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VISITE
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a living river

SANTA CRUZ RIVER 2026 DOWNTOWN TUCSON TO MARANA



MILESTONES OF STEWARDSHIP



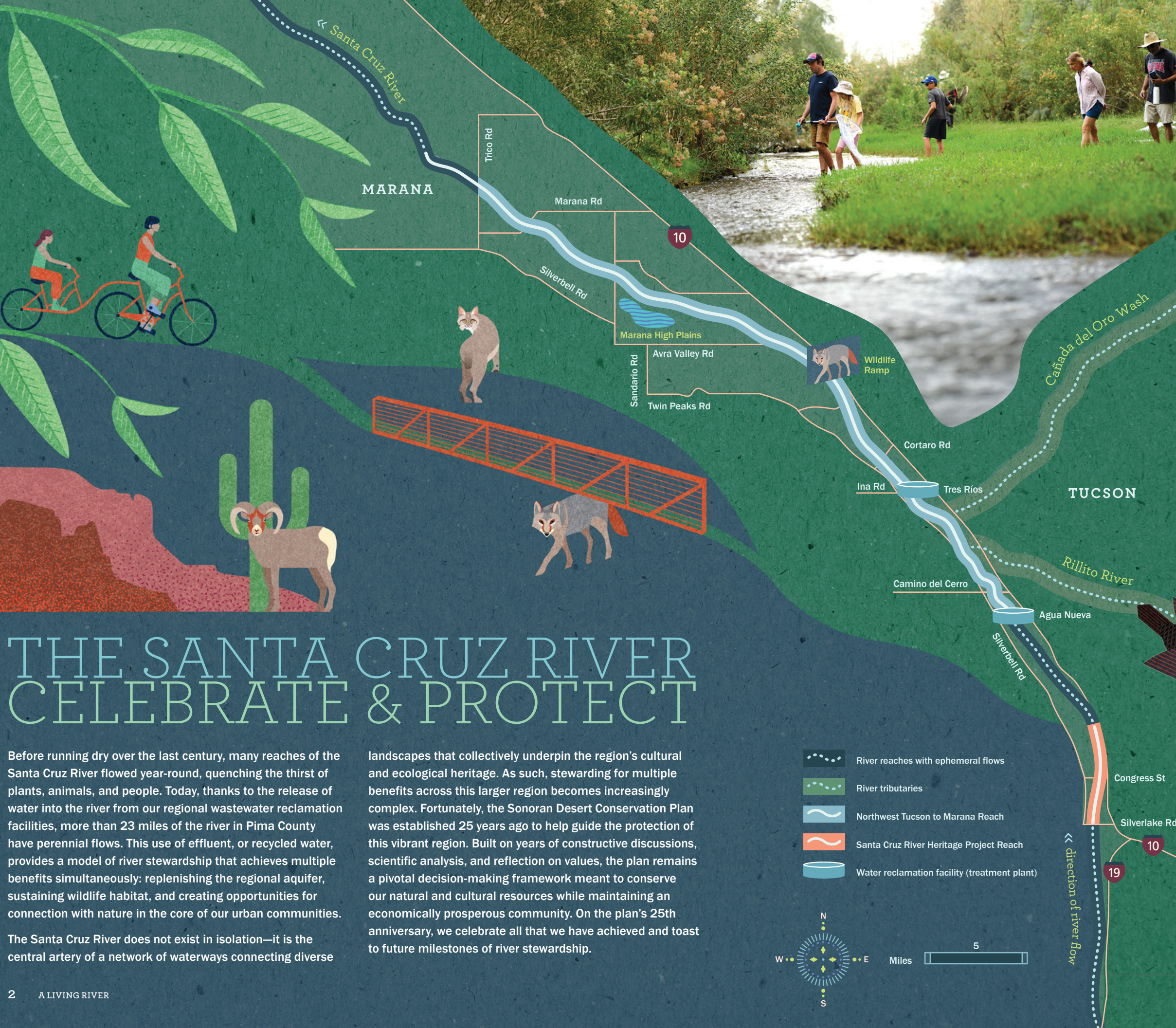
THE SANTA CRUZ RIVER CELEBRATE & PROTECT

Before running dry over the last century, many reaches of the Santa Cruz River flowed year-round, quenching the thirst of plants, animals, and people. Today, thanks to the release of water into the river from our regional wastewater reclamation facilities, more than 23 miles of the river in Pima County have perennial flows. This use of effluent, or recycled water, provides a model of river stewardship that achieves multiple benefits simultaneously: replenishing the regional aquifer, sustaining wildlife habitat, and creating opportunities for connection with nature in the core of our urban communities.

The Santa Cruz River does not exist in isolation—it is the central artery of a network of waterways connecting diverse

landscapes that collectively underpin the region's cultural and ecological heritage. As such, stewarding for multiple benefits across this larger region becomes increasingly complex. Fortunately, the Sonoran Desert Conservation Plan was established 25 years ago to help guide the protection of this vibrant region. Built on years of constructive discussions, scientific analysis, and reflection on values, the plan remains a pivotal decision-making framework meant to conserve our natural and cultural resources while maintaining an economically prosperous community. On the plan's 25th anniversary, we celebrate all that we have achieved and toast to future milestones of river stewardship.

- River reaches with ephemeral flows
- River tributaries
- Northwest Tucson to Marana Reach
- Santa Cruz River Heritage Project Reach
- Water reclamation facility (treatment plant)



Tracking River Conditions

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Annual *Living River* reports share conditions along the flowing reaches of the Santa Cruz River. Included here are conditions from downtown Tucson to Marana for the 2025 water year (October 1, 2024, to September 30, 2025). Scan the QR code to learn more about data available since 2012.

Land Acknowledgement

We respectfully acknowledge that the Santa Cruz River flows through the land and territories of Indigenous peoples. Today, Arizona is home to 22 federally recognized tribes, with the Santa Cruz Watershed being home to the O'odham and the Yaqui, whose relationships with the land and river continue to this day. Learn more about the San Xavier District of the Tohono O'odham Nation at www.waknet.org and the Yaqui Tribe at www.pascuayaqui-nsn.gov

Notable Achievements

- Completed first-of-its-kind wildlife ramp south of Avra Valley Road.
- Removed 11 tons of river trash with the help of 577 volunteers.
- Built 5 structures near Twin Peaks Road to reduce river channel erosion.
- Augmented levee and removed sediment to improve flood capacity between Ina and Cortaro.

MANAGING FOR DIVERSE BENEFITS

Rivers perform many important services for people and wildlife. They move nutrients and sediments, recharge aquifers, sustain cooling trees and plants, promote and enhance recreational opportunities, and connect living organisms across habitats. As floodwaters spill out of a river’s channel and onto its adjacent floodplain, riparian vegetation slows flood flows, reduces erosion, and filters water as it percolates into the ground.

The Santa Cruz River provides these benefits, but like many urban rivers, its natural state has been altered by development. As communities have grown and constructed buildings, parks, and other infrastructure close to the river channel, its historically wide floodplain in the Tucson area has shrunk. Therefore, preserving the river’s important resources and

processes, while also protecting humans and property, requires careful management and stewardship.

Releasing effluent into the river provides critical habitat, helps replenish the aquifer, and enhances vital open space in the middle of the urban area where people can connect with nature. Effluent flows are monitored to minimize contact with closed landfills and gravel pits adjacent to the river. Trees, thick vegetation, and accumulated sediments also require attention, because they can impede flows and cause floodwaters to spill out of the channel, especially in narrow urban stretches. To maintain flow capacity, these impediments are occasionally removed or managed. Other improvements and infrastructure further enhance the river as a community amenity.



Sonoran Desert Conservation Plan, a model for balancing growth and conservation

Twenty-five years after its establishment, the Sonoran Desert Conservation Plan remains a model for integrating conservation science, open-space preservation, land-use planning, cultural resource values, growth management, and long-term stewardship of the Santa Cruz River and its surrounding watershed. The accomplishments highlighted on the right are just two of many projects reflecting the plan’s values of protecting diverse landscapes in Pima County while also promoting an economically healthy community.



Marana High Plains project increases local recharge while providing habitat

Co-managed by the Regional Flood Control District and the Wastewater Reclamation Department, the Marana High Plains Effluent Recharge Project was built in 2002 to divert effluent from the river into adjacent infiltration basins. This multi-benefit project reflects key components of the Sonoran Desert Conservation Plan by blending aquifer replenishment with riparian habitat restoration—more water released from the Tres Ríos facility becomes groundwater that is retained within our community, and the native vegetation planted around the basins creates habitat along a major wildlife corridor. Pima County recently doubled the permitted capacity of the project, from 600 to 1,200 acre-feet per year. To date, the project has stored over 10,000 acre-feet of water in the aquifer for future needs while benefitting untold wildlife with food, shelter, and respite.



Wildlife ramp enhances regional migration and connection

The Sonoran Desert Conservation Plan identifies six critical landscape areas where it is imperative to protect wildlife corridors and remove obstacles to wildlife connectivity. One of these is the corridor necessary for wildlife to move from the desert and mountains east of the Santa Cruz River and Interstate 10, to the Tucson Mountains and west to the Ironwood Forest National Monument. The steep slope of the

levee on the bank of the Santa Cruz River north of Twin Peaks Road posed an obstacle to wildlife crossing the river. The Regional Flood Control District recently completed an award-winning ramp that provides an accessible slope for wildlife while still maintaining the levee’s role in flood safety. The project also added a pedestrian bridge for the stretch of the Chuck Huckelberry Loop that crosses over the ramp.

SANTA CRUZ RIVER HERITAGE PROJECT REACH

The Santa Cruz River near downtown Tucson once flowed year-round and supported a rich ecosystem inhabited by native fish, lowland leopard frogs, Sonora mud turtles, and other aquatic wildlife.

Over time, groundwater use from agricultural expansion and urban growth lowered groundwater levels. By the 1940s, groundwater beneath the river had dropped and much of this reach was dry. Perennial flows returned in June 2019, when the City of Tucson | Tucson Water launched the Santa Cruz River Heritage Project. Developed as part of a long-term recharge and water resilience strategy, the project releases highly treated reclaimed water into the river north of Silverlake Road to raise groundwater levels while supporting riparian habitat, recreation, educational opportunities, and community connection. The project reflects Tucson Water's One Water approach: using all sources to strengthen long-term water resilience while enhancing environmental stewardship and quality of life.

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Photo: Looking at river flood and Sentinel Peak

Vermilion flycatcher (*Pyrocephalus obscurus*)



94
bird species

Flame skimmer (*Libellula saturata*)



28
dragonfly species

From serving water to restoring an ecosystem

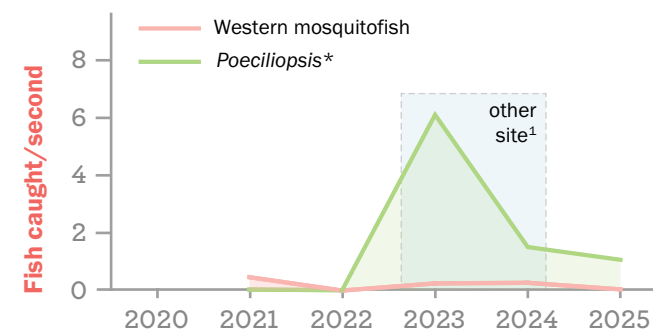
In its 125th year as a city department, Tucson Water traces its origins to the Santa Cruz River, the source of the first water delivered through Tucson's municipal system. Long before extensive groundwater infrastructure existed to pump groundwater, the river sustained communities throughout the valley for centuries. In 1882, Tucson's first municipal water system drew directly from the Santa Cruz River through a pipeline constructed near present-day Valencia Road, providing dependable water service to a growing desert city.

As the region expanded through the early twentieth century, increasing agricultural and urban groundwater demands gradually lowered aquifer levels across the basin. Over decades, the water table receded below the riverbed, and once-perennial Santa Cruz River sections eventually ran dry.

Today, Tucson Water is helping write a new chapter in the river's history—one focused on restoration, resilience, and long-term stewardship. Through the Santa Cruz River Heritage Project, reclaimed water now supports perennial flow in portions of the river once again, sustaining riparian habitat, expanding educational opportunities, and reconnecting the community to the waterway that helped shape Tucson itself.

Fish are thriving in this reach of the river

Gila topminnow (*Poeciliopsis occidentalis*), an endangered native fish once found throughout the river, was reintroduced to the Santa Cruz River Heritage Project reach in 2020. Annual surveys monitor the number of fish caught per second, allowing comparisons of fish numbers across years and between sites. A factor complicating the fish count is the presence of two non-native species, nearly identical to Gila topminnow: Western mosquitofish (*Gambusia affinis*) and an all-female hybrid of the Gila topminnow and the headwater livebearer from another river in Mexico, *Poeciliopsis occidentalis-monacha*. As of 2025, this site had the highest number of *Poeciliopsis* species in the Tucson area (1 fish caught/second). In 2023 and 2024, the survey site was dry and another site closer to the outfall was surveyed where the numbers were even higher, averaging 3.8 fish caught/second. Though Gila topminnow may be doing well, we don't know how many of these fish are hybrids, since identification requires dissection or genetic analysis.



*Percentage Gila topminnow versus hybrid is unknown.

¹Site dry and survey occurred closer to outfall where *Poeciliopsis* numbers averaged 3.8 fish/second.

Sonora mud turtles are established

Initial turtle surveys conducted by University of Arizona in 2022 found only 3 individual non-native turtles in this reach, 1 pond slider and 2 spiny softshell turtles. These 3 turtles were not observed again and may have been individuals trying to expand from the northwest reach of the river during large monsoon floods in 2021. A single native species, the Sonora mud turtle, was once abundant in the river and 8 were reintroduced to the Santa Cruz River Heritage Project reach in 2023 and 2024. An analysis of radio telemetry data that tracks turtle movements indicates that all 8 have stayed in the area. Although there is no evidence yet of the turtles reproducing, the project area shows promise.

Sonora mud turtle (*Kinosternon sonoriense*)



246
river program participants



NORTHWEST TUCSON TO MARANA REACH

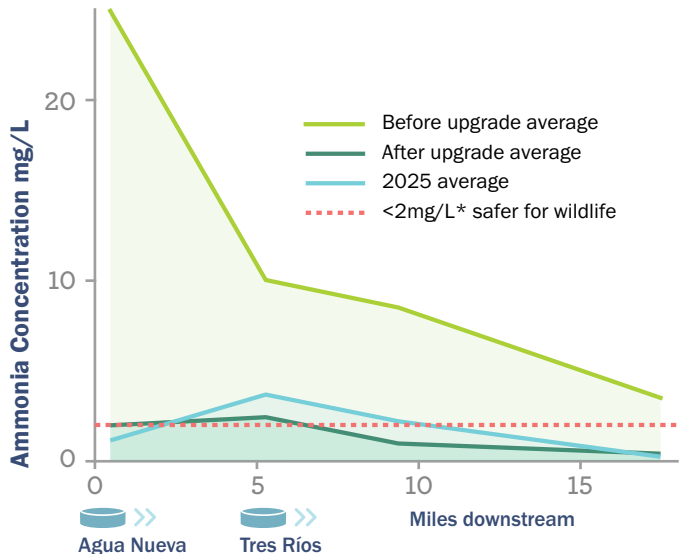
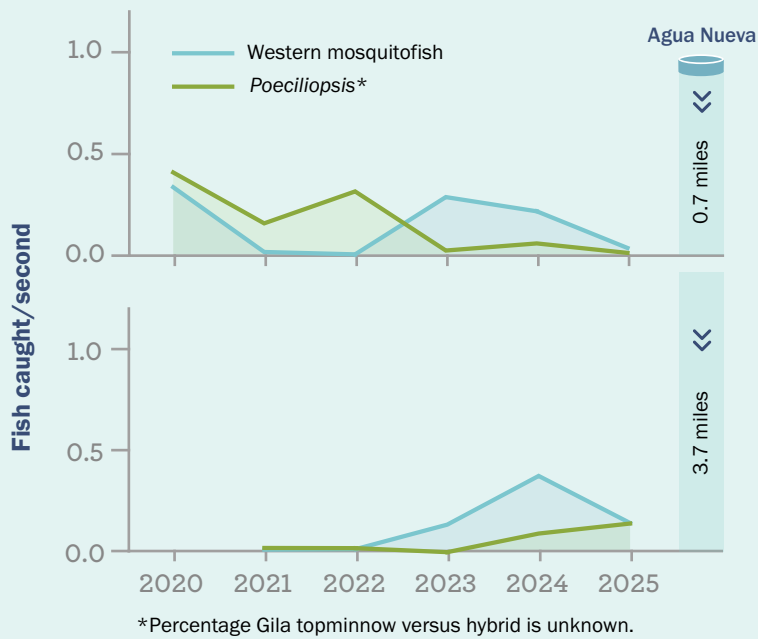
Beginning just north of Prince Road, this reach historically had only seasonal flows but is now Pima County's longest continually flowing section. Since the 1970s, Pima County's water reclamation facilities have released effluent into the river here year-round, creating a ribbon of green vegetation. Upgrades to the treatment process in 2013 resulted in higher-quality water that supports a thriving and more diverse aquatic community, including native and non-native fish species. Pima County and the Regional Flood Control District have identified projects to further improve this stretch of the river. These include creating a more meandering flow path to enhance wildlife and plant diversity, ensuring that human life and property are protected during high flows, and increasing connections to the river corridor for people and wildlife.

Bobcats are one of many species that make their home along this reach of the river. Watch a video captured by Pima County staff near the Agua Nueva facility.



Numbers of *Poeciliopsis* fish vary by location

After a 70-year absence, the Gila topminnow (*Poeciliopsis occidentalis*) was first detected near the Agua Nueva facility in 2017. As discussed on page 7, understanding the status of the Gila topminnow's return is complicated by the presence of Western mosquitofish and the hybrid *Poeciliopsis occidentalis-monacha*. Since 2023, *Poeciliopsis* numbers recorded at a site about 0.7 miles from the Agua Nueva facility appear to be declining. Western mosquitofish also appear to be declining here. However, at another site three miles downstream, *Poeciliopsis* appear to be increasing. This area may have more habitat available, since at this site the river's shallow waters wind through cattails and other vegetation, creating a more complex environment than the relatively uniform flow channel with deeper water closer to the treatment plant. Although Gila topminnow numbers could be increasing, we don't know how many of the *Poeciliopsis* fish are hybrids.



*Ammonia standard varies with temperature and pH.

River's already high-quality water likely to further improve

Ammonia, a form of nitrogen common in effluent, can be toxic to fish and other aquatic wildlife at high concentrations (generally, <2 mg/L is considered safe). After the 2013 facility upgrades, the effluent in the river contained less ammonia. As the water travels downstream, natural processes further break down contaminants and improve water quality. The Regional Wastewater Reclamation Department is building a new treatment process, the Anammox Sidestream, at the Tres Ríos facility that is expected to remove more ammonia, while using less energy than the current process. When completed, the new treatment process will be the first of its kind implemented in the region, highlighting Pima County's innovative and focused commitment to environmental stewardship and service to the community.

245
bird species



35
dragonfly species

Non-native turtles more abundant than Sonora mud turtles

Sonora mud turtles were once abundant in the Santa Cruz River. Recent research from University of Arizona has documented more non-native turtles than mud turtles throughout this reach. The highest numbers of mud turtles were found in areas with shallower, slower flows that are more like the river's historic flow patterns. In areas with faster, deeper water, the non-native spiny softshell and pond slider are the most abundant turtle species found.

1,943
river program participants

IT'S YOUR RIVER GET INVOLVED!

Create art and poetry about the river

For 25 years, the Pima County Conservation Lands and Resources staff has connected young people with water in the desert through science and art with the Living River of Words program. Participating schools bring hundreds of students on field trips to the river each year. In addition, any local youth (ages 5–19) can enter the program's Living River of Words Youth Poetry and Art contest. Some of the 2026 contest finalists are featured in this report. For more information, visit www.pima.gov/RiverofWords

Join a Nature Program

Whether it is a guided tour, a virtual program, or creative exploration, there is a program available for any age group to explore and learn about the Sonoran Desert and Santa Cruz River. The event calendar on University of Arizona's Santa Cruz River Connections website has a great compilation of programs: santacruz.arizona.edu



Flame skimmer (*Libellula saturata*)

Get Involved with Sonoran Institute

Follow us on social media and join our mailing list. Learn about Santa Cruz River events and get updates on all Sonoran Institute programs. Sign up at: tiny.cc/scrnews



The Leafy Damselfly Nymph by Melanie Saenz, Grade 6
Los Amigos Tech Academy • Mr. Buckley

THE MEANING OF A RIVER

People see me as just
a water source,
but I can do so much more.
I care for the animal kind.
I give home to very special fish.
I shimmer and shine
like the moon at night.
But what gives me my name
is the way I give the humankind
a world of their own.

Linnaea Reddoch, Grade 4
Wilson K-8 School • Ms. LaJoy



The Red Ocotillo by Mayle Castro, Grade 6
Los Amigos Tech Academy • Mr. Buckley



Rufous hummingbird (*Selasphorus rufus*)

Explore the River

When we asked last year how you spend time at the river, readers of this report listed relaxation, nature enjoyment, and exercise as the top reasons they visit. With small neighborhood parks, nature preserves, sports fields, and the Chuck Huckelberry Loop recreation path, there are plenty of places along the river to enjoy these pursuits. The Loop is particularly popular, with approximately 148,000 pedestrians and cyclists traveling along one stretch between Speedway and Grant last year!



The Bird's Sunrise by Kaiyah Crosby, Grade 6
Safford K-8 School • Ms. Hipps

Build community at the river

Cleanup events help beautify the Santa Cruz River and provide an opportunity for people to connect with fellow community members and organizations helping to steward the river. In 2025, a total of 577 people removed about 11 tons of trash from the river during 17 cleanup events. Connect with Sonoran Institute or contact AdoptaSite@tucsoncleanandbeautiful.org for information on Tucson-area cleanups.

148,000

pedestrians
& cyclists

ACKNOWLEDGEMENTS

Sonoran Institute, Pima County, and City of Tucson | Tucson Water developed and prepared this report with funding from the Pima County Regional Wastewater Reclamation Department, Pima County Regional Flood Control District, City of Tucson | Tucson Water, and community stakeholders. We thank all who contribute to the data collection and conservation efforts along the river. We especially thank the University of Arizona and Michael T. Bogan for his expertise, public education, and diverse research efforts along the Santa Cruz River.



The Desert of Life by Amaya Hendricks, Grade 4
Safford K-8 School • Ms. Rupe

IMAGE CREDITS

Cover photo: Marana High Plains Recharge Project by **Randy Metcalf/Pima County 2–3:** Dragonfly tour on the Santa Cruz River by **Julius Schlosburg 5:** Marana High Plains Recharge Project by **Randy Metcalf/Pima County;** Wildlife ramp by **Nanda Srinivasamurthy, Pima County 6:** Flame skimmer dragonfly by **Spencer Harding;** River flood c.1903 courtesy of **Arizona Historical Society;** Vermilion flycatcher by **Agnieszka Baca 6–7:** Fish and Sonora mud turtle by **Michael T. Bogan 7:** Child with binoculars by **Spencer Harding 8:** Marana High Plains Recharge Project by **Randy Metcalf/Pima County 9:** Snowy egret by **Sally/Adobe Stock;** Roseate skimmer dragonfly, and dragonfly tour on the Santa Cruz River by **Julius Schlosburg 10:** Children at Mission Garden, and Flame skimmer dragonfly by **Spencer Harding 11:** Rufous hummingbird by **Monica Lara**

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SONORAN INSTITUTE has worked since our founding in 1990 to realize our vision that the Santa Cruz River, from Mexico to Marana, is a living, flowing river and the foundation of community health and prosperity. The Sonoran Institute's mission is to connect people and communities with the natural resources that nourish and sustain them.



Sonoran Institute



@SonoranInstituteFlix

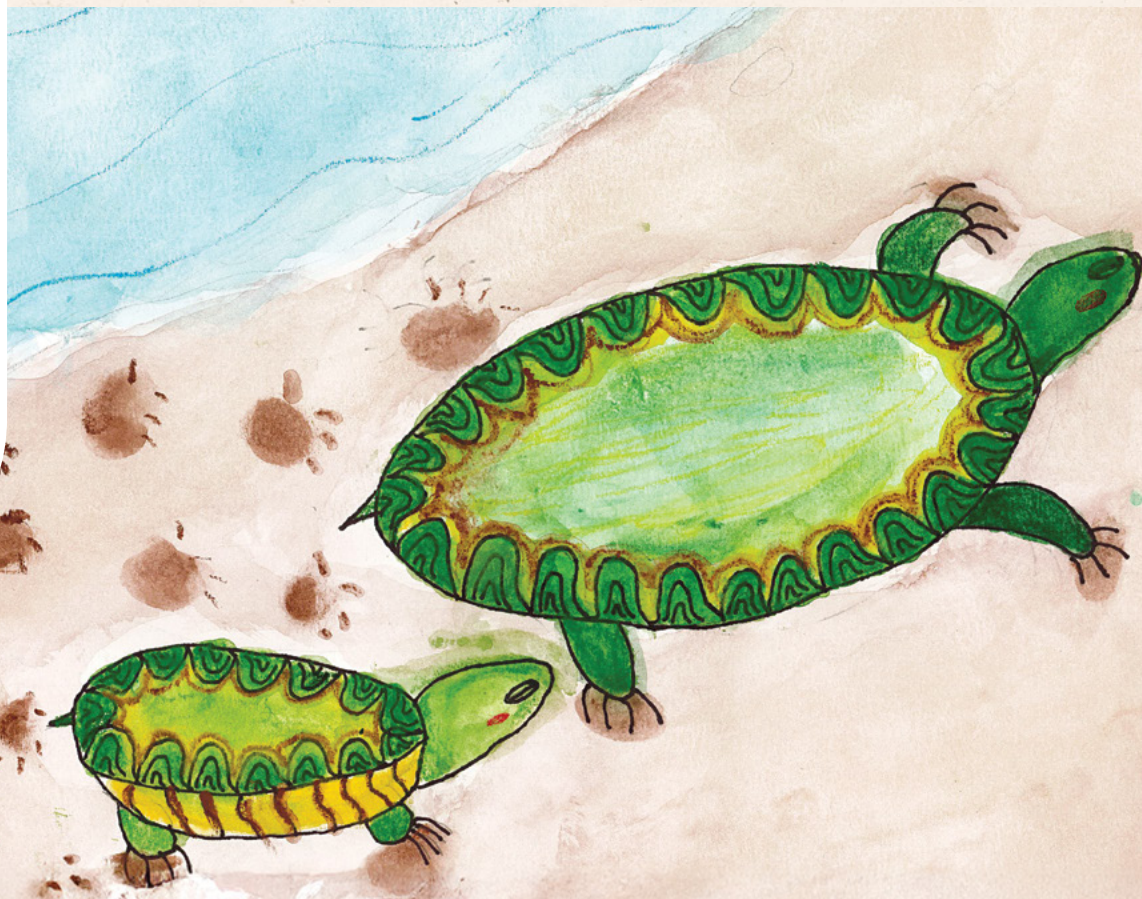


SonoranInstitute

Help track frogs with FrogSong

FrogSong is a community science project on iNaturalist managed by Pima County. Data will inform management decisions and help track populations of both invasive and native amphibians over time.

LEARN MORE
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PIMA COUNTY—pima.gov

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Pima County Regional Wastewater
Reclamation Department
Pima County Conservation Lands
and Resources
Pima County Parks and Recreation

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Tucson Water

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komkud by Allie Juan, Grade 9, Hasan Preparatory & Leadership School • Ms. Jasmine