



Aquatic Invasive Species

LEVI SPARKS

River Authority Operations Manager

BANDERA COUNTY RIVER AUTHORITY AND GROUNDWATER DISTRICT

What is an invasive species?

- ▶ Any species that has a tendency to spread to a degree believed to cause damage to the environment, economy, or human health.
 - ▶ Plant, fungus, or animal
 - ▶ Typically introduced by humans
 - ▶ Does not have to be from another country

Arundo donax and Zebra mussels

- ▶ Possibly the two biggest threats at this time to Banderá County's aquatic ecosystem
- ▶ Threaten natural species and humans
 - ▶ Ecologically
 - ▶ Economically
 - ▶ Safety



Arundo

- ▶ Also called giant cane
- ▶ Native to the Mediterranean Basin
- ▶ Widely planted by humans
 - ▶ Present in 26 states.
 - ▶ Listed as invasive in 21



Arundo Biology

- ▶ Tall, perennial grass
 - ▶ Over 20 feet in height
- ▶ Extensive, creeping rootstocks
- ▶ Spread by budding
 - ▶ It is assumed that the seeds are not viable
- ▶ Massive amount of water usage
- ▶ Brought by Spanish colonists



Issues with Arundo

- ▶ Ecological Issues
 - ▶ Crowds out native plants
 - ▶ Reduces wildlife habitat
 - ▶ Higher fire frequency and intensity
 - ▶ Modifies river hydrology
- ▶ Economic and Safety Issues
 - ▶ Treatments can be time-consuming, costly, and difficult
 - ▶ Multiple revisits are needed
 - ▶ Modifications can cause flooding
 - ▶ No flood buffer



Treatments

- ▶ Chemical Control
 - ▶ Glyphosate
 - ▶ Has to be appropriate for aquatic use
 - ▶ 1% solution of chemical with 0.5% solution of surfactant
 - ▶ Usually treated in late July to early October
- ▶ Mechanical Control
 - ▶ Extremely time consuming
 - ▶ Difficulty to do properly
 - ▶ Must get entire root stock



Management of Arundo within Bandera County

- ▶ BCRADG is working closely with the Nueces River Authority to help continue control efforts in the Nueces River Basin within Bandera county.
- ▶ BCRADG is partners in the Healthy Creeks Initiative led by Texas Parks & Wildlife for control efforts in the Medina River Basin within Bandera County. This partnership allows for the control of Arundo at no cost to the landowner.

INVASIVE SPECIES IN
TEXAS

ARUNDO DONAX IMPAIRS CREEK HEALTH.

Invasive species like *Arundo* (giant cane), privet and others can harm Texas creeks and rivers. They devastate habitat and keep our waterways from providing essential ecosystem services, such as recreation, fresh water supply, and drought and flood protection.

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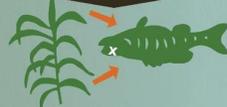
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Texas counties,
most problematic in several
Hill Country rivers and along
the Rio Grande.



Arundo can grow up to
2 INCHES PER DAY,
crowding out and replacing
native plants.

FISHING & BOATING IMPACTS



Arundo and other invasive plants degrade habitat for fish such as Guadalupe bass, the official state fish of Texas.



Blocks access for bank, wade, and kayak fishing, a **\$14-32 million industry** in the Hill Country.

DAMAGE TO RIVER BANKS

Arundo roots are very weak below the surface, causing river bank erosion.



They crowd out native grasses whose roots reach more than **6 times** deeper, stabilizing banks. An unmowed native buffer acts as a sponge and helps absorb water.

DROUGHT & FLOOD RISK



Arundo's high wax content makes it a wildfire hazard—particularly during drought.

Can increase the area impacted by flooding up to **10%**

Keep our creeks healthy. Prevent invasives:

- 1 Don't mow, let it grow
- 2 Let woody debris be
- 3 Plant natives

Zebra mussel (*Dreissena polymorpha*)

- ▶ To date, zebra mussels have been the most aggressive freshwater invader worldwide
- ▶ Native to the Black, Caspian, and Aral Seas.
- ▶ Most likely spread by bilge water
- ▶ 24 Texas lakes are classified as “infested”
 - ▶ Canyon Lake
 - ▶ Lake Travis
- ▶ More are listed as positive (found on more than one occasion)
 - ▶ Medina Lake

Zebra Mussel Biology

- ▶ Maximum shell size from 3.5 to 4 centimeters
- ▶ Found in large clusters
- ▶ Identified by their striped patterns
- ▶ Free-floating larval stage
 - ▶ Veliger stage
- ▶ Adaptable to a wide range of substrates



Issues with Zebra Mussels

- ▶ Ecological Issues
 - ▶ High rate of filtration
 - ▶ Outcompete native mussels
 - ▶ Will attach to native mussel shells causing the death of native species
- ▶ Economic Issues
 - ▶ Millions of dollars are spent each year on trying to control zebra mussels
 - ▶ Disrupt entire city water supply systems
 - ▶ Damage to landowner watercrafts
- ▶ Safety concerns
 - ▶ Lacerations due to stepping on large colonies
 - ▶ Sinking of navigation buoys



Treatment of Zebra Mussels

- ▶ Chemical
- ▶ Manual
- ▶ Dewatering
- ▶ Screens
- ▶ Ultraviolet light
- ▶ Biological
- ▶ **Most ineffective**
- ▶ **Prevention is the key!**

ZEBRA MUSSELS HIDE HERE.

Protect our Lake and Rivers from Invasive Species



IT'S THE LAW: Remove invasive plants and debris and drain all water before leaving this water body.
TexasInvasives.org



**CLEAN, DRAIN AND DRY
YOUR BOAT AND GEAR EVERY TIME**

TEXAS
PARKS &
WILDLIFE

 **Bandera County**
River Authority & Groundwater District
Protecting & Preserving our Natural Resources

Future Plans for Prevention /Management of Zebra Mussels

- ▶ BCRADG is working closely with SARA and Texas Parks and Wildlife to continue monitoring efforts for zebra mussels
- ▶ Will continue to do public outreach to educate landowners about prevention of an infestation of the Medina and Sabinal Rivers and to reduce the spread within Medina Lake
- ▶ Future mussel surveys within the river systems to detect native mussels
 - ▶ Some native species may be of concern
- ▶ Find potential funding for detection methods and monitoring equipment
- ▶ If you believe you have found zebra mussels anywhere in the state, please contact me (Levi Sparks) or a member of TPWD, including game wardens.

Conclusions

- ▶ Prevention of the spread of invasive species is the best solution
- ▶ Boots on the ground approach is key
- ▶ **Landowner involvement is critical to success!**



Questions?