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Preventing the Spread of Invasive Zebra Mussels: Frequently Asked Questions for Marina/Boat Repair & Maintenance Operators on Infested Lakes

What are zebra mussels and why should we care about getting involved to help prevent their spread?

Zebra mussels are small (~1.5 inches long) shellfish that are native to the Black and Caspian Sea drainages of Eurasia. Adult zebra mussels attach to and damage boats, docks, buoys, dams, and bridges—costing millions of dollars each year in the US for increased repairs and maintenance. When they infest water conveyance systems for water treatment and hydroelectric use, those increased costs are passed on to the consumer in the form of higher water or power bills. When zebra mussels infest a water body, there's no feasible way to get rid of them without killing our wildlife or adding toxic chemicals to our water supply—not to mention that the cost of treating large lakes would likely be in the billions! Preventing new infestations is the key to reducing the damage and costs associated with zebra mussel infestations in Texas. Boaters statewide are now required to drain all water from their boats to prevent the transfer of microscopic zebra mussel larvae. However, the adults attach to boats, hiding in crevices, through-hull fittings, and motor intakes and boats that have been moored on infested lakes are extremely high risk for transporting these invasive mussels—it only takes one boat with zebra mussels (each female capable of releasing a million larvae a year) to start a new infestation. Additionally, transporting zebra mussels—knowingly or unknowingly—is a Class C Misdemeanor and tenants leaving your marina could receive a citation and a fine up to \$500. Marinas on infested lakes can help to increase boater awareness and offer guidance on the steps they need to take to have the boat inspected so they're not responsible for spreading this destructive invasive species to new lakes.

To learn more about zebra mussels, check out these resources online:

- www.texasinvasives.org/zebramussels
- www.texasinvasives.org/cleandraindry
- Texas Parks and Wildlife Department has produced these two videos for the public awareness campaign that outline the zebra mussel problem in Texas:
 - "Stop Zebra Mussels" (3.5 minutes) - <https://www.youtube.com/watch?v=E4Y5ILzKgHg>
 - "Attack of the Zebra Mussels" (1.5 minutes) - <https://youtu.be/-NJKYlrqcXw>
- The TexasInvasives.org database has a species profile for zebra mussels with a lot of helpful information: http://texasinvasives.org/animal_database/detail.php?symbol=10
- The US Geological Survey Nonindigenous Aquatic Species (USGS-NAS) Zebra Mussel FAQ page is another great way to learn more: http://fl.biology.usgs.gov/Nonindigenous_Species/Zebra_mussel_FAQs/zebra_mussel_faqs.html
- ...and their Zebra Mussel fact sheet provides some really detailed information: <http://nas.er.usgs.gov/queries/FactSheet.aspx?speciesID=5>

Where have zebra mussels been found?

Texas

As of June 2016, Zebra Mussels have infested lakes Belton, Bridgeport, Dean Gilbert (no motorized boats), Lewisville, Ray Roberts, and Texoma. In addition, zebra mussels have repeatedly been detected in lakes Waco and Lavon and Fishing Hole Lake (no motorized boats). For a list of infested Texas lakes that is always kept current, please visit www.texasinvasives.org/cleandraindry

United States

The US Geological Survey Nonindigenous Aquatic Species (USGS-NAS) website maintains current maps of sightings of zebra mussels and their close relatives the quagga mussel (both invasive in the US and both a concern for Texas). There is a printable static map:

http://nas.er.usgs.gov/taxgroup/mollusks/zebramussel/maps/current_zm_quag_map.jpg

How do I know whether a tenant/boat leaving a marina on an infested lake or coming to our lake/marina from an infested lake is high risk or in need of inspection and decontamination?

In general, we recommend that any boat that has been moored on an infested lake for more than a few days should be inspected and decontaminated. Unless the boat has been in dry storage for about a month, there's a chance it could be carrying live, adult zebra mussels that could start a new infestation. Adult zebra mussels can survive out of water for a long time and survival time increases during cooler, more humid months—in summer, a week or even a few days may be enough drying time to kill attached mussels, but during winter they could survive up to a month in some areas. Water trapped in ballast tanks or could contain microscopic zebra mussel larvae year round, and boats that can't be completely drained should also be decontaminated with a hot water flush, regardless of how much time they've spent on the water.

If an infested boat is leaving our marina on an infested lake or coming to our lake/marina from an infested lake, what should we do? We don't want zebra mussels to spread!

Before the boat is moved, call Operation Game Thief - 1-800-792-4263 – they will know who to contact to help coordinate having the boat inspected or decontaminated if needed before it is moved to reduce the risk of spreading zebra mussels. You can also contact Brian Van Zee, TPWD Regional Director, at (254) 867-7974.

If a boat with mussels attached comes in and they aren't willing to cooperate to have the boat decontaminated, you can also look up local Game Warden contact information by county at <http://tpwd.texas.gov/warden/> and call them directly—the phone numbers provided are usually their mobile numbers. If there are multiple wardens listed for a county, it may be easiest to call their regional operation center.

If a boat has already left a marina on an infested lake (without cooperating on having it decontaminated) and you know where it is going, you can contact the local warden for the destination county and provide them with as much information as possible (Boat TXTAG, owner, destination marina, etc.) This will help us to work with the boat owner to prevent the boat from spreading zebra mussels. You can also contact Brian Van Zee, TPWD Regional Director, at (254) 867-7974.

Can a boat repair/maintenance shop or marina decontaminate boats to prevent the spread of zebra mussels?

Yes—any boat repair/maintenance shop or marina that can provide 140 degree Fahrenheit, high-pressure water and has the sprayer attachments for low-pressure flushing and motor flushing can decontaminate boats.

What is involved in the boat decontamination process?

Decontamination basics:

- **Remove attached zebra mussels.** Allow the boat to dry for several days to make attached zebra mussels easier to remove. Possession and transport of zebra mussels is illegal, so they must be removed before the boat is transported. Plastic scrapers are helpful for removing zebra mussels from boats.
- **Pressure-wash the hull with 140F water to remove or kill remaining mussels.** To be effective, it is essential that the water is 140F when it hits the surface of the boat and that there is at least a ten-second contact time—this often means that the pressure washer must be capable of operating at 180F, as the water cools in the air.
 - Pay special attention to crevices (e.g., where trim tabs attach, bolt holes, through hull fittings)
 - Flush the motor – but use low pressure around gimbal and use “earmuffs” attachment to flush lower unit (water enters intakes and exits prop hub – flush until water exits prop hub at 140F)
- **Flush/soak the bilge, ballast, live wells, ropes and gear with 120 degree Fahrenheit, low-pressure water**—most pumps can't withstand temperatures over 130F or high pressure spray without damage
 - DON'T forget the anchor and gear—anchors and their ropes frequently harbor adult mussels and are often overlooked!
- **Allow the boat to dry completely before launching in another water body.** During summer months, a week should be sufficient but longer drying time will be necessary during winter months. The 100th Meridian Initiative has a great resource for estimating how long boats should dry AFTER decontamination to help ensure that any remaining mussels are killed: <http://www.100thmeridian.org/emersion.asp>

Where can I learn more about decontaminating boats or obtain training for staff?

The Pacific States Marine Fisheries Commission has put together a great video that provides information on: “Inspection & Decontamination 2011” (28 minutes) - <https://www.youtube.com/watch?v=JX8TmwTx-tU>

The 100th Meridian Initiative website has a great resource roundup for this with references from states that have inspection and decontamination programs: <http://www.100thmeridian.org/decon.asp>

The Texas Parks and Wildlife Department does not currently offer certification in decontamination. Inspection and decontamination training is available through the 100th Meridian Initiative free of charge, but the courses are usually held in Lake Mead and so there will be expenses for travel, lodging, and meals – learn more at: <http://www.westernais.org/upcoming-classes>

What laws does Texas have regarding boats and zebra mussels that my clients should know?

Possession/transport: It is illegal to possess or transport zebra mussels, knowingly or unknowingly, regardless of whether they are alive or dead, adult or juvenile—including microscopic larvae. Zebra mussels are designated as ‘Harmful or Potentially Harmful Shellfish’ under Title 31 Chapter 57A of the Texas Administrative Code.

Water draining: Persons leaving or approaching public fresh water are required to drain all water from their vessels and any on-board receptacles (includes live wells, bilges, motors and any other receptacles or water-intake systems coming into contact with public waters) under Title 31 Chapter 57N of the Texas Administrative Code. This rule applies at all sites where boats can be launched and includes all types and sizes of boats whether powered or not, personal watercraft, sailboats, kayaks/canoes, or any other vessel used to travel on public waters.

Penalties: Violation of either law is a Class C misdemeanor punishable by fines up to \$500.

More information: The Texas Parks and Wildlife website has information on both laws (including the exceptions to the water draining rules) in an easy-to-understand format: <http://tpwd.texas.gov/regulations/outdoor-annual/fishing/general-rules-regulations/possession-and-transport-of-exotic-aquatic-species>

Will every lake in Texas have zebra mussels eventually?

Most of the lakes in Texas are susceptible to and at risk from zebra mussels—meaning that they have the physical and chemical characteristics that make them high risk for zebra mussel invasion. Boats moored on an infested lake are likely infested with zebra mussels and pose an extremely high risk of causing a new infestation if moved to another lake—this is a year-round risk, as the risk of zebra mussels attached to a boat surviving is higher during cooler months. However, simply cleaning, draining, and drying boats between water bodies can help to slow their spread and prevent new infestations— every year a lake remains uninfested saves taxpayers money!

Why can't we eradicate zebra mussels from the infested lakes?

When zebra mussels invade a lake, there is no feasible way to eradicate them with current technology. Chemicals used to kill zebra mussels are often very toxic to other wildlife (especially native mussels), can't be used in drinking water supplies (e.g., copper-based compounds), or are cost-prohibitive for treating large, flow-through reservoirs such as we have in Texas.

What is TPWD doing to combat the spread of zebra mussels?

Our primary efforts to combat the spread of zebra mussels include (1) a targeted public awareness campaign and (2) ongoing monitoring of lakes for early detection of zebra mussels. Public awareness is critical to stopping or slowing the spread of zebra mussels and the campaign is essential for engaging boaters in these efforts.

We, along with partners, also monitor a number of lakes for early detection of zebra mussels by collecting plankton samples for microscopic and DNA analysis and monitoring juvenile settlement samplers. Early detection is essential for helping stakeholders to begin to implement control measures and for increasing awareness around newly-infested lakes. Because zebra mussel infestations are nearly impossible to eradicate, slowing their spread is critical—every year a lake remains uninfested saves taxpayers money!

Public awareness:

We hope that the education materials, along with the information in this FAQ sheet and the contacts provided below, will help to empower marina operators to prevent moored boats from transporting zebra mussels to other lakes. It is critical to remind boaters about the laws that are in place and the steps they need to take to prevent the spread of zebra mussels and other invasive species.

Texas Parks and Wildlife Department and a coalition of partners have invested in a zebra mussel public awareness campaign, which is only possible thanks to the support of partners. The campaign focuses on the “Clean, Drain and Dry” call-to-action and the legal, environmental and economic consequences of failing to take action. As in previous years the campaign will focus on the infested lakes, reaching boaters who are at highest risk for transporting zebra mussels to new waterbodies. Campaign materials target boaters with vessels docked on the lakes as well as day-use boaters who recreate on these lakes. The campaign includes signage at boat ramps, billboards, gas station advertising, radio, online, mobile and print ads, and direct mail to registered boaters. In addition, the Dallas/Ft. Worth, Austin and Waco markets will be reached with radio, billboards and online ads. There will also be a statewide presence with ads on boating websites and in targeted print publications.

My marina ran out of brochures, wallet cards, or other zebra mussel informational materials—how can I order more?

Free outreach materials, including brochures, wallet cards, posters and flyers can be ordered online for delivery by mail at <http://www.texasinvasives.org/action/spreadword.php> or you can contact the TPWD Marketing Specialists to request other items (see the contacts page of this FAQ sheet).

CONTACTS

For questions about zebra mussel ecology, how they spread, impacts, boat decontamination, regulations, or what to do if you encounter a boat:

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Local TPWD Inland Fisheries Management biologists for your district:

https://tpwd.texas.gov/business/about/divisions/inland_fisheries/offices/management_districts.phtml

To order more informational materials to provide to your clients:

Outreach materials can be ordered online for delivery by mail—visit:

<http://www.texasinvasives.org/action/spreadword.php>

For questions about the zebra mussel public awareness campaign, including outreach materials:

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