

# Aquatic Vegetation and Invasive Species Management

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*Briefing Paper*



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## **Introduction**

Texas Parks and Wildlife Department manages freshwater fisheries and other aquatic resources in Texas' rivers and lakes, providing arguably the best freshwater fishing in the nation. This includes trophy Largemouth Bass fisheries in reservoirs such as Lake Fork, unique wilderness fishing opportunities for Smallmouth Bass in one of the most scenic and pristine rivers in the southwestern US – the Devils River – and unique stream fishing opportunities for our official state fish – Guadalupe Bass – in the scenic, clear, spring-fed streams of the Texas Hill Country. These unique, high-quality fishing opportunities are world-renowned and generate billions of dollars annually for our state's economy. For example, many of our top fishing lakes generate an annual economic impact of \$14-32M annually, and bank, wade, and kayak fishing in streams of the Hill Country generates over \$74M annually. As a whole, freshwater fishing in Texas has an estimated annual economic impact of output of over \$3.7 billion, and is responsible for more than 29,000 jobs in the state.

**Aquatic Invasive Species: A Problem for All Texans** – Freshwater fishing is clearly important to our state's economy, and quality fisheries are dependent upon healthy habitats in our creeks, streams, rivers, and lakes. However, there are numerous issues degrading our waterways, one of the most significant being the introduction and spread of aquatic invasive species. These are non-native plants and animals that have invaded our waterways, streamside areas, and reservoir shorelines, forming dense stands or floating mats that outcompete native species. The most problematic aquatic invasive species were introduced into Texas from Africa, Eurasia, Australia and South America. This includes aquatic weeds and animals such as hydrilla, giant salvinia, water hyacinth, salt cedar, giant reed, and zebra mussels, all of which have been shown to have significant detrimental impacts in the state. For example, water hyacinth has been documented to consume as much as 13 times more water than native aquatic vegetation, contributing to water supply losses in a drought-stricken state. Additionally, dense mats of floating aquatic invasive plants have been shown to block waterways, impeding boating access and water-based recreation and negatively affecting water conveyance for agricultural irrigation and municipal water supply. Zebra mussels, a sessile, colonizing aquatic invasive mollusk were introduced into Texas waterways in 2009, and have been shown to colonize and clog water intakes and other water infrastructure, resulting in costly and ongoing maintenance and repairs. Furthermore, studies of real estate and property values have identified linkages between infestations of aquatic invasive species and declines in waterfront property values of up to 19 percent.

**Economic Impacts of Aquatic Invasive Species in Texas** – It's estimated that the annual economic impact of aquatic invasive species in the US is more than \$140 billion, and globally, the impacts are estimated at more than \$4 trillion. In Texas, the impacts of aquatic invasive species are far-reaching, they are not likely to go away, and they are costing the state billions of dollars annually. Texas Parks and Wildlife Department estimates that effective management of aquatic invasive species in Texas would require \$45 million annually.

**Texas Parks and Wildlife Department and Our Partners Take Action to Manage Aquatic Invasive Species** – Texas Parks and Wildlife Department has an established aquatic invasive species program that works cooperatively with river authorities, water utilities, municipalities, private landowners, and other local partners to manage aquatic invasive species. Specific actions include biological surveys and monitoring to identify new introductions of aquatic invasive species, studies that attempt to identify potential introduction pathways, public outreach and other proactive measures to help prevent their spread, and on-the-ground treatment, including use of herbicides, mechanical removal, and biological controls.

**Maintaining Adequate Funding for Management of Aquatic Invasive Species in Texas** – Texas Parks and Wildlife Department’s Legislative Appropriations Request for State Fiscal Years 2016-2017 requested that the budget for management of aquatic invasive species be increased from \$1.1 to \$9 million annually. It was estimated that this funding level would enable Texas Parks and Wildlife Department and our partners to address an estimated 20% of Texas’ aquatic invasive species problems. The Legislature responded and allocated \$6.6M in funding over the biennium to address aquatic invasive species issues (through Rider 34 – *Statewide Aquatic Vegetation and Invasive Species Management*). For Texas to keep pace with the constant and growing problems associated with aquatic invasive species, it will be critically important that the state’s investments of technical and financial resources be supported at adequate levels for the long-term.

**Progress in Implementation of a Comprehensive Aquatic Invasive Species Management Program for Texas** – As referenced above, the Texas Legislature allocated \$6.6M in funding and 5 new FTEs to Texas Parks and Wildlife Department over the current biennium to address statewide aquatic invasive species issues. This represents an unprecedented investment of resources by the Legislature that is expected to allow the department and partners to implement (1) a nearly 5x increase in the annual acreage of aquatic invasive plants treated, (2) expansion of our capacity in use of biocontrols, (3) enhanced early detection and containment of zebra mussels and other aquatic invasive species, (4) development and implementation of strategies to control invasive riparian plants (e.g. salt cedar and giant reed) primarily along rivers in the western half of the state, and (5) critical research to better assess the environmental and economic impacts of aquatic invasive species.

*Challenges and Opportunities* – This new investment of resources by the legislature is supporting a short-term (hopefully long-term) expansion of the department’s Aquatic Invasive Species Program, involving an immediate and significant increase in administrative (e.g., supervisory, contract management, budget management) and technical (e.g., project planning, delivery, monitoring, reporting) responsibilities. Furthermore, this expanded scope (and extremely short timelines for delivery) requires a distributed, team-based approach. As such, the department has established a multi-divisional working group to help coordinate delivery of projects supported by this increase in available funding.

Furthermore, the challenges of quickly “scaling up” the scope and scale of TPWD’s aquatic invasive species control efforts also serve as an opportunity to further engage external organizations in project management and delivery roles. By establishing new or expanded partnerships with universities, river authorities, municipal water districts, non-profits, local, state and federal agencies, local communities, and other partners, we are able to leverage existing personnel, equipment and other resources to deliver projects more quickly and efficiently. Since legislatively-appropriated funding became available in September 2016, the department has established new or expanded partnerships with numerous organizations to help deliver aquatic invasive species outreach, research, and control projects. A partial list of active projects is listed below.

- Aquatic Invasive Plant Management Projects:
  - Management of water hyacinth and giant salvinia at Lake Texana
  - Rapid response and early containment of a new introduction of giant salvinia at Lake Fork
  - Management of giant salvinia, water hyacinth, and crested floating heart at Caddo Lake and Cypress Bayou
  - Management of water hyacinth, hydrilla, and other problematic aquatic invasive plants on the Guadalupe River, its tributaries, and reservoirs
  - Management of water hyacinth on Armand Bayou and its tributaries
  - Management of giant salvinia at B.A. Stenhagen Reservoir
  - Management of giant salvinia at Sam Rayburn Reservoir
  - Management of water hyacinth and giant salvinia at Lake Striker and Striker Creek
  - Management of water hyacinth on the Colorado River downstream of Longhorn Dam
  - Management of giant salvinia at Toledo Bend Reservoir
  - Management of giant salvinia at Houston County Lake
  - Management of water hyacinth and giant salvinia at Lake Murvaul
  - Management of yellow floating heart at Moss Lake
  - Management of giant salvinia at Lake Naconiche
  - Management of giant salvinia at Lake Timpson
  - Management of giant salvinia and Eurasian watermilfoil at Brandy Branch Reservoir
  - Management of giant salvinia at Martin Creek Reservoir
  - Management of giant salvinia at Clear Creek
  - Management of giant salvinia at Hemphill City Lake
  - Management of water hyacinth at Lake LBJ
  - Management of water hyacinth at Bessie’s Bayou
  - Management of giant reed in the Sabinal River
  - Management of giant reed in the Nueces River
  - Management of giant reed in the Pedernales River and its tributaries
  - Management of giant reed in the Blanco River

- Management of saltcedar in the Brazos River and its tributaries upstream of Possum Kingdom Reservoir
- Management of elephant ears on the Llano River and its tributaries
- Aquatic Invasive Species Research and Development Projects:
  - Research focused on development of endocides to be used in management of giant salvinia
  - Research to inform development of methods for management of invasive suckermouth catfish in Texas
  - Research to delineate the range of invasive bighead carp in Texas and inform related management
  - Research to guide development of enhanced methods for prevention and management of zebra mussel-infested waterbodies statewide
  - Research to evaluate the risk of invasion of zebra and quagga mussels into Texas reservoirs statewide
  - Research to to guide development of enhanced methods for establishment of native vegetation in Texas reservoirs
  - Production and rearing of giant salvinia weevils to support Management of giant salvinia on east Texas reservoirs
- Aquatic Invasive Species Outreach and Prevention Projects:
  - Zebra Mussel Public Awareness Campaign focused on the eight reservoirs infested with zebra mussels in north and central Texas
  - Giant Salvinia Public Awareness Campaign focused on the 15 reservoirs infested with giant salvinia in east Texas
  - Installation of semi-permanent giant salvinia and zebra mussels boat ramp signage at all public boat ramps on the 23 reservoirs infested with either giant salvinia or zebra mussels
  - Development of a companion guide to the "Your Remarkable Riparian" manual entitled "Troubleshooting Invasive Plants"
  - Update of the "Guide to Identification of Harmful and Potentially Harmful Fishes, Shellfish and Aquatic Plants Prohibited in Texas"