

Aquatic Invasive Species



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What is an Invasive Species?



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‘Invasive species’ means, with regard to a particular ecosystem, a non-native organism whose introduction causes or is likely to cause economic or environmental harm, or harm to human, animal, or plant health. [Executive Order 13751; Dec. 2016]



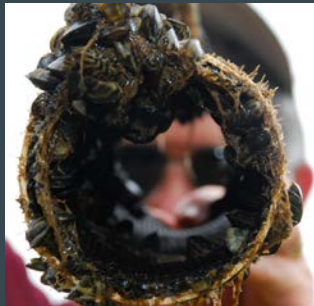
Texas Cichlid
(*Herichthys cyanoguttatus*)



Tilapia
(*Oreochromis* species)

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Zebra Mussel (*Dreissena polymorpha*)

- Native to Black & Caspian Sea (Eurasia)
- Attach to hard surfaces, clog pipes up to 18" in diameter
- Increase infrastructure maintenance costs, efficiency, and down time
- Retrofitting hydroelectric facility is costly

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Hydrilla (*Hydrilla verticillata*) and Water Hyacinth (*Eichhornia crassipes*)

- Native to Asia or Africa (Hydrilla) and South America (Water Hyacinth)
- Grow rapidly, difficult to eradicate
- Impede water delivery and flood control
- Costly to manage

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Carrizo Cane (*Arundo donax*) and Saltcedar (*Tamarix* species)

- Native to Mediterranean
- Outcompete native plants, create monocultures, degrade wildlife habitat
- Change channel shape, degrade instream habitat

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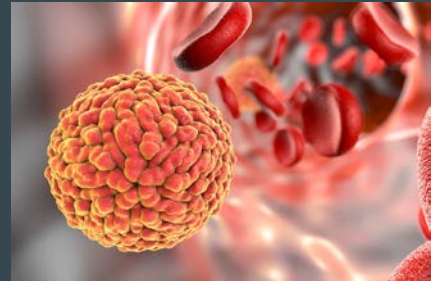


Carrizo Cane (*Arundo donax*) and Saltcedar (*Tamarix* species)

- Native to Mediterranean
- Exacerbate flooding, increase wildfire frequency and intensity

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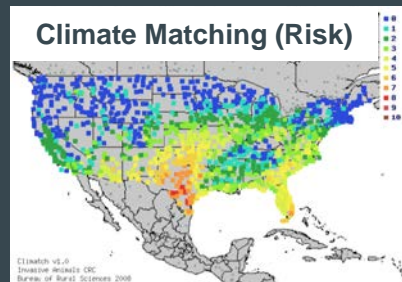


Zika Virus

- Non-native
- Significant impacts to human health

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Redclaw Crayfish (*Cherax quadricarinatus*)

- Native to Australia
- Very popular and desirable for aquaculture (prohibited in Texas, NOT Injurious Wildlife)
- Not very aggressive or a strong competitor
- Vector for Crayfish Plague (*Aphanomyces*), which could decimate native U.S. species

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Rio Grande ~~Texas~~ Cichlid
(*Herichthys cyanoguttatus*)

- Invasive in some rivers or portions thereof



Tilapia
(*Oreochromis* species)

Invasive Species are NOT...

- Native, weedy species (e.g., Juniper)
- EVERY non-native species (e.g., agricultural species)
- Non-native species that just don't have natural predators
- Always a problem everywhere, for every species



Round Goby (*Neogobius melanostomus*)

- Native to Eurasia, Introduced & Invasive in the Great Lakes Region
- Subsidized by Zebra Mussels – “Invasional Meltdown” phenomenon
- Impact native fishes by competition for nest sites and predation on small fish, fry, fish eggs
- Aided Lake Erie Watersnake (*Nerodia sipedon insularum*) recovery—the snake was removed from federal T&E list in 2011. Round Gobies now make up 90% of its diet.

Regulatory Approaches

Single-Species: the “Black List” of *prohibited* species

- species causing harm somewhere before it can be listed

Multi-Species: the “White List” of *approved* species

- preventive—all species *not* on the list prohibited

Pathways: regulate high-risk pathways for invasion

- proactive, best protection against unknown risks



Some Laws on Aquatic Invasive Species

Lacey Act (1900): bans importation (but not interstate trade...) of species identified as 'Injurious Species' by the USFWS

- Limited to non-native vertebrates, crustaceans, mollusks (no insects or spiders)
- Current list includes Brown Treesnake, Common Yabby, Wels Catfish, anacondas, certain salamanders that could carry chytrid fungus, etc._
- Grounds for listing include harm to wildlife resources

- Before 1949 amendments, the Lacey Act used a "white list"

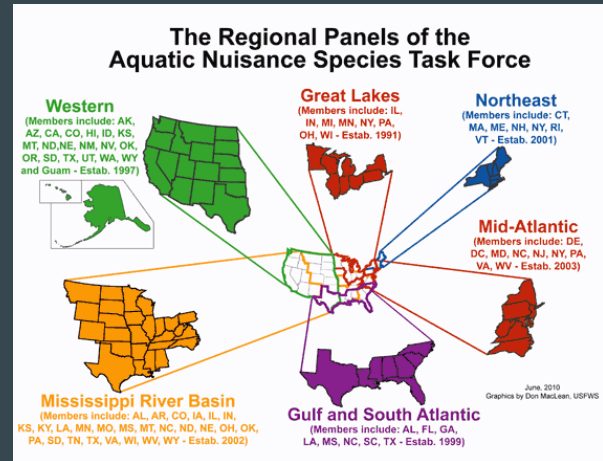


Wels Catfish
(*Silurus glanis*)

Some Laws on Aquatic Invasive Species

Nonindigenous Aquatic Nuisance Prevention and Control Act (1990) and National Invasive Species Act (1996 amendment):

- Focus is prevention, control, research
- NANPCA mandated Great Lakes ballast water management program; NISA created *national* program, encouraged international
- Established the Aquatic Nuisance Species Task Force (federal), advised by regional panels (federal and state agencies, public and private sectors)



Some Laws on Aquatic Invasive Species

Executive Orders 13112 (1999) and 13751 (2016 amendment): Safeguarding the Nation from the Impacts of Invasive Species

- Called upon executive departments to take steps
- Established the National Invasive Species Council
 - executive level coordinating body
 - supported by NISC Secretariat
- Invasive Species Advisory Committee – “advises” NISC, members include state, territorial, tribal, local government, academic, NGO, and private representatives

State Laws on Aquatic Invasive Species

Harmful or Potentially Harmful Aquatic Species

Title 31 Ch 57A, Texas Administrative Code

It is an offense for any person to release into the water of this state, import, sell, purchase, **transport**, propagate, or **possess** any species, hybrid of a species, subspecies, eggs, seeds, or **any part of any species** defined as a harmful or potentially harmful exotic fish, shellfish, or aquatic plant.



See the TPWD website for a full list: Go to Water > Invasive Species

http://tpwd.texas.gov/huntwild/wild/species/exotic/prohibited_aquatic.phtml

State Laws on Aquatic Invasive Species

Draining of Water from Vessels ...Public Fresh Water

Title 31 Ch 57 Texas Administrative Code, Rule 57.1001

Except as otherwise provided, no person may use any **public roadway** to transport a vessel **to or from a public water body** unless all bilges, live wells, and other similar receptacles and systems holding or capable of holding **water on board the vessel** have been **drained**. This regulation is applicable statewide, with some noteworthy exceptions: travel between points on the same lake, same day; tournament participants; emergency responders.



State Laws on Aquatic Invasive Species

Removal of Harmful Aquatic Plants

Parks and Wildlife Code Section 66.071

On leaving any public or private body of water in this state, a person shall immediately remove and lawfully dispose of any exotic aquatic plant on the list of prohibited plants that is clinging or attached to the person's:

- (1) vessel or watercraft; or
- (2) trailer, motor vehicle, or other mobile device used to transport or launch a vessel or watercraft.



See the TPWD website for a full list: Go to Water > Invasive Species
http://tpwd.texas.gov/huntwild/wild/species/exotic/prohibited_aquatic.phtml

Pathways for Aquatic Invasive Species

- **Inadvertent introductions**

Hitchhiking

Ballast or bilge water

Equipment transfer

Pipeline transfer

Downstream dispersal

- **Intentional introductions**

Ornamental plants

Erosion control

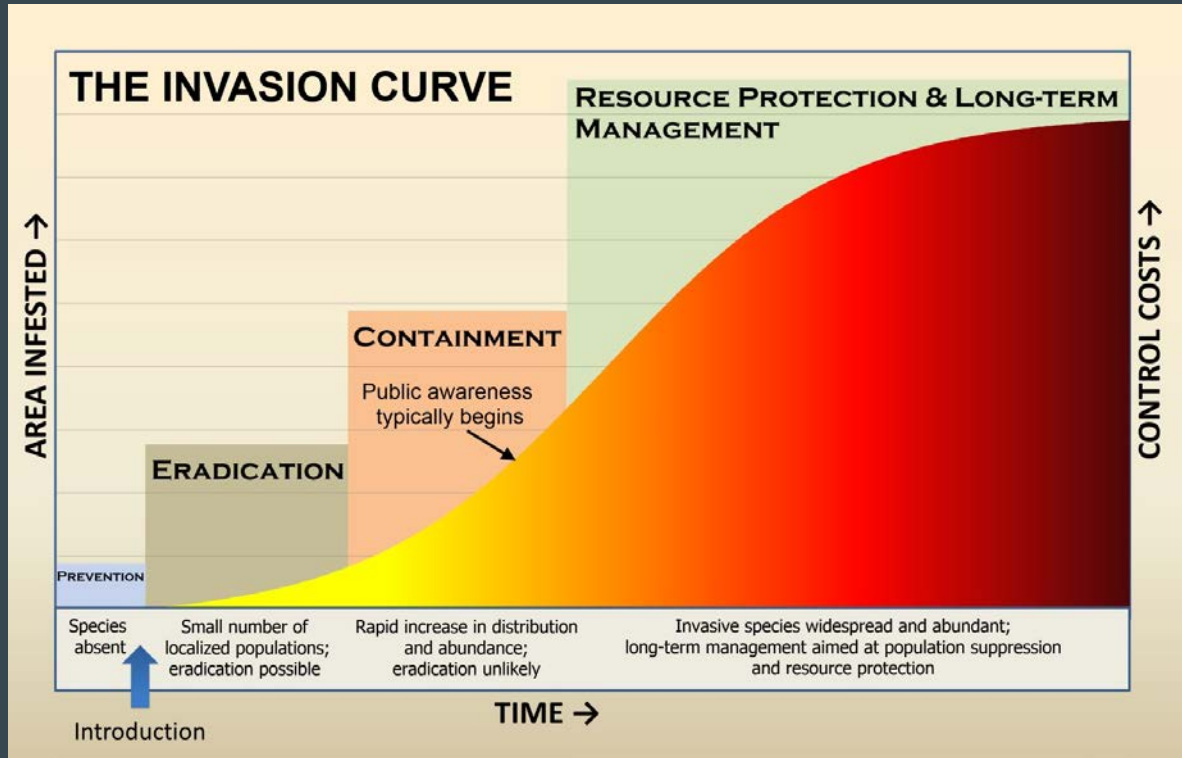
Pet / aquarium/ classroom

Bait fish

Biological control



Aquatic Invasive Species Management



Costs of AIS Management in Texas

Cost of effective management of aquatic invasive species (AIS) in TX:
~\$45M/yr

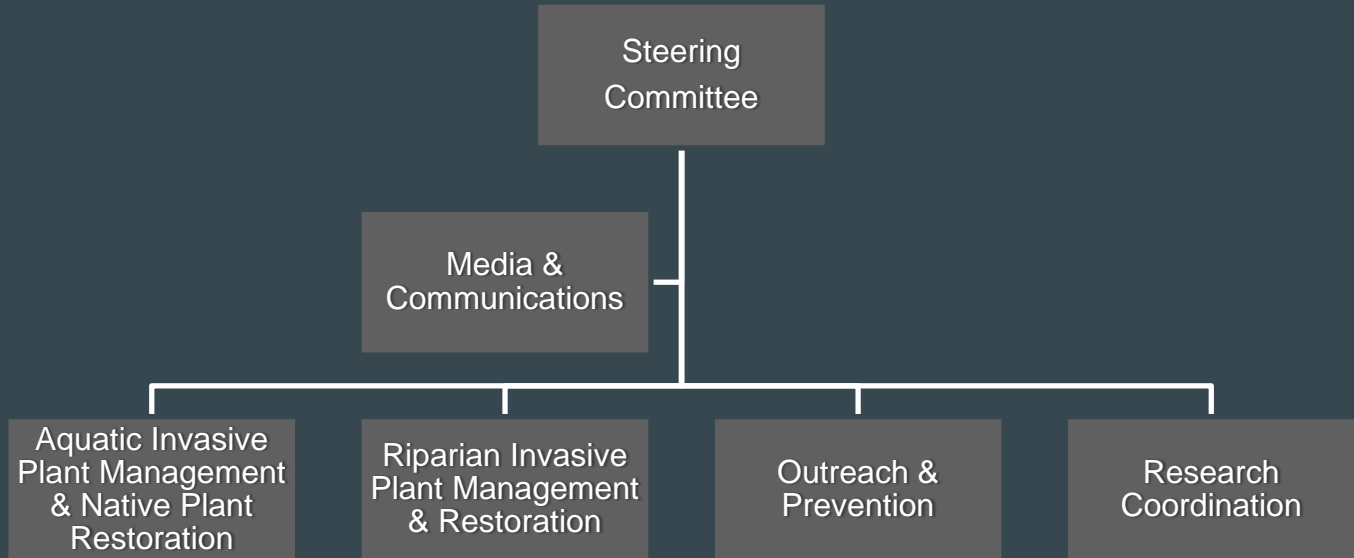
TPWD Legislative Appropriations Request for 2016-2017 requested AIS management budget be increased from \$1.1 to \$9M/yr.

Legislature allocated \$6.3M to Inland Fisheries for FY 2016-2017

Additional federal boater access funds and partner funds help to expand on state-funded efforts

Funding provided at same level for FY 2018-2019—but still a legislative rider (not base budget)

TX Aquatic Invasive Species Management



Statewide Aquatic Vegetation and Invasive Species Management

<https://tpwd.texas.gov/landwater/water/aquatic-invasives/>

Aquatic Invasive Plant Management



Giant Salvinia (*Salvinia molesta*)



**Water Hyacinth
(*Eichhornia crassipes*)**



Biopesticide Research & Biological Control Releases

Riparian Invasive Plant Management



Saltcedar (*Tamarix* species)



Elephant Ear (*Colocasia esculenta*)



Carrizo Cane (*Arundo donax*)

Thanks! Questions?

Get Involved:

Texas Invasives:

<https://www.texasinvasives.org/>

TPWD Volunteer Opportunities

Learn More:

National Invasive Species Information Center (USDA):

<https://www.invasivespeciesinfo.gov>

National Invasive Species Council (USDO):

<https://www.doi.gov/invasivespecies/> (formerly [invasivespecies.gov](https://www.invasivespecies.gov))

Aquatic Nuisance Species Task Force:

<https://www.anstaskforce.gov>

Nonindigenous Aquatic Species (USGS):

<https://nas.er.usgs.gov>

