



# EAHCP STEWARD

News from the Edwards Aquifer Habitat Conservation Plan - Sept.-Oct. 2023

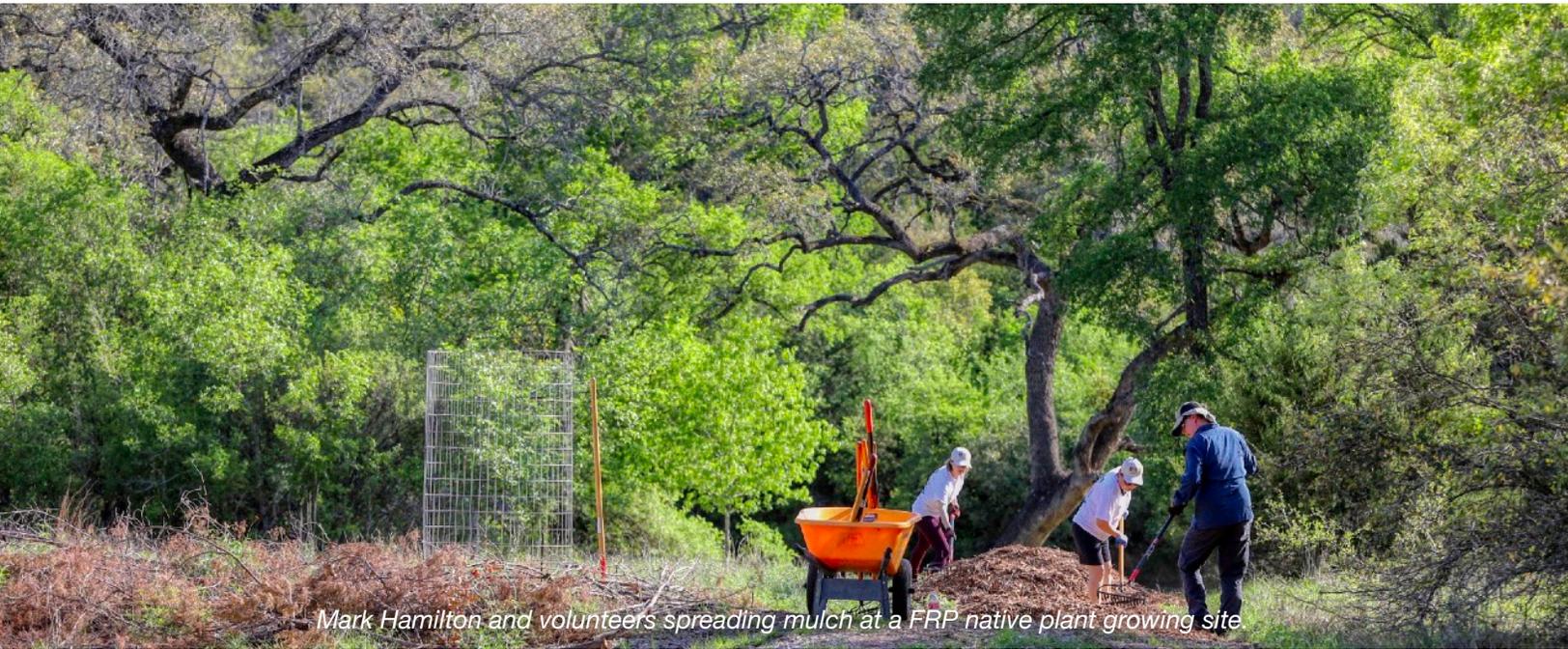


## Time Will Tell

*EAA's Field Research Park team studying best land management practices to conserve the Edwards Aquifer*

**T**he Edwards Aquifer Authority's Field Research Park (FRP) sits in one of San Antonio's fastest developing areas, yet you wouldn't know it given the peacefulness provided by the FRP's 151 wooded acres. The only hustle and bustle found there comes from a couple of four-wheel ATVs that go back and forth between land management research sites on the property. But, beneath that relaxed natural surrounding is some serious research happening designed to help protect the Edwards Aquifer which is the predominant water supply needed for America's seventh largest city to grow and prosper. *(In the photo are Mark Hamilton, left, and Thomas Marsalia.)*

## Time Will Tell - Continued



*Mark Hamilton and volunteers spreading mulch at a FRP native plant growing site*

“The research park actually sits on the Edwards Aquifer Recharge Zone very near Cibolo Creek,” said Mark Hamilton, EAA’s Executive Director of Aquifer Management Services. “We’ve been working with the City of San Antonio for many years on an Edwards Aquifer protection program and as we were conducting a geologic assessment here, we learned they had acquired this property as an easement for the City. So, we talked to them about allowing us to do research on the property to enhance our knowledge of the aquifer. That led to the City offering to give the property to the Edwards Aquifer Conservancy. Needless to say, we jumped at the opportunity. The bottom line is, the FRP is one more tool we have to help us manage and sustain the Edwards Aquifer over time. That not only benefits people living here, but also protects the endangered species being studied and conserved in Edwards Aquifer Habitat Conservation Plan.”

That land deal was completed in December of 2019 and shortly thereafter, the EAA began its groundwater research program on the property. Hamilton characterized the property as ideal for conducting studies on how groundwater moves through the area. However, he also noted that as the research team assembled its research plan, they learned more about how the health and depth of the soil and diversity of vegetation could potentially improve water quality and quantity in the aquifer. So now the research team is all in on trying to better understand how this distinctive land’s surface and subsurface impacts water recharging the aquifer.

“While we have some very good ideas on what we need to study here, quantifying results of those studies is non-trivial to say the least,” Hamilton quipped. “Over the past few years, we’ve installed several land management demonstration areas around the property. For example, the berms, swales and various tree plantings are designed to slow down rainwater running off the property to allow sediment to fall out before it gets to Cibolo Creek. That process also allows more time for water to seep into the soil, rehydrate the land and plants, and increase the organic carbon in the soil. The overall improvement of soil health advances the water-holding capacity of the land which in turn facilitates our ability to bring back more native plants.”

Thomas Marsalia, Aquifer Protection Manager for the EAA, manages the FRP operations and described the various land management research areas in play now.

## Time Will Tell - Continued

“Mark mentioned the berms and swales we constructed. We create berms and swales by excavating soil from one area and mounding it into a type of barrier to slow down the flow of water as it runs downgrade over the land. We are also planting native trees on top of the berms to hold the berm mound in place and allow them some extra



*Bore hole drilling and geology research tent at the FRP.*

room to grow root systems that the thin, rocky hill country landscape doesn't provide. When it rains, water collects in the lower elevated swale giving it more time to percolate into the subsoil.

“When we started in 2020, we planted about 70 different species of native woody plants. Some have done well, others have not. But keep in mind those are indicators of what works best here in this type of hill country environment in Northern Bexar County. Southern Bexar County has a different soil makeup so a different variety of native plants should be planted there.”

Marsalia said the native mulberry, Mexican plum, Eve's necklace, sycamore, cedar elm and red oak trees do very well in this part of Bexar County. Additionally, the Texas madrone and big tooth maple are some regional native trees they are experimenting with. Given the harsh climate conditions as of late, the team is quickly learning which trees grow well and help shade the land. As for hearty native plants, Marsalia pointed to Turk's cap, Gregg's mist flower, inland sea oats grass, lantanas, cedar sage, and tropical salvia.

“This location in Texas is where the Chihuahuan desert, Southern plains, and Eastern woodlands converge and that very diverse set of ecosystems gives us a large amount of plant species that can thrive here,” Marsalia noted.

With droughts being ever present in water planners' minds, the effort to increase the use of low water use native plants in landscapes around San Antonio could have a sizable impact in the City's overall water conservation efforts. Hamilton explained that there are still many unknowns regarding managing land in South Texas, but the fact that native plants have survived here for hundreds of years certainly gives researchers some success stories to build around.

“For example, many native grasses like Eastern gamma grass can grow root systems anywhere from six to 12 feet which enables them to withstand the type of heat we're experiencing now,” Hamilton said. “Plus, those root systems improve the overall health of the soil because they interact with the microbes in the soil. Additionally, that type of solid root system will hold soil in place to keep it from running into a river or creek even in torrential rains. We also are working on learning how the various species of native plants can help improve recharge to the Edwards Aquifer.”

## Time Will Tell - Continued

One novel type of device Hamilton and his team are using to learn about water flowing beneath the surface is called a nuclear magnetic resonance tool (NMRT). The first step in utilizing the NMRT is to drill several bore holes to about 30 feet deep in strategic locations. Then, by inserting the tool into the holes, researchers can get a look at how water moves between the land surface and the top of the water table. Being able to track the quantity and movement of subsurface water gives the team an idea of whether or not the land management practices happening above ground are improving the soil and aquifer recharge below ground.



*Thomas Marsalia working on one rock dam at the FRP.*

“Using the NMRT is like giving the earth an MRI,” Hamilton related. “We are utilizing this tool with our berm and swales constructed on the property. We’re measuring what’s happening below ground at the top, middle and bottom of the berm system. Plus, we have a control area we’re monitoring where there are no berms and swales to slow down surface water. Comparing the two areas of study should give us the ability to quantify how successful our land improvement practices might be working.”

“To sum up the type of research we’re doing at the Field Research Park, we are really trying to understand the minute details of how the water balance is occurring in the typical South Texas landscape. We want to quantify as best we can how each drop of water is divided as it falls from the sky. We’re looking at how much water goes to recharge the Edwards Aquifer, how much runs off into the creeks and becomes potential recharge, how much of it evaporates and then how much of that water does the soil retain. Knowing these details will help us know which land management techniques work the best in this area of the State. Then, we can transfer that knowledge to homeowners and business owners to help them not only beautify their own landscapes, but most importantly to save large amounts of water from being wasted on non-native grasses and plants. That not only helps the community spend less on water development but also helps us protect endangered species now thriving in the Edwards Aquifer springs systems.

“This research road we’re on will be a long and winding one, but we’re very hopeful that the next five to six years of research will deliver some new knowledge we can put to good use in conserving and preserving the Edwards Aquifer.”



# EAHCP STEWARD SHORT TAKES

*[Listen to this month's EAHCP Steward Podcast by clicking here.](#)*

## **2023 City of New Braunfels Dos Rios Watershed Cleanup**

The 7th Annual Dos Rios Watershed Cleanup will be held on October 14th, 2023. Mark your calendar and join us to help keep our beautiful waterways clean and free of litter. [Please follow the link for more information on this event.](#)

## **2023 City of San Marcos Fall River Cleanup**

City of San Marcos is hosting a clean-up event on October 7th that will target litter in various sections of the river as well as major tributaries. [Please use link below for more information on this event.](#)

## **Sign Up Today for the National HCP Coalition Conference**

You can now register for the National HCP Coalition Conference being held at the U.S. Fish & Wildlife Service Training Center in Shepherdstown, West Virginia. The conference kicks off on Monday, November 6 and concludes Thursday, November 9 at noon. [Download the flyer here.](#)