 hours, OR
 - Place the moss ball in boiling water for at least 1 full minute, OR
 - Submerge the moss ball in chlorine bleach, diluted to one cup of bleach per gallon of water, OR Submerge the moss ball in undiluted white vinegar for 20 minutes.
- 2) Once step 2 is complete, place the moss ball and any of its packaging in a sealed plastic bag and dispose in the trash.
- 3) If vinegar, boiling water, or bleach was used, the liquid can be disposed down a household drain—never down a storm drain where it could enter and damage local waterways.

If the moss ball was placed in an aquarium, please take these additional steps:

- 1) Collect any fish or other living organisms and place them in another container, with water from a separate, uncontaminated water source.
 - Test the pH and temps of the new water and the water the fish came from. Fresh tap water can be dramatically different from an established tank especially if the tank has turned more acidic over time.
 - For ALL city water add a dechlorinator to the new water before adding the fish to the temporary holding container.
 - Add an air stone in the temporary container so they do not suffocate during the process.
 - Ways to reduce stress in the holding container include:
 - Adding clean plastic plants that can just float around
 - Keeping the animals in a low light area
 - Separate overly aggressive fish into a separate holding container
- 2) Sterilize the contaminated aquarium water by adding ¼ teaspoon bleach for each gallon of water. Let the water sit for 15 minutes and then dispose of the sterilized water down a household drain.
- 3) Clean aquatic plants using a saltwater dip:
 - In a separate container, add 1 cup of aquarium salt to one gallon of fresh water.
 - Remove the plants from the aquarium in small batches.
 - While holding the plants by the base and keeping the roots out of the saltwater dip, dip them into the saltwater for 15-20 seconds.
 - After dipping the plants, move them to a container of uncontaminated fresh water for 48 hours.
- 4) Clean the aquarium and accessories using one of the following methods, ensuring that the disposal method you choose is in accordance with manufacturer recommendations:
 - Boiling Method:
 - Use water that is 140 degrees F to flush and coat the tank and all accessory surfaces, OR
 - Disinfection Method:
 - Make a disinfection solution using 1/3 cup of bleach per gallon of water.
 - Soak the aquarium, substrate, rocks, décor, and filter media in the bleach water solution for 15 minutes.
 - Rinse off all items prior to setting up the aquarium.
- 5) Re-establishing the tank:
 - Dispose of the previously used filter media and replace with new media.
 - Use a dechlorinating product to neutralize any residual chlorine prior to reintroducing aquatic life.
 - Add commercially available aquarium bacteria starter to replace all the beneficial bacteria that were removed during this process.

- It is recommended that you do another water change within a week and continue to monitor the tank for any unusual or unexpected aquatic life.

Guidance to Retailers:

- Place a moratorium on the purchase and sale of all moss balls until a method of testing and treatment can be established to ensure a clean trade.

Inline Planted Aquatic Holding System

- Dispose of all moss balls using ONE of the following methods, ensuring that the disposal method you choose is in compliance with state laws and animal welfare regulations:
 - Place the moss ball into a sealable plastic bag and freeze for at least 24 hours, OR
 - Place the moss ball in boiling water for at least 1 full minute, OR
 - Submerge the moss ball in chlorine bleach, diluted to one cup of bleach per gallon of water, OR Submerge the moss ball in undiluted white vinegar for 20 minutes.
 - Once step 2 is complete, place the moss ball and any of its packaging in a sealed plastic bag and dispose in the trash.
 - If vinegar, boiling water, or bleach was used, the liquid can be disposed down a household drain—never down a storm drain where it could enter and damage local waterways.
- Move all aquatic life into an appropriate aquarium(s) with compatible aquatic life in an adjacent system. Be sure to use Net Soak on all nets used to move aquatic life in between tanks.
- Utilizing a large red trashcan, fill it approximately ¼ full with filtered water. This bucket will be used to house the plants for 48hrs.
- Fill a 5 gallon bucket approximately ¾ full with filtered water and mix in 4 cups of freshwater aquarium salt.
- Stir until the salt is fully dissolved.
- Remove the aquatic plants in small batches. While holding the plants by the base, dip them in to the bucket of saltwater for 15-20 seconds, remember to hold the roots above the water line.
- After dipping the plants, place them into the clean water trashcan, where they will remain for the next 48 hours.
- Water from the 5 gallon bucket and clean water trashcan can be disposed of down the drain once no longer needed.
- After all aquatic life have been removed from the system, remove pre-filter pads/socks as well as carbon. Add 50 cups of marine aquarium salt per 4' section and create some agitation while pouring in the salt to help it dissolve.
- Allow the system to operate with the saltwater for 24hrs.
- After 24hrs turn off the system pump and drain the system of all water.
- Refill system with filtered water and replace all filter media.
- Turn on system pump allowing the system to run for 24hrs.
- After 24hrs of operation, utilize your refractometer to test the water, ensuring there is no residual salt. If the specific gravity is higher than 1.003, drain 50% of the aquarium water and refill with filtered water.
- If no salt is detected, reintroduce the plants into the aquariums and add plant food.
- Allow an additional 48hrs of operating with just plants before slowly reintroducing fish and invertebrates.
- Closely monitor weekly water test results and any aquatic life loss and address any concerns immediately.

Free-standing Plant Tank

- Dispose of all moss balls using ONE of the following methods, ensuring that the disposal method you choose is in compliance with state laws and animal welfare regulations:

- Place the moss ball into a sealable plastic bag and freeze for at least 24 hours, OR
- Place the moss ball in boiling water for at least 1 full minute, OR
- Submerge the moss ball in chlorine bleach, diluted to one cup of bleach per gallon of water, OR Submerge the moss ball in undiluted white vinegar for 20 minutes.
- Once step 2 is complete, place the moss ball and any of its packaging in a sealed plastic bag and dispose in the trash.
- If vinegar, boiling water, or bleach was used, the liquid can be disposed down a household drain—never down a storm drain where it could enter and damage local waterways.
- Utilizing one of your clean large trashcans, fill it approximately $\frac{1}{4}$ full with filtered water. This bucket will be used to house the plants for 48hrs.
- Fill a 5 gallon bucket approximately $\frac{3}{4}$ full with filtered water and mix in 4 cups of your freshwater aquarium salt.
- Stir until the salt is fully dissolved.
- Remove the aquatic plants in small batches. While holding the plants by the base, dip them in to the bucket of saltwater for 15-20 seconds, remember to hold the roots above the water line.
- After dipping the plants, place them into the clean water trashcan, where they will remain for the next 48 hours.
- Remove pre-filter pads/socks as well as carbon. Add 1 cup of marine aquarium salt per gallon of water and create some agitation while pouring in the salt to help it dissolve.
- Allow the system to operate with the saltwater for 24hrs.
- After 24hrs turn off the system pump and drain the system of all water.
- Refill with filtered water and replace all filter media.
- Turn on system pump allowing the system to run for 24hrs.
- After 24hrs of operation utilize your refractometer to test the water, ensuring there is no residual salt. If the specific gravity is higher than 1.003, drain 50% of the aquarium water and refill with filtered water.
- If no salt is detected, reintroduce the plants and add plant food.

Guidance to Suppliers:

- Place a moratorium on the importation, purchase and sale of all moss balls until a method of testing and treatment can be established to ensure a clean trade.
- Dispose of all moss balls using ONE of the following methods, ensuring that the disposal method you choose is in compliance with state laws and animal welfare regulations:
 - Place the moss ball into a sealable plastic bag and freeze for at least 24 hours, OR
 - Place the moss ball in boiling water for at least 1 full minute, OR
 - Submerge the moss ball in chlorine bleach, diluted to one cup of bleach per gallon of water, OR Submerge the moss ball in undiluted white vinegar for 20 minutes.
 - Once step 2 is complete, place the moss ball and any of its packaging in a sealed plastic bag and dispose in the trash.
 - If vinegar, boiling water, or bleach was used, the liquid can be disposed down a household drain—never down a storm drain where it could enter and damage local waterways.
- If tanks are used to consolidate moss balls, clean the system in accordance with the guidance to retailers.

•