Texas Parks and Wildlife Department State ANS Key Updates
Gulf and South Atlantic Regional Panel on Aquatic Nuisance Species
April 2021

Five Years of Enhanced AIS Management Efforts

Since the beginning of state fiscal year 2016 (September 2015), the Texas Legislature has increased state funding allocations to TPWD for aquatic invasive species management. The TPWD recently prepared a report on enhanced efforts over the past five years, which is attached.

Zebra Mussels

Since their initial introduction into the state in 2009, zebra mussels have invaded 31 lakes across six watersheds in Texas. Texas Parks and Wildlife Department (TPWD) and partners continue to monitor 43 lakes for early detection, 21 for population monitoring, and one post-treatment.

Aquarium Moss Balls

In March 2021, zebra mussels were found on "marimo moss balls" for aquaria in states around the U.S. and in some Canadian provinces, triggering a wide-scale rapid response effort. The TPWD Law Enforcement investigated numerous stores in Texas, finding an empty zebra mussel shell on moss balls being sold at one store in Austin; one major chain had already pulled these projects from shelves before store visits were conducted. A member of the public also provided a report, with photographs, of potentially live zebra mussels on moss balls sold at another major chain in Temple. TPWD Law Enforcement worked with Petco and PetSmart corporate as well as distributors to address the issue and TPWD issued a press release to increase public awareness.

Lake Waco Eradication

In January 2021, TPWD announced the successful eradication of zebra mussels from Lake Waco in Central Texas. This eradication was made possible only by very early detection, timing of detection prior to peak spawning, and a multi-agency rapid response effort. In September 2014, City of Waco employees found zebra mussels at a single boat ramp on Lake Waco, which were later confirmed by TPWD. Additional surveys in the area found approximately 75 more adult mussels as well as a few zebra mussel larvae, but all were in a localized area around the ramp and adjacent marina. Additionally, an infested barge believed to be the source of the invasive mussels was identified in the adjacent marina and removed from the lake two days after the mussels were detected. The owner was cited for illegally introducing prohibited zebra mussels. At that time, the lake was designated as 'positive' for zebra mussels, but the invasion had not reached fully established, 'infested' levels.

The introduction of zebra mussels into Lake Waco presented a unique opportunity for action due to the highly localized nature of the introduction and how quickly the mussels were detected. In October 2014, partner agencies worked together on a rapid response effort to install nearly an acre of benthic barriers (i.e., 30 mil polyvinylchloride plastic sheeting) over the shoreline and lake bottom in the affected area and weighted it down with sandbags. This method was used in an attempt to kill the mussels by blocking oxygen, impede dispersal of larvae prior to spawning, and prevent them from becoming established in the lake. This was a very substantial undertaking that took a lot of creative thinking and required many staff from the City of Waco, US Army Corps of Engineers and Texas Parks and Wildlife to accomplish, not to mention heavy equipment, boats and

commercial divers. The late Tom Conry with the City of Waco was a driving force behind this project.

The benthic barrier was removed in March 2015 after nearly five months of being in place. While one potentially live mussel was found and eliminated after the plastic was removed, evidence indicated the effort was successful in creating extremely low oxygen conditions not conducive to zebra mussel survival over much of the area. Since 2015, TPWD and the City of Waco have continued to monitor the lake intensively, and no zebra mussel larvae, settled adults, or their DNA have been detected in the lake since. The results confirm that the eradication effort was an unprecedented success and Lake Waco has been downgraded to 'undetected/negative' status. The TPWD and partners will continue to monitor the lake for reintroduction.

Lake Buchanan

In December 2020, TPWD designated Lake Buchanan in the Colorado River Basin as fully infested with zebra mussels. This represents an upstream introduction of zebra mussels and is not the result of downstream dispersal as was previously seen with many of the lakes in this river basin; downstream Inks Lake is now at risk of invasion via downstream dispersal. Lower Colorado River Authority (LCRA) scientists discovered zebra mussel larvae in plankton samples taken from three sites around the lake in October. The TPWD then confirmed the identity through microscopic and genetic analysis. The LCRA analyzed samples collected in November and again found zebra mussels at two of the three sites. Then in early December, crews working on a floodgate project at Buchanan Dam discovered several settled zebra mussels. Additional surveys for settled mussels were conducted by LCRA on the shorelines while Lake Buchanan Conservation Corporation volunteers also checked their installed settlement samplers. Zebra mussels were not detected at any of these locations. Although few settled mussels were found at the dam, the presence of both larvae and adults and detection of young larvae in samples taken a month apart indicate that a reproducing population is present in the lake.

Medina Lake

In February 2021, zebra mussels were detected in Medina Lake, marking the first introduction of invasive zebra mussels in the San Antonio River Basin—the sixth river basin in Texas to be invaded. On Feb. 11, a member of the public submitted a report with a photo to TPWD of a zebra mussel located at a boat ramp near the mouth of Haby's Cove. Subsequently, TPWD staff conducted searches at the site where the original mussel was found and near Red Cove Marina. Biologists located two zebra mussels attached to rocks along the shoreline near the site where the first mussel was discovered. Bandera County River Authority & Groundwater District (BCRAGD) staff conducted a search on Feb. 24 and located a single zebra mussel attached to a settlement sampler at a dock approximately three miles upstream from the first location where zebra mussels were detected. The BCRAGD later conducted additional surveys of shorelines, boat docks, boat hulls and engines at numerous sites around the lake; no additional zebra mussels were found. The lake has been designated as 'positive' for zebra mussels and additional monitoring will be conducted to assess whether/when a fully established, reproducing population is present.

Lake Placid

Lake Placid, located in the Guadalupe River Basin, was previously designated as 'positive' for zebra mussels, but was upgraded to fully infested status in March 2021. In May 2019, zebra mussel larvae and a single adult were documented at Lake Placid, but biologists had not yet found evidence of an established, reproducing population in the lake. However, in early February 2021, during some routine maintenance activities at the Lake Placid dam, Guadalupe-Blanco River Authority

employees discovered a population of adult zebra mussels in the hydroelectric turbine near the bottom of the dam. Numerous mussels of different size classes were found, indicating the presence of an established, reproducing population.

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. Since state fiscal year 2016 (August 2015) when the Texas Legislature first allocated approximately $3.2M annually to TPWD for aquatic invasive species management, aquatic plant control efforts have increased approximately five-fold. Currently, infestations are being managed on more than 50 water bodies around the state, primarily in East Texas. Efforts to rapidly respond to new infestations with containment and control strategies have also increased due to the increase in funding and staffing.

There have been no new invasions of giant salvinia or other problematic aquatic invasive plants documented since the last GSARP meeting in December 2020. It was hoped that winter storms would have resulted in significant giant salvinia mortality, but early reports indicate that, while some kill occurred, the snow cover may have insulated the giant salvinia against the impacts of the freeze and die-off was lower than expected.

Riparian Plant Management

Riparian invasive plant management continues to be a focus, prioritizing treatment of giant reed (*Arundo donax*) and saltcedar. Partnership efforts begun in late 2015 have accomplished treatment of these species on over 425 private properties and several public properties in key Native Fish Conservation Areas where conservation efforts can have maximal benefit. Treatment efforts for giant reed will expand this summer to include a new project on San Felipe Creek.

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 in-house social media. The campaign is currently preparing for the 2021 launch in May.

Research

Four research projects are currently being funded by TPWD and partners, focusing on effects of water chemistry on zebra mussel reproduction and early development, population dynamics and impacts of zebra mussels on native unionids, native plant competition methods for enhancing hydrilla control, and the bait fish pathway for introduction of Gulf Killifish and Sheepshead Minnows outside their native range within the state and hybridization impacts. Research projects will be completed by end of fiscal year 2021. The TPWD has also recently issued a request for proposals for new research projects for state fiscal years 2022-2023.

5 Years of Aquatic Invasive Species Management Accomplishments (Fiscal Years 2016 - 2020)

Aquatic Invasive Plant Management

- Over 50 water bodies being actively managed
- Intensive early detection and rapid response
- More than 60,000 acres of giant salvinia treated
- Nearly 1.5 million giant salvinia weevils introduced as biological controls
- More than 6,000 acres of water hyacinth treated
- Nearly 1,000 acres of other species treated

Increasing Public Awareness to Slow the Spread

- Annual aquatic invasive species outreach campaign from Memorial Day through Labor Day
- Nearly 800 million "impressions" generated
- Supported by funding from a coalition of 13 partners
- Billboards, gas station advertising on key routes
- Prominent signage at 275+ boat ramps
- Digital and social media advertising
- Communication with 575K+ registered boaters
- 91% of boaters surveyed have heard or seen "Clean, Drain and Dry" message

Restoring Texas Streamsides

- Watershed-scale control of river and creekside invasive plants at no cost to landowners
- Over 325 landowners participating in Arundo control across five Hill Country river basins
- Over 15,000 acres of saltcedar treated on over 100 properties on the Brazos River
- Elephant ear control on more than 50 miles of the Llano River

Invasive Mussel Early Detection

- Coalition of 15 partner entities work together to monitor more than 40 lakes for early detection of invasive mussels' DNA, larvae, or settled adults
- Partners monitoring existing populations in over 20 water bodies
- Zebra mussels successfully eradicated from Lake Waco as a result of very early detection and coordinated, interagency rapid response