Friends of the Santa Cruz River

The Flow

October 2021 Friends of the Santa Cruz River Newsletter

The Going Got Tough, but...

By Ben Lomeli
President

Friends of the Santa Cruz River (FOSCR) was formed in 1991 to "ensure a continued flow of the river's surface waters, promote the highest river water quality achievable, and to protect and restore the riparian ecosystem and diversity of life supported by the river's waters."

Our non-profit, all-volunteer group focuses on the portion of the river from its headwaters in the San Rafael Valley in Arizona, south into Mexico, and then north through Santa Cruz County, to the Pima County line. We work with riverside landowners, government agencies, other citizens, local schools, and community groups to keep the river flowing, its banks clean and green, and its environment bountiful to both wildlife and people.

Like so many other organizations in this area and even around the world FOSCR has been affected by the global pandemic.

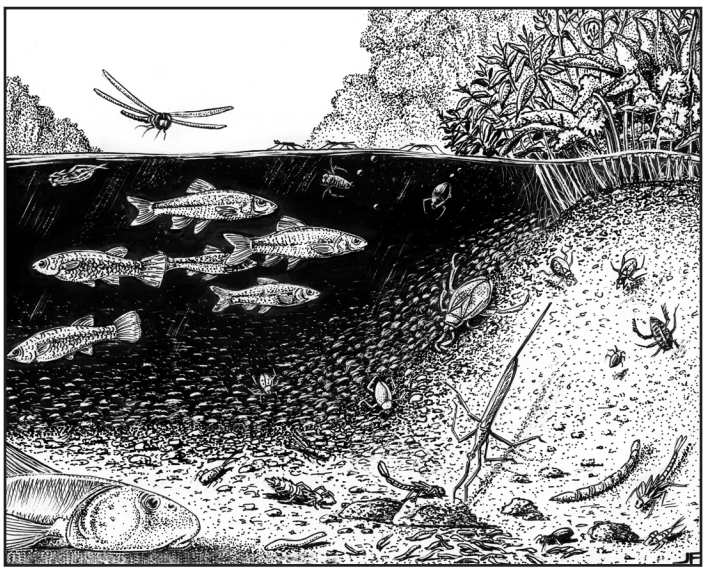
Before COVID-19, FOSCR held monthly potlucks and Board of Directors meetings at the Tubac Community Center. In-person meetings stopped after February 2020, but virtual (ZOOM) meetings started up in July 2020.

Our annual river clean-up was also cancelled Spring of 2020. This year, the clean-up has been on hold due to post-monsoon site accessibility.

Our 2020 Annual Membership meeting was cancelled, including all guest speakers, presentations and awards ceremonies normally scheduled then for all our members and always open to the public.

We were able to hold our 2021 Annual Membership meeting virtually. Diane Austin (Professor and Director, School of Anthropology, University of Arizona) spoke on the topic of Problems and Possibilities for Arizona's Borderland Waterways.

Fortunately, our river monitoring program "River Watch", has continued uninterrupted. We added a couple of crew members with new volunteers. We continue to observe social distancing practices while out in the field, and are almost done updating the field handbook.



FOSCR's outreach and education efforts have been the most affected by COVID-19. We have not been able to bring students from local schools to the river. Nor have we been able to make any presentations at the schools. We also had to cancel our 2020 annual school "Celebrate the River Student Art" contest for local student artists. Because of continuing precautions against COVID-19 variants, we will most likely cancel the 2021 contest as well. However, as precautions continue to ease, FOSCR looks forward to soon resuming our education and outreach activities as we move forward into the 2021-22 school year.

Our advocacy efforts for public health, safety and environmental concerns have also been challenged and required changing most activities to virtual media. I still participate, (virtually now), on the International Boundary and Water Commission – Southeast Arizona Citizens Forum.

We have learned though that even with COVID-19, the departure of Sherry Sass (our long-term President who moved to New York in 2020), and the retirement of Marty Jakle, another long-term board member, FOSCR is able to continue on-the-ground monitoring and advocacy efforts by shifting to virtual media, and recruiting four new board members

Several new revitalization committees have been formed to spearhead the various branches of our mission statement.

President's Message, con't from page 1...

Through our recruitment efforts, FOSCR has gained some fantastic new board members.

While we continue towards resuming our regular activities, FOSCR is also reorganizing and branching out in new areas.

There have been upgrades to our website, and we continue to build our GIS (Geographic Information System) capabilities. Several FOSCR members also participated in a street trash clean-up this summer.

We are starting a new program called REACH (River Ecology And Community Health) to encourage stewardship of sections of the rivers banks. (See Blue Evening Star's article on page 5.)

So, while the going got tough, the Tough Got Going. We look forward to continuing building and nurturing our partnerships with other organizations—such as The Tubac Nature Center, Anza Trail Coalition, Researcher Days, Waterkeeper Alliance, Rio Compartido, Valle Verde Ranch & Proposed Wetland—who seek to advocate for our natural world.

Thanks again to all who care and help us out! The river needs all of us. Please visit our website and get involved.

WATERKEEPER® ALLIANCE AFFILIATE

The Flow is published by Friends of the Santa Cruz River (FOSCR), a nonprofit, volunteer organization dedicated to ensuring the continued flow of the Santa Cruz River, the life-sustaining quality of its waters, and the protection of the riparian biological community that it supports.

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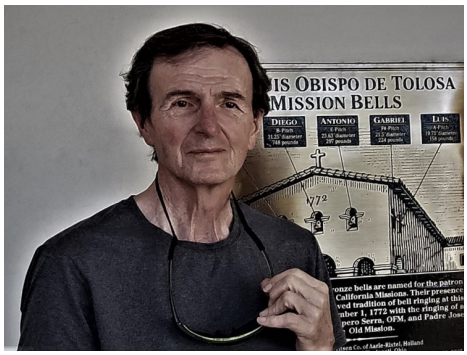
Reid Penland, Featured Board Member



Born and raised in Flagstaff, Arizona, Reid and his wife Kate moved to the San Francisco Bay area in 1987 to pursue career opportunities, Reid as the Alameda County Surveyor.

Since 2015, both Reid and Kate are glad to be back "home" with time to discover Tubac and all its outdoor splendor and diversity of culture. Reid has been a FOSCR Board Member since 2018.

Reid's contributions to FOSCR encompass a wide variety of service to the river and to the the organization. Reid has worked extensively to revitalize the website. He continually provides progressive and creative ideas for FOSCR's future, including being key in creating the new FOSCR REACH program. Reid also played a leadership role in organizing and conducting river clean-ups. He did all of the manual landscape work in the front of the TCC. And he has never missed a BOD meeting!

Some of his additional accomplishments to date include:

- Working with a willing U of A graduate student to produce a many layered GIS study of the Upper Santa Cruz River
- Supporting RiverWatch by taking Chavez Siding & Nogales Wash end-point flow pictures each month
- Working with a willing Catchafire grant volunteer to give FOSCR website a total facelift
- Being an integral part of the Revitalization Committee in 2020 that resulted in finding four new fabulous board members and re-visioning FOSCR goals during a time of transition
- Becoming chair of FOSCR Partnerships committee
- Taking over the tracking of FOSCR membership data and communications
- Moving items from FOSCR room at Tubac Community Center into storage so other groups can co-share the space
- Assisting with FOSCR's responsibilities as affiliate of Water-Keepers Alliance
- Creating Thank You cards to send to our many friends and supporters

Trash–Eliminate and Prevent

Ben Lomeli, FOSCR President
Nohe Garcia, FOSCR Vice-President

Trash is ugly, unsightly, unhealthy, and uninviting. No one wants to visit, enjoy our beautiful natural and cultural amenities, move, or open a business here if they see trash on the highways, streets, roads, parking lots, and waterways.

Please do not litter. One piece of trash attracts many more. It often attracts unwanted wild scavengers, poses contact dangers to humans, and creates habitats for germs, bacteria, pests, etc. Please control and properly dispose all your discards. Keep your car or yard clean, but please do not throw it out on public areas.

Please help with upcoming cleanups. Tell your friends and neighbors to join the effort to change the culture of inconsiderate convenience to a culture of community pride, respect, responsibility, and wellbeing. Let us care enough to set an example for others by doing the right thing. Organize cleanups on your street or neighborhood.

Tourism and nature-based recreation provide significant revenues for our border county. We all benefit from a clean, safe, and healthy and attractive community environment that can sustain a viable economy.

Garbage on our streets and roads is often transported by wind and storm runoff into Nogales Wash and the Santa Cruz River accumulating into huge unsightly and dangerous piles. Styrofoam and plastics break down into microscopic pieces that cause all kinds of problems for wildlife, the environment, and human health. Discarded bottles and broken pieces of glass can spontaneously start fires during hot sunny days.

Sheriff Hathaway vowed to follow-up on reports with specific violator information. Cameras and vigilant residents could help in that regard. Signage, especially in known trouble spots, and fines against littering would help too.

Please advocate for recycling programs to help reduce the volume going to our limited capacity landfill.

The Longevity of Trash

By Lah-May Bremer,
FOSCR Secretary

I remember as a child, the first lady of the United States, Lady Bird Johnson, joined and promoted the Keep America Beautiful Campaign. I still to this day recall some of the Public Service Announcements broadcast on television. I also recall noting on roadside signs the fines those who illegally discarded trash were subject to.

When the organization that I belong to as a minister and missionary (Global Community Communications Alliance) first moved to Santa Cruz County, one of the first service acts our leadership took on was to participate in the Adopt-a-Highway program. Filling those blue bags with trash was, sadly, easy to do—there was never a shortage of garbage along the roadside.

It is so easy to generate trash, but how long does it take for trash items to decompose. I found quite a bit of information on the Internet and learned we're not the only region dealing with this problem.

From the website longevitylive.com I learned plastic items take many years to decompose:

Plastic bottles - 450 years
Disposable diapers - 550 years
Plastic bags 200-1,000 years
Fishing line - 200-1,000 years

Other items often seen along the road and on river cleanups and their decomposition time:

Cigarette butts, 10-12 years
Rubber boot soles, 50-80 years
Plywood, 1-3 years
Tin can, 50 years
Ropes, 3-14 months
Aluminum cans, 200-250 years
Batteries, 100 years
Lumber, 10-15 years
Tinfoil, Does not biodegrade
Glass bottles, 1 million years
Styrofoam, Does not biodegrade

Tires—lots of them—are also found on river clean-ups. Tires are toxic. They contain a host of chemicals and metals that should not be in the human body. And they do gradually erode and break down, leaching those chemicals into the environment.

Living in this region for more than 10 years now, seeing the trash along the roadside and participating in some river cleanups, I feel the time has come for a new and revitalized impetus to keep our environment clean. And I believe that many others are looking around and feeling the same.

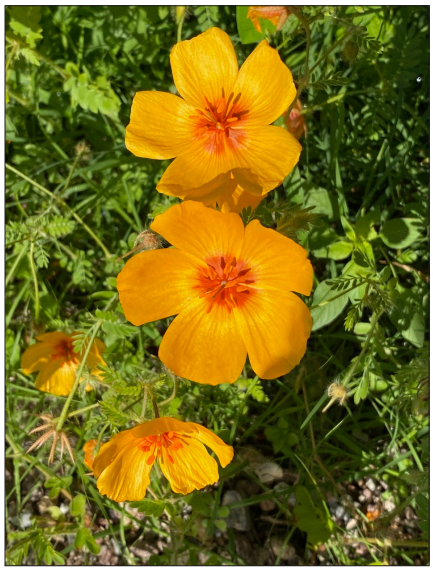
We cannot claim to love God, if we continue to live in unclean environment and pollute the waters. God gave man and woman the authority to rule every living creature and to safeguard the living resources. We have a duty to perform and responsibility to fulfill this role.

~Lailah Gifty Akita

What An Amazing 2021 Monsoon Season

By Marty Jakle
Former FOSCR Board Member

Wow. This is the best monsoon season I've seen since I've lived in the area (15 years) and is one for the record books with 14 inches and counting. Besides turning the area a vivid green it has given rise to a bumper crop of wildflowers.



The most obvious wildflower is the Arizona Caltrop or monsoon poppy, (Kallstroemia grandiflora) which is not to be confused with the desert gold poppy; abundant here in the spring depending on rainfall. It is carpeting the land iAnn a blanket of yellow flowers. The monsoon poppy is always found during the monsoon season, especially along roadsides, but this year a banner year for the species. The best year I've seen.

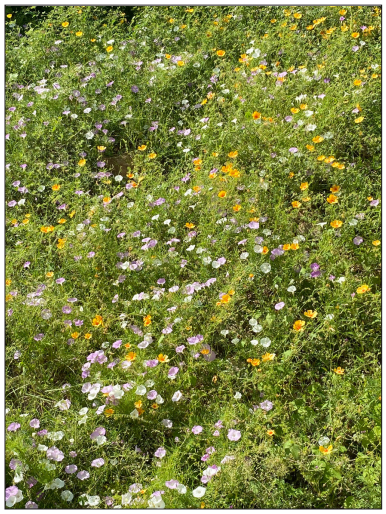
Another species which is having a similar season is the pink bottle brush, (Mimosa dysocarpa) whose flowers look like whitish/pinkish woolly worms at the ends of the shrub. I commonly see it growing along the roadsides.

A species that I see more often this monsoon is the mala mujer, (Cnidoscolus stimulosus) a bizarre looking plant with small, white flowers and growing about 1 ft. tall. It has spines all over it—on the stem, seed pods and even on the underside of its leaves. The upper surface of the leaf has white spots making where the spines grow on the leaf's underside.

The ubiquitous morning glory (Convolvulaceae sp.) is also having bumper year. Like its name implies it blooms in the morning, shriveling up by noon. It's taking over my place—its fences, trees and anything it can climb on. It reminds me a bit of the infamous kudzu vine that I would see on family vacations to Florida. I've seen its funnel-shaped flowers colored the normal purple, but also white, pink, and lavender.

It's cousin, the field bindweed, (Convolvulus arvensis) blooms later in the day and has the same colored & shaped flowers.

Here's a tip for putting a name to many of the plants and animals you see. A handy Free app for identifying them is "Seek". Download the app and using your phone camera, you scan what you want to I.D. and the name (hopefully) will appear on the screen. It works by using artificial intelligence and compares your specimen with its vast memory bank.



REACH—Santa Cruz River Stewardship Program

Are You Willing To Steward a Portion of the Santa Cruz River?

By Blue Evening Star
FOSCR Board Member

FOSCR is creating our very own "Adopt-A-River Program". We have begun by talking with people who are running similar programs around the country, and meeting with our partners to define a program that fits our particular area and its unique demographics.

Here is how the program is taking shape:

Under the guidance and direction of Friends of the Santa Cruz River (FOSCR) a 501(c)(3) non-profit organization, this environmental stewardship program matches volunteers to designated portions along the banks of the Santa Cruz River (and its tributaries) for environmental stewardship.

Our program's name arises naturally from the acronym REACH, and stands for River Ecology And Community Health.

We are confident this program will encourage local neighbors to take on greater stewardship of the river, as well as expanding and bringing together the community of people who already care about the river.

The FOSCR board members on the REACH committee are Blue Evening Star, Reid Penland, and Nohé Garcia.

Initial feasibility studies with representatives from Anza Trail Coalition (Connie Williams), Tumacácori National Historical Park (Tony Palmer) and Tubac Nature Center (Carolyn Fowler) have been very positive. We are already recognizing ways in which the REACH program can unify and synthesize the efforts of people throughout the community who value the Santa Cruz River.

We are currently defining which parts of the Santa Cruz River (including tributaries and washes) will be available for stewardship by identifying areas where people already have legal access to the river, and reaching out to landowners (with river or tributaries or washes on property) to see if they are willing to participate. We are also looking into liability insurance issues.

We plan to provide equipment for picking up trash; instructions on where to report river-related concerns; and signage (for display in home or business) to recognize stewards and their reaches.

Stewards will safely pick up trash in bags. Stewards also will monitor and report concerns such as debris and pollution, issues involving wildlife or domestic animals, issues with trail access, rubble, dumping, fire, and invasive species. Stewards are encouraged to do something at least once a year to educate others about the need to stop putting trash into the environment. Stewards will also be encouraged to share stories and photos about the river with FOSCR and other partners. Note: Bottle dam clean-ups are coordinated separately from REACH program.

In addition to individual volunteers, some organizations we plan to contact, and invite to participate, are Horse Riding Clubs, Hiking Clubs, Birding Groups, Home Owners Associations, Businesses, Schools, and Artists.

We hope to expand into having partners in Mexico involved as well.

Stay tuned for opportunities to claim your portion of the river to steward.

For more information, call Friends of the Santa Cruz River at 520-403-2823. Comments or suggestions on the REACH program are welcome at https://friendsofsantacruzriver.org/reach/

"A Casual Day in the Healthy River" by Daniela Borund, Desert Shadows Middle School, Nogales, Honorable Mention 2019 Student Art Contest.

RIVERWATCH: The Story

By Connie Williams
RiverWatch Team Lead

Soon after the sun comes up, a team of trained FOSCR volunteers meet at the river crossing on Chavez Siding Road. Some unpack equipment while others leave to search for the endpoint of the water's flow north of Tubac and in Potrero Creek, a major river tributary. Birdie Stabel begins the day by heading into the water to photograph the sample site. Data collected will be used by the Arizona Department of Environmental Quality (ADEQ) to help ensure the river water remains as safe as it usually is when not in flood stage.

Birdie Staple

Birdie Stabel and her husband, Nick Blesser, were part of RiverWatch's first team almost 30 years ago, with both working as Team Lead for much of that time, and Birdie now serving as Senior Advisor. Long-time friend and RiverWatch team member, Brian Vandervoet appreciates the contribution made by this couple. He says,

As Citizen Scientists, Nick Blesser's and Birdie Stabel's commitment to River Watch for almost three decades has provided a trove of information about the health of the Santa Cruz River unparalleled in southern Arizona. Their work demonstrates to all of us how a small dedication of time, multiplied by months and years, can inform local and state leaders about impacts of floods and droughts, and about how policies, both national and international, influence this bi-national waterway.

Another invaluable long-time member is John Shasky, who has been a much- appreciated regular for at least 15 years. John is the expert on measuring river discharge and we always appreciate his cheerful attitude on sample mornings. Tubac residents, Rich Kiker and Brian Vandervoet are our two newest members, and we are grateful for earlier members like Sherry Sass, Mark Larkin, Ginny Shasky, Claire McJunkin, and Sherry Mullins, who gave much time and energy to this project in years past.

Ben Lomeli, FOSCR President and a retired Hydrologist for the Bureau of Land Management said of RiverWatch:

This group is awesome. They are disciplined, trained, and a prime example of citizen science in action. They have reliably carried on FOSCR's monitoring mission since the start.

John Shasky

Documenting and reporting changes in water quality and quantity is the core mission of RiverWatch. The Santa Cruz River water wasn't always as safe as it is today. NAFTA, the 1994 North American free-trade agreement, brought many factories and a lot more people to Nogales, Sonora. Heavy metals and other dangerous toxins released by these factories into

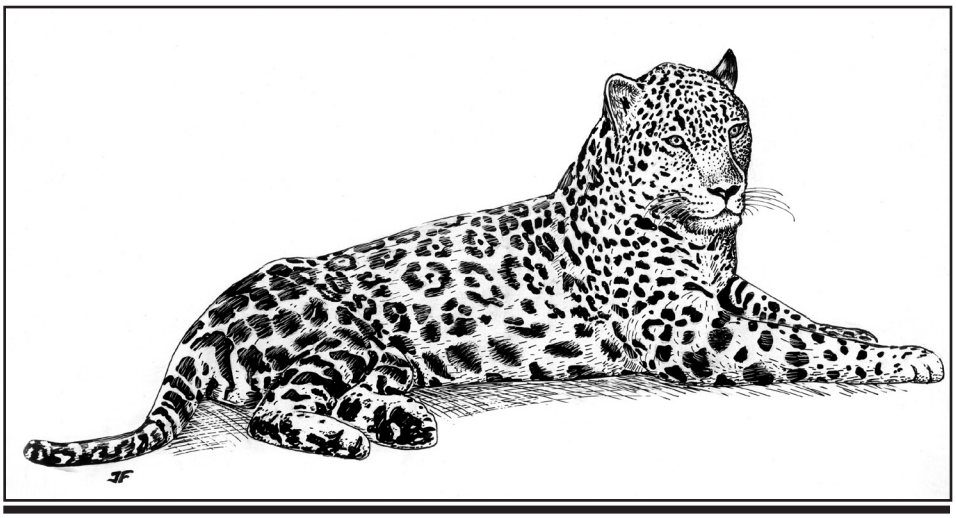
From left to right: Nick Blesser, Birdie Stable, UofA student observer, Ben Lomeli, John Shasky, and Rick Kiker. Photo by Connie Williams.

My Observations on The Santa Cruz River at Amado

By Laurinda Oswald
FOSCR Board Member

The Santa Cruz River is an interesting river for many reasons, but mainly because it runs South to North for a big part of its journey, and because it is a trinational river: Mexican, American, and Tohono O'Odam.

The first humans in the area were recorded over 13,000 years ago living in the fertile valley along with mammoth, tapir, ground sloths, horses, bison, camels, and various predators. Over time the large grazers were hunted out and the Hohokam tribe took over with their complex irrigation systems to help grow their crops. By the time the Europeans showed up in 1690 the Hohokams had evolved into the Pima (later named the Tohono O'Odam) and at that time there were antelope, mountain sheep, deer, javelina, quail, turkey, grizzly bears, beavers, wolves, jaguar, and mountain lions. The grass was recorded as being as high as a man on horseback and the river was perennial for most of its length as it flowed North. In the early 1800s the fur trappers arrived in the Santa Cuz valley and by the time they left there were no more beavers, and that, in my mind, was the beginning of the long decline in the health of the river.



The Southern Pacific Railroad line was put down in the late 1800s which altered the flow of many of the drainage washes on the East side of the river and opened the area up to commerce. Poor cattle grazing management and drought conditions stretching from the mid 1800s to the mid 1900s degraded the uplands, and timber cutting to feed the new steam powered irrigation wells decimated the historic Mesquite forests and added to the decline in the water table and the health of the floodplain and river. During the 1940s, 50s, and 60s large scale farming ramped up with the advent of heavy machinery to move dirt and wonder chemicals to kill weeds and promote growth. It was during this time that many washes were straightened and channelized and large portions of the historic floodplain were plowed into cotton fields. The Old Nogales Highway, and then I-19, altered the drainages from the West by forcing the floodwaters to go under tight bridges and into straightened washes.

The first big flood in my experience came through Amado in 1967. At the time there was a whole neighborhood of houses at the T in Amado Road on the East side of the river. Trains stopped at the siding to pick up cattle to take to Tucson, and there were acres of irrigated cotton fields all around. After the first "500" year flood in 1967 many of the old adobe houses didn't make it and most of the farmland was abandoned, but then came the next "500" year flood in 1972. After that flood most people had moved away, but when the "1000" year flood of 1983 came through even the holdouts left. There is a bullet-riddled structure that still shows the floodwater line to remind us of what can happen.

In October of 1983 hurricane Octavio parked itself over the area and dumped its rain over many days. What an event that was!! I walked along the

Riverwatch, con't from page 6...

Sonoran sewers and sent downhill to the Nogales International Wastewater Treatment Plant (NIWTP) soon overwhelmed its capabilities. Toxins contaminated the river. Fish disappeared. Some cattle and wildlife reportedly died after drinking the water. But the wakeup call didn't arrive until a massive die-off of cottonwoods and willow in an 8-mile Rio Rico stretch shocked agencies and the public in 2005.

FOSCR, established just a few years before NAFTA passed, worried about the problem. FOSCR leadership worked with the Sonoran Institute, the USGS, ADEQ, the International Boundary Water Commission (IBWC), and policy-makers at every level to bring awareness to the issue on both sides of the international border, and it worked. Congress approved funding. In 2009, the $66 million state-of-the-art renovation of the NIWTP went on line, and its impact on water quality was quickly apparent. Oxygen levels in the water rose, toxin levels fell, and fish returned to the river.

On this sampling day 12 years later, the RiverWatch team will monitor water discharge and quality at five locations, including in Rio Rico and as far south as Ruby Road. Water acidity, oxygen levels, murkiness, and temperature are recorded. A sample of water is collected at each site, to be processed and incubated later to determine E. coli levels. The presence or absence of fish is noted.

The final happy stop before processing bacteria samples back at the Tumacácori Mission is for breakfast in Rio Rico.

My Observations, cont'd from page 7...

railroad tracks to see where the swollen Sopori Wash was joining the swollen river, and while I was standing there I watched as the force of the water twisted the metal tracks with a sickening sound. The power of nature made me feel very small. We had no power, water, or phone for 2 weeks, but we had a pool and a propane stove to boil the water. After 10 days we were able to drive up to the Continental Bridge in Green Valley to take a decent shower, collect the mail, make some calls, and buy some food. For many months until things dried out we either went up to the Continental Bridge, or down to the Rio Rico bridge, all on back roads

The date 1-28-1958 is visible in the upper left corner. Starting from the bottom, the big wash coming in from the left is the Sopori, it is still mostly connected to its floodplain.... The next two washes up show the straightening to get under the road and past the farmland.... On the oxbow bend in the river below the Sopori you can see where an attempt is being made at straightening the turn.... Old Nogales Hway is on the left, and the dark spot is the lake that was at Arivaca Junction.... Lakewood, in Amado, is barely a thought.... North of Amado at the Halfway Station you can see signs of the even older Nogales Rd when that establishment was right off the road.... In the middle of the picture, half way up the river, is a horseshoe shaped thing on the west side, I think that is pre-European.... Elephant Head Rd is a ranch road of the Canoa that barely crosses the river.... Check out how much farmland was farmed at the Canoa!!! Also, you can see where the river was straightened to gain more farmland on the Canoa.

The river has ebbed and flowed past Amado through the years. In an old aerial photo from 1958 the river was a thin ribbon of water in a small channel. The photo also shows earth-works trying to straighten the river to gain more farmland, and it shows vast farmland on the Canoa Ranch north of Elephant Head Road, now all rewilded. During the wet years of the 1980s the river was clean, flowed regularly, and had fish in it. By the late 1990s, after a brief dry-up, the river came back in an un-natural state. It stank, and flowed constantly, getting deeper over time because the Wastewater treatment plant in Rio Rico was unable to deal properly with the effluent. In 2009 the treatment plant was upgraded and we no longer get consistent flows. Its all flash-flooding now, after minor rains to the south, as the water leaves the watershed. After all of these floods the river is almost 400 feet across in some places as it reclaims and creates new floodplains and it is constantly shifting and adjusting itself. The Santa Cruz is a dynamic entity that reminds us that we humans have changed the landscape and that the river changes with it.

My first memories of the Amado river crossing start in the 1960s. At that time we had a narrow bridge because of the community that lived at the T in the road, and also for the Whipple Observatory that

Regeneration

Note: Avalon Organic Gardens is an ecologically innovative farm and ecovillage that borders the Santa Cruz River. This article is contributed by Centria Lilly, Farm Operations Advisor for Avalon Organic Gardens and TaliSeen (Samuel) Combs, Farm Manager for Avalon Organic Gardens

We hear so much about "regenerative agriculture" these days, and those of us who still believe there is such a thing (and that it exists as a possibility in our busy, technologically-driven existence) are tasked with the challenges of manifesting this regenerating spirit in the future of agriculture. We—the rancher, farmer, gardener, naturalist, environmentalist, and all those whose hearts belong to the natural world—are called to repair and heal our common ground, the sacred yet disappearing terra firma.

The Santa Cruz River Valley (nestled at the base of the Tumacácori Mountains in southern Arizona)—also known as the "Palm of God's Hand"—is, for most of us who live in this bio region, our chosen garden. We love her in our many ways and are blessed with a still virgin beauty that only some can claim as their backyard. We are writing the beginning chapters of what could be great potentials in this river valley, with its unique soil variations, monsoon rains and drought, and a vast variety of Sonoran Desert vegetation.

As stewards of these lands, we who live here are faced with the greatest of opportunities to resurrect our soils, clean up waterways, and most of all maintain an agrarian culture comprised of souls, and animal and plant life, with a future possibility of healthy mutual cohabitation using age-old but newly rebirthed farming techniques.

Centria Lilly, Farm Operations Advisor for Avalon Organic Gardens

Potentialities are fraught with uncertainties and, as land managers with a regenerative vision who also need to make ends meet, we are continually faced with the tug-of-war between the real and the ideal, the possible and the actual. History has proven we can learn from our mistakes, and in the realm of agriculture there have been many. We need not look too far to see that we humans have attempted to control the environment and placed expectations and demands upon the earth to meet our growing appetites, all to the detriment of our health in communities, whole cultures, and even the land itself. We, as a global society, continue to take more than our share. The increasingly unfair distribution globally of available resources is nothing short of an abomination.

Science and technology have not always acted in the best interest of sustainable land management. Notable scientists and environmen-

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My Observations, cont'd from page 8...

was built by the Smithsonian in 1966 on Mt Hopkins. My memory from that time was of dumping garden debris along the banks of the river to add to the old cars and farming implements that were already there to strengthen the banks. I moved back to Amado Road in 1982 after being away and at that time we had a decent cement bridge that was put in after 1972. There was also a suspension footbridge in case the water got too high for cars as this was the only access for the observatory. The flood of 1983 widened the river on either side of the damaged bridge so it stood out in the middle of the river for awhile, but we still used it to cross the water. Elephant Head Road got a new bridge in the early 1990s because of the growing community there, and the Smithsonian built a new road to their new basecamp, so since then Amado Road has been an unpredictable wet crossing.

During the 1980s and 1990s Amado still had a dense cottonwood forest along the river and a shallow wetland near the railroad tracks, but that all changed in the 2000s when the water table started to drop and the trees died a slow painful death. This die-off, starting in the north and moving south, coincided with the Freeport/McMoran copper mine tailings in Green Valley getting taller and taller. The mine has a well on the north side of Elephant Head Road and is sucking the aquifer dry. 40,000 acre feet of water flow through the Santa Cruz aquifer each year, and the mine uses 35,000 acre feet, so that doesn't leave much water for everything else.

For many years I have thought that upstream water capture would be a good idea for flood mitigation and aquifer recharge, and I am hoping for green infrastructure projects to slow the flow of water before it gets to the river. Once the water is in the river it flows out of the watershed, often in a topsoil-depleting flash flood. Humans have caused great changes to the watershed in a short amount of time, and we will never be able to restore the river, but we should be able to improve its health over time by conserving and capturing more water.

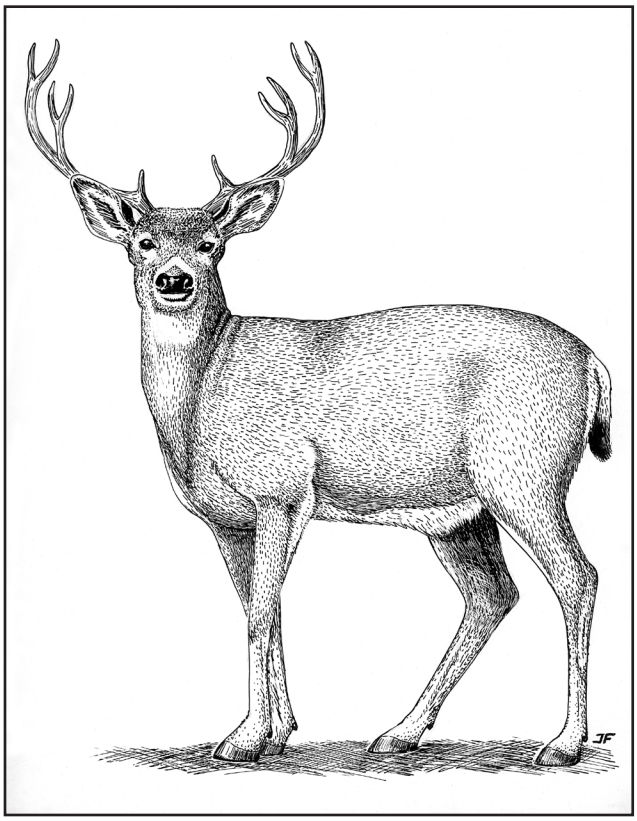
Regeneration, con't from page 9...

talists, such as Allan Savory—who says "you cannot separate a culture from its lands"—are now coming full circle and seeing the error of their ways when their practices and theories were led too strongly by logic, statistics, and figures while the intrinsic instincts of the heart were forgotten at best and mocked and ridiculed at worst. Many once-renowned experts in the field of industrial agriculture are now making an about-face and opening their minds and hearts to voices coming from the wilderness, who have not yet lost touch with Mother Nature, nor their own common sense. They are retracing their steps and seeing the error of their ways.

Avalon Organic Gardens and Eco-Village has been an experimental agri-"cultural" endeavor for nearly 30 years, with "culture" being integral to this effort to build a sustainable model in the art of living. We value and cherish the human "temple" and have found that there is no "one-size-fits-all recipe" on this diverse planet when it comes to preparing the ground for cultivation, tending to the harvest, and transforming it into life-giving nutrition at the dining table. The one thing we all share in common is the understanding that growing and consuming natural, chemical-free foods for ourselves and our animals is an essential for healthy living.

Avalon Gardens Co-Founder and author Niánn Emerson Chase, a descendant of Ralph Waldo Emerson, in a series of articles on sustainable living called "Walking The Balance" writes: "First and foremost, we must establish within ourselves on a personal level the balance of idealism within divine pattern and living it on a practical level. As citizens of a troubled world, we too must step out in compassionate and intelligent activism for a kinder, more sane and sustainable world."

Fifteen years ago when we first arrived in Tumacacori, we early on discovered that "cohabitation" with Bermuda grass, amaranth, and buffelgrass was going to pose challenges. We intensely grazed in the beginning, just to stay ahead of the seed crop coming from these noxious weeds. We composted, spread manure, used effective micro-organisms, installed drip systems to replace flood irrigation methods to save water, excavated stormwater management and retention basins to reduce erosion and flooding, planted pollinator gardens, constructed bat houses, cultivated bees, heritage grains, and legumes, planted trees, established a permaculture food forest, and yes, we had a few composting toilets and certainly we weeded 'til the cows came home. You'd think we've done it all. Yet that said—as of this writing—we are faced with one of the most monstrous and densest weed growth seasons we have ever experienced!!!! Thank you monsoons.



We have made every effort to pool our collective resources—material, physical, and spiritual—with the upside being that we are also experiencing some of the most positive results from furthering our experimental farming and ranching practices. We are witnessing the land responding to responsible stewardship. We are just now embarking on pivotal farming methods for a future regime of no-till seed drilling, better animal rotation methods for grassland management, unlocking the latent nutrients in our soil using mycorrhizae, and compost, compost, and more compost. We fully expect a turning point for our land, and we already see the fruits of these labors in our small but hardy micro-region, where we intend to farm with methods and techniques that will ensure increasing sequestration of carbon.

TaliSeen (Samuel) Combs, Farm Manager for Avalon Organic Gardens

From the Carbon Cycle Institute we learn:

> *Land management is among the largest contributors to climate change. Agriculture is the ONE sector that has the ability to transform from a net emitter of CO2 to a net sequesterer of CO2 — there is no other human managed realm with this potential. Common agricultural practices, including driving a tractor, tilling the soil, over-grazing, using fossil fuel based fertilizers, pesticides and herbicides result in significant carbon dioxide release. Alternatively, carbon can be stored long term (decades to centuries or more) beneficially in soils in a process called soil carbon sequestration. Car-*

Regeneration, con't from page 10...

bon Farming involves implementing practices that are known to improve the rate at which CO2 is removed from the atmosphere and converted to plant material and/or soil organic matter.

What more does our future hold as discoveries in the fields of mycology, microbial bioremediation, and plant-based phytoremediation succeed in using plant, bacteria, and fungal species to clean up contaminants and improved the quality of water and soils? What are we held responsible for in conserving and capturing the precious water that comes from the rains and the rivers of Arizona? What can we imagine for the future of this region taking into consideration of the limited resources? What to grow, how far to transport, and what new industries can sprout from such innovation?

We can make a difference in the carbon cycle by making some integral changes to how we view and execute modern land management. We can make changes in our personal lifestyles, yet not sacrifice quality, but rethink ways to reduce the quantities of consumption and think "outside the box" of what is involved in the cultivating, processing, packaging, and shipping of the foods we consume and the feeds our animals consume.

So, friends, every day do something that won't compute. . . . Give your approval to all you cannot understand. . . . Ask the questions that have no answers. Put your faith in two inches of humus that will build under the trees every thousand years. . . . Laugh. Be joyful though you have considered all the facts. . . . Practice resurrection.

— Wendell Berry

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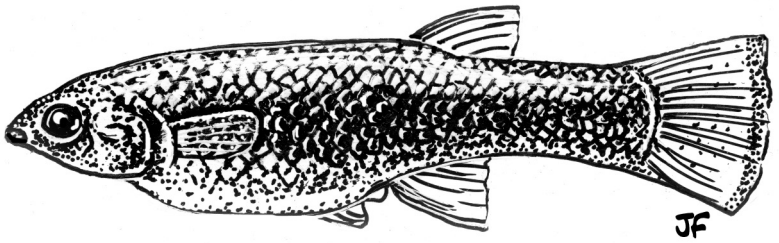

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