Texas Parks and Wildlife Department State ANS Key Updates
Gulf and South Atlantic Regional Panel on Aquatic Nuisance Species
June 2022

Zebra and Quagga Mussels

Since their initial introduction into the state in 2009, zebra mussels have invaded 33 lakes across six watersheds in Texas. Since the last GSARP meeting, zebra mussels have invaded three additional lakes in Texas—Lake Brownwood and Inks Lake in the Colorado River Basin and Medina Lake in the San Antonio River Basin (a new river basin).

In 2021, quagga mussels were detected for the first time in a Texas water body—Lake Amistad in the Rio Grande Basin on the Texas-Mexico border. Single quagga mussel veliger larvae (i.e., per plankton sample) were detected on four different dates across two sites in the lake and confirmed by DNA testing. To date, no settled mussels have been detected and no veligers were detected in samples collected in April 2022. The National Park Service will continue to monitor the lake with support from Texas Parks and Wildlife Department (TPWD).

The TPWD and partners continue to monitor 44 lakes for early detection of invasive mussels and 28 for population monitoring and to support research on enhancing detection methods and better understanding population dynamics.

A recently completed zebra mussel establishment risk assessment indicated that, with the exception of low-calcium East Texas lakes, power plant lakes, and a few lakes with high salinity, all studied (N=133) Texas lakes are at high risk of zebra mussel establishment despite the state being at the southernmost extent of the range of this species. Prior to their invasion of Texas, it was believed they would not be able to become established in the state due to high temperatures.

Aquatic Invasive Plants

Numerous aquatic invasive plants are highly problematic in Texas including giant and common salvinias, water hyacinth, hydrilla, and crested and yellow floating hearts. However, there have been no new invasions of giant salvinia or other problematic aquatic invasive plants documented since the last GSARP meeting and treatment efforts have been highly effective, with no Texas lakes currently experiencing access issues as a result of aquatic invasive plants. Giant salvinia coverage has been reduced to approximately 300 acres in Caddo Lake and to approximately 75 acres in Toledo Bend where it is effectively contained in the upstream areas; these lakes have historically been highly infested requiring daily to weekly contracted herbicide application efforts throughout much of the year. At Toledo Bend, staff have begun re-seeding American lotus in treated areas and across many lakes we are seeing significant regrowth of native plants in treated areas. Winter 2021-2022 was mild and mortality of aquatic invasive plants was low but wintertime treatments were effective and while plants are rebounding quickly, regrowth is sporadic in terms of geographic distribution. The current drought situation is allowing saltwater intrusion into estuarine habitats, which has eliminated giant salvinia and water hyacinth infestations in many previously highly infested bayous. Salvinia weevil success in southern latitudes has been very good, with weevils found in many new locations and already providing significant control early in the year. Hydrilla treatment continues to be limited to small local lakes and state park sites to clear areas around

fishing piers, boat ramps, and swimming areas; in many lakes, hydrilla provides much-needed fish habitat and control efforts are therefore highly targeted.

Riparian Invasive Plant Management
Riparian invasive plant management continues to be a focus, prioritizing treatment of giant reed, saltcedar, and elephant ears. Partnership efforts begun in late 2015 have accomplished treatment of these species on over 400 private properties and several public properties across eight watersheds in key Native Fish Conservation Areas where conservation efforts can have maximal benefit.

Invasive Carp
The TPWD, Oklahoma Department of Wildlife Conservation, and Arkansas Game and Fish Commission are partnering with Auburn University and Texas Tech University to study the distribution and population dynamics of bigheaded carp (*Hypophthalmichthys* spp.) in the Lower Red River Basin across the tri-state area. Both bighead and silver carp have been detected in the Red River, including all Texas tributaries, but in relatively low numbers. Regulations preventing the transfer of live nongame fish from waters with invasive carp have been expanded to include all such tributaries and will go into effect September 1, 2022. To date, no bigheaded carp have been detected in the Sulphur River, a major tributary of the Red River in Texas and Arkansas where bighead carp have previously been detected. This project is nearing the end of its second year and funding has been approved for continuation of the population assessment for a third year along with expansion of the project to include acoustic telemetry to guide sampling and inform future potential removal efforts. This project also includes collection of much-needed baseline data on native fish assemblages.

Outreach and Prevention
The TPWD aquatic invasive species outreach campaign continues to be a focus, with state and partner funding supporting these efforts. The campaign employs diverse delivery methods including billboards, gas station advertising, boat ramp signage, geofenced digital radio ads, pre-roll videos, other digital advertising, print ads and mailings, and social media. The 2022 campaign is currently underway and will run through the majority of the peak boating season. Other outreach includes in-house social media on a variety of aquatic invasive species topics as well as during key events (e.g., National Invasive Species Awareness Week). Targeted emails to licensed anglers in areas where invasive carp have been detected are also used to reach these anglers with a message regarding preventative bait regulations and the risk of spreading these species through bait bucket transfers.

Research
Four research projects are currently being funded by TPWD and partners through an aquatic invasive species small grants program.

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

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 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. The study will also implement this technology to augment early detection monitoring in Texas.

Assessing the Population Dynamics and Body Condition of Zebra Mussels Within and Between Two Texas Water Bodies with Different Population Trajectories: Lakes Belton and Stillhouse Hollow - Temple College

Long-term studies have indicated that some zebra mussel populations in Texas decline in density and growth rates over time, whereas others do not. This study seeks to better understand population dynamics in two lakes with different population trends in conjunction with food availability and water quality parameters. This study will evaluate potential explanations for population declines that will have implications for predicting ecological and economic impacts of zebra mussels in infested waters and aid in guiding mitigation strategies.

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 - Texas State University

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.

Assessing abundance, sex ratio, and space use by suckermouth armored catfish to enhance control efforts - Texas A&M University; Texas State University

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.