

NEWSLETTER

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ISSUE 6: FALL 2022

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Over the past eight years Wildlife Corridors LLC and Borderlands Restoration Network have been working together to create and permanently protect what is now the 1800 acre and growing Borderlands Wildlife Preserve which serves as a critical unobstructed corridor connecting the Santa Rita, Patagonia and Huachuca Mountain ranges. This land was originally platted for hundreds of new homes, but is now permanently protected providing safe passage and rich habitat for countless wildlife forever.

In addition to the generous support of donors and partners who made the original purchase possible, this year we were honored to receive over \$1,000,000 in funding from the United States Forest Service Forest Legacy Program, as well as nearly \$600,000 from The Nature Conservancy to help protect an additional 480 acres in partnership with the Town of Patagonia. This funding pays off all the remaining original debt from the original 1100-acre purchase allowing us to make progress towards an additional proposal to the Forest Legacy Program to protect more land.

While we can sometimes forget to reflect on incremental achievements as we push forward, this is a milestone to be celebrated allowing us to now do even more in the region. In June we started the search for a new Conservation Director position that amongst other duties will help expand conservation initiatives and facilitate conversation and relationships in the borderlands region to build a coalition of regional organizations to coordinate wildlife conservation actions and address conservation areas of mutual concern.

To celebrate this milestone and the contributions of all that have made the Borderlands Wildlife Preserve possible, we invite you to a public celebration on Saturday, November 12 at 9AM at the AZ Trail Casa Blanca Canyon parking

lot in Patagonia where the AZ Trail connects to the Borderlands Wildlife Preserve. Join us for

By: Kurt Vaughn, Executive Director

refreshments and remarks from the Forest Legacy Program, BRN, and Wildlife Corridors while you enjoy and celebrate the beauty of the preserve.



www.borderlandsrestoration.org/events for full details.



fter an hour of crossing washes quiet with the dryness of early April, we find ourselves at Rancho Nuevo – a ranch managed by Cuenca Los Ojos (CLO) in northern Sonora. Rancho Nuevo rests in the southern Peloncillo Mountains, where the Madrean Sky Islands give way to the vast wildness of the Sierra Madre Occidental. Everything is a bit bigger and wilder here. Jaguars roam with a regularity that only exists as a distant memory or a bold hope in Arizona. Mottled, multi-trunked sycamores form stands that scratch the sky and stretch along the riparian corridor for miles, housing an understory of shrubs I don't quite recognize. It's familiar enough to lend comfort, yet new and unknown enough to hold a little bit of extra magic.

We spend a week at Rancho Nuevo attending a watershed restoration workshop hosted by the CLO Conservation Director, José Manuel Perez Cantú, his four-man maintenance crew, and a fantastic cooking staff led by Sandra. Workshop participants include myself, three other BRN staff members, two BRN Sonoran interns, and two members of the Caminantes del Desierto from Hermosillo. Much is familiar about the watershed restoration approach employed by CLO. The conceptual approach to restoration is the same as ours – they create dams perpendicular to the flow of water to slow water flow, encourage sediment deposition, and increase infiltration. But there is newness too. The scale at which CLO conducts restoration work is large. Many of their efforts are focused in riparian areas with numerous tributaries that accumulate to form large flow volumes and velocities. These large drainages see high magnitude flow events that require large-scale, Workshop participants tightly pack rocks collected from upstream into the gabion baskets.

Photos by BRN Sonoran Intern, Jorge Chacón.

technical restoration solutions. This is done through the construction of gabions – large wire baskets filled with rocks built across the riparian center of a watershed or sub-watershed. They are big impact structures that collect six or more feet of sediment, and each one can take several weeks to build. BRN. on the other hand, focuses erosion control and water retention work in upland tributaries, where water is just starting to coalesce and gain momentum. Our structures are small and each one on its own has minimal impact, but by installing hundreds of structures in series through a network of upland drainages, we start to get noticeable results.

At Rancho Nuevo, we spend several days learning to construct a gabion across an eroding 20 foot wide drainage. We learn to cut the wire for the gabion baskets, lay it out so it fits the drainage perfectly, and sew the baskets together using "chorizo" – a spiraling piece of wire that easily threads through the stiff wires of the gabion, stitching them together. We collect and pack rocks into the baskets using a backhoe, and we secure the baskets to the bedrock channel.

Our days of field work are peppered with delicious home-cooked Mexican food, and our evenings are spent walking the creek with beer in hand or swimming with the beavers that live upstream of where we sleep.



Borderlands Earth Care Youth Celebrates 10 Years

By: Jordan Sene, Youth Education Program Coordinator

his summer Borderlands Earth Care Youth (BECY) celebrated its 10 year anniversary with 13 borderlands youth interns and five adult leaders in two crews, one in Douglas and one in Patagonia. Both crews learned and worked on a variety of restoration worksites alongside conservation professionals creating a transformative and inspiring summer internship experience.

Amongst many learning opportunities, the Patagonia crew had the chance to work at BRN's Borderlands Nursery & Seed helping establish a native seed growout field that will expand growing capacity of native plants for seed collection. Interns also helped propagate and transplant native plants to be used in ecological restoration projects and for retail sale at the nursery. Participants toured the newly expanded seed lab and learned more about the uniqueness and importance of the Madrean Archipelago and how our local native plants have distinct adaptations to regional conditions. After helping clean and prepare native seed, interns made seed pellets used in restoration to help seeds stay in place, avoid predation, and assist in germination when they are distributed in the landscape.

BECY Patagonia crew also worked on local community projects including building a rain garden in the heart of Patagonia. Initiated by Patagonia residents, the BECY Patagonia crew shaped and armored the earth to passively harvest rainwater that flows down the side of the street during rainstorms. This rainwater will now soak into the Patagonia Memorial Garden, supporting native trees and newly planted wildflowers. This project was supported by local residents and the United States Forest Service, through a local Secure Rural Schools grant. BECY Patagonia also partnered with the Patagonia Youth Enrichment Center to create four new vegetable garden beds, install a rainwater-fed drip irrigation system, and install a second

rainwater collection cistern to collect rain water from the roof supporting the sustainable mini-urban farm project.

At Deep Dirt Farm, youth worked alongside BRN's education staff, professors and students from the University of Arizona's Southwest Field Studies in Writing. Since 2018, BECY has participated in an exchange with creative writing students seeking Master's Degrees from the University of Arizona. The UA students learn about life, work, and restoration on the US/ Mexico border while hosting creative writing workshops so BECY interns can creatively explore the impact of their summer experience on their lives. The team worked together to collect seed. weed, and turn over the twenty-two beds in the main greenhouse.

Halfway through the season, both BECY Patagonia and Douglas worked together alongside BRN's Watershed Restoration staff at T4 Ranch. Together, they completed dozens of erosion control structures and collected multiple piles of wood that will be mulched in the fall. The mulch will then be spread throughout the tops of drainages to help protect the topsoil, soak in water and support diverse native vegetation.

The Douglas crew had the opportunity to complete work on the Winkler and Sycamore Ranch in New Mexico thanks to the Malpai Borderlands Group. At Winkler Ranch they removed a quarter mile of barbed wire fencing because the landowner will be installing a wildlife fence, allowing wild animals to pass through and will keep cattle safe. At this site, they also completed six large trincheras with volcanic rock found throughout the landscape. At Sycamore Ranch, interns repaired existing trincheras.

Interns also spent two weeks in the Huachuca Mountains building over 50 erosion control structures within the Coronado National Forest to help reestablish habitat for Montezuma Quail. This project was funded by Southern Arizona Quail Forever and the National Forest Foundation. While in the Huachucas, interns learned how to identify native plants and tips on how to track wildlife.

For the last couple of weeks, the crew returned to the Douglas Public Library and the Douglas High School Land Lab. Last year, BECY installed a rainwater harvesting cistern off the roof of the DHS Land Lab greenhouse. At the library, interns installed an irrigation system and watered plants put in to support green space at the library. This year at the Land Lab, students incorporated a rainwater harvesting berry patch. At the library, they installed a grape trellis and planted a pollinator garden. For their last day, they toured El Coronado Ranch to see first-hand the flowing waters and results of erosion control structures after 20-25 years.

After six weeks of hard work the program came to a close concluding with a graduation celebration in each community where interns presented each of their individual community restoration projects that are a requirement for successful completion of the program. The interns shared with their family, friends, and the community the experiences they had and how the program impacted them personally.

We are grateful to all the participants, staff and partners that make this program a reality each year that has now touched the lives of 170 participants making the borderlands more resilient in more ways than one.





Sowing the **Seeds of Growth**



By: Perin McNelis, Assistant Manager, Native Plant Program

In 2016, BRN's Native Plant Program moved its seed lab from the borrowed, less than 400 sq ft, guest house of a generous volunteer to the old cafeteria at the historic "Old Main" elementary school in Patagonia. At the time, we were over the moon with the increased space and room to grow, and it was hard to imagine we would ever expand capacity enough to necessitate another sizing up. But, over the last five years the seed program has grown steadily. 2022 has been a record year for the seed lab, and we foresee this area of our program continuing to expand into the future.

After a record monsoon in 2021, along with our largest seed collection contract to date, we pushed to take advantage of the abundant seed by collecting additional seed for commercial use to support nursery production and seed sales. But, our old seed lab suddenly felt very cramped with barely enough room to walk between the bags and kiddy pools of drying grass seed harvests weighing nearly 700 lbs. In January 2022, we faced the year ahead with many pounds of seed to be cleaned and numerous grants and contracts needing pelletized seed in increased quantities. All things considered, along with a newly expanded seed production grow-out field, there was an urgent need for more space for our seed work.

We were thrilled when Native Seeds/ SEARCH presented us with the opportunity to expand our existing lease for the land our nursery sits on to include more acres and the large seed barn on their fallow conservation farm in Patagonia just across the road from our nursery facilities. The barn sits on a 70-acre farm in a historic floodplain at the confluence of Sonoita and Harshaw creeks, with lovely views of both the Santa Rita and Patagonia Mountains.

The barn provides a generous 3000 sq ft with two large garage doors for increased ventilation, easy delivery of materials, large drying racks for our growing seed collections and farmed seed harvests, plus a bathroom, kitchenette, and on-site laundry facilities. With the help of our wonderful volunteers, it took us nearly a month to move in and set up the space to be functional for our purposes. Travis Gerckens, our very handy Farm and Maintenance Lead, was able to use his skills to screen in all the drying racks for mouse protection and pull an old trailer into the barn to retrofit it to be our new walk-in refrigerated seed storage. This new space supports our current increased needs for seed work and gives us room to grow further.

The expanded farmed seed increaser plot expands our growing space from 0.75 acres to 1.25 for seed production, allowing for an additional 12 species to be





produced for a grand total of 18 different species growing on our farmed plot. We have maintained our grow-out contracts with the Petrified Forest National Park and the Institute of Applied Ecology for Tonto National Forest, also adding rows for new projects, including a grow out for Southern Arizona Quail Forever for seed of species that support Montezuma Quail habitat, a grow-out for the United States Forest Service to produce seed to be used in our ongoing revegetation project in Mansfield Canyon in the Santa Rita Mountains, as well as rows of species to be used for commercial purposes like





BECY interns cleaning seeds at BRN Seed Lab.



nursery production and retail seed sales. With 11 seed pellet deliverables in the first half of 2022, amounting to more than 1,000 lbs of pellets, we used our small cement mixer to help us complete orders. The process of mixing clay, seed, and compost and the pelletization with the cement mixer stirs up a lot of fine dust. The seed cleaning and pelletizing on our "to-do" list was daunting in terms of physical capacity to carry out this essential and dusty work in our old small space with little airflow.

Pelletizing seed is a low-cost and lowtech way of overcoming challenges of successful revegetation seed applications in arid systems like the southwestern United States, such as predation by ants and other creatures. Seed pelletization combines seed with compost as a nutrient base and clay as a binder, plus some water, to coat seeds in a protective layer and form balls that can sit on the landscape until there is enough moisture to dissolve the clay and allow the compost to provide a good media for the seeds to germinate allowing greater flexibility to when seeds can be applied. There is a considerable need for locally sourced, regionally adapted, bulk native seed to meet restoration goals. Yet, the upfront costs of wild seed collection can be costly and apply pressure on wild populations over time. There are also few producers willing to work with the finicky wild species that don't behave like domesticated crops. Growing wild species for restoration quality seed requires careful management to maintain the genetics that carry beneficial adaptations to the specific conditions of our local ecosystems and diversity to adapt as these conditions may change. This management may include decreasing and removing irrigation after a season or replacing short-lived perennials with stock grown from wild seed every so often. It is an investment in time and funds to establish grow-out fields, but the inputs diminish as the plants take root and begin to need less and less care. Harvest is much more efficient and less taxing on our employees, allowing for larger yields and cost less over time. We see this type of seed production as a source of growth for our program and a niche we are well suited to fill.

Beneath the Surface

By: Tess Wagner, Watershed Restoration Program Manager

ne of the first things I noticed when I moved to southern Arizona in 2014 is how obsessed everyone is with water. During my first monsoon season, my National Park Service supervisor took me out to see a wash flow. She pointed with excitement to a small trickle of water threading its way through what seemed to be an unnecessarily large wash (I had not yet seen the roaring flash floods that carved the channel into its present geometry). I looked at her, naively unimpressed. "That's it?" She laughed. "You'll learn to appreciate it. It's not just about the trickle. It's about what's happening beneath the surface that's allowing that trickle to happen."

Since then, I've learned to appreciate water as the lifeblood of the arid southwestern United States and the northern deserts of Mexico. It is precious, rare, and its presence or absence is a defining factor in determining how our landscapes are formed and where our spectacularly diverse assemblage of ecosystems thrive. If you understand how water flows through the landscape, you also understand a lot about how energy, material, and life flow through the landscape. This is because in addition to being precious and limited, water is a primary transport mechanism for our landscapes creating a corridor along which wildlife can travel and sediment and debris is continually shifted and concentrated downstream.

It's easy enough to see and understand how water moves across the surface of our landscapes. Water leaves its mark long after the rainy season has subsided. Drainages form where water collects and flows, and rills and gullies provide hints as to where destabilized land is succumbing to the erosive force of water. Sometimes pieces of the story are missing where there isn't active erosion or a clearly defined channel it can be nearly impossible to perceive the subtle topographic nuances that guide water. To provide clarity in these cases, all you need to do is watch the landscape during a rain event. This will show you exactly how water flows across the earth's surface and negate any uncertainty.

But understanding our hydrologic system does not end at understanding surface water flow. Surface water is inextricably linked to groundwater. Despite the fact that we nonsensically legislate the two separately in Arizona and we infer a difference and disconnect based on what we can easily observe, there is a constant flow between surface water and groundwater. The availability and dynamics of one are innately connected to the availability and dynamics of the other. Ignoring this connection is a detriment to managing our water resources.

When we deplete groundwater through pumping, surface water trickles downwards to recharge aquifers and surface water availability is diminished. When we pollute surface water, dissolved pollutants trickle down into our aquifers, polluting groundwater resources. When we alter the uplands of our landscapes through mining, over-grazing, and urbanization, our impacts travel downstream, manifesting as increased surface water flow volumes and velocities in our riparian corridors. The increased erosive force of these high magnitude surface flows causes downcutting and channelization in our riparian corridors which further drains groundwater reserves as the earth holding the groundwater in place is removed.

In short, you cannot impact surface water without impacting groundwater, and you cannot impact groundwater without impacting surface water.

When we conduct watershed restoration, we are not just considering how water flows across the earth's surface. We are considering the entire landscape, both what is visible and what is beneath the surface and the way that water interacts with it. Each rock structure we put in the ground slows surface water flow, causing it to deposit its sediment load and pool. As water pools, it infiltrates into the ground, providing moisture for plant roots and seeds and potentially trickling down through miniscule pore spaces to recharge aquifers. Although the structures we build are above the surface of the earth, our work considers and extends below the surface, repairing relationships and flows that have been destroyed through land-use change and over-extraction of both surface and groundwater resources.

Although we typically embrace groundwater restoration as an important piece of our restoration work, this past summer BRN



has been working on a new restoration project where a primary goal is to locally limit surface water infiltration and enhance the separation of surface water and groundwater. What can I say, we occupy strange times, and sometimes superficially strange answers are good solutions. Hear me out.

Surface water in Arizona is scarce and it continues to become both temporally and spatially more scarce. Maintaining yearround surface water resources is critical to the sustainability and success of wildlife populations. Maintaining surface water sources is an important part of watershed restoration, but it is also challenging. Where surface water exists, it quickly infiltrates into the ground, following gravity and the path of least resistance to fill the empty pore spaces left by depleted groundwater supplies.

If we want to provide a perennial surface water source for wildlife, we likely need to locally sever the connection between surface and groundwater. This is what we have been working on this past spring and summer at the Borderlands Wildlife Preserve (BWP). Under the guidance of our friends at Bat Conservation International, clay from the bottom of an existing stock tank pond was removed and then put back in place in layers, with each layer being compacted to create an impermeable, watertight seal not unlike a water-tight clay pot. In addition to re-compacting the bottom of the pond, the pond was recontoured and the edge was roughened to create a variety of depths and habitats for riparian flora and fauna. Once we fence the pond off from current livestock, we will also conduct a large revegetation effort to restore sacaton flats and riparian habitat to the area.

Although a primary goal in restoring the pond to hold perennial water is to locally minimize water loss through infiltration, we will be installing erosion control and water detention structures upstream of and surrounding the pond to facilitate groundwater infiltration outside of the pond. Groundwater will feed the pond by way of an existing well and pump during dry parts of the year, and so contributing to groundwater recharge to offset this extraction is an important consideration.

It feels a bit strange to be sealing a small section of surface water off from groundwater resources, but in this case it's necessary to create an important perennial surface water source. We've done it with careful regard for underlying groundwater, and it's a solution that like any good watershed restoration solution is informed by what's happening both above and beneath the earth's surface.



Mesquite Artisan Training Free Workshops

- Beekeeping and Honey Production
 3-day series / October 14-16, 8AM-2PM
 Deep Dirt Farm, Patagonia, AZ
- Mesquite Pod Milling & Food Safe
 Processing of Mesquite Flour
 October 22, 9AM-2PM
 Patagonia, AZ

borderlandsrestoration.org/mesquite-workshops



BN&S Fall Plant Sale Sept 24, 9am-4pm & Sept 25, 9am-2pm

BN&S Open to the Public Oct 8 & 9, 9am-2pm (Patagonia Fall Festival Weekend) Native Seed Collection Workshop & Tour of Seed Lab Oct 15, 10am-2pm

Tucson Plant Delivery @ Exo Roast Co. Nov 12, 11am-noon & Dec 10, 11am-noon

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FULL DETAILS: www.borderlandsrestoration.org/donate



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Visit our website, www.borderlandsrestoration.org/donate to make your taxdeductible gift, or mail this form and your check made out to Borderlands Restoration Network to: **Borderlands Restoration Network PO Box 121 Patagonia**, **AZ 85624**

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I WOULD LIKE TO:



Sarah Taylor, CFRE Development & Communications Director E: staylor@borderlandsrestoration.org P: (520) 216-4148 Fall Plant Sale Sept 24, 9AM - 4PM & Sept 25, 9AM - 2PM Borderlands Nursery & Seed 42 San Antonio Road Patagonia, AZ

Borderlands Wildlife Preserve Public Celebration

Nov 12 at 9AM AZ Trail Casa Blanca Canyon Parking Lot Patagonia, AZ

Restoration Partners & Founders Circle giving society members receive 10% off purchases

> at Borderlands Nursery & Seed

borderlandsplants.org