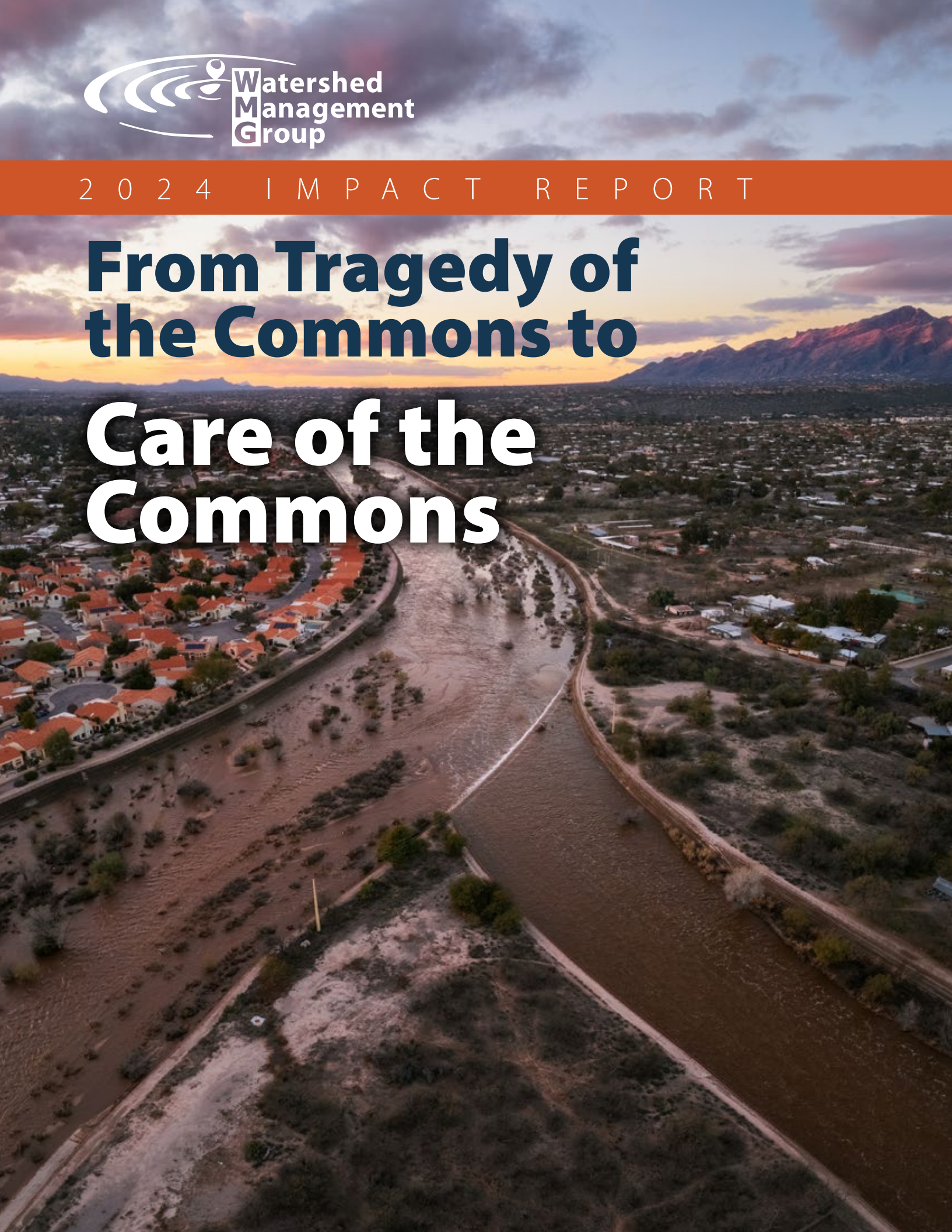
Watershed Management Group

2024 IMPACT REPORT

From Tragedy of the Commons to Care of the Commons



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Cover photo: Sabino Creek flows into the Tanque Verde Creek, heading west into central Tucson. These creeks are fed and recharged by mountain rain and snowmelt, an important source of local water.

To learn about resilience in the desert, we look to our desert plants which have adapted to make the most of wet times and to slow down and consume less during dry times.

Communicating Drought,
Collective Action Can Break the Scarcity Cycle

At our staff meeting in mid December, I announced our rainwater tanks were almost dry. We'd been operating on rainwater all year long at our Living Lab, demonstrating what it means to be hydro-local, enjoying rainwater for both indoor and outdoor uses, including drinking rainwater. Now it looked like we could run out of rainwater before year end and have to switch to municipal water.

As we peered into our tanks, and calculated just hundreds of gallons remaining, staff decided to take on the challenge of making our rainwater last until the new year.

We brainstormed a list of things we could do to save water in addition to our standard conservation practices. We agreed to wash dishes in a wash bin, use the tippy taps to wash our hands, pause on watering some of our new native plants in the cooler season, and take sponge baths instead of showers after biking into the office.

So did we do it? Yes! Those hundreds of gallons not only lasted through the end of the year, but lasted six more weeks. That meant six more weeks of drinking delicious rainwater!

Since then, I've reflected on this scenario, and how it relates to the drought planning work we are embarking on.

If staff didn't know the tanks were low, they would have likely continued business as usual and the tanks would have run dry within a week. But once all of us knew about the shortage details, we collectively devised solutions. Even a group of people already conserving water can conserve more!

The Southwest is in a long-term drought, or mega drought, now going on 30 years. Most years are dryer than normal, and this year we are experiencing a short-term extreme drought, following a few average and wet years.

In the Tragedy of the Commons framework, our shared resources, like our aquifers and rivers, will always be overused by the self-interests of individuals. Perhaps this tragedy is perpetuated when communities don't have information about drought and shortage and don't have shared conservation strategies.

What if instead we foster a Care of the Commons framework, where we communicate and collaborate, inviting people to steward and care for our precious watersheds? Then, just like at WMG's Living Lab, many people will make shifts to conserve water for the greater good.

A Care of the Commons framework is one we whole-heartedly embrace at WMG. In this impact report you'll find many examples of this framework at play, where reciprocity and relationships between nature and people create a new-found resilience.

Lisa Shipek
Executive Director

Catlow Shipek leads a session on local drought triggers with SCWC partners.

Protecting our Rivers and Aquifers

New Local Drought Planning Initiative Led by WMG

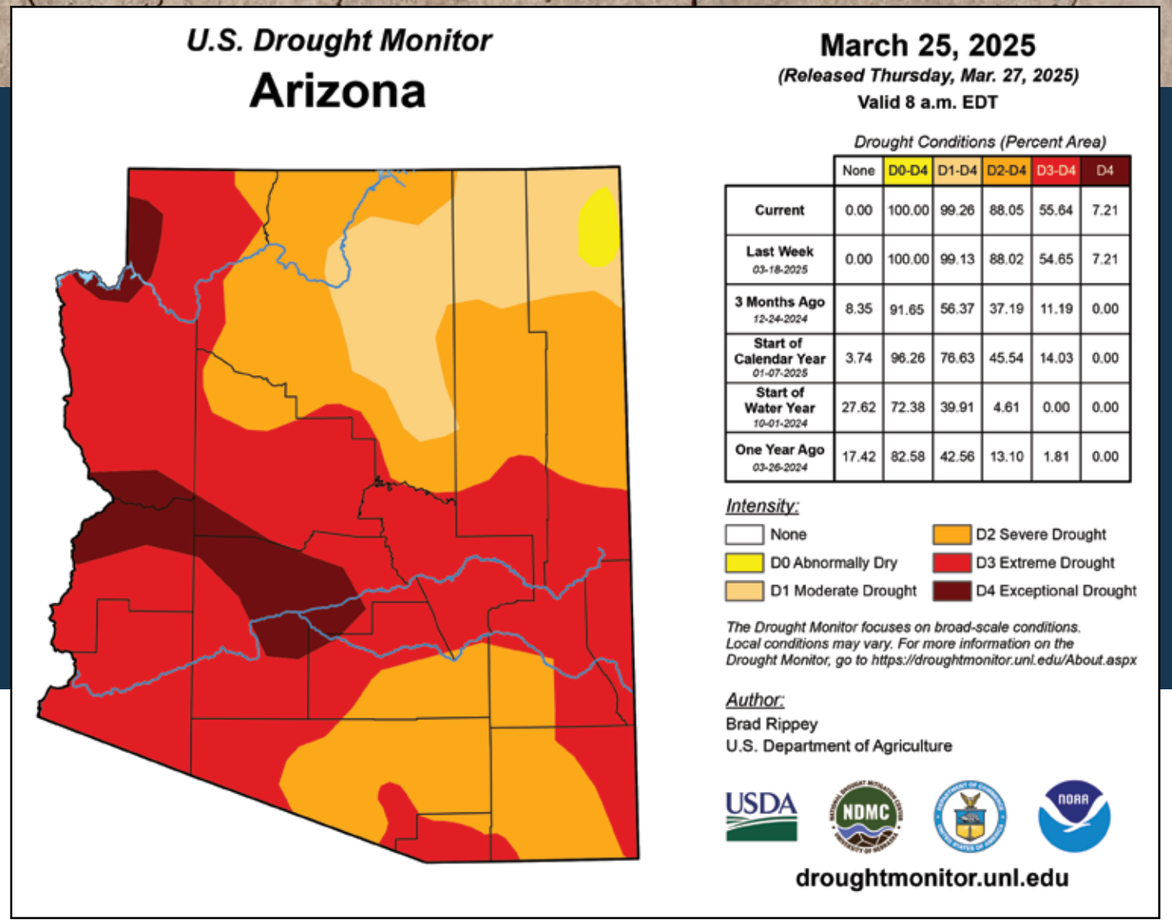
Take a minute to remember back to the summer of 2020. It's a summer many will remember for a long time, in the height of the COVID pandemic. And for those living in the Southwest, it was also a summer of extreme heat, drought, and wildfires.

In fact, 2020 was the hottest and driest period on record in the Tucson area. And while we all experienced that time, what did we do in response? After no specific drought declaration or response by the City of Tucson, Pima County, or water utilities, we at WMG started to wonder why…

Why was there no drought response? And what should our drought response be?

It turns out that the City of Tucson's drought response is based entirely on water levels in Lake Mead, where Colorado River water is stored and pumped hundreds of miles to be our primary municipal water supply. Pima County has a drought plan based on Lake Mead levels and some local conditions, however, no drought response actions have been implemented.

In 2020, we got a scant 4.2 inches of rain, compared to our average of 12 inches. On top of that it was hotter than ever, so our desert plants, urban forests, river ecosystems, and wildlife were suffering, even more than we were.



A recent drought monitoring map shows most of Arizona is in a severe to extreme drought stage.

As WMG is building a hydro-local movement, we are asking:

How do we have local water resilience—enough water for people, plants, animals, and our river ecosystems—even in times of drought?

And, what policies do we need in place to live hydro-local?

Finally, what can WMG do as an educational organization communicating with the public on watershed health?

Since that very dry year, WMG co-founders, Catlow and Lisa Shipek, have been diving deep into drought planning, learning more about the city and county's policies and actions, and bringing drought dialogues to the Santa Cruz Watershed Collaborative (SCWC).

SCWC was founded in 2017 and is a growing collaboration with over 40 government, nonprofit, tribal, and university partners all working towards a vision of people working together to ensure a healthy urban watershed with flowing rivers and streams. WMG helped co-found this organization and serves on the leadership team.

After several years of strategizing, pitching ideas, and writing grants, WMG secured two grants to lead a comprehensive drought planning

Existing Drought Plans

City of Tucson – Tucson Water

Drought trigger: Lake Mead levels

Drought response:

- Tier 1 declared in 2022
- Tier 2 declared in 2023 & 2024
- Tucson Water Conservation Program staff implement actions such as encouraging water audits to high water use customers

Pima County

Drought triggers: Lake Mead and some local conditions

Drought response: None to date

initiative, working with the Santa Cruz Watershed Collaborative including the City of Tucson and Pima County. The goal? To develop watershed-wide coordination of drought planning and drought response, ensuring local water reliability and local watershed health, which includes healthy aquifers and rivers.

So what is drought? And how do we measure it? Drought happens when there is below average rainfall and snowpack or dropping levels of aquifers, river flows, or reservoirs. But there are so many other factors that impact water availability, including many human factors around our water policies, land management practices, and economics.

Last fall, Catlow and Lisa started working closely with a new Drought Advisory Team including Tucson Water, Pima County Regional Flood Control, Pima Association of Governments, and the University of Arizona.

The advisory team started by creating a new working definition of drought: Drought is an episodic deficit in water availability for the human and/or natural communities of the lower Santa Cruz Watershed caused by less precipitation, reduced streamflow, or decline in shallow groundwater levels. Drought may be localized by sub-watershed, sub-aquifer, or extend across the watershed.

Now we are working on defining clear drought triggers based on local watershed conditions — not just water levels in Lake Mead. For example, below average rainfall in the Tucson area will trigger a change in drought status. Dropping groundwater levels in sensitive riparian areas, like Sabino and Tanque Verde Creek, could trigger a change in drought status as well.

The Local Drought Plan will also include communication tools, suggested management actions and messaging, and policy recommendations for partners and water utilities to utilize. WMG, alongside other SCWC partners, will start to communicate more regularly about drought, sharing coordinated messaging that will help create a collective response.

This work feels particularly timely as we experience another extreme drought period. August 2024 - March 2025 is the driest six months on record in the Tucson area. We are seeing the direct impacts of that extreme drought as many of our creeks are dry and many water harvesting tanks are now empty, waiting for more rain.

Now is a time for us all to respond, not only with water conservation efforts, but with stewardship actions to care for our stressed plants, animals, and ecosystems. We are eager to develop the tools and coordinated response to tackle the climate challenges of the day, and we're deeply grateful to the Santa Cruz Watershed Collaborative partners for working towards a more resilient water future together.

To better understand the impact of drought on our riparian areas, Lisa Shipek has been leading riparian health surveys in collaboration with other SCWC partners. Surveys have been done in shallow groundwater areas along Rillito River, Tanque Verde Creek, and Santa Cruz River.

Planting Seeds For A Better Future

A New Native Edible Garden Flourishes At The Living Lab Thanks To Our Apprentices

"I have a strong relationship with native plants, they take care of me," Jasmine Singer said as she looked over the native edible plant basin she helped build. ***"We are supposed to take care of the land and that is where my values stem from."***

Jasmine joined Watershed Management Group (WMG) as a Sustainable Built Environment Apprentice, alongside Nicole Parks, and together they have worked on projects that bring nature back to urban spaces. The native edible garden they built at WMG features cholla, chiltepin, banana yucca, ocotillo, jojoba, and evening primrose. The garden educates the public about plants native to the Sonoran desert that have been traditionally eaten by indigenous people and can be incorporated into our diets today.

The WMG Apprentice Program helps people from diverse backgrounds gain job experience in environmental fields. The first cohort of eight apprentices kicked off last summer, and thanks to donor support, five new paid apprenticeship positions will be hired this year.

Nicole hopes that the new native edible basin at WMG will encourage people to build relationships with plants and learn from them.

"It's an intimate, beautiful relationship with plants that can really provide for you, specifically, plants that fit this region," Nicole said. ***"It makes you think about how much rain has there been? What season are we in? It really gets you in tune with things that are much larger than just yourself."***

Nicole moved to Tucson from Honduras when she was eight. Since graduating from the University of Arizona in 2020 with a degree in environmental science, she has been pursuing a career in conservation and is thankful that the Apprentice Program is helping her on that journey.

"It's allowed me to make a lot of really good connections and just remind me that I'm not alone in the way that I think," Nicole said. ***"Especially during these political and economic times, it's amazing to be around people that remind me that I'm not the only one who cares like this."***

Jasmine became interested in the opportunity at WMG after reconnecting with her Indigenous heritage and becoming interested in sustainable agriculture.

Jasmine is Diné (Navajo) of the Kinyaa'áanii/Nakai clans and her family lived in the Grey Mountain area of Northern Arizona until they were encouraged to leave the reservation for the promise of the ***"American Dream,"*** and the Indian Relocation Act of 1956 led Jasmine's relatives to Tucson.

Her grandparents instilled in her a love of native plants, and now she is using that passion, alongside the skills gained at WMG, to pursue a degree in Applied Indigenous Studies and Agriculture at Northern Arizona University.

"I am so thankful for the community that WMG has created collectively," Jasmine said about her experience at WMG. ***"It's really shown me what a community can do with the same values and goals."***

Jasmine and Nicole, WMG Apprentices, build a new native edible garden at WMG

Tackling Urban Heat Discrimination,
One Rain Garden At a Time

Students and volunteers build a rain garden at Prince Elementary.

WMG intern Manuel Barcelo works with refugees at New Roots farm on the Literacy Connects campus in the Amphi Neighborhood.

The Amphi neighborhood is one of the hottest areas of Tucson. This historically underserved midtown neighborhood has a lack of mature vegetation, creating an urban heat island effect that makes temperatures soar.

Last November, WMG helped to build a rain garden at Prince Elementary School, continuing our more than five-year-long relationship with the neighborhood, which began when we installed rain gardens at Amphitheater High School and Satori School. Now those school rain gardens serve as inspiration for new projects in the area.

Rain gardens are simple basin structures that harvest rainwater to nurture native trees and plants, which help to reduce temperatures. WMG's community conservation projects always actively engage participants in the learning process.

At Prince Elementary we held three education sessions with students, teachers, and parents to learn about the culture and history of the local watershed, the principles of water harvesting, and finally, being part of the design process.

"For them to design their own rain garden — that builds so much enthusiasm," said Joaquin Murrieta-Saldivar, WMG's Cultural Ecologist Director. ***"It's amazing the excitement that students have to design their own garden. When students start teaching parents that's a very inspiring thing."***

Resilient communities are built when neighbors help neighbors, and this project was made possible thanks to the support of St. Philip's in the Hills Episcopal Church, a long-term partner that has supported several projects in the Amphi neighborhood as well as their own church campus.

"All these partnerships are helping us to cool down the city, and to empower people to take action for the health of the community as well as the health of the watershed," Joaquin said. ***"It takes us back to the natural systems that belong in the Sonoran desert."***

WMG has also done work in the Amphi neighborhood on the Literacy Connects campus, which hosts the ***"New Roots"*** program that brings refugees together to share agricultural skills and connect to their new home through taking care of the land.

Manuel Barcelo, WMG's Native Edible Tree Intern, was able to work alongside refugee families to plant a veggie garden and additional landscaping. ***"When working with emergent English learners it is important to remember they are not beginning thinkers, but beginners in learning a new language."*** Manuel said. ***"The cross-cultural collaboration we were able to achieve together was incredibly inspiring and gave me hope for the future of Tucson."***

WMG is continuing to work to bring heat equity to the Amphi neighborhood through new projects at Literacy Connects, and by building rain gardens to cool bus stops in the area.

Do you want to sponsor a rain garden project in your neighborhood? Contact Joaquin Murrieta at **jmurrieta@watershedmg.org**.

Green Retreats, Weddings, and Parties
Rent the Living Lab For Your Special Gathering

We love to host events at our Living Lab and Learning Center, from our annual events like Beavers and Brews and Rainwater on Tap, to school groups, retreats, and now even weddings!

The Living Lab is a space where people can experience what it means to live hydro-local—surrounded by rain gardens and native edible plants as well as water-saving composting toilets and rainwater on tap to drink. The Living Lab is located in midtown Tucson, easily accessible by bus and bike, so it's a great place to promote sustainable mobility options.

If this sounds like a place you'd like to have your special event, then let us know!
Visit Watershedmg.org/Rentals to learn more and make a request for your event.

Creating River-Centric Communities

73 River Run Network workshops in 2024

8th year Flow365 volunteers monitor Tucson's creeks & rivers

66 acres of Tanque Verde Creek restored through removing invasive Arundo donax

4,243 River Run Network members

23 miles of cattle fence line monitored along Cienega Creek to prep for beaver reintroduction

17 Post-Assisted Log Structures (PALS) built along the Babocomari River

7 paid intern & apprentice positions with the RRN in 2024

4th Annual Binational Beaver Survey completed along San Pedro River

Santa Catalina Mtns
Sabino Canyon
Tanque Verde Creek
Rincon Mtns
Rillito River
TUCSON
Pantano Creek
Vail
Cienega Creek
San Pedro River
Babocomari River
Sierra Vista
Huachuca Mtns
Santa Cruz River
Santa Rita Mtns
Sonoita
Patagonia Mtns
Nogales
UNITED STATES
MEXICO

Thanks to all the organizations and landowners who partnered with our River Run Network in 2024 to restore our creeks and rivers!

Tucson, Santa Cruz Watershed
- City of Tucson Parks & Recreation
- Lakes at Castle Rock
- Pima County Regional Flood Control District
- Santa Cruz Watershed Collaborative
- Sky Island Alliance
- Strategic Habitat Enhancements
- Tanque Verde Valley Association
- Tucson Bird Alliance
- Tucson Clean & Beautiful
- Tucson Water
- US Forest Service

Babocomari & San Pedro River
- Cascabel Community Association
- Charles Quiroz (landowner)
- Joy Banks (landowner)
- Lower San Pedro Watershed Alliance
- National Park Service - Saguaro and Coronado NM
- PROFAUNA
- Sky Islands Alliance
- The Nature Conservancy
- US Fish & Wildlife Partners

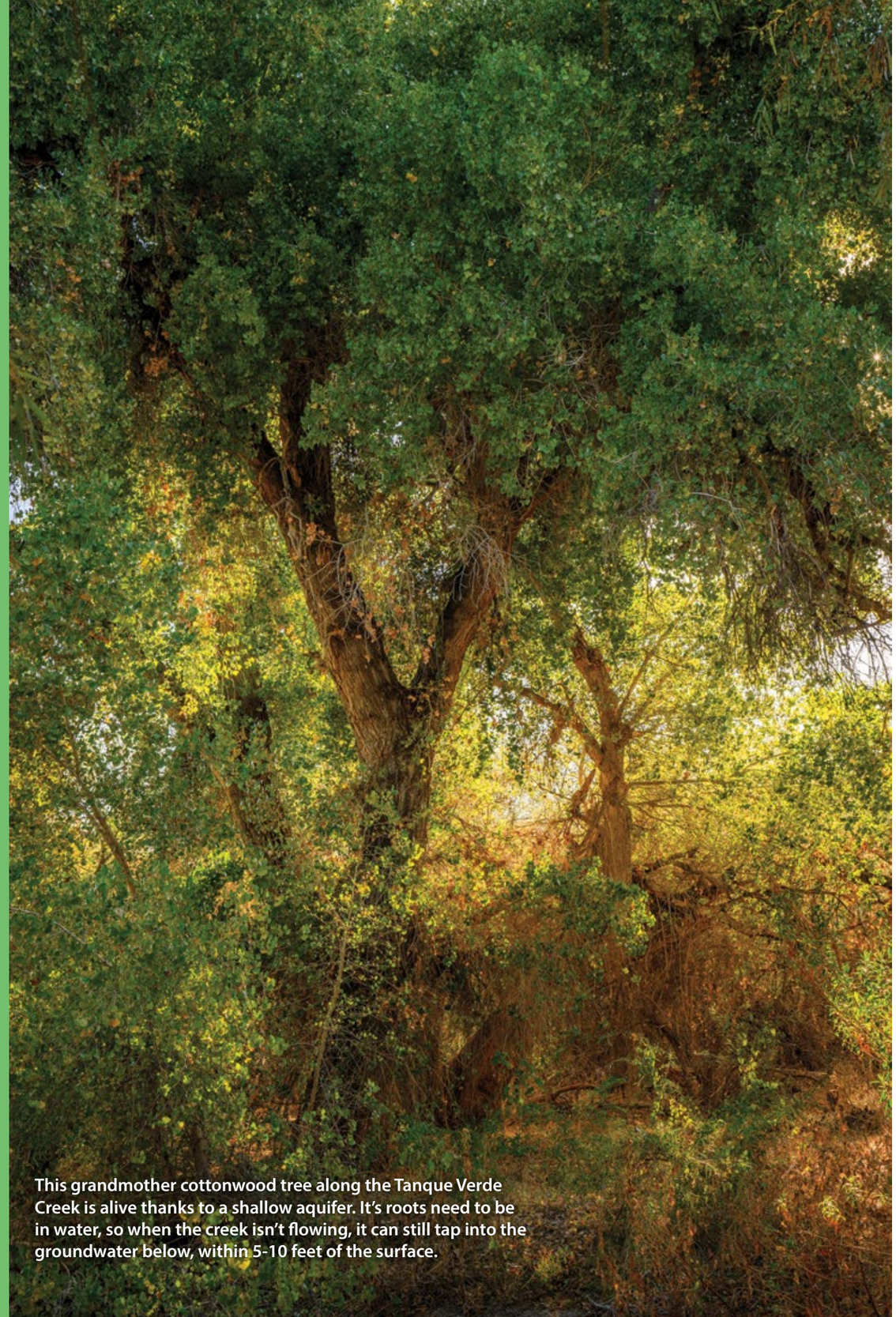
The middle Tanque Verde Creek's riparian forest, with Fremont cottonwoods, Goodding's willows, and Mexican elderberries, is supported by shallow groundwater. This middle stretch has seasonal flows, with 241 days of flow during the 2024 water year, October 2023 - September 2024.

The Story of the Tanque Verde Bosque

Have you ever sat under a grandmother tree?

A grandmother tree is a large, ancient, and significant tree, and you'll know one when you see it. There's a grandmother cottonwood tree along the middle stretch of the Tanque Verde Creek, watching over a remnant cottonwood-willow riparian forest in the Tucson area.

Reaching an age of 70-100 years old, this grandmother cottonwood has seen many changes to the creek, from dropping groundwater levels and less flow, to new development, the shrinking of the forest, and very few grandchildren.



This grandmother cottonwood tree along the Tanque Verde Creek is alive thanks to a shallow aquifer. It's roots need to be in water, so when the creek isn't flowing, it can still tap into the groundwater below, within 5-10 feet of the surface.

If you've walked along the creeks and rivers in the Tucson area, and much of the West, you might notice there are not many young trees. Cottonwood and willow tree populations are shrinking and young trees are rarely sprouting as groundwater pumping has dried up seasonal and annual creek flows, and the young roots can't reach deep enough to tap into the lower water table. Land management practices have also hurt these forests, with development encroaching onto floodplains and intensive cow grazing eating young plants.

And yet, if you take a stroll along the middle stretch of the Tanque Verde Creek today, you'll be delighted to see numerous young cottonwoods and willows popping up, many all on their own!

This area that is being restored we affectionately call the Tanque Verde Bosque–and this bosque, or forest, can once again be a multi-generational forest, expanding its extent and number of trees.

Hundreds of volunteers have been working with WMG to restore this creek, monitoring flows and groundwater, implementing water harvesting and recharge projects, and removing massive stands of Arundo donax, an invasive plant that has been sucking up a lot of water and choking out native plants for decades.

Sometimes river restoration work is about setting the right conditions for nature to succeed.

We're seeing that once the Arundo is removed, the space and water that was monopolized by this invasive species is now available to new cottonwood and willow seedlings. River Run Network volunteers have cleared invasive Arundo from more than 66 acres over the last few years. And in 2023 and 2024, good rains and snowmelt led to many days of surface flow that's needed for riparian trees to sprout.

Seeing the young cottonwoods and willows grow along the middle Tanque Verde Creek is a story we are so humbled to tell. We trust that the grandmother cottonwood tree will continue to share her wisdom and that this expanded forest will bring joy to us all.

Volunteers remove invasive Arundo donax on Saturdays at WMG's River Run Network events. 233 volunteers helped out in 2024, from individuals, to boy scouts, to University of Arizona students.

Binational Beaver Survey Expands With People Power

Volunteers survey a stretch of the San Pedro River looking for active beaver evidence as part of WMG's 4th Annual Binational Beaver Survey. This survey group was led by WMG high school intern Henry Schon (3rd from right).

"I can truly say, with no exaggeration, that this has been a life changing experience for me," said Henry Schon after co-leading his first Beaver Survey group.

Even though he is still in high school, Henry has become one of Watershed Management Group's most dedicated and experienced volunteers with the River Run Network, and this past fall, was given the opportunity to train and lead a group of volunteers as they searched for signs of beavers on the San Pedro River.

Since 2020, WMG and our partners have been using community science to monitor beaver populations along the San Pedro River in both Arizona and Sonora, Mexico. This collaborative approach trains volunteers to search for specific signs of beaver activity (such as chews, lodges, tracks, and scat) and document it using a GPS-enabled mobile app. The data is then evaluated by WMG staff in conjunction with other partners involved in the survey. The results are compiled into a comprehensive report that is made available to the public and used to inform conservation decisions and goals for the region.

Beavers were once a keystone species in the rivers of Southern Arizona until the mid 1800s when they were killed off by fur trappers. In 1999 the Arizona Game and Fish Department reintroduced beavers to the San Pedro in partnership with the Bureau of Land Management in order to revive the species and bring their benefits back to the land. Due to ongoing habitat loss and drought causing low river flows, it is important to continue to monitor their populations and survey the area for signs of beaver activity so we can understand how to help beavers thrive in the area.

In 2024, 115 volunteers and partners surveyed 54 miles of creek in both Arizona and Sonora, Mexico, making this our most comprehensive beaver survey to date!

WMG encourages our community to participate in these surveys to learn about the value that beavers can bring to the environment, become advocates, and be more connected to the land. Volunteers like Julie Swarstad Johnson, who participated in the Dec 14th survey on the Lower San Pedro, were able to document signs of beaver activity, including a gigantic beaver dam located in that stretch of the river.

"I'm so happy and thankful that I got to be here today," Julie said. ***"It's amazing to know that the beavers have been here and to be able to see their teeth marks. When you live in the city where so much has been wiped away it's hard to feel connected to how this land should look."***

To learn more about how you can be involved in upcoming beaver surveys and other community science initiatives, join the River Run Network at Watershedmg.org/RRN.

2024 Binational Beaver Survey Results

Population Estimate: 30-38 beavers living along the San Pedro in Arizona and Sonora.

Number of Dams: 9

Number of Active Lodges: 5

Trends: Beaver populations are continuing to decrease in Arizona and Mexico

Fun Facts: A large beaver complex was surveyed on the Lower San Pedro that may have multiple beaver families

Reserve Your Spot in our Next Water Harvesting Certification

Take this six-day comprehensive training in water harvesting systems design and construction to advance your career and deepen your skills for a resilient water future.

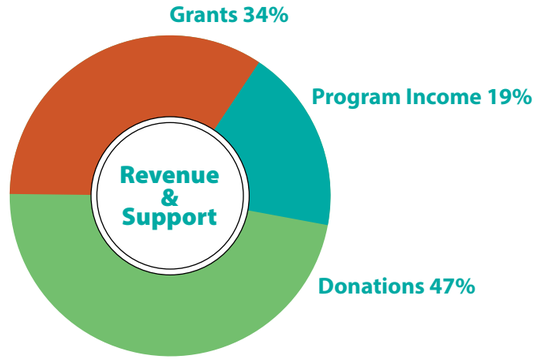
The Water Harvesting Certification is taught in Tucson, with hands-on and classroom instruction at our Living Lab and field sites. Experience all Tucson has to offer in water harvesting innovation, nature-based conservation, and collaborative community efforts.

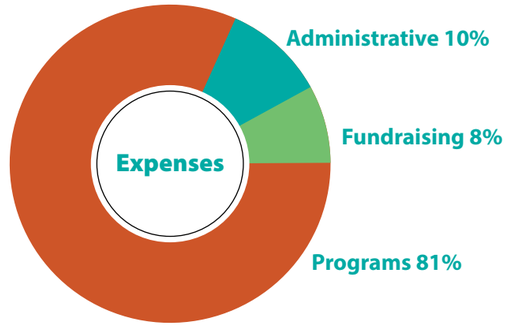
Fall Courses: **October 13-19, 2025**
November 3-8, 2025

Learn more and register here: Watershedmg.org/WHC

2024 Financial Report

Support and Revenue	
Donations	606,768
Grants	443,028
Program Income	240,989
Total Income	**$1,290,785**
Expenses	
Program Services	
Community Conservation (educational projects at schools, churches, & neighborhoods + green job training & consulting)	379,038
Living Lab & Learning Center (intern & docent program, Family Saturdays, tours, and educational workshops)	212,212
River Run Network (river restoration, community science, watershed planning & policy)	309,037
Watershed Education Outreach	102,119
Total Program Services	**$1,002,406**
Supporting services	
Administrative	125,509
Development	103,947
Total Supporting Services	**$229,465**
Total Expenses	**$1,231,862**





Members of the Unitarian Universalist Church of Tucson work with WMG to construct a rain garden with native plants to cool their church grounds.

Watershed Management Group
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Join the Flow!

If you share our vision to restore our heritage of flowing desert rivers, cool our cities, and live hydro-local, join our monthly giving program! Your monthly gift will provide stable funding for our programs and invest in a sustainable future.

Set up your monthly gift now at
Watershedmg.org/Flow