

An underwater photograph showing a diver in a blue wetsuit and red life vest swimming in clear blue water. The scene is illuminated by sunlight filtering through the water, creating a shimmering effect.

EAHCP STEWARD

News from the Edwards Aquifer Habitat Conservation Plan - Nov.-Dec. 2023



A Re-Captive Audience

SMARC Leading EAHCP Research on threatened San Marcos Salamander

A Re-Captive Audience - Continued



The San Marcos Aquatic Resources Center (SMARC) is part of the National Fish Hatchery System but they also guide the science and technology associated with protecting the threatened San Marcos salamander. The Edwards Aquifer Habitat Conservation Plan (EAHCP) built a refugia building on the SMARC property specifically to house, study and hold a captive assurance population of the Plan's threatened and endangered species. This way, if any unforeseen event decimated existing populations of the threatened and endangered species in the wild, the refugia and EAHCP teams could reintroduce those species held in the refugia. Simple, right?

Desiree Moore, a U.S. Fish and Wildlife Service research biologist leading one phase of the research of the San Marcos salamanders, explained that the word "simple" isn't quite part of this equation.

"One critical aspect of the Edwards Aquifer Habitat Conservation Plan (EAHCP) research program entails learning how to best capture [threatened and] endangered species from the wild to reproduce them in captivity," Moore said. "And while there has been a good deal of research on this salamander over the years, reproducing them in captivity so they would closely mirror what is in the wild now is a complicated matter. And that's what our overall research plan is trying to discover. This phase of the research we're working on now is about gathering data from wild salamanders we've captured, tagging them, releasing back into their natural habitats, and then recapturing for analysis. It's a type of tracking study we hope will significantly inform how we collect salamanders to ensure the Refugia population mirrors the wild population and to inform how to best reintroduce to the San Marcos Springs if some unexpected event drastically reduces the current population in the wild."

Prior to the recapture study, the team had to capture and tag salamanders with a small computer chip that is much smaller than a grain of rice. The chip is injected just under the skin and contains a nine-digit number used to identify the individual salamander. The original quantity goal of the tagging process was 100 salamanders. The stretch goal was 400. The team exceeded the 400 mark by capturing and tagging 454 salamanders and all within the first month and a half of the effort.

Moore explained the primary goal of the recapture research is to understand the makeup of the current San Marcos salamander population in their current habitat so they can duplicate that population in the refugia. To understand how to do that, they are tracking size, sex, body condition and other factors in this process. The secondary goal is to get some population estimates and maybe some understanding of how

A Re-Captive Audience - Continued

these salamanders move in the San Marcos Springs system. These salamanders are small and live where they're not easily seen so the mark/recapture system is the best system available now to employ. The recapture process will run for about a year. The purpose for recapturing over the course of the year is to determine whether there is any seasonality to the trends seen in the data collection.



A laser reader is used to check the tagged salamander's nine-digit ID number.

“Just below the Spring Lake Dam and a location near the center of Spring Lake are two locations the team recaptures salamanders,” Moore stated. “Due to varying depths of Spring Lake, there are two snorkelers and two underwater divers that spend the better part of a day recapturing salamanders. The snorkelers make several trips to the shore where other team members move collected salamanders from nets to a cooler. The divers make fewer trips to save air in their tanks.”

The next step in the process is Moore's exam table for determination of whether the salamander is one of the tagged individuals. The smallest salamanders will not have been tagged so they get to bypass the anesthesia process. The larger salamanders are placed one by one in a cooler with water from Spring Lake that has a small amount of a substance commonly used with aquatic animals to make them drowsy for a few minutes. That mixture is also buffered with baking soda to make sure the water is not too acidic for the salamander's gills. Once the salamander doses off, Moore measures their length, looks for physical anomalies such as parasites and any unusual body markings, checks for the computer chip and takes some photos. San Marcos salamanders have unique pigmentation patterns on their heads so the team can actually count some recaptures using photo identification in addition to the chips.

“During recapture, we use a laser reader to determine which salamander we have. We will know when and where it was tagged along with its length and sex. For the study, we compare the current information with the previous data to tell us if there has been any movement, growth, health changes, etc.” Moore noted. “Then there are questions to address such as, are particular types of movement associated more with females or males? Is there a survivability rate/stage associated with size? All of that information goes back to our main goal of being able to have a representative population of San Marcos salamanders at the refugia so that we could repopulate the wild environment if any catastrophic event occurred that might decimate those species now living in their natural habitats in the San Marcos Springs.”

Once Moore is finished examining each salamander, she places them in a recovery cooler to make sure they are fully awake and swimming around before being placed back in the wild. “Salamanders are tasty snacks for other fish, especially crayfish, in Spring Lake so our snorkelers and divers carefully place them in the rocks and watch to make sure they swim into the rocks for protection.”

A Re-Captive Audience - Continued



The recapture study is just one in a long line of studies the SMARC team is undertaking to learn as much about San Marcos salamanders as possible. Next year, they will be looking at the genetics of the population in the wild to ensure we have the same level of genetic diversity at the refugia in San Marcos.

“One key outcome of the husbandry studies happening at the refugia is that the team will want to have a standing stock that genetically compares to what is found in the wild,” Moore explained. “For example, you could have some active females in the captive population producing lots of eggs, but relying on a few females would not produce a genetically diverse population. So, that upcoming genetics study will be another essential component of our ever-growing base of knowledge about the San Marcos salamanders.

“Every one of these trips to the field is supported by many different people and organizations. For example, staff from the EAHCP, San Marcos Aquatic Resources Center, Austin Ecological Center, City of Austin and Texas State University have all been involved in this research. Plus, our divers, snorkelers and some of the shore team are volunteers. That type of involvement will really go a long way into making this research valuable in protecting these [threatened and] endangered species for many, many years.”

EAHCP STEWARD SHORT TAKES

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

National HCP Coalition Conference in West Virginia a Success

This year, the annual meeting of the National Habitat Conservation Plan Coalition was held at the National Conservation Training Center in West Virginia. Participants attended two-and-a-half days of HCP-relevant presentations on policy, HCP development and implementation, and science.

EAHCP Staff attended this event along with many other attendees from across the nation. Scott Storment, EAHCP program manager, gave a presentation on the EAHCP permit renewal process at this year's conference.

You can see the agenda and follow [links to the presentations here](#).

Follow the link to join the Coalition's mailing list and stay tuned for information on next year's meeting: <https://nhcpcoalition.org/contact/>



Stakeholders, Science and Implementing Committees Wrap Up 2023

The final Joint Stakeholder, Science, and Implementing Committee meetings for 2023 will take place Thursday, December 14 in the Edwards Aquifer Authority Board Room, beginning at 10 a.m. The meeting will also be available via streaming on Microsoft Teams.

VISPO Triggers for 2024

The Volunteer Irrigation Suspension Program Option (VISPO) is a unique initiative of the Edwards Aquifer Habitat Conservation Plan (EAHCP) for irrigation users who wish to help protect springflow for federally listed threatened and endangered species that rely heavily on the Comal and San Marcos Springs. The VISPO Program is an irrigation suspension program and compensates enrolled irrigation permit holders for being enrolled in the program but it also pays an additional suspension rate in years where irrigation

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suspension is required. The trigger used to determine suspension is based off the J-17 index well in Bexar Count. If the J-17 Index Well is at or below 635 feet above msl on October 1, enrolled water must be suspended for the following calendar year.

On October 1, 2023 the J-17 index well was at 630.3 feet above msl. Therefore, beginning January 1, 2024, those who are enrolled in the Voluntary Irrigation Suspension Program Option (VISPO) are required to suspend withdrawals of enrolled groundwater for the amounts agreed upon in their individual agreements. This is the first consecutive year that VISPO has triggered (the program was also triggered in 2022). To learn more about VISPO, [please click here](#).

Texas Aquatic Plant Management Society

The Texas Aquatic Plant Management Society consists of aquatic vegetation management professionals, companies, researchers, students, and Extension specialists dedicated to the aquatic vegetation management issues in Texas. The TAPMS focus is on educating youth and adults about aquatic vegetation management and preservation of natural aquatic environments, including control of invasive aquatic plant species and conservation and propagation of native aquatic plant species including rare or threatened species. On November 14-17, TAPMS held their annual meeting in Mesquite, Texas. Kristina Tolman, EAHCP Senior Coordinator and TAPMS President, gave a presentation on the EAHCP and the program's efforts to maintain native and non-native submerged aquatic vegetation in the spring systems. The next annual meeting will be held on November 12-14, 2024 in New Braunfels, TX.



***Texas Aquatic Plant
Management Society***

Interested in joining TAPMS? Please email, Olivia Ybarra (TAPMS President Elect and EAHCP Coordinator) at oybarra@edwardsaquifer.org.