



Texas State Report Gulf and South Atlantic Regional Panel on AIS Jekyll Island, GA - April 2023

Zebra/Quagga Mussels

Since the last GSARP meeting, there have been no new detections of zebra or quagga mussels in Texas or upgrades in lake infestation statuses.

The quagga mussel situation at Lake Amistad on the Rio Grande continues to be monitored by the NPS in collaboration with TPWD. Quagga mussel larvae have been detected in low numbers at two sites across multiple sampling dates in spring/summer 2021 and spring/summer 2022. To date, settled mussels have not been found on settlement samplers or in shoreline searches, including searches with detection canines.

Dreissenid mussel eDNA has been detected for the first time at three water bodies; results were delayed due to time for sample analysis. Zebra mussel eDNA was detected in Bois d'Arc Lake, which is not yet open to the public, for the first time in summer 2022 USGS samples; feces from a highly abundant waterfowl population is considered a possible source of eDNA. Quagga mussel eDNA was detected in Lakes Nasworthy and Waco (the latter where zebra mussels were eradicated through a control effort approximately 8 years ago). The TPWD considers eDNA an 'inconclusive' result and an indication that close monitoring is needed.

Invasive Carp

TPWD is continuing to work with Oklahoma Department of Wildlife Conservation, Arkansas Game and Fish Commission, Auburn University, and Texas Tech University to assess the population status of invasive bigheaded carp (bighead and silver) in the Lower Red River Basin across the tri-state area. To date, over 350 bigheaded carp have been found in the Red River upstream to Denison Dam below Lake Texoma and in all monitored tributaries. To date, only one bighead carp has been detected in the Sulphur River, a major Red River tributary in Texas and Arkansas. Thus far, successful reproduction has not been documented. Telemetry work has begun in the Red River, with most acoustic receivers in place and 29 bigheaded carp tagged to date. A grant is in progress for funding for lost/damaged receiver replacement during the second year of the project.

Aquatic Invasive Plants

Giant salvinia continues to be the most problematic aquatic invasive plant in Texas and is present in 25 reservoirs and 7 river systems. Early detection and rapid response efforts continue, and a recent introduction at Lake Pinkston has been treated and giant salvinia is now considered extirpated at Lake Pinkston. A reoccurrence found at Lake Gilmer was treated shortly after

discovery with no plants being observed in surveys conducted over the last few months. Biological control using giant salvinia weevils continues to show success and the weevils are being used as part of our IPM strategy on 15 water bodies with a total of 353,638 weevils released in fiscal year 2022 and another 137,586 weevils released in the first half of fiscal year 2023. Self-sustaining weevil populations are now present at J.D. Murphree WMA lakes, Toledo Bend Reservoir, Sheldon Lake, Lake Naconiche, Lake Nacogdoches, and Lake Raven. Herbicide treatments using a variety of herbicides were also used to control giant salvinia on 36 water bodies, with nearly 15,000 acres treated in fiscal year 2022 and almost 8,000 acres treated in the first half of fiscal year 2023.

Water hyacinth also continues to be problematic and is present in 58 reservoirs and all major rivers across the state. In fiscal year 2022, nearly 3,500 acres of water hyacinth were treated with herbicides on 30 water bodies, primarily using 2,4-D. Nearly 500 acres of water hyacinth have been treated in the first half of fiscal year 2023.

Crested floating heart is currently found in 3 public water bodies and yellow floating heart in 2 water bodies, including the latter being present on the Louisiana side of Toledo Bend Reservoir on the state border. Treatment using ProcellaCOR has been highly effective, and infestations have been significantly reduced on most water bodies.

Because hydrilla in many cases provides much needed fish habitat in those aging reservoirs in Texas with minimal littoral zones, treatments of this species are limited to addressing access issues at swimming areas, campsites, along shorelines where it has become problematic for lakefront landowners for access, boat ramps, and boat lanes unless coverage exceeds 40%. Control strategies include herbicides and triploid grass carp. In fiscal year 2022, 170 acres of hydrilla were treated across 9 water bodies. However, no hydrilla has been treated so far in the first half of fiscal year 2023.

Riparian Invasive Plants

Giant reed (*Arundo donax*) control is ongoing in Central Texas across the Pedernales, Blanco, Guadalupe, Medina, Nueces, and Llano rivers and San Felipe Creek. Control is implemented on nearly 400 private and public properties across these basins in collaboration with the landowners. However, due to staffing changes at the Nueces River Authority, the future of Nueces River (a long term project) and San Felipe Creek (a relatively new project) is currently uncertain.

Saltcedar control on the Upper Brazos River in critical habitat for smallmouth bass and sharpnose shiners in collaboration with the USFWS continues to be a priority. To date, over 20,000 acres have been treated across approximately 150 primarily private properties.

Watershed-scale elephant ear control on the Llano River continues, with over 50 river miles in monitoring or active management status. In 2022, survey and treatment efforts were hindered by severe drought, with only one treatment event conducted; multiple summer treatment events are planned for 2023.

Aquatic Invasive Species Outreach

Outreach and prevention remains a high priority in Texas. The TPWD, with support from 13 partners, implements an annual 'Protect the Lakes You Love' clean, drain, dry campaign targeting watercraft owners/operators during peak boating season. The campaign includes billboards and gas station advertising as well as a variety of paid targeted digital media including social media platforms, apps, digital radio, and pre-roll video. The TPWD is also implementing the 'Never Dump Your Tank' outreach campaign using digital media strategies to encourage aquarium owners to seek alternatives to release of aquarium life.

Aquatic Invasive Species Research

TPWD is currently supporting three AIS research projects through our biennial AIS grant program. A fourth has been completed. TPWD recently released a request for research proposals for FY24-25, with proposals due at the end of May for projects starting in September.

Near real-time detection and monitoring of invasive mussel species in Texas waterways

Early detection of zebra mussel veliger larvae requires microscopic analysis of plankton samples that can be time consuming and delay results. This project seeks to test a novel and efficient AI process to more quickly detect and enumerate zebra mussel veligers, refine the technology, and explore spatiotemporal variability of veliger presence and density over time in the study areas. Significant progress is being made on this project, although false positive rates remain concerning as they may be infeasible for the use of this project. Researchers are working to reduce and address the possibility of false positives, although this may come at the expense of increasing false negatives.

Using remote sensing to map *Arundo donax* populations in Native Fish Conservation Areas throughout Texas to better understand causal factors of invasion and set management priorities

Giant reed (*Arundo donax*) is a highly problematic invader of rivers and creeksides with significant impacts on both riparian and aquatic habitats and efforts to manage this species are ongoing in the Hill Country. This study will test and develop the use of remote sensing technology to identify infested areas and areas where infestation is increasing as well as examining landscape factors influencing infestations and identify areas at high risk of impacts. This technology will be applied to Native Fish Conservation Areas across the state to aid in prioritizing areas for future control efforts. Model refinement is ongoing and application of this technology at a broader geographic scale is in the initial stages.

Assessing abundance, sex ratio, and space use by suckermouth armored catfish to enhance control efforts

Non-native suckermouth armored catfish compete with native species, alter food webs, and cause habitat degradation through burrowing into banks, and efforts to remove these invasive fish are underway in the San Marcos River to protect imperiled species. This study seeks to assess seasonal abundance of this species in the San Marcos River as well as assess movement and

population sex ratios and test potential new control augmentation techniques. Results of this study will aid in guiding and enhancing the efforts of ongoing removal efforts. Through sexing nearly 400 fish obtained during a planned dewatering event, it was possible to identify sexually dimorphic characteristics and develop a method by which trained novices can identify sex from dorsal and anal fin ratios with nearly 90% accuracy. This method can be used to collect data from fish harvested during removal efforts and tournaments to better evaluate the effectiveness of these population controls. A manuscript on this work is being finalized for submission.