LRWA Watershed Report

Editor/Layout: Linda Fawcett

*Opinions expressed herein are not necessarily shared by LRWA

THE POWER OF STORMWATER

Long-time Hill Country residents know to respect how quickly damaging flash floods can be in our rivers and creeks!

Developers (when designing their projects) and new landowners need to also take heed of the flood potential of dry and minor streams, ditches, or sometimes just changes in elevation and/or the quality/depth of the topsoil and the quality/quantity of vegetation.

From MAJOR TEXAS FLOODS OF 1936, by Tate Dalrymple & others, US Dept of Interior, Federal Emergency Administration of Public Works: *"The rivers of Texas have been subject to great and frequent floods. Some of the maximum rates of discharge have exceeded any rates recorded from areas of comparable size elsewhere in the United States. The rivers of Texas are also subject to long periods of exceedingly low flow. Few people outside the State and probably not many of the residents of the State realize the great difficulties arising from these conditions that must be overcome in controlling and utilizing the flow of Texas streams."*

[Editor's note: Hearing about recent climate-change-driven floods in the news, I'm not so sure if Texas is still so unique nationwide as to the severity of its floods.]

Examples of Hill Country historic floods 1930s on:

A bad drought was temporarily broken by at least 3 major floods during the 1930s:

Sept. 1932: After heavy rain hit south and central Texas from August through October, the North Llano rose 30 feet and the South Llano 20 feet.

June 1, 1935: The maximum flood of record for the Main Llano recorded a peak of 46′ at Mason and 41.5′ at Llano. It was caused by a series of storms, and then rains over Edwards County. Besides the North and South Llano rivers, the James River and Johnson Fork Creek contributed record flows.

Sept. 1936: Rains up to 30 inches inundated the North Llano and its watershed, and an estimated 24.9-foot rise was predicted at Junction before the recording station was wiped out. Downstream, the Main Llano reached 22.9 feet.

Sept. 1952: Another extended drought was interrupted by flooding. The Llano

River had all but dried up, but then torrential rains hit the Hill Country. The Pedernales did a lot of the damage, but the Llano "spiked more than 12 feet in 60 minutes" (from Flash Floods of Texas, Jonathan Burnett.) "Rumors circulated that the bridge in Llano might go, as it did in 1935, but it held up to the 33.6-foot stage."

Late August, 1974: Linda Fawcett and Art Mudge remember a fast-rising, destructive flood on the North Llano River caused by heavy rain across its watershed, resulting in an estimated 25-30′ rise at the Ten-Mile Bridge on RR 1674. On the Fawcett Ranch it completely covered a 32-acre tract of riparian floodplain to a height well over the surrounding fence, taking near 100 young pecan trees as well as giant ones, and also covered the riparian zone across the river for a sizable distance before it receded fairly rapidly (with another significant rise several hours later).

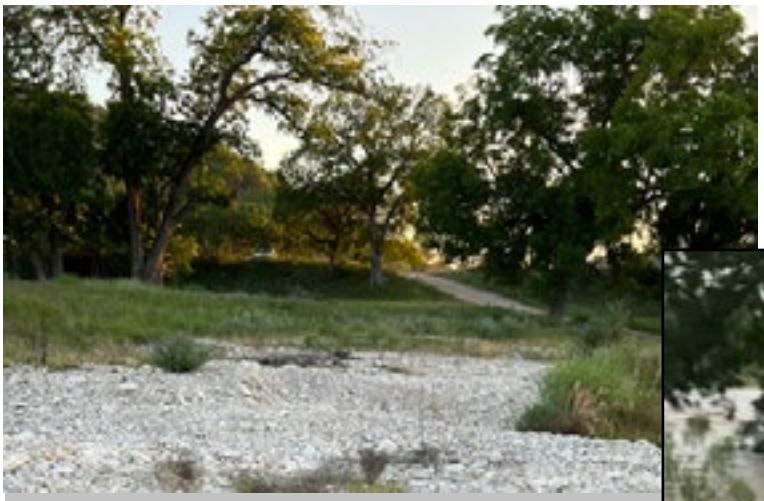
August 1978: Slow-moving remnants of Tropical Storm Amelia that made landfall at Corpus Christi deluged the Hill Country for several days causing major floods through the Bandera area, the Guadalupe, the Pedernales and Bear Creek, a feeder to the North Llano, that closed I-10 west of Junction for several hours.

June 21-23, 1997: the Llano River peaked 39′ at Mason, and 39.1′ at Llano (75% of a 100-year peak).

Oct. 16-17, 2018: Extreme rainfall near the headwaters of the South Llano caused a very fast rise that met the less-swollen North Llano at Junction to feed the Main Llano River, causing major damage all the way to Kingsland where it meets the Colorado River. The flood resulted in human loss of life plus substantial damage to bridges and riparian zones (loss of fences, live-stock and wildlife).

Oct. 26, 2023: In parts of the Hill Country a terrible drought and heat wave during the record-setting summer and early fall of 2023 was finally broken by up to 7 inches of rain across the North and South Llano watersheds over several days. Significant flooding.

July 23, 2024: Preceded by unusually frequent small rains in July, there was steady rain across the watershed for roughly a 24-hour period (rain gauges showed 4-6″ of rain). As a result, impressive flash floods including the South Llano, the Johnson Fork Creek, Bear Creek, and the North Llano. Zack Bierschwale reported a 30 feet rise at its peak on the Johnson Fork within just a couple of hours. Unlike last summer, the aquifer wasn't bone-dry so it didn't take much to cause a flash flood. Linda Fawcett estimated a 10-12′ rapid rise of the North Llano at the Ten Mile Bridge by the afternoon, and a 17 foot rise was recorded on the South Llano at Flat Rock.



Flash Flood, Johnson Fork near Junction (July 23, 2024):
Before & After at the same location but from opposite sides of the stream

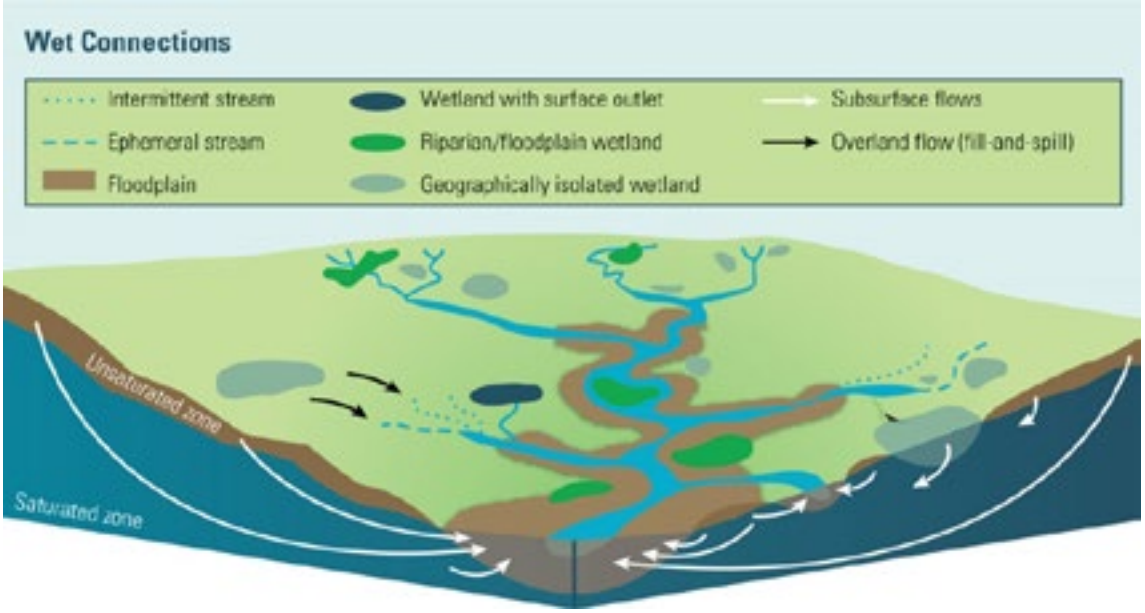
MORE FLOOD PICTURES

CLOCKWISE from TOP LEFT: 1) **June 1935** Flood, Junction, TX; 2) **Oct. 25, 2023:** S. Llano at Flat Rock crossing; 3) **July 23, 2024:** N. Llano just upstream of 10-Mile Bridge, RR 1674 (twice as wide as usual); 4) **Oct. 2018:** S. Llano Bridge, Junction; 5) **Oct. 2018:** Llano River at Llano; 6) **July 23, 2024:** Bear Creek at RR 1674 just before feeding into the North Llano.

SOME STREAM FACTS

A stream or creek is a body of water with surface water flowing within the bed and banks of a channel. Flow is controlled by surface and subsurface inputs, which can vary widely seasonally and between periods of rainfall. There are three types of streams:

- Perennial streams, the largest type, have water flowing year-round
- Intermittent streams experience seasonal flows
- Ephemeral streams flow only during and immediately after rain events



You can follow the flow of water from its origins upstream. Just as a tree's structure can "flow" from smaller twigs to larger branches, creeks function similarly with smaller tributaries (twigs) joining together to form larger creeks and streams (branches).

Flashiness reflects the frequency and rapidity of short term changes in stream flow in response to storm events. Streams that rise and fall quickly are considered flashy.

A stream's flashiness is determined by how quickly water levels peak after a rain event, and how quickly water levels fall after the peak. Non-flashy water is something that is seen year in and year out and somewhat predictable. Flashy is the unknown, the unpredictable. Components of flashy water include algae blooms, pesticides, and particulates in solids. Mountain runoff, early season warming, and rain events add to the turbidity of the raw water.

Impervious surfaces and agricultural land can also lead to an increase in flashiness.

Flashy raw water contaminents are a costly issue for water treatment plants. If utilities are unable to meet the requirements of their permits, this could lead to fines.

Mitigation strategies to decrease flashiness include restoring native vegetation and implementing rain gardens, grass swales, and forested riparian buffers. (Reference)

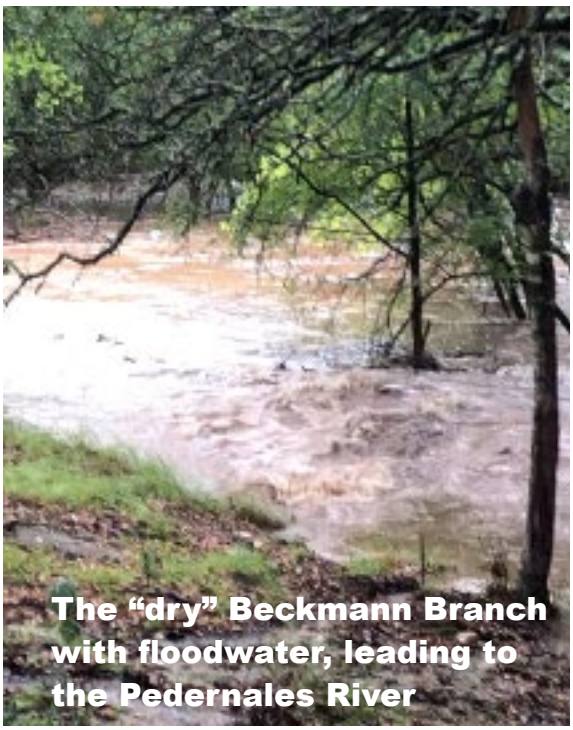
All intermittent and perennial streams in Texas are regulated under federal law and administered by both the United States Army Corps of Engineers (USACE) and the Texas Commission on Environmental Quality (TCEQ). Water quality is protected by the Clean Water Act as administered by the Environmental Protection Agency (EPA) and the State. Stream floodplains are regulated by the Federal Emergency Management Agency (FEMA) and TPWD regulates sand and gravel disruption in Texas streambeds.

WASTEWATER NEWS

Challenging Direct Discharge into the Pedernales River

TCEQ draft wastewater permits for two new developments near Fredericksburg being challenged by the Pedernales River Alliance (PRA)

Anyone from the Junction area who has driven SH 290 to Austin has likely noticed the many wineries and other tourist attractions, especially east of Fredericksburg, some with venue facilities for large gatherings. If located outside the city limits of Fredericksburg, they have to provide their own TCEQ-approved way to dispose of their wastewater, and they have been voluntarily using the TLAP* land irrigation/ reuse models or private septic systems for their relatively small amounts. However, recent large, multi-purpose developments that include single-family dwellings with much bigger wastewater disposal needs are being planned and built in the same area, with pending applications to the TCEQ for **direct discharge** of their treated effluent **(a first for *private* enterprises in the area)**.



The "dry" Beckmann Branch with floodwater, leading to the Pedernales River

* **TLAP: Texas Land Application Permit**

Village – Fredericksburg

This property is owned by Village at Grape Creek, LLC, and consists of two tracts of land; Property ID: 185873 and Property ID: 186275 (just north of Lazo Ranch). *Village's* development has a long strip of land which extends to SH 290E, with visible highway frontage and an entrance on the highway. The number of lots in this development has been increased to 185 @ 1/10 of an acre, each sold on the condo concept. They have filed for a permit that would allow them to dump 20,000 to 50,000 gallons of treated effluent into a "dry" creek (Beckman Branch on the FEMA map) that leads into the Pedernales River, which is problematic. Pools of water seen in the creek even in drought indicate evidence of underground water coming up from the Hensel Aquifer and/or the Ellenburger Aquifer (the latter being the source of drinking water for the area). Local residents fear that dumping treated effluent into the "dry" creek could contaminate both aquifers.

The effluent phosphorus level in the draft permit only cleans for 1mg/liter phosphorus (still seen as very high despite the fact that the Pedernales is not classified as a pristine stream). As a result, GEAA (Greater Edwards Aquifer Alliance) in their Public Comment to TCEQ strongly encouraged the adoption of at most 0.5mg/liter limit. Phosphorus is the one substance controlling the growth of algae and other aquatic plants. That can diminish the oxygen in a stream (affecting fish population for example) when in excess, and of course is also bad for recreational use downstream.

During extended dry periods, the treated effluent will sit in the "dry" creek, evaporate, accumulate, and when it rains a concentrated version would eventually flow into the Pedernales. Deb Youngblood of PRA has seen an old LCRA** manual that lists the creek

as a **"flashy"** creek (meaning subject to flash floods), and longtime area residents concur.

**** LCRA: Lower Colorado River Authority**

There are also many wells (78) found within a 1.5 mile distance of the Village WWTF's (wastewater treatment facility) discharge point, making cross-contamination of the local groundwater supply a real possibility. Most of these wells are not required to regularly test their water quality, subjecting owners to potential public health concerns.

The TCEQ Public Meeting on the Village was held June 13, 2024 in Fredericksburg, where a large number of concerned citizens of Gillespie County gathered to voice comments, concerns and questions about the permit to pollute (during the informal period of the meeting) and having their Formal Comments recorded in the second half. It was clear that no citizens present in the room were supportive of the permit. Now is the period to await TCEQ's decision to approve or disapprove. The hope is that the developers will drop the current permit in exchange for a No Discharge permit.

Arch Ray Resort & Arch Ray on the River (HOA), Fredericksburg

Arch Ray Resort is also located on SH 290E and currently appears to be a very large facility that includes wine tasting, wine production, a restaurant, event venue, auditorium and hotel. The Pedernales River Alliance has heard that this development will also have 244 lots at 1/10th of an acre each, sold as RV sites and/or B&B cabin sites (Arch Ray On the River, a Home Owners Association). The developers have submitted a request to the TCEQ for a permit to discharge 35,000 gallons of wastewater into the Pedernales River.

Members of the **Pedernales River Alliance** met with the developers (the Baxter family) and their OSSF* engineer in early April. The OSSF system appeared to be designed effectively for cleaning the water, but not to standards to avoid algae buildup in the Pedernales river, already a visible problem downstream. When a TLAP was suggested, or building an effluent holding tank with TCEQ specifications, the owners resisted. None of this made much sense considering their engineer's plan to put the treated effluent into an open ditch where it would be subject to mixing with stormwater making its way to the river and/or soaking through the soil to the aquifer below.

* **OSSF: on-site sewage facility**

**** VERY IMPORTANT: a Public Meeting on ARCH RAY has been granted by TCEQ, scheduled for AUGUST 19, 7PM, ROCKBOX THEATRE, 102 N. Llano St., Fredericksburg ****

Click here for more details on how to participate in the Public Meeting.

To send your Public Comment directly to TCEQ electronically, go to https://www14.tceq.texas.gov/epic/eComment/ and type in Permit # **WQ0005452000**. Then fill out the form and type in your comment, and/or attach a Word doc or PDF.

HAYS COMMONS

The TCEQ Public Comment period just ended (July 25) for the draft permit submitted by the 290-acre Hays Commons Development in Hays County, that if granted would set a dangerous precedent because **it would be the first wastewater permit for land application of treated sewage effluent over the Edwards Aquifer Recharge Zone**. This area is too sensitive to receive even

treated wastewater effluent over land, contaminating the karstic aquifer below and more immediately, likely to pollute Barton Springs and hundreds of nearby private wells in Northern Hays County and South Austin. The LRWA Board approved sending a Public Comment opposing the Hays Common permit largely because of its precedent. Stay tuned for future news.

Why be concerned about the proliferation of new developments and other small-acreage tracts (most from unincorporated land) in the Texas Hill Country?

*[The following is derived from an interview conducted by the Texas Standard with **Katherine Romans,** Executive Director of the Hill Country Alliance, February 2024.]*

As we all now recognize, the Texas Hill Country is one of the fastest growing places in the entire country, largely because of its natural resources and its stunning scenery. Growth accelerated during the pandemic, ostensively because during the pandemic many people were looking for nature and for space. Yet at the same time we are a region defined by drought more often than not with limited surface waters and limited aquifer resources. How is this growth controlled?

Unfortunately, Texas is the only state in the country where outside of incorporated municipalities, we have very few tools to plan for and manage growth. Except for Groundwater Management Districts (that only manage groundwater, not surface waters), there is not much that county commissioners can do to guide growth in a way beneficial for the communities.

But in the resulting vacuum have arisen a huge expansion in the number of grassroots community groups across the Hill Country, whether they be focused on a single issue, such as the Llano River or raising awareness about the importance of our dark skies, but all are optimistic and share interest in the conservation of the Hill Country. Therefore, the **Llano River Watershed Alliance welcomes a relatively new grassroots group operating from Fredericksburg: the Pedernales River Alliance**.

DID YOU KNOW?

- 30% of water is lost to evaporation when applied mid-day. Water your lawn between 6pm -10am to make every drop count.
- 1 inch of rain on a 1,000 square foot roof collects 600 gallons of water.
- 1 inch of rainfall on 1 square foot of impervious materials loses .6 gallons of water that could have soaked into the ground.
- It is important to clean your hummingbird feeders regularly, especially the “black stuff,” or what is molding sugar water (not good for the birds). There are brushes available for the inside of the feeder bottle just about anywhere that sells hummingbird feeder supplies, and pipe cleaners are also good for cleaning small areas.

Seven Central Texas mussels listed under Endangered Species Act/ 1,577 river miles of critical habitat designated across four river basins

USFWS Press release, June 3, 2024. Based on the best scientific and commercial data available, on June 4, the U.S. Fish and Wildlife Service listed 7 freshwater mussels found in Central Texas under the Endangered Species Act and designating 1,577 river miles of critical habitat for the species in the Colorado, Guadalupe, Brazos and Trinity river basins. Once abundant throughout the four river basins, the seven Central Texas mussel species have declined in recent years due to reduced water quality and habitat destruction.

The six species receiving an endangered listing are the Guadalupe fatmucket, Texas fatmucket, Guadalupe orb, Texas pimpleback, Balcones spike, and false spike, while the Texas fawnsfoot is receiving a threatened listing. Several of these species, such as the Texas fatmucket are found in the Llano river system.

The ESA listing of the freshwater mussels will support both new and current conservation efforts for the species. For the threatened Texas fawnsfoot, a 4(d) rule will apply to provide for the conservation of the species.

The 4(d) rule for the Texas fawnsfoot outlines prohibitions that are necessary for the conservation of the species along with exemptions for activities determined to have minor or temporary effects on Texas fawnsfoot populations, including habitat and population restoration, surveys, and some water management activities.

The critical habitat designations identify areas that are particularly important for the conservation of each of the seven species. Designation of critical habitat does not affect land ownership, establish a refuge or preserve, and has no impact on private landowners taking actions on their land that do not require federal funding or permits.Species listed as endangered or threatened under the ESA also benefit from conservation measures that include recognition of threats to the species, federal protection from harmful practices, and implementation of recovery actions.

Research focused on helping improve the understanding of the species has been funded by the Office of the Texas Comptroller, Texas Parks and Wildlife Department, the Service, river authorities, and others. Work is also underway to evaluate methods of captive propagation for the Central Texas mussel species at the Service's San Marcos Aquatic Research Center, Inks Dam National Fish Hatchery, and Uvalde National Fish Hatchery.

The Endangered Species Act of 1973 is the most significant piece of endangered species legislation and is considered one of the world's most important conservation laws. The ESA provides for the protection of ecosystems, the conservation of endangered and threatened species, and the enforcement of all treaties related to wildlife preservation. The ESA has been highly effective and credited with saving 99% of listed species from extinction. Learn more at the Service's Endangered Species Act 50th Anniversary website.

It's time to make our voices heard !

The Greater Edwards Aquifer Alliance is preparing for the 2025 Texas Legislative Session.

On **Saturday, August 24th, 2024,** GEAA will host an informative hybrid in-person/online meeting and we invite YOU to join!

Opening day for the State Legislature will be here before you know it.

This session portends changes that may profoundly affect the way growth will be managed in our region. Join us to learn how to use free tools that are available to track bills, as well as topics of interest.

- learn how to effectively advocate for the causes near and dear to your heart
- discuss the impacts of past legislation and changes that may come up in 2025
- discuss GEAA's legislative agenda for the upcoming session

Details for in-person attendance:
Date: Saturday, August 24th
Time: 1:00pm-3:00pm
Location: Alamo Colleges District Office
2222 N. Alamo Street, San Antonio, Texas 78204

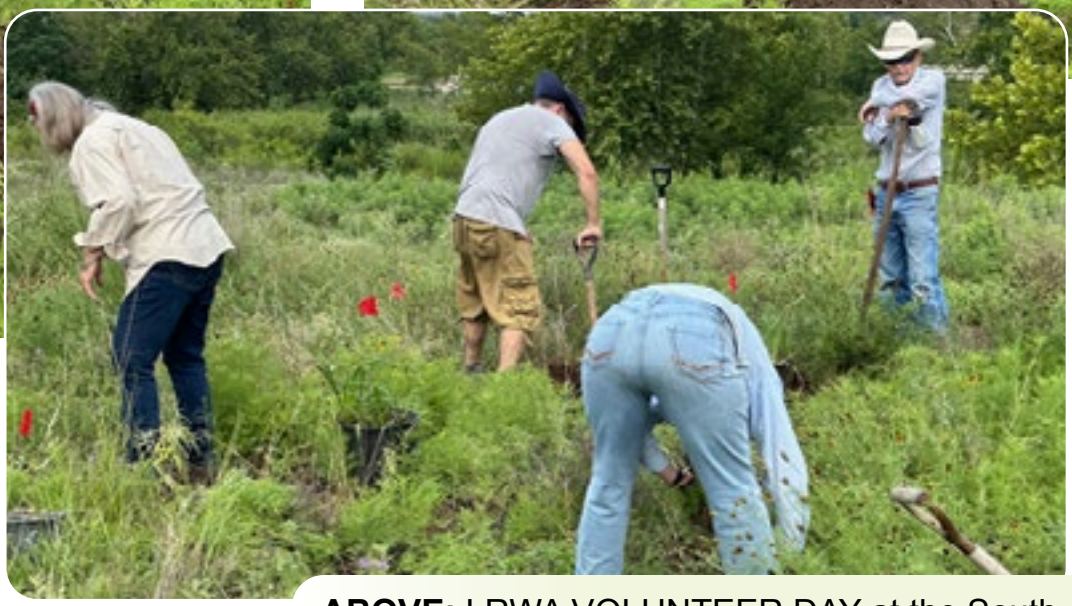
REGISTRATION:
To register for either in-person or virtual attendance, please click the link HERE.

MORE LEARNING OPPORTUNITIES

Do you want to find a way to engage in water-related conservation and outreach?

- **You could join the LRWA Board (!) and/or...**
- **Become a Texas Waters Specialist!** A Texas Parks & Wildlife program of a corps of well-informed volunteer specialists who provide education, outreach, and service dedicated to the beneficial management of aquatic resources and aquatic habitats within their communities for the state of Texas. **For more information**, visit https://tpwd.texas.gov/education/water-education/texaswatersprogram/texaswatersspecialist and afterwards download two PDFs about the 2024 Webinars and the Volunteer Registration and Reporting Guide.

RECENT LRWA ACTIVITIES



ABOVE: LRWA VOLUNTEER DAY at the South Llano State Park, June 23: Finishing up an LRWA riparian restoration site next to the river by planting soil-holding native plants gathered from elsewhere in the park. Volunteers: Scott & Martha Richardson, Glen Coleman, Linda & Tommy Fawcett, Art Mudge, Nol Dear, Steve Totten.

(will not identify whose derrière!)

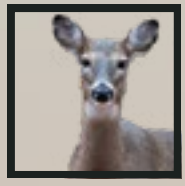
LEFT: ON THE HUNT FOR ARUNDO!

On the North Llano, somewhere in the vicinity of Buck Hollow, Arundo detectives Steve Totten and Glen Coleman (assisted by Linda Fawcett, who took the picture), standing in front of a big patch of *arundo donax* in June.

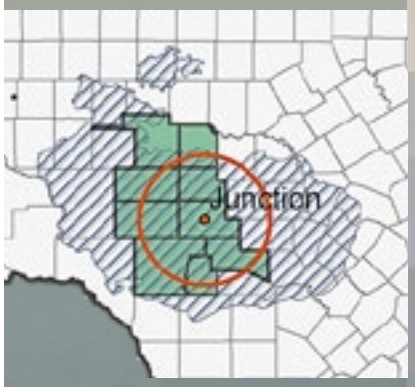
LANDOWNER PARTICIPATION NEEDED!

BIG GAME RESEARCH

Carsten Groos, M.S. Graduate Student
Dr. Warren Conway, Primary Investigator



AREA OF INTEREST



OBJECTIVES

Despite the economic significance of **white-tailed deer**, **axis deer**, and **aoudad** in the **Edwards Plateau region** of Texas limited information exists on the species' **current populations**, **habitat associations**, and **interactions**. This study aims to a.) develop estimates of the amount of area within current and previous distributions of landcover types within the region, and calculate regional landcover change over time, b). estimate species-specific population densities of white-tailed deer, axis deer, and aoudad within each designated landcover type to determine species preferences, and c.) use these pieces of information to estimate abundances through time as well as project future abundances and distributions of the 3 focal species in the Edwards Plateau region of Texas.

WHY CARE?

While native white-tailed deer are a well studied species in the Hill Country, little is known about the current populations and habitat preferences of axis deer and aoudad. Species-specific habitat selection and the potential effects of compounded grazing pressure have implications in range management and habitat conservation. Increased interactions between species can mean greater competition and risk of disease spread. Using the knowledge gained from this study, landowners and managers will be able to set better-informed goals. Applying the proper wildlife management tools to well-informed plans will result in greater management success.

OUR ASK OF YOU

We are looking for landowners of low-fence operations, within a ~60 mile radius of Junction, that are interested in being a part of this research. The research would include temporary access at predetermined times to allow spotlight surveys of these species. Access will be coordinated with landowners or land managers directly. Research will begin Fall 2024.

To find out more, please contact Carsten using the information below.

Phone: 512-743-4076
Email: Carsten.Groos@ttu.edu

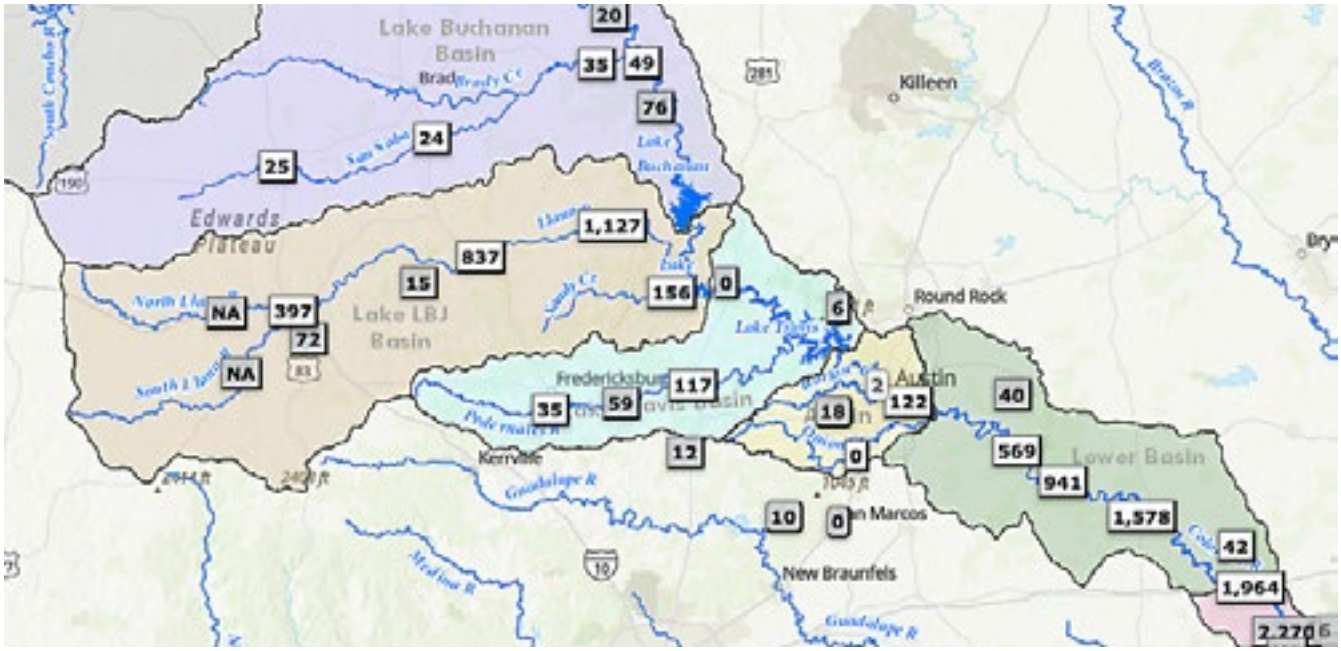
"I grew up hunting and fishing all over Texas with my father, and that early exposure to the outdoors spurred my curiosity and passion for wildlife. I am lucky to have spent a substantial amount of time in the Junction-Menard-Eldorado area with family and friends. I'm looking forward to returning to and working in this unique landscape."
- Carsten Groos

Llano River Field Station
TTU Center at Junction
Texas Tech University
Dr. Warren Conway, Director
Warren.Conway@ttu.edu

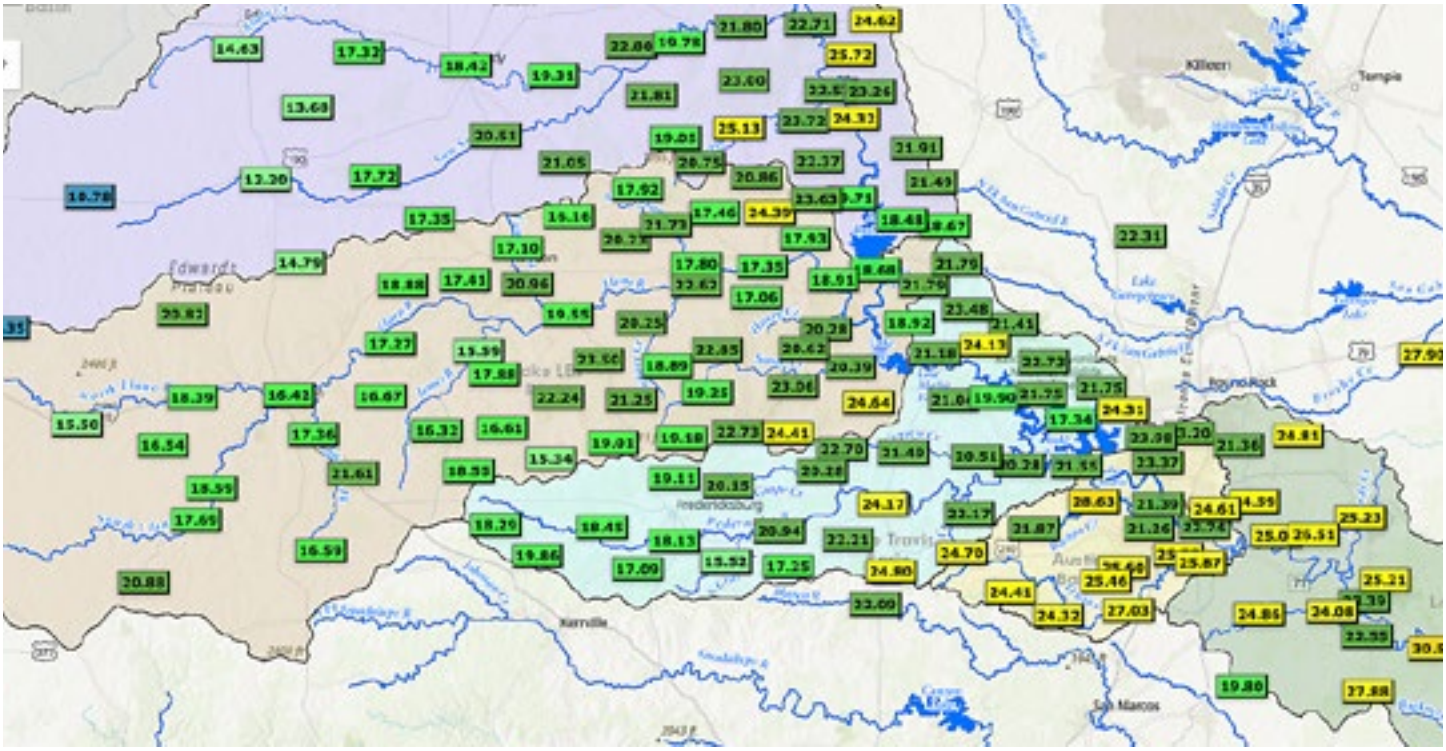
Healthy Creeks Initiative to Combat Invasive Arundo

FOR COMPLETE INFORMATION, Please go to https://www.llanoriver.org and then click on the link that reads: **Healthy Creeks Iniative to Combat Arundo**

LCRA Hydromet Stream Flow as of 7.27.24



Lower Colorado River Authority's Hydromet is a system of more than 275 automated river and weather gauges throughout the lower Colorado River basin in Texas. The website displays gauges maintained by the City of Austin and USGS. The Hydromet provides near-real-time data on stream-flow, river stage, rainfall totals, temperature and humidity. https://hydromet.lcra.org



LCRA Hydromet Rainfall this year as of 7.27.24