

# a living river

CHARTING SANTA CRUZ RIVER CONDITIONS  
NORTHWEST TUCSON TO MARANA—2018 WATER YEAR



CARING FOR THE RIVER:  
MAKING IMPROVEMENTS FOR NATURE AND COMMUNITY



SONORAN  
INSTITUTE



PIMA COUNTY





# THE SANTA CRUZ RIVER CELEBRATE AND PROTECT

The Santa Cruz River near Tucson has seen many exciting improvements since this report series began in 2013. Although the river flows are now shorter and more variable, the water is cleaner, aquatic wildlife diversity is increasing, and the endangered Gila topminnow again calls the river home. Projects all along the river are enhancing wildlife habitat and improving recreation opportunities. And, for the first time, there is promise that water will remain in the river.

From northwest Tucson to Marana, the Santa Cruz River provides Pima County's primary wetland habitat, with river flows sustained year-round by the release of effluent—highly treated wastewater. Pima County has released recycled water into the river since the 1970s, but river conditions dramatically improved recently, thanks to the county's investment of over \$600 million in December 2013 to upgrade the treatment process. The substantially improved water quality supports both a rare aquatic environment and a river park that reconnects our community to our rich river heritage.

Currently, several state and local efforts are helping secure water for the river and ensure that stretches continue to flow year-round. The fact that the river environment's health is being considered as part of the water planning process bodes well for the future of the Santa Cruz River and is truly cause for celebration.

You can be part of this process as well. Add your voice by participating in community workshops designed to help the Pima County Regional Flood Control District develop a river management plan. Where can we invest to further improve this important corridor? What management alternatives do we prefer? Where can we align priorities to maximize aquifer recharge and wildlife habitat while ensuring flood safety? Help us determine the future of this living river!





# TREND OF IMPROVED RIVER HEALTH CONTINUES IN 2018



Roseate skimmer dragonfly (*Orthemis ferruginea*)



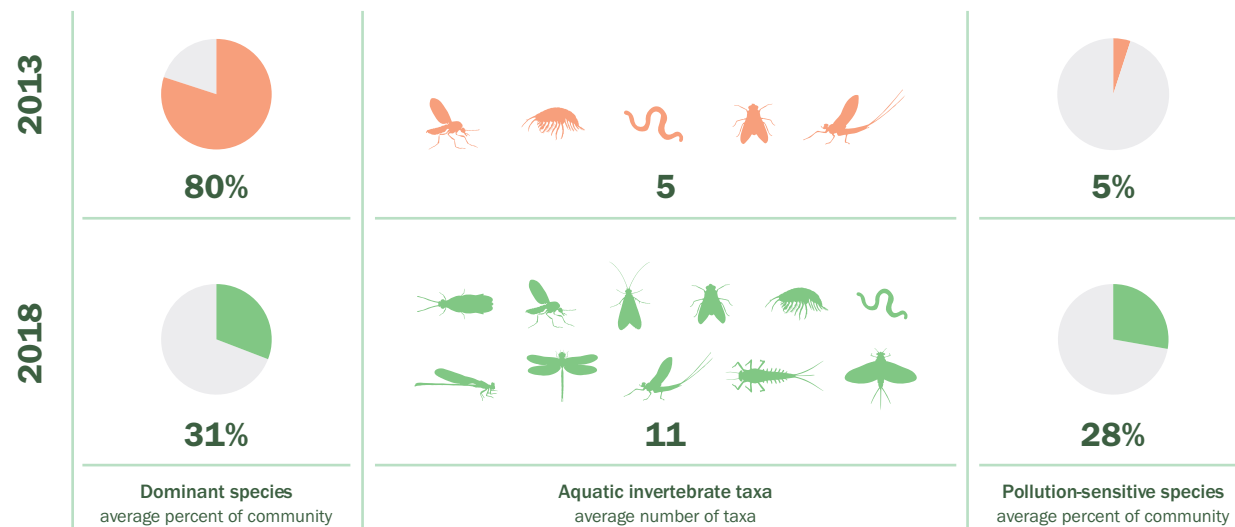
## AQUATIC INVERTEBRATE DIVERSITY INCREASED

Aquatic invertebrates break down organic materials in rivers and are important food for wildlife. Species sensitive to pollution are a key indicator of river health; the more pollution-sensitive species present, the healthier the river. Diversity of species also indicates a healthy aquatic ecosystem.

Of species sampled at four sites in 2013, a single group comprised 80% of the aquatic invertebrate community on average. In 2018, the average dropped to 31%. This trend toward increased diversity is supported by a

doubling of the number of species and an increase in pollution-sensitive species.

University of Arizona researchers found over 160 invertebrate species along this reach of the Santa Cruz, including 12 pollution-sensitive species and over 40 species of dragonflies. Some dragonflies, like the powdered dancer and neotropical bluet, recently appeared and are now very common. The newest arrival in 2018 is the russet-tipped clubtail, a species associated with large rivers whose nearest population is along the Gila River near Kearny.

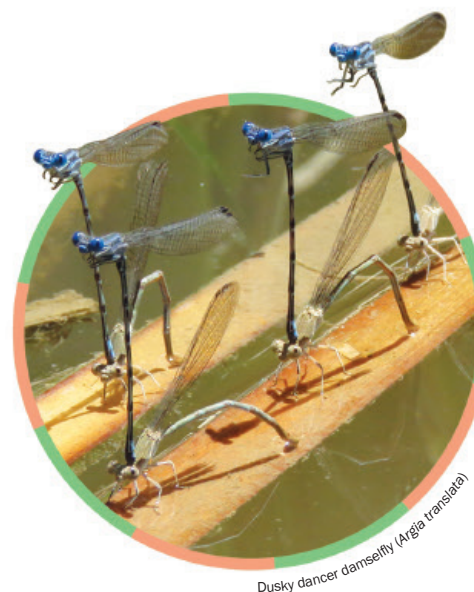
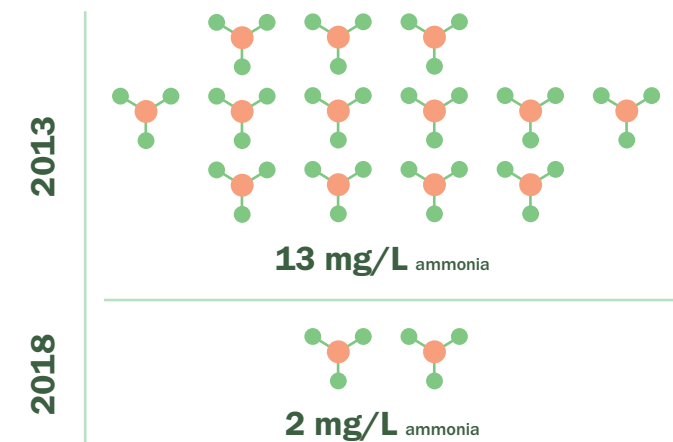


Review all data in supplementary report at [www.tiny.cc/tlr18](http://www.tiny.cc/tlr18)



## WATER QUALITY IMPROVED

Increased aquatic invertebrate diversity is primarily the result of improved water quality. Perhaps most significant are the reduced levels of ammonia, a form of nitrogen common in effluent and toxic to aquatic life at high concentration. Average ammonia concentrations declined from a toxic 13 mg/L in 2013 to 2 mg/L in 2018, and the percentage of discrete water samples with elevated ammonia dropped from 83% to 21%. Pima County is evaluating system processes and installing new technologies in 2019 to address occasional, short-lived periods of elevated ammonia in the river.



Dusky dancer damselfly (*Argia translata*)



Powdered dancer damselfly (*Argia moesta*)

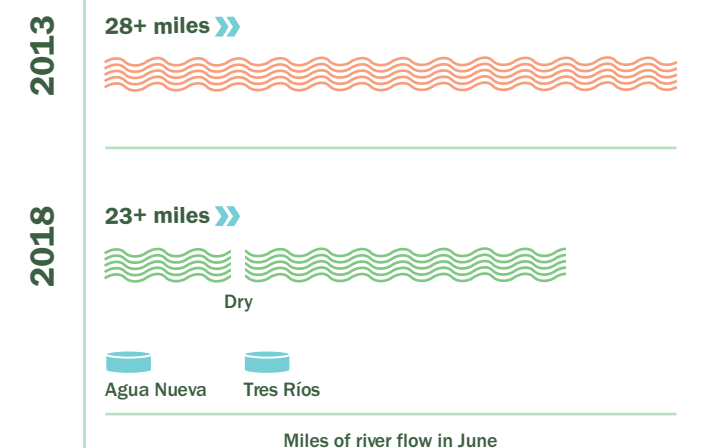


Russet-tipped Clubtail dragonfly (*Stylurus plagiatus*)



## JUNE FLOWS FROM AGUA NUEVA NO LONGER REACH TRES RÍOS

Since the upgrade, flow extent is shorter and more variable, especially in June, when miles of flow are lowest. In June 2013, the river flowed uninterrupted for over 28 miles. In June 2018, flow decreased to just over 23 miles and went dry for a 0.6 mile stretch before being replenished by the Tres Ríos facility. This dry stretch before Tres Ríos is now common in June and has ranged from 0.3 to nearly 2 miles in length. Many factors impact flow extent. Decreased flow may indicate increased recharge; in fact, the rate of recharge was four times higher here than in 2013. However, the Agua Nueva facility also released 75% less water (5,600 acre-feet in 2018 vs. 22,300 acre-feet in 2013). While recharge helps replenish the aquifer, fewer miles of flow means less habitat for wildlife, including fish and aquatic birds.





# OUR LIVING RIVER HOW SHOULD WE MANAGE IT?

## IN-CHANNEL RECHARGE RECEIVES MORE CREDIT

In 2019, Arizona enacted exciting legislation that provides an incentive to release effluent into the river. Previously, water owners releasing effluent into the river to recharge the aquifer earned only 50% credit for the volume recharged. Thanks to the new legislation, signed as part of the Drought Contingency Plan negotiations for the Colorado River, three stretches of the Santa Cruz River in Pima County will now receive 95% credit for effluent recharged along the river. This critical legislation is a huge milestone to celebrate.

## TIME TO FOCUS ON RIVER MANAGEMENT

With increased assurance that water will continually flow in the Santa Cruz River, now is the time to determine how best to manage and improve the river corridor. The Pima County Regional Flood Control District, which has operational control and owns much of the corridor, is preparing a management plan for the Santa Cruz from Grant Road to Trico Road. While the Flood Control District's primary responsibility is to minimize flood risk, there are opportunities through this process to enhance the river's diverse benefits.

To protect the river corridor's wildlife habitat, increase recreation opportunities, and preserve cultural resources, the Flood Control District and various project partners already have several efforts underway that include:<sup>1</sup>

- 1 Creating Meander Bend Park, located on the west bank of the river north of Grant Road, by filling an existing pit, restoring native vegetation, and installing a ramada.
- 2 Building new pedestrian bridges and connecting to existing pathways on the river's east side, allowing users to cross the Rillito River and Cañada del Oro Wash on the Chuck Huckelberry Loop trail.
- 3 Increasing the wetted area of the river, north of Cortaro Road, by replacing the single low-flow channel with three channels. This promotes aquatic habitat, water recharge, and growth of vegetation, while reducing erosion near development.



- 4 Protecting important habitat for over 200 birds and other wetland species at Marana's El Rio Preserve. Soil cement will preserve and stabilize the river's banks and connect wetland ponds with the river.
- 5 Highlighting the region's cultural traditions with new interpretive signage within the Los Morteros Conservation Area, located adjacent to El Rio Preserve.
- 6 Developing a drainage plan for the Marana area to increase flood safety, support development, and protect community amenities (unmapped).

## YOUR INPUT IS NEEDED

In order to create a river management plan, the Flood Control District is identifying areas of concern along the river and developing management priorities and alternatives, which may result in additional opportunities for river improvements. As such, the Flood Control District wants to understand the community's preferences through feedback on past and current projects. Your input is essential in the development of a plan for the Santa Cruz River that reflects community values. See next page for details on how to join the conversation.

<sup>1</sup>See the general location of these projects on the map on page 3.

## YOUTH POETS AND ARTISTS RECEIVE NATIONAL RECOGNITION

Living River of Words is a Pima County program that encourages young people to explore how water moves through the landscape and to learn about the connections that plants, animals, and people have with water. Students visit the Santa Cruz River and create art or poetry entries for the Living River of Words Youth Poetry and Art contest. Finalists are displayed in a traveling exhibit throughout Pima County and submitted to the national River of Words contest. Eight of the 2018 finalists from the Tucson program were finalists at the national level! Some of the 2019 selections for the traveling exhibit are shown on page 6 and the back cover. Learn more at: [www.pima.gov/nrpr](http://www.pima.gov/nrpr).

## ACKNOWLEDGEMENTS

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## IMAGE CREDITS

**Cover** left: Spot-winged glider dragonfly (*Pantala hymenaea*) by Michael T. Bogan; right: Santa Cruz River by Charlie Alolkoy: [www.alolkoyphotographics.com](http://www.alolkoyphotographics.com) **2:** Green heron ©Bill Hatcher/Sonoran Institute, 2019; Western pondhawk dragonfly by Michael T. Bogan; Gila topminnow by Bruce D. Taubert **3:** Santa Cruz River by Charlie Alolkoy **4-5:** All dragonfly and damselfly photos by Michael T. Bogan **6:** Artwork by Olivia Hitchings, age 10, Hendricks Elementary School — Janet Slingerland; Photographs ©Bill Hatcher/Sonoran Institute, 2019 **7:** Blackbirds and cottonwood tree ©Bill Hatcher/Sonoran Institute, 2019

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# GET INVOLVED

- Share your thoughts on river management at an upcoming workshop. Join a mailing list to learn more at: [www.tiny.cc/scrworkshop](http://www.tiny.cc/scrworkshop)
- Follow the Flood Control District's progress on the Santa Cruz River management plan between Grant Road and Trico Road at: [www.pima.gov/SantaCruzRiverPlan](http://www.pima.gov/SantaCruzRiverPlan)
- How do you want to see your floodplain managed? Make your voice heard and help develop a floodplain management plan at: [www.pima.gov/fmp](http://www.pima.gov/fmp)
- Celebrate Dragonfly Day on the Santa Cruz on November 9, 2019. Learn more at [www.sonoraninstitute.org](http://www.sonoraninstitute.org)
- Stay informed! Join the Sonoran Institute mailing list for the latest Santa Cruz news: [www.tiny.cc/scrsignup](http://www.tiny.cc/scrsignup)







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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. We work at the nexus of commerce, community, and conservation to help people in the North American West build the communities they want to live in while preserving the values which brought them here. We envision a West where civil dialogue and collaboration are hallmarks of decision making, where people and wildlife live in harmony, and where clean water, air, and energy are assured.



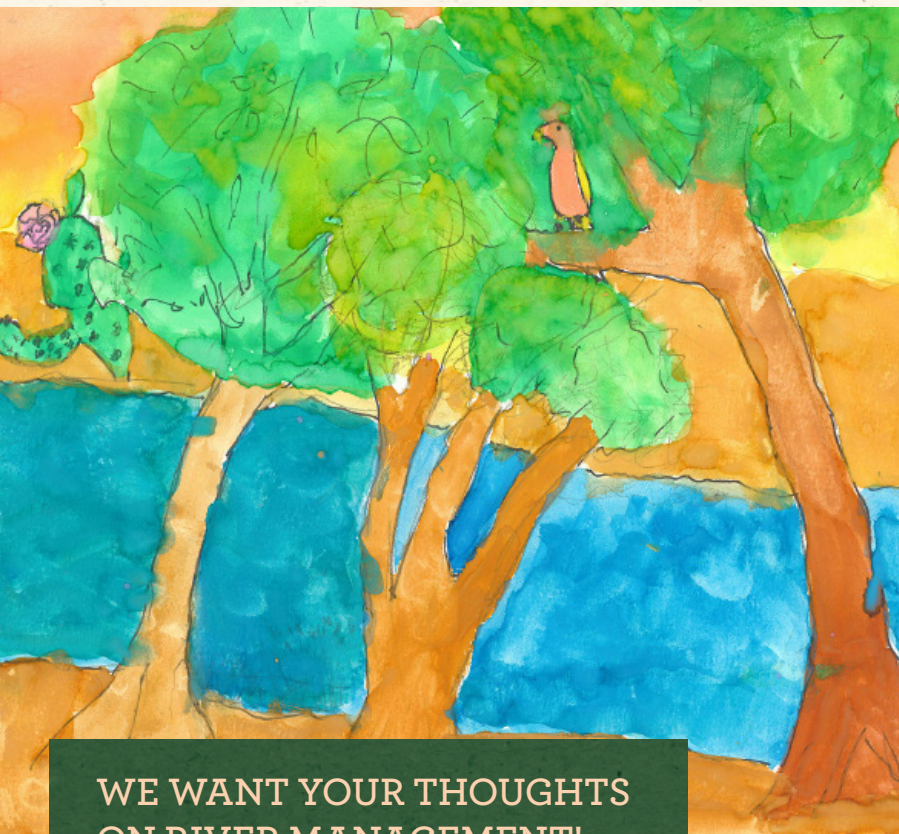
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Brianna Brock, age 11, DeGrazia Elementary School — Aaron Hart

Hayden Hishaw, age 11, Basis Tucson North — Carrie Vonier

## WE WANT YOUR THOUGHTS ON RIVER MANAGEMENT!

Sign up for information about upcoming workshops at: [www.tiny.cc/scrworkshop](http://www.tiny.cc/scrworkshop)

### PIMA COUNTY

Pima County Regional Flood Control District  
Pima County Regional Wastewater Reclamation Department  
Pima County Office of Sustainability and Conservation  
Pima County Natural Resources, Parks and Recreation

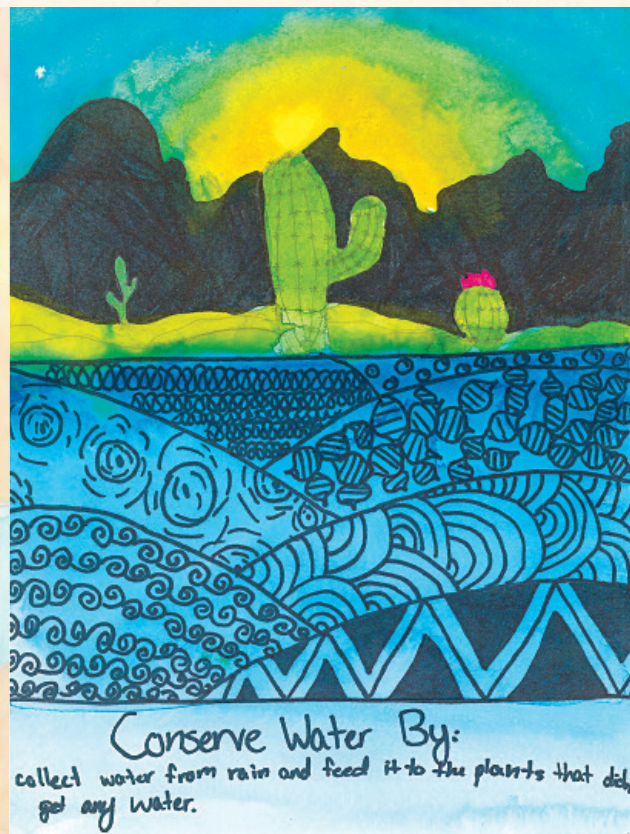
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