NEWS DROP

MAGAZINE

A QUARTERLY PUBLICATION

SPRING 2019

EDWARDS AQUIFER AUTHORITY

Edwards Aquifer Auhority

from the **GENERAL MANAGER**

Roland Ruiz - EAA General Manager

I am pleased to present the inaugural issue of the Edwards Aquifer Authority (EAA) NEWS DROP quarterly magazine!

We are introducing the NEWS DROP as a way to stay in touch with you and to share with you the work we do and, more importantly, why we do it. In each quarterly issue, we will bring attention to our latest efforts, programs, projects and key initiatives from throughout our service region.

We will bring you stories highlighting various aspects of our mission--everything from status updates on our Habitat Conservation Plan to the latest developments in other water conservation and aquifer protection and research initiatives.

You also will learn about our non-profit support organization, the Edwards Aquifer Conservancy, and how individuals, community organizations, educational institutions, and businesses can partner with us to raise awareness, understanding, and support of our mission.

All this is part of a greater vision of tomorrow: one centered around an engaging EAA culture of service and collabration connected by the common value we share in managing, enhancing, and protecting the region's primary water resource, the Edwards Aquifer, for today and for generations to come.

It is in this spirit that we invite you, our friends and neighbors, to learn more about the aquifer and consider how we can best work together to sustain and preserve it.

Hope you enjoy, and thanks for reading!

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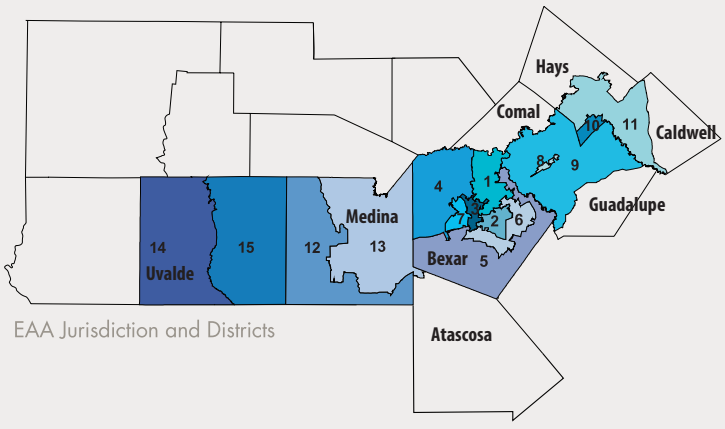

EAA Jurisdiction and Districts

FEATURED STORIES | SPRING 2019

Inaugural Issue

There Is One Universal Constant About Money

— AND THAT IS, THERE NEVER SEEMS TO BE ENOUGH OF IT TO MEET EVERY NEED. HERE AT THE EDWARDS AQUIFER AUTHORITY (EAA), WE ACT AS RESPONSIBLE STEWARDS OF THE FUNDS ENTRUSTED TO US TO CARRY OUT OUR MISSION OF MANAGING, ENHANCING AND PROTECTING THE EDWARDS AQUIFER.

Ron Ellis - EAA Board Treasurer & EAC Chairman

The EAC has just completed a strategic plan and has established the primary funding goals for 2019 to be pollution prevention, STEM/Education outreach & scholarship, and water recharge enhancement. Within these goals, initiatives, such as the creation of a fund dedicated to addressing abandoned wells, can have a profound impact on the quantity, quality and general wellbeing of the water supply within the aquifer region.

The EAC plans to escalate its efforts to raise awareness and share information about the Aquifer with potential financial supporters, and work to secure financial gifts and grants for these efforts. In time, the Conservancy could become a major source of funding for the EAA, and further advance the agency's mission beyond its current means.

EVERY DAY THE MEN AND WOMEN OF THE EDWARDS AQUIFER AUTHORITY (EAA) perform a myriad of tasks, ranging from administration to science research. The results of these collective efforts advance the mission in a truly meaningful way.

There are, however, opportunities just beyond the grasp of our annual budgets – prospects that, with the appropriate financial support could be realized and make the Aquifer that much more secure and productive. In 2014 the EAA established the Edwards Aquifer Conservancy (EAC) as a 501(c)(3) tax-exempt organization, to serve as a supporting organization for the EAA.

Specifically, the EAC is a fundraising entity, whose purpose is to seek financial support to supplement the costs of additional EAA initiatives and projects that would contribute to the sustainability and vitality of the Edwards Aquifer.

Since its inception, the EAC has received major funding from the CEMEX Company which supported an Education Excursion Program whereby educators were given exclusive access to aquifer-related locations and personal interaction with EAA staff geologists, hydrologists and biologists at no cost. And H-E-B underwrote the cost for a Virtual Edwards Aquifer Experience to be offered online to educators, students and the public. That experience can be accessed at **www.aquiferium.org**.

If you would like to learn more about the Conservancy, and how you can help, please contact Mike De La Garza at mdelagarza@edwardsaquifer.org, or Breanna Sauceda at bsauceda@edwardsaquifer.org.

Castroville Regional Park
Castroville, Texas

When a Well Isn't Well After All

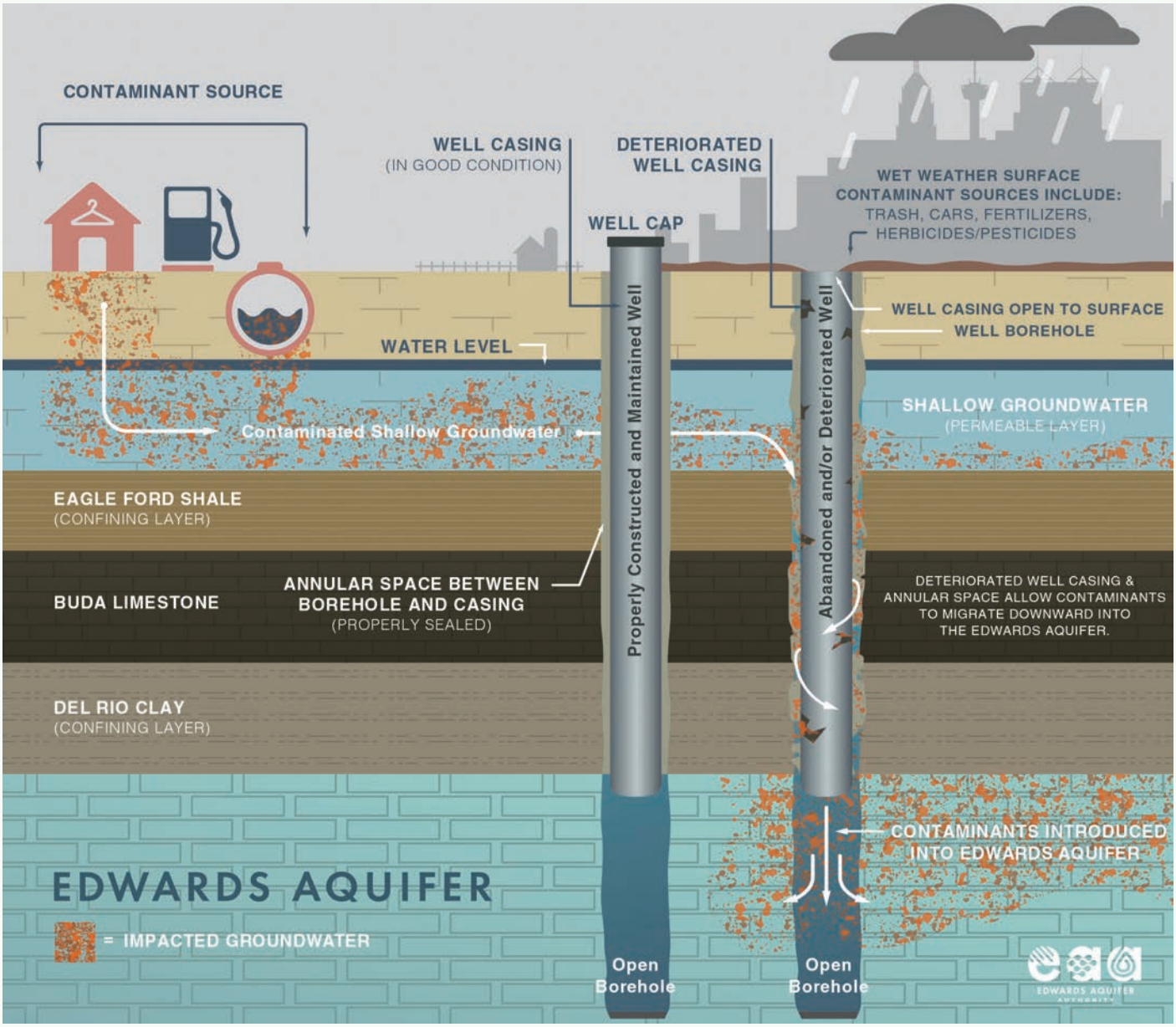

Illustration: "Potential for Edwards Aquifer Groundwater Contamination; Abandoned and/or Deteriorated Wells."

THE EDWARDS AQUIFER AUTHORITY'S PRIMARY MISSION IS TO MANAGE, ENHANCE, AND PROTECT THE WATER AND INTEGRITY OF THE EDWARDS AQUIFER. One of the primary threats it deals with are wells that have been abandoned, have not been properly maintained, or are in a state of deterioration. These wells represent a primary danger to the EAA mission and occupy a top-of-mind status.

There are approximately 300 abandoned wells within the EAA jurisdiction. Abandoned wells are defined as wells not physically or legally capable of making beneficial withdrawals; are not currently registered, and/or carry no official permit to operate.

When a Well Isn't Well After All [Cont.]

There are different approaches to fixing an abandoned well. It could be a relatively easy fix, or one that presents more complexity. Easy fixes include reconnecting power, installing a water meter for non-exempt wells, or simply registering the well itself. On the other hand, fixing an abandoned well due to deteriorated condition might necessitate a repair where the well must be fixed to meet proper specifications from the EAA. Roger Andrade, EAA Groundwater Protection Manager, states that specific repairs may include extending casing to a minimum of 12 inches above ground surface, installing a liner in the well, or capping a well through an EAA capping permit, allowing for possible future use.

The EAA relies upon GIS technology to map well locations. In considering the severity of each of the wells, the program ranks the abandoned wells based upon highest to lowest ratings, vis-a-vis the potential risks to water quality. Factors to be considered include: poor surface conditions; deteriorated casings; and relative proximity to known contamination, development density and traffic.

The repair or permanent plugging of a well can be an expensive proposition. To secure wells properly and professionally, care must be taken to employ experts who will meet the EAA standards, as mandated by law. The availability, or lack thereof, of appropriate funds is always a constraint. Hence, the need for the EAA's ranking of abandoned wells, so it can address those that require the most attention initially, and work the list accordingly.

One of the opportunities for funding may come through the Edwards Aquifer Conservancy, a non-profit institution which has been established to raise funds for important EAA initiatives. The Conservancy is studying ways in which funds could be identified and secured to facilitate and accelerate permanent closures of these wells.

It hopes to realize results on this front soon.

Until then, the EAA will continue to monitor and assess the overal circumstances of the critical wells list, and work to identify and assess wells throughout the EAA jurisdiction to minimize potential risks to water quality.

EAA technicians inspecting a well

WHY IS THE PRESENCE OF ABANDONED WELLS SO CRITICAL?

Wells are essentially conduits that go directly into the belly of the aquifer—like straws stuck into the ground that offer an uninterrupted flow. When a well is not maintained or hasn't been properly secured, there is a risk that contaminants of all kinds could flow downward directly into the waters of the aquifer, causing contamination.

HABITAT CONSERVATION PLAN
EDWARDS AQUIFER

Welcoming
SCOTT STORMENT

SCOTT STORMENT IS NEW TO THE EDWARDS AQUIFER HABITAT CONSERVATION PLAN (EAHCP), BUT HE HAS A WEALTH OF ENVIRONMENTAL AND PROGRAM MANAGEMENT EXPERIENCE VERY SIMILAR TO THE EAHCP'S MISSION. NEWS DROP HAD THE OPPORTUNITY TO SIT DOWN WITH STORMENT TO GET HIS THOUGHTS ABOUT THOSE PAST PROJECTS AND THIS NEW MAJOR STEP IN HIS CAREER.

NEWS DROP: Welcome to the EAHCP team. We know you've been on the job a handful of weeks and are still getting the lay of the land at the EAA, but there are lots of people interested in getting to know you. Give us a quick rundown of your educational background and professional experience.

Storment: It is definitely a pleasure to be at the EAA and managing the EAHCP. I earned a bachelor's degree from Texas A&M before heading to the University of New Mexico to do my graduate studies in Natural Resource Planning and Environmental Finance. After getting my master's degree there, I was fortunate to lead a binational watershed enhancement program as a staff member for the Texas Natural Resources Conservation Commission, which is now the Texas Commission on Environmental Quality. Our job was to develop best practices for improving water quality in the Rio Grande River watershed that encompassed Colorado, New Mexico, Texas and Mexico.

That project involved dealing with some endangered species and their habitats as well. In addition to environmental conditions, we also worked with communities in that watershed and the Mexican government to balance the economic development with environmental needs. After completing work on the Rio Grande Alliance, which is what that project was called, I transitioned to using some of my environmental finance training in the wastewater infrastructure development sector.

There I managed some programs aimed at helping the half million people living in the "Colonias," which were substandard housing communities along the Texas-Mexico border. That experience led me working in the Governor George Bush administration as the first director for Colonias Initiatives. We helped people who were desperately poor connect their small homes to sewer lines to improve sanitation there. From there I transitioned the North American Development (NAD) Bank in San Antonio and worked on water, wastewater, energy and air quality projects.

This was also the timeframe when renewable energy supplies were being developed and so I had the opportunity to learn a lot about solar, wind and even bio-gas power. Everything the NAD Bank financed had to include some sort of environmental improvement aspect to it.

I left the bank to start my own environmental services company. We did projects in the U.S. and Mexico and I had the good fortune of doing some work for major companies like USAA. One of the things I managed was the Water Forum, a local event that focused on regional water issues.

That event helped me get to know some of the folks from the Edwards Aquifer Authority. I briefly worked for a company called Ameresco before coming to the EAA. There I learned a tremendous amount about water conservation technologies which should transfer very well to my new work on the EAHCP.

NEWS DROP: Sounds like your work experience has an abundance of similarities to what the EAHCP is about, which should be a nice head-start for you.

Storment: The overlap is very striking for me. I've helped develop small and large watershed plans in this area of the country. And in every case, there is a direct link between the river system and the local aquifers. Each system contains water quality and quantity issues to deal with. Additionally, an important component of these types of projects is teaching communities about these resources and how they can help protect them. All three of those topics are directly relevant to priorities of the EAHCP and EAA. After spending so much of my recent career on the water infrastructure side, it has been refreshing to reengage on the environmental policy, program and planning aspects that make up the EAHCP.

NEWS DROP: Speaking of policy and science, how do you see those things coming together in the EAHCP?

Storment: Well, there are a myriad of official participants in the EAHCP, and then there are several non-voting participants who are definitely involved in this program. What amazes me most is how successful the program has become using a consensus-based approach to decision making.

These are not easy issues to manage and there are very different points of views on managing resources like the Edwards Aquifer. However, I think there are two very important factors that make this type of decision making system work here. First, there has been a plethora of solid, scientific studies to inform decision makers and interested parties along the way.

Scott Storment - Sr. EAHCP Director

Additionally, the common interest of managing resources from a local, or in this case, regional aspect rather than deferring to state or federal authorities is a definite motivator for working together. From my experience, solving problems regionally are always the best ways to get positive results for a group like the Edwards Aquifer community. I am a firm believer in that approach.

NEWS DROP: After studying the EAHCP for a short time, what are the things that stand out to you as the most important next steps in the program?

Storment: There are a number of decisions to be made about Phase 1 and 2 of the EAHCP coming in the near term. I'm fortunate to have inherited a successful and well-running program, but as we all know, there is a long path before us and I'm definitely looking forward to working with everyone on this challenge.

REPRODUCE TO REINTRODUCE

New Research on San Marcos Salamanders & Texas Blind Salamanders Underway

"Our team of young scientists are extremely engaged and enthusiastic. We learn new things each day and then have to assemble those bits of information into sound science we can pass on to other researchers and the EAHCP team"— Dr. Lindsay Campbell

ONE CRITICAL ASPECT OF THE EDWARDS AQUIFER HABITAT CONSERVATION PLAN (EAHCP) research program entails learning how to best capture endangered species from the wild and reproducing them in a refugia lab. That effort is meant to ensure there are plenty of Edwards Aquifer Region endangered animals held in captivity to reintroduce into the wild if a severe drought or other unforeseen disaster happened to wipe out the species now living in the protected habitats.

"We have some experience with reintroducing the endangered fountain darters and Texas wild-rice back into the wild, but we are really at the beginning of generating that body of knowledge about the San Marcos salamander and Texas blind salamander," said Dr. Lindsay Campbell, a U.S. Fish and Wildlife Service supervisory biologist and point person on the EAHCP refugia program.

"This presents interesting challenges in collecting endangered salamanders from the wild and figuring out how best to maintain and reproduce them in the lab."

Collecting the Texas blind salamanders involves catching them with traps or drift nets over springs. The research team members set traps in two different 30-foot Edwards Aquifer wells about a mile from the San Marcos refugia center.

After testing various types of traps, they settled on two heavy plastic minnow traps tied together with thread that will not degrade. The team typically works over a two-week period going out three days a week to lower and retrieve traps. They use small bits of potato peels and pistachio nuts as bait to draw in the salamanders.

San Marcos salamanders are collected by hand using divers at Spring Lake and snorkeling just below Spring Lake dam. Drift nets are employed at the diversion spring in Spring Lake.

"The food we use in the Texas blind salamander traps grows biofilm while it's in the Edwards well, which then attracts the invertebrates the salamanders feed on," said Kelsey Anderson, a U.S. Fish and Wildlife Service biological science technician working at the San Marcos refugia center. "We only keep one out of three [Texas] blind salamanders we catch in traps.

That is a limit we placed on ourselves in order to be conservative with our preservation efforts. We just don't know enough about these salamander population numbers to be too aggressive in taking them out of the wild at this point.

However, when we collect Texas blinds in a drift net that are shot out an aquifer spring, we take 100 percent of those thinking that they will not survive in the lake or river environment." Once the salamanders have been captured and quarantined to ensure their health and the health of other salamanders in the lab, the fun and interesting work begins.

TEXAS BLIND SALAMANDER

The lab is now tagging the salamanders to set a baseline of information from the date they were placed in their new homes.

The tagging system is based on colors and helps team members quickly identify males from females and then monitor their growth and habits over time. However, when we collect Texas blinds in a drift net that are shot out an aquifer spring, we take 100 percent of those thinking that they will not survive in the lake or river environment."

Campbell explained that the long-term goal is to have 500 San Marcos salamanders and 500 Texas blind salamanders on hand for reintroduction if that is ever needed. The current reintroduction strategy would be to release 50 individuals per stocking site with the goal of 500 total individuals released and monitored during the first stage of reintroductions.

"One of the things you quickly learn about this research is that there are many details you have to know before you ever get to that point of reintroduction.

For example, if we needed those salamanders to be 30 centimeters in length for reintroduction, we need to learn how long it takes for them to grow into that length.

Then you take another step back and figure out what the survival rate is of salamanders to that life stage to calculate how many salamanders you would need to hatch to get to the target number of individuals at 30 cm

Then you calculate how many clutches of eggs it would take to get your target number to hatch and how long it would take to produce that many clutches. Another step back informs you about the whole husbandry process.

So, really, we're just beginning to refine this knowledge of our salamanders and put more solid parameters on the estimates from the past."

The first part of the team's husbandry research on San Marcos salamanders showed that the males can be very persistent in the pursuit of a female who is ready for the "courtship dance."

Given that new knowledge, they will be placing the males and females together in groups, but will be removing the males after 48 hours to reduce the potential stress on females.

The females typically oviposit eggs about a month after mating has occurred, and the team has observed clutches of eggs numbering anywhere from seven to 73 eggs.

"We feel positive that this research will lead us to knowing as much about these endangered species as we do now know about others protected by the EAHCP," Campbell concluded.

SAN MARCOS SALAMANDER

GIVE AND TAKE

Federal Permit Gives EAA, EAHCP Partners Ability to Study, Protect Endangered Species

THE ENDANGERED SPECIES ACT (ESA) PROHIBITS THE "TAKE" OF LISTED SPECIES THROUGH DIRECT HARM OR HABITAT DESTRUCTION. IN THE 1982 ESA AMENDMENTS, CONGRESS AUTHORIZED THE U.S FISH AND WILDLIFE SERVICE TO ISSUE PERMITS FOR THE "INCIDENTAL TAKE" OF ENDANGERED AND THREATENED WILDLIFE SPECIES. THAT MEANS PERMIT HOLDERS CAN PROCEED WITH AN ACTIVITY THAT IS LEGAL IN ALL OTHER RESPECTS, BUT THAT RESULTS IN THE "INCIDENTAL" TAKING OF A LISTED SPECIES.

One of the most intensive efforts the Edwards Aquifer Authority (EAA) is engaged in today deals with the Edwards Aquifer Habitat Conservation Plan (EAHCP). While the EAA is one of five permit holders associated with the EAHCP, the agency dedicates additional personnel and financial resources to the program primarily because it helps achieve its mission of managing, enhancing and protecting the Edwards Aquifer.

THE EDWARDS AQUIFER HABITAT CONSERVATION PLAN PARTNERS WERE GRANTED AN INCIDENTAL TAKE PERMIT (ITP) FROM THE U.S. FISH AND WILDLIFE SERVICE IN 2013. However, there was nothing incidental about the seven-year application development process.

And today, maintaining compliance with the ITP is all business for the EAHCP team. "The whole purpose of everything we do as part of the EAHCP program is to comply with our Incidental Take Permit which outlines what we must do to protect the endangered species during a drought of record," said Scott Storment, EAHCP program manager. "The permit actually helps drive many of the decisions we make. From our research, we are learning how much water from the springs the species need to live in worst case drought scenarios. That way, we don't spend extra dollars and resources going beyond those parameters." "Our permit does specify a limit on the numbers of endangered species like the fountain darter or Texas blind salamander that we can take," Storment explained. "And to reiterate, taking means doing any kind of harm to the species, disturbing their habitat or anything of that nature. Taking doesn't just mean killing a darter or salamander. We know that public recreation, our field research and other types of activity near the spring openings causes harm to the species, so we've developed many programs to mitigate that habitat disturbance in order to maintain our permit."

Storment noted that most people around the Edwards Aquifer Region are well aware of the various uses of the water from the aquifer. He also expressed that everyone knows during the 1950s drought of record, the Comal Springs went dry. While the Endangered Species Act didn't exist at that time, the species did. In the 1990s, various organizations brought a lawsuit against the federal government because nothing had been done to protect the Edwards Aquifer endangered species. It was that lawsuit and the desire to maintain regional control of the Edwards Aquifer water use that jump started the various aquifer protection plans in place today. In fact, the creation of the Edwards Aquifer Authority was created to manage pumping from the Edwards Aquifer as a means to help protect spring flows in New Braunfels and San Marcos.

"Despite the great work and progress of the EAA, there was still no guarantee that the springs would not go dry in another drought of record," Storment explained.

"So in the 2006-2007 timeframe, stakeholders from around the Edwards Region came together to create a specific plan to keep the springs flowing during a drought of record. That plan was developed as a Habitat Conservation Plan and ultimately submitted in 2012 to Fish and Wildlife Service as part of the Incidental Take Permit application. It is important to understand that an ITP is a legally binding agreement between the U.S. Secretary of the Interior and the permit holders. In our case, that is the Edwards Aquifer Authority, City of New Braunfels, City of San Marcos, City of San Antonio through the San Antonio Water System and Texas State University."

The Edwards Aquifer ITP will run through 2028. The 15-year Edwards Aquifer permit period is a relatively short timeframe for a typical ITP. But, the original EAHCP planning team knew the region still had much to learn about the Comal and San Marcos Springs systems. So, the team decided to spend the better part of the first permit cycle to become more knowledgeable about this ecosystem and then prepare to apply for a 30-50 year permit in 2028.

"The ITP permit process is obviously a lengthy and detailed path," Storment concluded. "But, now that we have some very specific guidelines to follow, water providers and users in the Edwards Region have certainty in the amount of water they can count on from the Edwards. That goes a long way toward creating sound water management plans into the future. Our cities now have confidence that having a stable water supply is a positive element of their growing communities."


FOUNTAIN DARTER

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Cover & Back Cover: San Marcos River; San Marcos, Texas