JULY 2023

# ON THE WATER

*Texas Aquatic Plant Management Society Newsletter*

HERE'S WHAT'S UP!



## President's Update

*By Kristina Tolman*

Thank you to those of you that attended our 2022 TAPMS Conference in San Marcos. This year our 2023 TAPMS Conference will be held at the Mesquite Convention Center in Mesquite, Texas. Located 35 minutes east of the Dallas/Fort Worth Airport (DFW) and 20 minutes from downtown Dallas, Mesquite offers small town charm with big city amenities. Among other events, the Mesquite Convention Center hosts the annual National Championship Rodeo, and also has the Mesquite Golf Club that has scenic fairways and challenging holes. This small town also has many parks with walking trails and fishing spots.

Visit our 2023 TAPMS Annual Meeting website to learn more about how to register and book your hotel room at the Mesquite Hampton Inn. We hope that you will join us November 15-17 in Mesquite!!

Remember you can always stay up to date by following our social media accounts or subscribing our email blasts on our website: https://www.tapms.org/


Photos Courtesy of Mesquite Convention and Visitors Bureau

# John Bunker Sands Wetland Center

*by Kristina Tolman*

As part of our 2023 TAPMS Conference, we are offering a free tour of the John Bunker Sands Wetland Center at 1:00 PM on Wednesday, November 15th. Established in 2009 in partnership with the North Dallas Municipal Water District, John Bunker Sands Wetland is the largest man-made wetland in the United States and covers approximately 2,100 acres. The Wetland Center is a man-made wetland that serves multiple purposes including water supply management, flood control, environmental education, and habitat for diverse wildlife species.

Water in the wetland is sourced from treated effluent from nearby wastewater treatment plants, and plants and substrate within the wetland absorb and filter approximately 95% sediment, 80% nitrogen, and 65% phosphorous from the water. After the wetland, the water is transferred to Lavon Lake and the Wylie Water Treatment Plant where it is treated again and then distributed to people within 10 counties. John Bunker Sands Wetland Center serves as a living laboratory for research while also being a sanctuary for countless species. We hope that you will attend this free tour as part of the 2023 TAPMS Conference. Visit our 2023 TAPMS Conference website to learn more about the conference.

**Special thanks to our sponsors for making Texas Aquatic Plant Management Society 2022 Annual Meeting possible!**

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# The Endangered Species Act Turns 50!

## Texas Aquatic Plant Species Continue to Benefit from ESA Protections

*by Oliva Ybarra*

Texas Aquatic Plant Species Continue to Benefit from ESA Protections
Nearly 50 years ago, the Endangered Species Act (ESA) of 1973 was placed into law. Since then, over 1,300 species throughout the country have been listed as either endangered or threatened. Protections offered by the ESA have recovered species populations, like the symbolic American bald eagle and the American alligator, from the threat of extinction.

These same conservation laws and protections that have aided such iconic animal species, also work to safeguard plant populations that are also in risk of extinction. The following are four native aquatic Texas plants that are currently listed by the ESA as either threatened or endangered.

**Little Aguja Pondweed (*Potamogeton clystocarpus*):**

The little aguja pondweed has only been found in the intermittent creek beds of the Davis Mountains in West Texas. The creek beds are generally shallow and contain alluvium substrate.
This plant has light green stems and green linear leaves that grow when completely submerged underwater. Perennial flowering occurs when the plant briefly extends above the water. Mature egg-shaped brown to yellow-green fruits will appear underwater and are critical for proper plant identification.


CREDIT: TPWD – ED SCHNEIDER

The little aguja has been listed as endangered in the federal register since 1991 and is also recognized by the state of Texas as endangered. Changes in water quality and drought are considered the major cause of the decline of little aguja populations. Landowners and herbicide applicators should be mindful of this species when practicing plant management in Jeff Davis County.

**Texas Golden Gladecress (*Leavenworthia texana*):**

The Texas golden gladecress occurs in the glades of the Weches geologic formation within the Pineywoods of East Texas. This species is likely to be found in shallow soil depths that contain high moisture content.
This plant species is a winter annual that depends on cool, wet winter months to promote flowering through Feburary and March. The Texas golden gladecress is best identified when flowering with four bright yellow petals and a long, narrow seedpod that contain 5 to 11 circular seeds. Terminal leaf segments are generally long and wide with a rosette base.

The Texas golden gladecress has been listed as endangered in the federal register since 2013. The decline in this species is likely due to habitat loss, climate change, and drought. Populations of this endangered plant species are currently found on privately owned land in San Augustine and Sabine counties. Landowners should be mindful of this species especially during flowering season as it will be easily identified and is not known to be confused with any other plants in that region.


CREDIT: TPWD – JASON SINGHURST

# The Endangered Species Act Turns 50!

## (continued)

**Texas Wild-Rice (*Zizania texana*):**

Texas wild-rice is an aquatic plant species endemic to the upper 2.5 miles of the San Marcos River in Hays County and is dependent on the springflow emitting from the Edwards Aquifer. This perennial aquatic grass produces clumps of immersed, ribbon-like leaves that sway with stream flow and prefers shallow water of 1 m or less with moderate to fast current and sandy to coarse substrate.

Flowering of this aquatic plant is observed above the water surface and typically occurs from spring to summer. The long green linear leaves can grow to 200 cm long and 3-25mm wide with a narrow vein extending down the middle.

Texas wild-rice was one of the first aquatic plants to be covered by the ESA and has been listed as endangered since 1978. It is also recognized as endangered by the state of Texas and has received special protection from Texas Parks and Wildlife Department by designating the upper San Marcos River a State Scientific Area through 31 TAC §57.910 which includes fines of up to $500 for uprooting or disturbing Texas wild-rice. Due to its limited range, this species is threatened by drought, changes in water quality, and pollution. Recreators of the San Marcos River should be highly considerate when navigating around this endangered plant species. Since 2013, the Edwards Aquifer Habitat Conservation Plan has enhanced the distribution of this rare species in the upper San Marcos River, use the link below to explore the changes: Texas wild-rice coverage 2013-2022 interactive swipe tool


CREDIT: TPWD – JACKIE POOLE

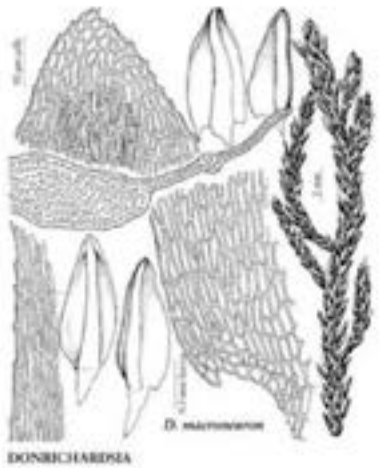
**South Llano Springs Moss (*Donrichardsia macroneuron*):**

The South Llano Springs moss is an aquatic moss endemic to the upper South Llano River in west-central Texas. This species is likely only found along the Seven Hundred Springs area within the Edwards Plateau and is largerly dependent on the springflow emitting from the Edwards-Trinity Aquifer.

CREDIT: USFWS – SOUTH LLANO RIVER IN CENTRAL TEXAS

This aquatic moss grows on submerged or partially submerged rocks. When exposed to full sun, the moss is yellow-green and can appear blue-green to black-brown in shaded areas. Gametophyte stems can reach 3 to 14 cm in length with loose leaves that spread to 0.8mm wide by 1.8 mm long when moist.

The South Llano Springs moss was recently listed as endangered in the federal register on May 30, 2023. Declines in this moss species population are likely due to increases in groundwater pumping from the Edwards-Trinity Aquifer, decreases in springflow, drought, poor water quality, and encroachment of non-native plant species within the highly endemic habitat. Private landowners and herbicide applicators along the South Llano River should be mindful of this moss species as it is sensitive to changes in water quality.




SOURCE: FLORA OF NORTH AMERICA

# LIVE! REGISTRATION & ABSTRACT SUBMISSION

2023 “Early Bird” registration is now open and will run until October 2nd. Registration will then increase to regular prices. Registration is free for students and regular registration starts at $230.

We are currently accepting Professional and Student abstracts for or 2023 meeting. Deadline for submissions is September 2nd. Presentations should be 12 minutes with an expected 3 minute Q&A period.

TAPMS is seeking deserving college students currently enrolled in relevant academic programs and who are interested in applying for the $1,500 David Allen Bass Scholarship.

Discounted group block rates of $149.00 for the dates of the conference are available until October 31st. Link for the attendees to make their reservations: TAPMS 2023 Conference

More information can be found using each QR code with your smart device or by going to the TAPMS Annual Meeting Page: https://www.tapms.org/2023-annual-meeting/

# Evaluation of Invertebrate Use of American Water-Willow (Justica americana)in Lake Conroe, Texas

*by Ryan O'Hanlon*

## Introduction

The native range of water-willow (*Justicia americana*) extends from southern Texas into northern Canada and from Kansas to the eastern coast of the United States and inhabits shallow riffles and stream banks (USDA and NRCS, 2015; Penfound, 1940).Characteristics of water-willow that support its use as an integral part of habitat management projects in reservoirs include: its hardy nature and tolerance to desiccation (Strakosh et al., 2005), ease of establishment and resistance to aquatic animal herbivory. As a case for its hardy nature, it can persist in water bodies inhabited by nonnative Grass Carp (*Ctenopharyngodon idella*) that have been stocked to vegetation.

Aquatic plants, including water-willow, provide a structure for aquatic larvae to climb to the water's surface to complete their lifecycle to adulthood (Cowx and Welcomme 1998). Habitat manipulations show that complex physical structures provide refugia for organisms within the water column, resulting in greater local abundance and diversity of zooplankton, macroinvertebrates, and fishes (Strakosh et al., 2006).

Macrophytes within the littoral zone increase habitat complexity and increase biodiversity by balancing competition and predation among community taxa (Manatunge et al., 2005; Rennie et al., 2005). More specifically, water-willow is associated with increased abundance and diversity of macroinvertebrates and fishes (Strakosh, 2006). Personnel from the Texas Parks and Wildlife Department (TPWD) Inland Fisheries office in Snook, Texas planted Water-willow stands in the Caney Creek arm of Lake Conroe, Conroe Texas in the summer drought of 2011 (USGS, 2014; National Integrated Drought Information System, 2014) to reintroduce vegetation in the presence of nonnative, herbivorous, triploid Grass Carp. The stands have persisted and at the time of this study were growing in water depths averaging 1.2 m (range 1 to 1.3 m).

## Methods

All water-willow stands within the Caney Creek arm were surveyed Figure (1) and categorized into three groups based on surface area diameter: bare substrate (containing no vegetation), small (1.0-2.0 meters), medium (2.1-3.5 meters), and large (3.6-5.5 meters).Macroinvertebrates were collected from the water column, stems/leaves and substrate. Macroinvertebrates and water-willow stems were simultaneously collected from one randomly selected representative stand with a plankton net. Substrate was excavated where water-willow stems had been removed for benthic invertebrate analysis. Macroinvertebrates were picked by hand from leaves and stems, as the vegetation sample. Macroinvertebrates that were collected via plankton nets cod end, were collected as the water column samples.Soil collected was sieved (420µm mesh) to separate macroinvertebrates from debris, sand, and other material.

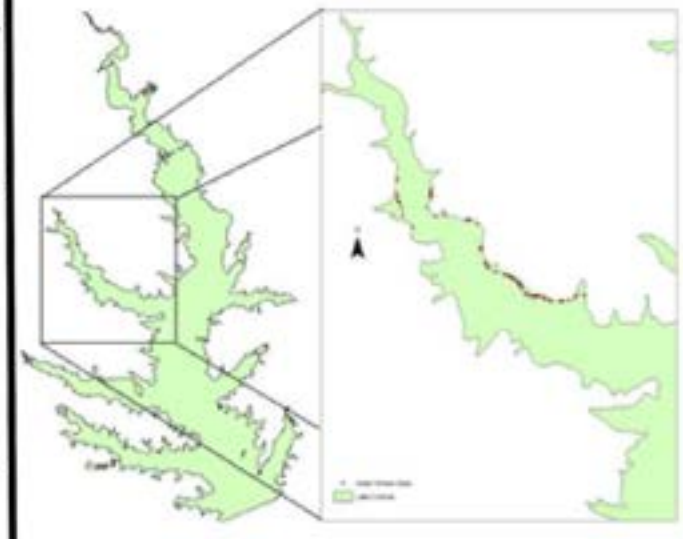


FIGURE 1. POTENTIAL SITES WITHIN LAKE CONROE.

# Evaluation of Invertebrate Use of American Water-Willow (Justica americana)in Lake Conroe, Texas

*(Continued)*

**Results**

A total of 37 macroinvertebrate taxa were observed, within 17 orders across all sites and seasons. A total of 14 taxa described as common included chironomids which made up 60%; those that were uncommon included 23 taxa often with one individual observed. RDA was used to interpret this data. *Palaemonetes* shrimp were correlated with the fall season. *Amphipoda* with higher stem count densities, stem weights (g) and the medium size category of stands. *Zygoptera* were correlated with large size category of stands. *Trichoptera* and chironomids were correlated with greater stand diameters and location in the water column.

**Discussion and Conclusion**

The common macroinvertebrate taxa were most abundant in vegetated versus bare substrate category. Macroinvertebrates were most abundant in stems (N=34,096), while the water column and stem location samples held the most taxa (N=12 and N=11, respectively). Thus macroinvertebrates may be utilizing water-willow as habitat (Rennie et al., 2005; Savino et al., 1992; Spotte, 2007; Beckett et al., 1992). Leeches and annelids were the sole taxa present in the benthos samples, with annelids showing the stronger correlation (Figure 2).

Chironomids were the most abundant macroinvertebrate observed and were found in all water column samples. This is likely related to chironomids being the most abundant macroinvertebrate taxon in freshwater systems (Armitage, et al., 1995; Epler, 1995; Tokeshi, 1995a). Their high abundance and correlation with vegetated stands suggests they utilize water-willow more than bare substrate in Lake Conroe. Amphipoda were correlated with increased stem weights and stem counts. Their presence in high stem density sites may be due to the increased surface area for attachment and their utilization of epiphytes as a food source (Hargrave, 1970).

Palaemonetes shrimp showed correlation with the fall season and medium category stands. Palaemonetes likely utilize water-willow as an attachment point to feed on epiphytes (Morgan 1980; Quiñones-Rivera and Fleeger 2005; McCall and Rakocinski 2007). Similarly, Zygoptera larvae were associated with large category sites. These large stands provide the cover from predators that are required to complete their lifecycle and later emerge as adults (Cowx and Welcomme 1998).

Macrophytes are known to hold concentrations of both high diversity and abundance of prey fish and prey macroinvertebrate taxa (Moxley and Langford 1982). This study suggests that water-willow follows that trend, providing habitat for macroinvertebrates in Lake Conroe.

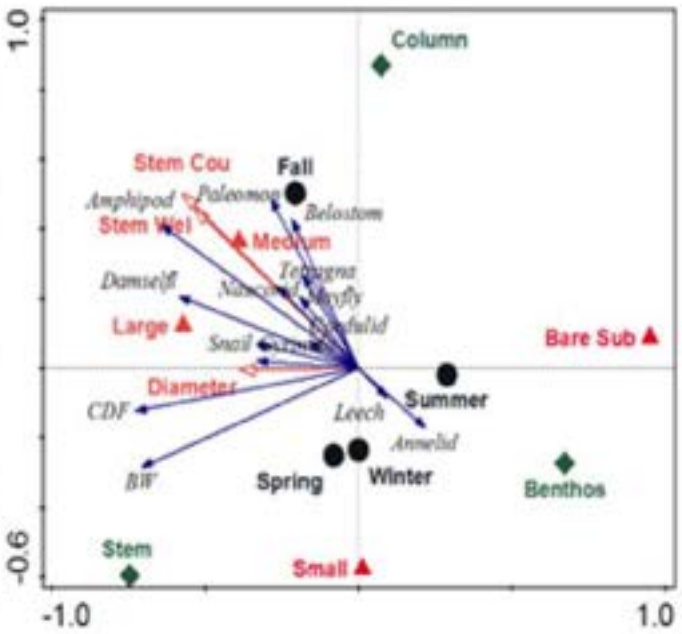



FIGURE 2 RDA ANALYSIS OF MACROINVERTEBRATE ASSEMBLAGES ON 1ST AND 2ND AXES BETWEEN SEASONS, CATEGORY DIAMETER (M), STEM WEIGHT, STEM COUNT AND MACROINVERTEBRATE LOCATION OF ALL COMMON MACROINVERTEBRATES.

LITERATURE CITED UPON REQUEST:
RYAN@STONEFLYAQUATICNURSERY.COM

# Become A Sponsor

Sponsorship registration is now open for our 2023 Annual Meeting! Sponsors help make our meeting possible every year and our members love hearing about new, effective products or application techniques to improve management of aquatic vegetation.

See below for our sponsorship levels and benefits. If you would like to become a sponsor, you can register by visiting https://www.tapms.org/become-a-sponsor/ or going directly to our Eventbrite platform found HERE. For sponsorship levels that include more than one attendee (Diamond, Platinum, Gold), sponsors should add corresponding attendees item to cart (i.e. "Gold Level Attendees") at no cost, to input all attendee information.

***It is up to the sponsor to ensure that TAPMS has their most recent logo and ads (if necessary).***

Please contact Kelly Duffie (duffiek@helenaagri.com) if you have any questions.

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# APMS & Regional Updates

*by Regional Representatives*

- 2023 Annual APMS Meeting
  - July 23-27, 2023 Indianapolis, IN
- 2023 South Carolina APMS Meeting
  - October 9-11, 2023 North Myrtle Beach, SC
- Florida APMS 47th Annual Training Conference
  - October 16-19, 2023 St. Petersburg, FL
- International Aquatic Plants Group
  - November 13-17, 2023 Antwerp, Belgium
- Midwest APMS Annual Meeting
  - February 26-29, 2024 Columbus, OH