

July-August - 2018

Rollin' on the River

Conservation Crew patrols San Marcos River to inform tourists and help keep the river clean



Conservation Crew member Rachel McCaig gets a thumbs up from a tuber enjoying the San Marcos River.

There are some high-level research and pollution prevention measures being implemented at the San Marcos Springs and San Marcos River as part of the Edwards Aquifer Habitat Conservation Plan (EAHCP). At the same time, a group of mostly Texas State students are employing some never out of fashion elbow grease each day to protect those environmental treasures. For eight hours a day, five days a week, the Conservation Crew walks the river banks and kayaks the spring-fed waterway picking up trash, monitoring changes in the river and talking to visitors from all over the state about the importance of keeping the San Marcos River clean and healthy for its endangered species.

“We developed the concept of a Conservation Crew in 2013 to help implement our responsibilities under the EAHCP,” said the Crew’s Manager Eric Weeks. “Each day, we’ll have four to six Crew members head out in teams along the river to help keep it free of debris and most importantly to connect with as many visitors as possible in explaining the uniqueness of the San Marcos River and the endangered species living there. That gives tubers a good understanding of why certain park rules exist and a better appreciation for how they can help preserve the river while enjoying it at the same time.”

As expected, the summer season brings the most visitors to the river and consequently the most trash as well. To combat the potential for additional debris finding its way into the river, the Conservation Crew, in partnership with Keep San Marcos Beautiful, City of San Marcos and EAHCP, has set up three litter boats and two information stations at the places of heaviest traffic. The litter boats are chained to pillars and float in the middle of the river for tubers to use as they drift by. Cleaning out the boats is more efficient than collecting cans from the bottom of the river. As for winning the minds and hearts of visitors regarding litter prevention, Weeks explained they constantly engage visitors about the harm littering does to the protected habitat in the San Marcos River.

Because recreation has continued to increase at the river over the past few years, the City of San Marcos has made some other changes to park rules. They have banned or limited the use of charcoal grills, pop-up tents and tables and other recreational items as a means of keeping visitors a little further from the river as well as minimizing trash that's part of those types of gatherings.

"We do work well with the park rangers who can fine people for littering and or using styrofoam, glass and alcohol in the park," Weeks mentioned. "For the most part, the public is receptive to our information and cautions about littering. From time to time though, the team will run into an unruly person or two and we turn those folks over to the park rangers." Weeks explained that the Conservation Crew members are trained to look for changes in the river that might indicate an unidentified source of pollution. Cell phone cameras are used to document those issues and reports are filled out at the end of the day to ensure that problems can be effectively addressed by the EAHCP staff.

While trash duty is an essential element of the job, Weeks noted they have not had to worry much about having enough team members. He said they look for students who have a passion for the river, who are not shy and eager to learn.

"We really don't have to do too much advertising to get people to apply. Word of mouth seems to get the job done for us. Being on the Conservation Crew is a great job and so lots of students want to be a part of it. While some of the members are paid by Texas State, others are earning college credits required for their majors with this work. And fortunately, some people just volunteer for free just because they love the river."

Editor's Note - For the story, we canoed the river with Conservation Crew members Lane Malone, Nina Garcia and Rachel McCaig. Malone has been on the Crew for three years and is pursuing degrees in computer science and English. Garcia became a Crew member this summer and is studying water resources. McCaig is also spending her first summer as a CC leader and is a natural resources and environmental studies student. Please take a few minutes to listen to the interview we did with these hard-working students. You'll be glad you did.

Data Driven

Tolman leverages GIS system to enhance understanding of Edwards Aquifer ecosystem

So, you're standing in an area near Landa Lake, enjoying the beautiful surroundings, and you get to wondering what type of vegetation is dancing in the flowing water from the Comal Springs. Kristina Tolman can help you with that. Well, actually her newly-created GIS web application can.

Tolman is a program coordinator for the Edwards Aquifer Habitat Conservation Plan (EAHCP), and is also a GIS (Geographic Information System) specialist. While she has been working on the EAHCP for the last two years, she spent nearly eight years at the Meadows Center in San Marcos studying and analyzing the ecosystem there.

Upon arriving at the Edwards Aquifer Authority to work on the EAHCP, she waded into a very deep pool of data collected by EAA biological monitoring contractors since 2001. Combing through different historical biological datasets can be cumbersome and time consuming. And while she understood the importance of the data to the EAHCP, she took it upon herself to stitch the data together in a way that would help the public understand what it all means.

"ESRI is the world's leading GIS company, so they have been at the forefront of producing templates to help specialists like me present the data in a more public-friendly fashion," Tolman said. She recently attended the

ESRI user conference and learned about new web mapping applications and templates that are more mobile-friendly than previous versions.”

The ultimate goal is to have this technology connected to the EAA website where the public can easily access it while they enjoy the Comal and San Marcos Springs systems.

In creating the web applications, Tolman starts with satellite maps and then overlays data from the huge database of EAHCP information. That data consists of vegetation coverage polygons, endangered species sampling areas, EAHCP work site areas, and more, then she codes and links photos, videos, and other types of descriptions to the spatial information. The magic comes in how all of that information is then presented to viewers.



“Let’s say you’re at Landa Park and you see aquatic vegetation but you may not know what you’re looking at,” Tolman explained. “What you could do is grab your phone, navigate to this application, find yourself on the map and then click on the vegetation polygon. That would bring up a description of the vegetation with the

scientific and common name, area of the vegetation, as well as a picture of the species. Another example is our EAHCP Contractor Tour application where you can zoom to a EAHCP restoration site and watch a video of the contractor talk about their work and how their work is beneficial for the ecosystem.”

In addition to creating a helpful tool for the public, EAHCP researchers and contractors are also seeing new ways to use the data in plotting out future enhancements they can make to the programs they’re working on. For example, in some areas of the system, some native vegetation has had to be replanted several times before taking hold. In other areas, one planting does the trick. That type of information is readily viewed in the GIS application Tolman is preparing and it gives program managers insights into how to approach restoration work in various areas of the ecosystem. She explained the benefits this way.

“If a contractor sees that they’re having trouble with a particular area, they then can use the data to look at conditions like river flow, depth, velocity, and substrate of the river bed and a host of other characteristics of that specific location. By understanding that information, they can apply the observed species’ habitat preferences to other restoration locations in the ecosystem. We’re just trying to piece together the data that’s been collected over the years and presenting it in a way that helps people make good decisions going forward.”

Tolman noted that she is getting close to being able to make the system available to the public. She will be presenting the work to the EAHCP Science Committee and other internal groups over the next few months, but hopes to have a part of the new GIS application up for public use by the end of the year.

“If people have a better understanding of these environmentally sensitive areas, they can help us protect them. And that’s good for everyone and everything living here.”

Making Major Headway at Headwaters in New Braunfels

EAHCP contributes to enhancing water quality in Comal River system



The Comal Springs is a place of many beginnings. It is the source of the cool waters of the Comal River. The City of New Braunfels grew up around the picturesque site. And archaeologists think that the first native settlers made their home there as far back as 10,000 years ago. Today, another group has moved onto the property to create an environmental and educational jewel for the region. The hopes are high that this new beginning will be a source of community pride far into the future.

“The Headwaters at the Comal is a nonprofit organization dedicated to old New Braunfels

converting the 16-acre site of what was an Utilities’ (NBU) warehouse and fleet facility into a place where people can learn, have fun and experience nature and the history here as well,” said the organization’s Managing Director Nancy Pappas. “This is an historically important and environmentally sensitive piece of property, so our work is being carefully planned and carried out by a great team of professionals.”

After deliberating with New Braunfels citizens, the New Braunfels Utilities decided it would move forward with the project and pick up half of the \$25 million price tag. NBU then created the nonprofit to raise the remainder of the funds and oversee the project development.

The Edwards Aquifer Habitat Conservation Plan (EAHCP) is also contributing funding to support the City of New Braunfels’ Impervious Cover and Water Quality Protection Initiative which protects water quality and endangered species at the Comal Springs. In the past, the City allocated funds to remove existing impervious cover from the Headwaters property and to low-impact development efforts on the project.

Currently, the group has completed Phase 1 of the property restoration which included removing asphalt, clearing one building from the grounds, restoring riparian areas around the springs, creating some trails throughout the property and installing stormwater protection features like berms and bioswales to significantly reduce the amount of pollutants from runoff that gets into the spring areas during rain events. In Phase 2, which Pappas projects to be the final chapter of the development, the team will be raising about \$10 million, restoring the remaining buildings into a conference center and what they are calling the Comal Springs Education Center. The Center will be an open air facility covered with vines, pollinator plants and sail cloths designed to catch rainwater for use on the property.

“These design aspects will demonstrate a ‘one water concept’ which mirrors the earth’s own water cycle,” Pappas explained. “Also on the site, we will have several demonstration gardens which will be watered from our rainwater catchment system. Once the native plants are established, they will not require any irrigation water. These areas will serve as means to let people living and building in this part of Texas know that they can have a beautiful landscape without irrigating heavily. The native plants will enhance the bird and insect populations which makes for an overall healthy environment.”

Pappas described four eco-zones planned for the Headwaters property. There will be a prairie restoration highlighting native grasses that can survive lengthy dry periods. A restored riparian area will be featured along

the spring runs and associated creek. That type of vegetation provides shelter and food for the endangered species living near the springs. Phase 2 will bring new woodland and xeriscape areas to the property. “Another unique feature of the Headwaters site is that there is a large, functioning ground storage tank being used by New Braunfels Utilities to supply drinking water to residents and businesses in the area,” Pappas noted. “There is an Edwards Aquifer well on the property from which water is pumped into the storage tank. One major difference in this tank versus others you would see is that there is a special diverter pipe which takes excess chlorinated water into a natural catchment area before it flows into the spring areas. Previously, in emergency situations, that chlorinated water would just run into the river which was not good for the endangered species. Now, the overflow water will be naturally filtered before hitting the waterway.”

New Braunfels, like a lot of other cities along Texas’ I-35 corridor, is seeing considerable growth. That is the central reason the City of New Braunfels, New Braunfels Utilities and the Headwaters at the Comal are all determined to make the Headwaters a teaching component about the challenges and opportunities that come with new development.

“Water is the most important part to all life. And we firmly believe that the Headwaters at the Comal will help us learn what we collectively can do to protect our water resources and enhance the quality of life for current and future residents.”