Date: September 24, 2021

To: The Honorable Chair and Members
Pima County Board of Supervisors

From: C.H. Huckleberry
County Administrator

Re: Eighth Annual A Living River Project Report Release – Charting Santa Cruz River Conditions Downtown Tucson to Marana – 2020 Water Year

Introduction

The attached 8th Annual Living River Report characterizes Santa Cruz river conditions from the Agua Nueva outfall to Trico Road as well as the downtown Heritage reach. This year’s report focused on Pima County’s stewardship activities along the river and managing for diverse needs. This year’s theme is “Water for the River” to highlight the first designation of water from the Conservation Effluent Pool for the fish and plants in the river.

The Annual Report is a partnership between several departments in Pima County, and the Sonoran Institute. The Pima County Regional Wastewater Reclamation Department (RWRD), the Pima County Regional Flood Control District (District) provided funding for this report, and, for the first time, Tucson Water also provided funding. The District also funded the Living River of Words Youth Poetry and Art Contest conducted by the Pima County Department of Natural Resources, Parks and Recreation (NRPR).

In addition to the Annual Report, the Sonoran Institute prepares a digital supplementary report cataloging a more comprehensive dataset of river conditions.

Findings

The cleaner effluent discharged into the river provides the conditions for aquatic life to thrive. Since water treatment upgrades came online in 2013, nearly five times the number of invertebrates now call the river home. Cleaner effluent discharged into the river also infiltrates more quickly into the aquifer system. This condition allows more water to go underground rather than flow on the surface resulting in shorter flow extent.

The report explains that the endangered Gila topminnow has expanded its range in the Santa Cruz River since it first appeared downstream of the Agua Nueva Wastewater Reclamation Facility (WRF) in 2017, and now is also found downstream of the Tres Rios WRF as well.

The improved conditions also have drawn more people to the river. Last year people were asked to provide feedback on specific projects along the Santa Cruz River as part of the District’s Santa Cruz River Management Plan. This year’s report documents strong public support for the vast majority of projects proposed in the Santa Cruz River Management Plan.
Revised Format

This year the report was expanded to 12 pages including two page spreads for each of the two effluent-dependent reaches: The Agua Nueva outfall to Trico Road reach, and the downtown Heritage reach. Additionally, a version translated into Spanish is available.

Public Outreach

The more concise format also allows more reports to be printed (this year 13,000, compared to less than 2,000 reports in the first few years). To expand the outreach, 1,300 copies of the Living River Annual reports were included in the ‘Nature-to-Go kits’ prepared by NRPR. Reports will be distributed through all 27 branches of the Pima County Library system. Once again, we are planning to mail the report to 11,000 households along the river. Mailing the report allows the County to engage more directly with the public regarding the long-term plans for the Santa Cruz River corridor by asking them to participate in a public survey on the Santa Cruz River Management Plan alternatives.

The Living River Project continued to engage young people in science and art activities highlighting the Santa Cruz River via NRPR’s Environmental Education program. Through web resources, online workshops, and take-home educational kits, we reached more than 1,300 families and engaged 49 schools and community organizations in the Living River of Words program this year. A selection of the youth art and poetry inspired by these activities is displayed in a traveling exhibit circulating through Pima County libraries. Seven of these art pieces won international recognition this year.

The District is sponsoring virtual Dragonfly Day on October 2nd in partnership with the Town of Marana, NRPR, the University of Arizona, and Sonoran Institute. This event will showcase the diversity of the dragonfly population supported by the river. Dragonfly Day will coincide with the release of this 8th Annual Living River Report.

CHH/sp

Attachments

c:  Jan Lesher, Chief Deputy County Administrator
Carmine DeBonis, Jr., Deputy County Administrator for Public Works
Francisco García, MD, MPH, Deputy County Administrator & Chief Medical Officer, Health and Community Services
Yves Khawam, PhD., Assistant County Administrator for Public Works
Suzanne Shields, P.E., Director, Regional Flood Control District
Jackson Jenkins, Director, Regional Wastewater Reclamation Department
Linda Mayro, Director, Office of Sustainability and Conservation
Chris Cawein, Director, Natural Resources, Parks and Recreation
a living river

CHARTING SANTA CRUZ RIVER CONDITIONS
DOWNTOWN TUCSON TO MARANA—2020 WATER YEAR

WATER FOR THE RIVER
THE SANTA CRUZ RIVER CELEBRATE AND PROTECT

When the Sobaipuri O’odham, ancestors of the Tohono O’odham Nation’s San Xavier District, arrived here over 12,000 years ago, the Santa Cruz River provided the essential water to live in this hot, arid region. The river has since changed and groundwater pumping dried many stretches, but we celebrate more than 24 miles of thriving river, a new flowing stretch, and the first-ever dedication of water specifically for river health.

In Pima County, two reaches flow year-round thanks to the release of effluent, or highly treated wastewater, from two water reclamation facilities treating wastewater from homes and businesses in our urban areas. In the 1970s, releasing effluent in the river in northwest Tucson was an easy way to dispose of wastewater. Over time, effluent’s role in raising the water table and giving life to native plants and wildlife through river flows has become apparent.

In 2019, Tucson Water’s Santa Cruz River Heritage Project brought water back to the river near downtown Tucson by piping effluent to a new outfall, or release point. Today, the river in downtown Tucson and from northwest Tucson to Marana flourishes with willows, cattails, water birds, fish, and other wildlife. Parks all along the river are increasingly vibrant as more people connect with nature and explore our river heritage.

The Santa Cruz and other waterbodies are the lifeblood of the desert. Recognizing this, elected officials created the Conservation Effluent Pool 20 years ago to apportion some effluent for river conservation projects. With the first applications finally approved in 2021, some of this water will be used to sustain river flows specifically to benefit plants and aquatic wildlife in the downtown Tucson reach and downstream of the Agua Nueva reclamation facility. This important decision can serve as a model for other sections of the river. Join us to celebrate and protect this living river!

NOTABLE ACHIEVEMENTS

- Water is designated for the river’s fish and plants
- Gila topminnow found in more reaches of the river
- Aquatic invertebrate diversity increases
- Broad support for proposed improvement projects
- River popular for recreation and wildlife viewing

LAS CAPAS

The river corridor and its floodplains are rich with evidence of people living and farming along the river since ancient times. Near the current day Tres Ríos facility lies an ancestral village that archaeologists named Las Capas, meaning “the layers.” Here, researchers have discovered farm fields and canals (outlined with chalk in upper right) that were used intensively by indigenous people for over 4,000 years.

Las Capas aerial by Henry Wallace, Courtesy Desert Archaeology, Inc.

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Las Capas aerial by Henry Wallace, Courtesy Desert Archaeology, Inc.

Tracking River Conditions

Included here are Santa Cruz River conditions in the flowing reaches of the Heritage Project and northwest Tucson to Marana during the 2020 water year (October 1, 2019 to September 30, 2020). To explore more information, download a supplementary report from the Sonoran Institute website at www.tiny.cc/tlr20.

Sonoran Institute launched the annual Living River reports in 2008 to track river conditions in Santa Cruz County. The effort expanded in partnership with Pima County in 2012 and the City of Tucson in 2020 to report on conditions in the flowing reaches in Pima County. All Living River reports can be found on the Sonoran Institute website: www.sonoraninstitute.org.

LEGEND

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

Sonoran Institute illustration by Robert B. Ciaccio, Courtesy Desert Archaeology, Inc.

Greater yellowlegs (Tringa melanoleuca)

Spotted sandpiper (Actitis macularia)

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Rivers provide water for people and wildlife, move nutrients and sediments, recharge aquifers, and sustain cooling trees and plants. When flooding, water spills out of the river's channel and onto the adjacent land—the floodplain. Riparian vegetation on the banks and in the floodplain works to slow flood flows, reduce erosion, filter water as it percolates into the ground, and provide habitat for wildlife.

While the river serves multiple purposes, a top priority is that it is capable of safely letting floods pass through urban areas. Historically, the Santa Cruz River winding through the Tucson area had a very wide floodplain. But as our communities grew and buildings, parks, and other infrastructure were built close to the river, the floodplain narrowed. This is especially true near the Heritage Project, where development confines the river and floodplain to a narrow corridor near downtown Tucson.

In this reach, preventing flooding of adjacent neighborhoods is critical. Thick, tall vegetation and accumulated sediment can impede flows and cause floodwaters to rise out of the channel and into neighborhoods. Therefore, trees and excess sand and dirt are occasionally removed to encourage growth of grasses or small shrubs instead. North of the Agua Nueva and Tres Ríos facilities, the river corridor is wider. Here, the river can meander a bit, floodwaters can more safely rise, and flood flows can easily pass regardless of dense or tall trees.

Stewarding this important resource is complex. The Pima County Regional Flood Control District is leading a process to engage the community in the development of a management plan for the river from Grant Road to the Pinal County line. In the downtown reach, the Flood Control District is working closely with City of Tucson to manage the Heritage Project.

**Heritage Project Reach**

The floodplain along the Heritage Project is a narrow corridor near downtown Tucson. Trees and excess sand are occasionally removed to prevent flooding of adjacent neighborhoods.

**Northwest Tucson to Marana Reach**

The floodplain north of the Agua Nueva and Tres Ríos facilities is wider. Floodwaters can safely rise and spread out, even with the presence of dense trees along the flowing water.

**Flood safety**—accumulated sediment and vegetation was removed from the downtown reach in May 2020 to increase the volume of floodwaters that can safely pass and reduce risk of flooding adjacent neighborhoods.

**Wildlife habitat**—the Conservation Effluent Pool was created 20 years ago to set aside water for riparian projects. In 2021, Pima County and Tucson Water were the first applicants granted portions of this supply to ensure there is water to support Gila topminnow near the Agua Nueva facility and riparian vegetation near downtown.

**Groundwater quality**—effluent put in the river naturally seeps into the ground and raises the water table. Near downtown, the water table is carefully monitored to prevent water from reaching historic landfills and from the possibility of leaching contaminants into the groundwater.

**River access and recreation**—the Flood Control District is considering wide-ranging improvements to enhance visitor experience of this community amenity, including increased access to the river and to The Chuck Huckleberry Loop trail.

**Non-native species removal**—community members are removing invasive buffelgrass in the downtown reach. Tucson Audubon and Northwest Fire District are removing salt cedar which poses a fire risk along the river north of Agua Nueva.

**Tres Ríos**

Tres Ríos 32,300 acre-feet

**Agua Nueva**

Agua Nueva 12,100 acre-feet

1 acre-foot (AF) = 0.75 football fields covered with water one foot deep
HERITAGE PROJECT REACH

Beginning north of Silverlake Road, this reach historically flowed year-round until 1914. As groundwater levels declined with increased pumping, it has typically been dry since the 1940s. Flows returned in June 2019, when Tucson Water launched the Santa Cruz River Heritage Project. Using the reclaimed water system, the project transports effluent from the Agua Nueva facility and may release up to 3,150 acre-feet annually into the river downtown. Though developed primarily to recharge water in the aquifer, the Heritage Project is also creating riparian habitat, establishing community cultural connections, and enhancing development opportunities.

FLOW GOES FARTher THAN ANTICIPATED

Overall, the flow extent of the Heritage Project is farther than anticipated. Expected to only reach Mission Lane, in June 2020 flows traveled twice as far—over two miles—to Speedway. The project is still new, and the volume of water being released is a key factor influencing how far the river flows. However, natural factors like soil type, vegetation density, and scouring floods also play a role. Tucson Water adjusts the flow rate to maximize recharge while keeping rising groundwater levels away from historic landfills.

WILDLIFE QUICKLY FIND THE WATER

Wildlife diversity increased with the new water in the river, and University of Arizona research documented the quick arrival of dragonflies. Only days after flows began, two sites had an average of five dragonfly species. By late summer, this average was up to 21, comparable to the number of species found at a reference site in Marana. A similar pattern of colonization occurred after the return of flow following sediment removal in spring 2020.

134 bird species
214 plant species

The Heritage Project has created a new ribbon of green vegetation. A wetland with cattails and other riparian vegetation quickly formed near the outfall where the water pours into the riverbed. In spring 2020, a project to remove accumulated sediment and vegetation temporarily halted flow, but the wetland area that was preserved near the outfall allowed plants to quickly rebound over the summer with the return of water.

1 mile anticipated flow length
2 miles June flow length
Mission Lane
Speedway Boulevard

Wildlife quickly find the water. A similar pattern of colonization occurred after the return of flow following sediment removal in spring 2020. As of October 2020, the endangered Gila topminnow also lives here. Although this native fish is in other reaches of the river and may have eventually appeared without help, wildlife managers sped up its arrival by introducing over 500 individuals. To give the topminnow and all native wildlife the best chance, signage reminds people of state law prohibiting the release of pets, plants, or wildlife into the river.
Beginning near El Camino Del Cerrito, this reach historically had only seasonal flows but is now Pima County’s longest section of flowing river. Since the 1970s, Pima County water reclamation facilities have released effluent into the river year-round, creating a lush ribbon of green vegetation. Following upgrades to the treatment process in 2013, this much higher-quality water supports a thriving and more diverse aquatic community, including native and non-native fish species. Now the Flood Control District has identified 20 projects to further improve this stretch of the river, such as creating a more winding flow path to foster more wildlife diversity.

NORTHWEST TUCSON TO MARANA REACH

Review more information in the supplementary report at www.tiny.cc/tlr20

Pima County facilities release high-quality water into the river that is both low in ammonia (a common component of effluent that is toxic to aquatic wildlife) and high in dissolved oxygen. As the water flows downstream and away from the facilities, natural processes further clean the water and improve conditions for aquatic wildlife. Ammonia breaks down and decreases in concentration while oxygen increases.

The high-quality water in the river is allowing aquatic invertebrates to thrive, as indicated at four monitoring locations in the river. In 2020, the number of aquatic invertebrate species observed reached a new annual high with an average of 14 species. Distance from the reclamation facilities may also influence diversity. From 2015 to 2020, average number of aquatic invertebrate species in the river increases with increased distance from the facilities.

FLOWS GUARANTEED AS TOPMINNOW EXPAND RANGE

Returning to the river in 2017, the endangered Gila topminnow appears to be thriving and possibly expanding their presence downstream. In fall 2020, this native species was found for the first time at three locations in the river. However, the river’s variable flow extent and occasional drying in summer remain concerns for the topminnow, as water from Agua Nueva does not always reach Tres Ríos in June. Approved in 2021, water from the Conservation Effluent Pool will now guarantee minimum flows be released for topminnow and other aquatic life even during the driest months downstream of Agua Nueva.

AQUATIC WILDLIFE DIVERSITY INCREASING

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The river is a great place to see wildlife, dragonflies, and birds. During Trail, complete with interpretive signage, and be sure to visit “the mortars” for a visit to Saguaro National Park.

GET INVOLVED!

EXPLORE THE RIVER Whether flowing or dry, the river and the nearby parks have much to explore. An easy way to discover the river is to travel along The Chuck Huckelberry Loop. This path, which includes about 25 miles of multi-use trail along the river, was voted best recreational trail in 2021 by USA Today. Pima County started collecting daily counts of pedestrians and cyclists along the path near St. Mary’s Road in June 2020. By September 2020, about 2,300 pedestrians and 45,500 cyclists used this stretch of the path.

The river is a great place to see wildlife, dragonflies, and birds. While visiting the river, you may have seen bushes, or dragonflies flitting over the water. Unfortunately, you were certain to also notice a lot of trash. The good news is that people are starting to tackle this problem. Volunteers help the Sonoran Institute to quantify and categorize the kinds of trash found in the river. This will help identify the different trash sources to better engineer long-term solutions. In addition, Tucson Clean and Beautiful regularly organizes cleanups with community partners. But you can also pick up trash right near your home and make a difference. With all washes ultimately leading to the river, trash can come from anywhere in the community. Help spread the word! Document your efforts to pick up trash with a post on social media and add: #NotInMyRiver

JOIN A TRASH CLEAN-UP While visiting the river, you may have seen a coyote trotting across the channel, a roadrunner darting through the bushes, or dragonflies flitting over the water. Unfortunately, you were certain to also notice a lot of trash. The good news is that people are starting to tackle this problem. Volunteers help the Sonoran Institute to quantify and categorize the kinds of trash found in the river. This will help identify the different trash sources to better engineer long-term solutions. In addition, Tucson Clean and Beautiful regularly organizes cleanups with community partners. But you can also pick up trash right near your home and make a difference. With all washes ultimately leading to the river, trash can come from anywhere in the community. Help spread the word! Document your efforts to pick up trash with a post on social media and add: #NotInMyRiver

1,400 TOTAL PROJECT REVIEWS

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IT’S YOUR RIVER

WE HEARD YOU Last year we asked for your feedback on proposed projects for the river north of Grant Road. Thank you for all your responses! We received over 1,400 project reviews from 358 people. While all 20 proposed projects received support, the five most favored include: litter traps, stream restoration near the outfall where water is added to the river, wildlife connectivity under I-10, trash clean-up events, and creation of a new wetland in a former gravel pit. This new wetland is already underway with removal of non-native salt cedars a key first step. Review all the feedback at: www.tiny.cc/surveyresponse

EXTRA INFORMATION

A Visit to Saguaro National Park

by Ileana Valentina Borquez-Rojas, age 7, Academy of Math and Science — Delanie Ornstein

One Lonely River: The Santa Cruz

by Mary Appel, age 10, Independent Entry

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ADDITIONAL RESOURCES

• Kids can enter the Living River of Words Poetry and Art contest. This Pima County program helps young people learn about water in the desert through science and art. View some of the 2021 finalists in this report. Learn more at: www.tucsonaz.gov/water/request-audit

• Follow the Pima County Regional Flood Control District’s progress on the management plan for the Santa Cruz River between Grant Road and Trico Road at: www.pima.gov/SantaCruzRiverPlan

• Stay informed! Join the Sonoran Institute mailing list for the latest Santa Cruz news and events: www.tiny.cc/scnews

• Follow the Sonoran Institute on social media for information and updates on the river management plan and other Santa Cruz River news.

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IMAGE CREDITS

Cover photo: Santa Cruz River by Charlie Alolkoy; www.alolkoyphotography.com 2: Greater Yellowlegs by Michael T. Bogan; 3: Spotted Sandpiper by Lisa Manouwitz, courtesy of Tucson Audubon; Girl riding on The Loop by Pima County Communications Office 4–5: River cross section by Terry Moody;Sonoran Institute 6: Before and after river photos, and Sonoran Desert toads laying eggs in the new water by Michael T. Bogan; 7: Dragonflies by Michael T. Bogan; Rillows by Martin Melina, courtesy of Tucson Audubon; 8: Gila topminnow by George Andrejko, courtesy of Tucson Audubon; Girl riding on The Loop by Pima County Communications Office 9: Gila topminnow by Claire Zugmeier;Sonoran Institute
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.

HELP CLEAN UP THE RIVER!
Join the #NotInMyRiver campaign

Sunset Reflection by Zahra Rafiyath, age 7, Independent Entry

CITY OF TUCSON MAYOR AND COUNCIL
Regina Romero, Mayor
Lane Santa Cruz, Ward 1
Paul Cunningham, Ward 2
Karin Uhlich, Ward 3
Nikki Lee, Ward 4
Richard Fimbres, Ward 5
Steve Kozachik, Ward 6

CITY MANAGER
Michael Ortega

CITY OF TUCSON
Tucson Water
www.tucsonaz.gov/water

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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Adelita Grijalva, Vice-chair, District 5
Rex Scott, District 1
Dr. Matt Heinz, District 2
Steve Christy, District 4

PIMA COUNTY ADMINISTRATOR
Chuck Huckelberry
www.pima.gov
Worms Eye View of the Desert
Abrielle Zoucha, age 8
Independent Entry
Grand Prize—Art—Category 2
The 2021 Living River of Words book is dedicated to all the parents, guardians, family members, neighbors, club leaders, librarians, teachers, and other community members who – even during this extraordinary year – helped inspire young people in our community to connect with nature and express their creativity. Thank you!

International River of Words Project

Pima County’s Living River of Words program serves as a regional coordinator for the international River of Words, a project of The Center for Environmental Literacy at Saint Mary’s College of California. Artwork and poetry created by this year’s local finalists will be entered into the international contest for a chance to be recognized at the next level in 2022.

Beginning on page 32 of this book, you will see the international finalists who were local Living River of Words finalists in 2020 and went on to be recognized at the international level this year. We are very proud to have these students and their creative work representing Pima County and Arizona!

Living River of Words Traveling Exhibit 2021

At the time of printing, Pima County Libraries have reopened with limited capacity and services. Although we will not be able to host an in-person awards gathering this year, the Living River of Words traveling exhibit – featuring the artwork and poetry of this year’s local and international finalists – will be displayed at local libraries and other venues throughout the coming year.

Please check our website for a schedule and more details:
www.pima.gov/riverofwords
Living River of Words: Youth Arts and Science

It has been a challenging year-and-a-half for all of us. Some of us have lost jobs, become ill, or lost loved ones. Many suddenly found ourselves acting as workers, parents, and teachers – all at the same time. We have all had our daily routines, favorite activities, and social supports disrupted. And we have all watched the news with dismay as the pain and stress of illness, injustice, natural disaster, unrest, and isolation confronts us and our neighbors.

And yet…

We have also come together to support one another and solve problems in ways we never imagined, navigating uncertainty, disappointment, and tragedy. Many activities moved online. School. Work. Graduations. Birthday parties. And we often found ourselves both connected and disconnected through our screens. For many, the joy of spending time outside in nature is one thing that remained a source of solace during all of these challenges.

The 2020-21 Living River of Words (LROW) season was drastically different than any other in the program’s nearly two-decade history. As the COVID-19 pandemic gripped our community, we were not able to display last year’s traveling exhibit in libraries. As the new school year began, we could not visit classrooms, take students to explore the Santa Cruz River, or send community artists into schools.

Instead, we too adapted and adopted contactless and online methods for reaching students and families. Through our website, online workshops, and Nature-to-Go kits, we reached more than 1,300 young people with science and art programming and received more than 230 entries to the Living River of Words: Youth Poetry and Art Contest.

The special connection between people and nature, and our deep community ties to waterways like the Santa Cruz River, shine through in the works selected by our judges – and in all the entries we received. Indeed, the art, photography, and poetry in this year’s book and exhibit reflects not only the beauty of our local watersheds and wild places, but also the creativity and resilience of young people in our community.

Thank you to all the community partners, teachers, schools, families, and talented young artists and poets who helped make this exhibit possible. It is a bright light
in our community during some very challenging times and a testament to the power of nature, science, and art in our world.

Our Living River: The Santa Cruz
The Santa Cruz River has long been the lifeblood of the region, attracting the first humans over 12,000 years ago and sustaining agriculture and communities along its banks ever since. Today, many parts of the river flow only when it rains. But thanks to the release of effluent (highly-treated wastewater) into the riverbed, two stretches of the river in Pima County – one flowing through northwest Tucson and Marana and one downtown – have come back to life with flowing water, lush trees, and diverse wildlife.

In 2017, the Gila Topminnow, a native fish that had disappeared from the Santa Cruz, was discovered in its waters again. This year, we celebrate Pima County being awarded additional effluent from the Conservation Effluent Pool to ensure healthy habitat in a northern reach of the river.

The Living River Project, conducted by Pima County and the Sonoran Institute, measures conditions of this valuable ecosystem and tracks the impacts of our community investment. LROW supports the broader Living River Project by introducing students, teachers, and parents to the Santa Cruz River.

Thank You!

Living River of Words can only succeed with in-kind services and financial support from: Pima County Regional Flood Control District; Pima County Regional Wastewater Reclamation Department; Pima County Natural Resources, Parks and Recreation; Pima County Public Library; Pima County Department of Environmental Quality; Pima County School Superintendent’s Office; Marana Parks and Recreation; Environmental Education Exchange; The Stewart L. Udall Parks in Focus Program; Friends of Agua Caliente Park; Arizona Project WET; Pima County Master Naturalists; The University of Arizona Poetry Center; and Sonoran Institute.

Many thanks to the community partners; teachers; school administrators; science, poetry, photography, and art instructors; judges; volunteers; and graphic designers who worked diligently to bring Living River of Words through the annual cycle of activities, including: Christine Hoekenga, Yajaira Gray, Marsha Colbert, Alex Wolfe, Jeffrey Babson, Sandy Reith, Axhel Muñoz, Julie Strom, Barbara Goenaga, Sevi, Bret Muter, Mike Kruse, Mely Bohlman, Edie Price, and Doris Evans.
The Drought
The water trickles though my toes as I gaze at a new baby sapling.
I wonder what it’s going to look like when the stream I’m standing in is big and wide.
Then I remember the drought, That wretched, mournful, bitter, down cast, gloomy, unhappy, thing.
The drought is all ready a horrible word.
sometimes it can last for weeks or months even.
Thats why it’s such a relief when the monsoons come.

Cecilia Nichols, age 9
3rd Street School – Anna McCallister-Nichols
Grand Prize–Poetry–Category 2

A Visit to Saguaro National Park
Ileana Valentina Borquez-Rojas, age 7
Academy of Math and Science - Prince – Delanie Ornstein
Grand Prize–Art–Category 1
Monsoons
Pebbles are wet, Clouds are grey. The rain has come. The desert is green, the sun is dappled. The monsoons are here. Clouds fly fast, trees move in the gale. The winds have arrived. Puddles are choppy, Birds struggle to stay in the air. The gusts are blowing. The rain calms, the wind dies down. The storm will come again.

Zoey Fuchs, age 8
3rd Street School – Anna McCallister-Nichols

Cacti Reflecting in Monsoon Waters
Violet Roop, age 8
Independent Entry
In the Wash
We go in the wash
And see ants collecting food
We even smell some beautiful flowers.

We see water which makes the flowers grow
And sometimes when it rains
The sun is shining with a glow.

Sometimes we can’t go to the wash
It’s maybe raining
A bit too much …
Oh no,
There’s a flood!

*Trevor Malone, age 6*
*Independent Entry*
*Grand Prize—Poetry—Category 1*
Santa Cruz

A river of restoration for all of natures animals at the bank.
A mountain like a sentinel, standing proud and tall.
‘A’ mountain watching over us all.
River water returning for Santa Cruz River.
Roaring and surging forward in its grand mass.
Hollering in joy as it flows forward and comes back.
Its waves charging onward over rock, pebble, and dirt.
Coming for all of nature's children to settle around and enjoy.
Roadrunners dashing across the river, briefly taking flight.
Cardinals soaring, flitting down in a blur of red.
Coyotes howling, a chorus of happy barks.
Bluejays singing, sitting on cacti.
Javelinas’ snort and squeal, leading young ‘reds’ to returning river.
Hummingbirds humming and flapping their wings.
Butterflies dancing in the air, displaying their glory for all to see.
What a beauty it all is!
Watch the water fill.
Watch it surge.
Look on to see nature’s return.
How all the animals celebrate its coming.
How gorgeous the sight is!
Santa Cruz River, flow for us all again.

Angel Osegueda, age 14
Independent Entry
Grand Prize—Poetry—Category 4
Sundown on the Santa Cruz
Harrison Hitchings, age 8
Hendricks Elementary School – Melissa Siegel

The Desert Life at Night (Wolves)
Lena Carson, age 12
Independent Entry
Grand Prize–Art–Category 3
Riddle Me This

My limbs stretch out like a sunray.
Flowing through Tucson is my history.
Though I house organisms, both predator and prey,
Why life buffers within me is a mystery.

I pass the border twice between the US and Mexico.
People in the past almost dried me up,
Yet I still carry their dreams like an echo.
Luckily they realized their harm and began to clean me up.

They stopped overgrazing, overusing, and
Began reconstructing, began preserving me.
My bed restored, so future me can see offspring.
Thanks to them, I am healthy as can be.

To natives around me, I am a caregiver.
By name, I am the Santa Cruz River.

Katherine Wei, age 16
Independent Entry
The Desert Moon

The Sun rises.
Animals come out as pink
as roses.
But the Night creatures
are as silver as diamonds.
They call to the Moon
For Aid and rest.

Diego Fatás-Belous, Age 7
Independent Entry

Through the Looking Grass

Dahlia Schorr, age 15
Sky Islands Public High School – Amy Wood
Grand Prize–Photography–Category 4
From the Riverbank
Aleena Rafiyath, age 13
Independent Entry
Grand Prize–Art–Category 4
To the River

Down the mountains, through the plains
Around the cacti and o’er the hill
To the river, the peccary goes
Down the path, past the tree
And the bobcat joins the trek
Under the Arizona sun
Around the cacti and o’er the hill
To the river, they go
And here comes the rabbit
And above, is the cactus wren
Under the Arizona sun
And as the human walks by
To the river, the creatures go
Under the Arizona sun
To the river, they go
To the lessening stream, they go
Under the Arizona sun
And as the day departs, and the night arrives
The river, they have reached
And from the Santa Cruz, they drink
Peccary, bobcat, rabbit, and bird
Around the cacti and o’er the hill
To the river, they went
To the river, they went

Jake Fraser, age 12
Independent Entry
Grand Prize—Poetry—Category 3
The Santa Cruz River
Stream, stream, large stream
Abundant river bring water to drink
Natural resources are important to live
The Santa Cruz River
Alive, we have to keep

Conserve nature is our dream
Revitalization initiatives are needing to bring
Union, union, union forever a team-
Zounds! 12,000 years giving us water to drink

River, river, large river
I want you to live
Valuable aid is ready, I think
Ever, ever, ever believe
Regions are stick forever to win

Roberto Duran Carrion, age 6
Academy of Math and Science–Prince – Delanie Ornstein

Bird with a Cattail
Portia Cooper, age 16
Independent Entry
The Flying Carrot
Milla Jacobs, age 5
Independent Entry

Life in the Sonoran Desert
Sylvia Peebles, age 8
Innovation Academy – Brenda Mendez
Summer Storm in Sonora

Clouds gather above,
Blocking out the sun,
While my hair curls at my temples.
The temperature goes down,
As the humidity goes up,
Making the air thick and heavy.
I wait in suspense,
Wishing for a heavy rain,
To relieve me from the desert heat.
A breeze rolls by,
Cool, damp air,
Raising goosebumps from my skin.
I feel a drop,
A single fat ball of water,
And I wait excitedly for the next.
In a few minutes
The sky has opened up,
It is raining cats and dogs, as they say.
My hair is soaking,
My skin, drenched,
But still I stand in the rain.
I turn my face up,
Let the drops splash my cheeks,
Then I walk to my dry house.
I fall asleep
To the soothing melody,
Of rain on the roof above me.
The next morning,
The beauty is gone,
The bright sunlight erasing the storm.
The wet pavement of the street,
The aromatic creosote,
The critters frolicking on the damp ground.
All fade in the harsh glow,
Of the sky-bound orange globe,
Which chases the residents to their ACs.
I am left to dream
Of the beautiful droplets,
And to wait for the next monsoon.

Lindsay Gaines, age 14
Emily Gray Junior High School – Brittany Baechler
Life
Gwyndolyn Balman, age 15
Educating Children Outdoors – Kathy Balman
**Killdeer**

A curious little fellow
with copper jacket
alabaster waistcoat
and ebony stripe

A funny little fellow
with quick stride
darting glance
and twinkling eye

A picturesque little fellow
piping his melancholy note
silhouetted against the blinding sheen
of the evening light
reflected on the water

*Cecilia Appel, age 14
Independent Entry*

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**The River**

*Jing-yi Genevieve McFatter, age 10
BASIS Tucson North – Carrie Vonier*
Fish on a Mission
Fiona DeWald, age 14
Sky Islands Public High School – Amy Wood

Diamonds
Wade Olsson, age 11
Olsson Homeschool – Jeannette Olsson
I See
I See water, the blue Shining reflection off The Sun, I
See the nature and living Life as if it was a village with happy People. I See the rocks with there own designe It’s almost like you can see the years Put in almost like a story. I See cowboys with horses walking on the soft shining Yellow like sand.

Anyssa Catalan, age 15
Favor Celestial – Barrio Kroeger Lane – Josefina Cardenas

Bumpy Lizard
Grayson Matlock, age 8
Innovation Academy – Pam Barrett
The Water Bird
Jasper Torrance, age 8
Independent Entry

Cloudburst
Up from the azure helping hale plants
Making branches very long
A lot of wishful gloom
Refreshing Rain

Kate Valenzuela, age 13
Mary Belle McCorkle Academy of Excellence – Alejandra Alvarez and Kevan Kiser-Chuc
Resilience During COVID
Ryann Odum, age 12
Roskruge Bilingual K-8 – Alejandra Alvarez and Kevan Kiser-Chuc
The Heart of the Desert
Dear Desert Sunset,
The sun goes down
and the moon comes up.

In between
cacti are starting to sleep and the mountains are growing dark.
The sky is the color of ocotillo flowers
Owls watch the sun set while coyotes howl.

Azalea Martinez, Age 7
Independent Entry

Sunset Reflection
Zahra Rafiyath, age 7
Independent Entry
Down at the Stream
Omar Sahtout, age 7
Academy of Math and Science - Prince – Delanie Ornstein

Flower Silhouettes
Jennica Lugo, age 14
Roskruge Bilingual K-8 – Stacy Redondo and Kevan Kiser-Chuc
Santa Cruz

The old Santa Cruz!
That mighty brood,
That we drained, damned, and pillaged
So we could make more food.

Past the Santa Ritas!
But we wouldn’t let it beat us,
So we took the blood of that river,
And passed the murder off as ideas.

And so we are the guilty host,
To an old dry ravine’s river ghost.
So beware all who settle here
Of the life that offers “most.”

Cameron Hagerty, age 15
Sky Islands Public High School – Amy Wood

Black-footed Ferret

Cecilia Kramer, age 11
Vizzini Art Studio – Kristin Vizzini
In the Desert
Aliah Kiwanuka, age 6
Independent Entry
Desert Rain
A single raindrop
can make a huge difference.
First, it falls on a plant. It’s brothers, sisters,
Mom, dad, aunts, uncles, grandmas, grandpas and cousins
go
down
with
it.
Over time the plant grows. Wind, water, and snow
move the seeds of the plant and more plants grow.
Until finally people can live on the earth with the oxygen
the plants produce. The rain comes from heaven
and flies to the ground. It feeds the plants that grow
and helps them breathe. Plants, animals, cacti, need it.
We seek water to have life for the universe.

Gabriel Cooper, age 10
Ajo Pima County Community Center – Khalil Bratton

The Lizard
Sophia Rocker, age 7
Innovation Academy – Lori LaRussa
Lady Bug on a Rock
Ava Mariñez, age 6
Independent Entry
Sonoran Desert
Mizelle Navarro, age 7
Academy of Math and Science - Prince – Delanie Ornstein

Life in the Creek
Karla Togawa, age 18
Independent Entry
The Snake Desert Habitat
Parker Bedyk, age 8
Innovation Academy – Lori LaRussa

Santa Cruz Life
Inesh Wijeweera, age 8
Innovation Academy – Brenda Mendez
A Sunset in the Saguaro
Nyla Lainhart, age 6
Independent Entry
The American Coots of Sweetwater
Gloria Brooks, age 17
Independent Entry

One Lonely River: The Santa Cruz
Mary Appel, age 10
Independent Entry
Life by the River
Railyn Stamp, age 8
Innovation Academy – Brenda Mendez

After It Rains
Adrienne Howard, age 13
Desert Sky Middle School – Lisa Nussmeier
Local Winners in International River of Words 2021

Living River of Words is a regional coordinator providing local support for River of Words: a project of The Center for Environmental Literacy at Saint Mary’s College of California. River of Words is its own watershed: a linked network of people throughout the United States and the world who are committed to teaching the art and poetry of place to young people.

In the pages to follow we honor local student finalists from Living River of Words 2020 who went on to be selected as finalists in the international River of Words 2021 Youth Poetry and Art Contest.

Bethel Eyasu, age 7
Cragin Elementary School – Heather Wenning
International River of Words Finalist
Blue Skies in Tucson
Isabella Owens, age 10
BASIS Tucson North – Carrie Vonier
International River of Words Finalist
Aniyah Dunn, age 6
Cragin Elementary School – Ellan Price
International River of Words Finalist
Maia Garcia, age 15
Tucson High Magnet School – Marea Jenness
International River of Words Finalist
Rey Compos, age 18
Tucson High Magnet School – Marea Jenness
*International River of Words Finalist*

Benjamin Castañeda, age 8
Innovation Academy – Lori LaRussa
*International River of Words Finalist*
Multidear
Angelleena Hoover, age 12
Hollinger K-8 – Rebeka Denson
International River of Words Finalist
For more information about *Living River of Words: Youth Arts and Science* contact:
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Environmental Education
Phone: (520) 724-5375
Email: eeducation@pima.gov
Website: www.pima.gov/riverofwords

Natural Resources, Parks and Recreation
Regional Flood Control District
Regional Wastewater Reclamation Department
Pima County Public Library
School Superintendent’s Office

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