

HARVESTING RAINWATER 2 // LANDSCAPE SCALE 3 // OF THE EARTH 4 // WILDLIFE PRESERVE 6



Left: BRN employees harvest native seed for revegetation projects. Right: Pelletized native seed ready for revegetation.

Collaborating to Control Invasives

By: Kurt Vaughn, BRN Executive Director

Grasslands are among the world's most endangered ecosystems. Unfortunately, they are also among the most unappreciated, partially because of what we can't see since up to 80% of the biomass of a grassland is underground! Grasses have deep fibrous roots which store carbon and help make these ecosystems resilient to fire and grazing.

Here in the Sky Islands our grasslands support hundreds of species from endemic plants, migratory birds and threatened mammals like pronghorn and black-tailed prairie dogs. However invasive plants pose one of the biggest threats to our Sky Island grasslands and the species that call them home.

Invasive species are introduced nonnative species that can take over ecosystems reducing the diversity of native plant and animal species. A particularly aggressive species of invasive grass called Yellow bluestem has started spreading throughout Southeastern AZ along roadsides and across rangelands, converting diverse grasslands to invasive monocultures. This species has been documented in small populations in the Sonoita-Elgin grasslands.

With support from the Arizona Department of Forest and Fire Management BRN

will lead a collaborative effort in collaboration with the Appleton-Whittell Research Ranch, the Babacomari Ranch and the Tucson Audubon Society. This cooperative effort is aimed at controlling this invasive grass on 21,000 acres of mixed grassland habitat directly adjacent to the Las Cienegas National Conservation Area and Coronado National Forest.

While this species has been found in small, relatively controllable patches for over a decade it has recently begun to spread to new places and can be seen along many roads and within the grasslands. With our partners we will monitor and map the extent of invasive grass species across the 21,000 acres, repeatedly treat invaded areas and facilitate the establishment of native species in treated areas.

Revegetating treated areas with native plants helps keep invasive species from returning and speeds the recovery of the grassland. To improve the success of the reseeding efforts we will use pelletized seeds, seeds added to a mixture of clay, high-nutrient soil or compost and water. Seed pellets are formed mechanically in the cement mixer and by hand and dried. Because seeds embedded in pellets have high soil contact and are protected from seed predation by insects and rodents,

they require minimal soil disturbance. Also, these seeds remain on site until heavy rains arrive with the monsoon, which wets up the clay and allow seeds to germinate while the soil is moist.

We are grateful for the support of AZ Forest and Fire Management and look forward to working with our nonprofit and private partners to control this invasive grass and restore diverse native species to our local Sky Island grassland.



Travis Gerckens pelletizing seed for projects with BRN.

Patagonia Youth Enrichment Center youth mulch blueberry bushes at the berry patch.

Harvesting Rainwater & Sustainable Gardens for Youth

By: BRN Staff

As daylight waned and winter came into its own, the Patagonia Youth Enrichment Center (PYEC) began planning for the summer 2022 monsoon season building upon prior efforts to harvest rainwater, build vegetable gardens and plan future crops. Through collaborations with BRN programs including Borderlands Earth Care Youth (BECY), and Şu:daḡi 'O Wuḡ Doakag (Water is Life) the youth center is creating a sustainable and rich landscape that creates opportunities for youth to learn and care for the land while growing sustainable food crops.

During the summer of 2021, BECY installed a 2,500-gallon cistern to gather rainwater from the youth center roof. A full cistern and a gravity-fed irrigation system now allows rainwater to support a verdant garden of peas, carrots, onions, lettuce, kale, chard, and broccoli, which is tended to by youth center attendees. Additionally, BRN has developed a landscape plan with the intention of expanding the food gardens, building a food forest, adding pollinator gardens, and providing a passive rainwater chicken coop. When it rains, a small cistern in the coop will fill with water accessible to chickens.

As part of this expansion, students visiting BRN from The Webb School in California and participants from our Şu:daḡi 'O Wuḡ Doakag (Water is Life) program from Baboquivari High School on the Tohono O'odham Nation, came together to install rain basins and a berry patch. The rain basins are connected to the roof with gutters and PVC piping, allowing water to trickle in when it rains. Next, they installed an irrigation system that will be connected to a new cistern generously donated by PYEC parent, Matthew Hendricks of Hendricks Sewer & Drain. Unlike many native plants that require less water, the berries will need supplemental watering during dry times of the year.

Through a series of collaborative workshops led by BRN and PYEC, and funded by the Wildlife Conservation Society, New York Community Trust, and generous PYEC donors, Patagonia youth have since planted six blueberry bushes, three raspberry and blackberry bushes, two pineapple guava trees, and two kiwi vines. These plants were inoculated with compost and compost tea from Deep Dirt Farm. PYEC youth are now completing their finishing touches on the berry patch, removing excess soil and stabilizing the basins with rock. Feel free to peek over the fence across from the Patagonia Volunteer Fire Department to see their progress!

Youth are already planning what they'll do with the bounty from the berry patch – jam, blueberry muffins, and gobbling fresh raspberries off the bush. Some of the youth have never tasted the fruit that is now growing at the PYEC. The berry patch rain garden and the cistern-fed veggie garden will continue to sustain Patagonia families long into the future.

If you're interested in learning more about harvesting rainwater in rain gardens or cisterns, sign up for our upcoming free Rainwater Harvesting Workshop series on Saturdays in April, with in-person classes both in Patagonia and Huachuca City.



Şu:daḡi 'O Wuḡ Doakag interns check out the rain-fed vegetable garden at Patagonia Youth Enrichment Center.

borderlandsrestoration.org/rainwater

Working at the Landscape Scale

By: Kurt Vaughn, BRN Executive Director



As you likely know our little corner of AZ boasts some of the highest biodiversity in the US. However, this landscape faces ongoing threats from habitat fragmentation, wildfire, soil erosion and invasive species. Since its importance as a wildlife corridor was identified by the AZ Game and Fish Department we've seen the Borderlands Wildlife Preserve, which links 1.75 million acres of protected lands in the Huachuca, Patagonia, and Santa Rita Mountains, as a key strategic location to focus our conservation and restoration efforts.

Decades of drought combined with historic overgrazing, loss of perennial water flow, topsoil erosion, wildfire, and the pressures of extractive industries have left this region's ecosystems compromised. But we envision creating a resilient, connected landscape by improving soil retention, carbon storage,

and groundwater recharge; providing perennial surface water for wildlife; controlling invasive species while enhancing native vegetation; mitigating fire hazards and inspiring local stewardship.

To this end BRN is proud to announce our new Landscape Scale Restoration project funded by a pair of grants from the US Forest Service and the AZ Department of Forest and Fire Management. This project has four main focus areas.

Enhance water quality and quantity:

BRN will build hundreds of erosion control structures in actively eroding arroyos. These structures are constructed of parallel rows of self-reinforcing rocks, often only one-rock high but several rows wide, and are incorporated into eroding ephemeral stream channels. Structures like this have been shown to decrease sedimentation, increase

water infiltration, and promote native vegetation.

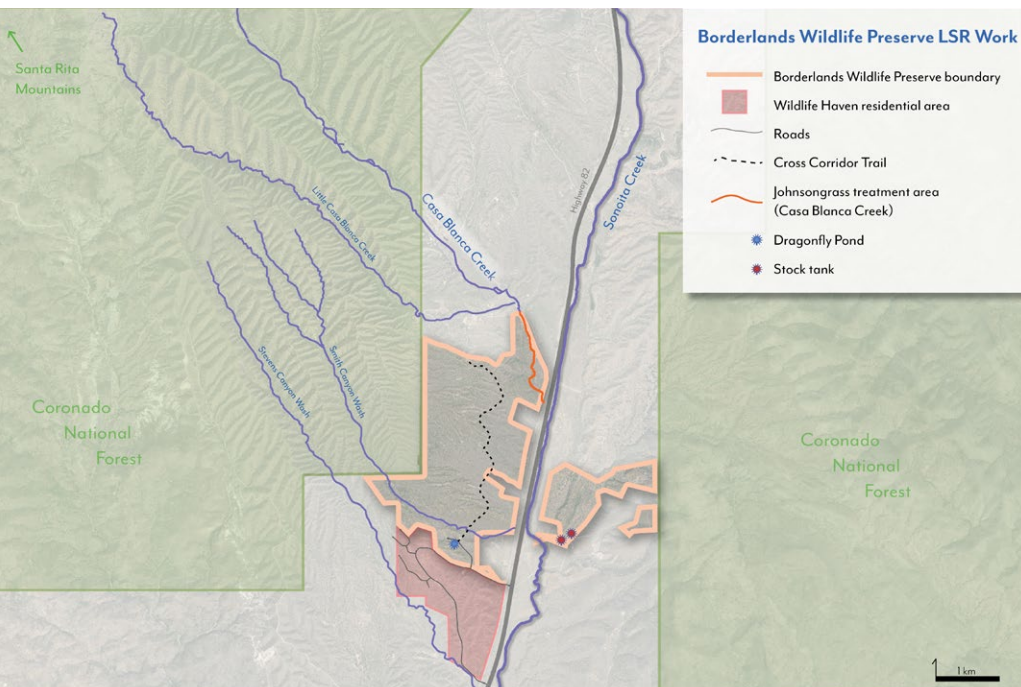
Restore wildlife habitat and build climate resilience:

BRN will work to control targeted invasive plant species populations and will install native plants and seed. In addition, we will collaborate with Bat Conservation International to enhance permanent surface water availability and native vegetation for wildlife at two pond sites.

Improve fire preparedness: As part of this effort, BRN will develop a Fire Response Plan for Borderlands Wildlife Preserve in conjunction with the Patagonia Volunteer Fire Department as well as share fire awareness information and best practices with landowners neighboring the Borderlands Wildlife Preserve.

Engage local community stewardship: BRN will offer opportunities for local residents to learn about the ecology and restoration of their home watershed. Borderlands Earth Care Youth (BECY), will focus on learning and implementing firewise practices throughout the Borderlands Wildlife Preserve, and will learn how these practices interface with other watershed restoration work. BRN will also host two week-long fire-preparedness and watershed restoration workshops designed to be accessible to landowners, practitioners, and students of all backgrounds and skill levels.

We are grateful for the support of our federal, state, municipal and nonprofit partners and look forward getting to work building a more resilient, connected landscape as well as strengthening our community's connection to the Borderlands Wildlife Preserve.





Of the Earth

By: Tess Wagner,
BRN Watershed Restoration
Program Manager

As humans, we are very good at manipulating the landscapes we occupy. Much of the time, our manipulations are quite obvious. We clear and level landscapes for developments; introduce new crops, livestock, and species that drastically alter the ecologies around us; and we extract such a diversity and quantity of natural resources at such a pace that rivers run dry, mining operations scar our mountains, and entire ecosystems are extirpated. Today, our relationship to the landscapes we live on is largely extractive and short-sighted, focusing on what we can take from the earth right now that will give us money and livelihood.

Restoration work is contrary to this general mode of human operation. Our outcomes do not inflict drastic, sudden, physical change on the landscape. Instead, our work responds to the dynamic context of the places around us, identifying and guiding off-balance flows and relationships towards a place of stability and resilience. We hope to work so closely with the ecology, hydrology, and geology of a site that we become a functioning part of it – not a controlling or overbearing part, but a part that is no greater or less than any other part. We hope that, eventually, our restoration work will be so tightly woven into the landscape fabric that all evidence of it disappears. We hope that our physical structures become covered by sediment and vegetation, and the vegetation we plant roots deeply into the soil, becoming indecipherable from the plants grown without the help of human hands. Through these activities, we not only help heal the places we work – we also redefine how we relate to and interact with the landscapes around us.

Left: BECY interns building a rock structure at the Huachuca Mountains.
Right: Volunteers planting native plants at the Borderlands Wildlife Preserve.



We heal our own fractured relationships with the earth.

By explaining this we provide context for where the BRN Watershed Restoration Program is headed. This year, we will put more focus on the restoration of the relationships between people and the landscapes we occupy. We will continue building and seeding structures, removing exotic invasive vegetation, and planting native vegetation, but we will also more thoroughly explore our role as educators. By partnering closely with the BRN Education Program and our friends at Cuenca Los Ojos (CLO), we will develop and conduct two one-week-long watershed restoration workshops for those new to restoration with funding provided through the Environmental Protection Agency (EPA) Border 2025 Program. Border 2025 is a model of cooperation and collaboration between neighboring nations, that will have achievable, tangible, on-the-ground, environmental, and public health results for communities in the US-Mexico border

region. This program will be replicable, and we hope to continue offering it beyond the end of the grant period.

In early April, we will spend a week at Cuenca Los Ojos (CLO) learning about their restoration practices and workshop curriculum development. We will head back to Arizona and use the knowledge we gained and the combined experience of our staff to develop a curriculum that guides people through landscape analysis, developing a restoration plan, and practical skills required for implementing restoration interventions. The workshop will be free and structured for those with little to no restoration experience. Through this project, we hope to help others explore their relationships with the places they live. We hope to expand our knowledge as educators and students and to help others contribute positively to the landscapes around them by listening, observing, and becoming a functional part of the landscapes we are undeniably a part of.

It is easy to get lost in screens and in our anthropocentric lives. But, it feels good and necessary to step out and spend time caring for the landscapes we live in. We are, after all, of the earth.



Zach Farley, BRN Restoration Crew Leader.

The Discovery Trail will be an accessible interpretive trail departing from the parking area and existing kiosk at the Borderlands Wildlife Preserve.

Blazing New Trails at the BWP

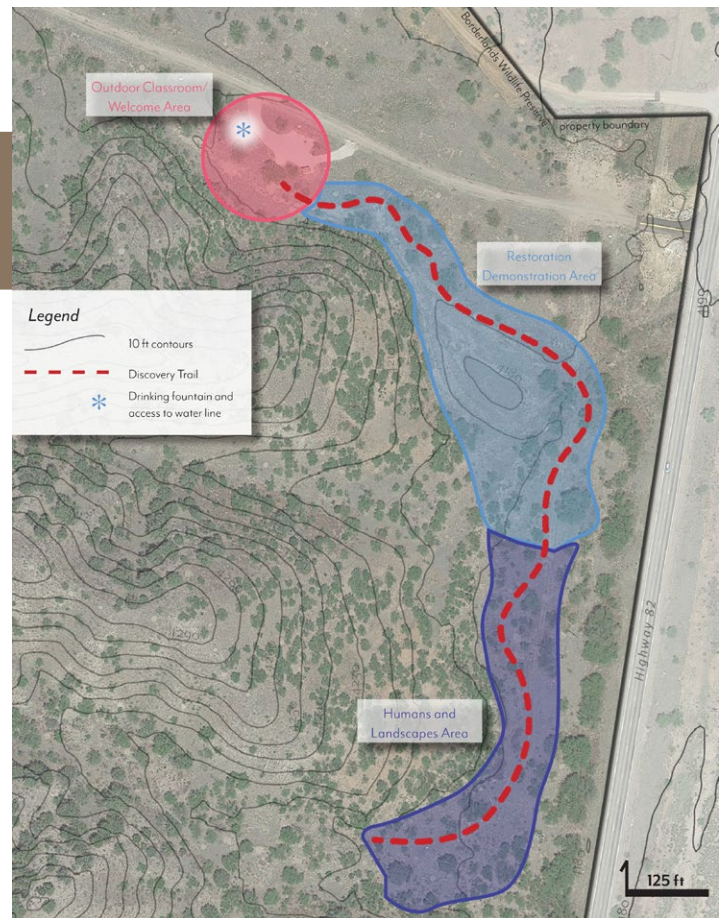
By: Cholla Rose Nicoll,
Borderlands Wildlife Preserve Coordinator

At Borderlands Wildlife Preserve, we try to balance providing access to natural areas for humans and keeping our wildlife safe and thriving in the most non-invasive ways possible. We hope to work towards both goals this coming spring!

As many of our readers are probably aware, a recent study published in *Nature Climate Change* has reported that the west is experiencing the worst drought in 1200 years. Climate change driven by relatively recent human activity has made it 40% worse. Evidence shows that the drought is also not over yet, potentially continuing until 2030.

The continued drought makes life harder for our local wildlife. Borderlands Restoration Network and many other organizations concerned with wildlife conservation act by providing water for wildlife. Thanks to a generous donation from one of our incredible supporters, we have purchased four new wildlife drinkers to install in the preserve. Three of these drinkers will replace previous hand-crafted drinkers, eventually moving to different areas of the preserve. Although both types of drinkers provide much-needed water to animals, these new drinkers are designed to be buried at ground level allowing smaller animals and bugs to access moisture more easily. Two of these drinkers have already been installed, and we are happy to say they are working great just in time for the driest part of the year.

In addition to our new wildlife drinkers, the preserve will also be gaining a new trail, The Discovery Trail (DT). The DT will be located at the main entrance to the preserve just behind the welcome kiosk, with construction starting in March and completion planned for late fall of this year. The DT will allow visitors to discover habitat restoration techniques and local history through a series of small educational trailside signs and demonstration areas. As the coordinator of this project, I am excited to be working on this trail with the help of Tess Wagner,



BRN's Restoration Program Manager. Tess has helped design this trail to be ADA compliant using universal design concepts. The BWP currently has no trails that are universally accessible. This trail will provide access to individuals using wheelchairs, strollers, and others with limited mobility or impaired senses and/or abilities. In addition to being universally accessible the DT will also be open to leashed dogs.

Please stay tuned for more updates and potential volunteer opportunities in the future to help with the completion of the Discovery Trail. This trail would not be possible without the generous donation of supporters and the MTN Dew Outdoor Grant program. Borderlands Wildlife Preserve continues to evolve into a place with more opportunities for all to enjoy nature and provide a haven for our local wildlife. We hope to continue to find the balance between the two and are always open to suggestions from the community. Please enjoy this spring in the Sky Islands and reach out anytime with questions about the preserve and new happenings.



New and old drinkers will continue to provide water to wildlife in the BWP.

Follow the Borderlands Wildlife Preserve at:
[@BorderlandsWildlifePreserve](https://www.instagram.com/BorderlandsWildlifePreserve)



Southeast Arizona Rainwater Harvesting

Free Workshop Series

- **Rain Gardens - Patagonia**
Saturday, April 9 / 10AM - Noon
Patagonia Youth Enrichment Center
- **Rain Gardens - Huachuca City**
Saturday, April 16 / 10AM - Noon
Huachuca City Senior Center
- **Rainwater Cisterns - Patagonia**
Saturday, April 23 / 10AM - Noon
Patagonia Youth Enrichment Center
- **Rainwater Cisterns - Huachuca City**
Saturday, April 30 / 10AM - Noon
Huachuca City Senior Center

Volunteer OPPORTUNITIES



Earth Day Montezuma quail habitat restoration

April 22 & 23 / 9AM - 1PM

Come celebrate Earth Day with BRN by helping us restore Montezuma quail habitat in the Huachuca mountains! Working alongside the BRN watershed restoration crew and our friends at Southern Arizona Quail Forever (SAQF). You will learn how to build wood and rock erosion control structures to address Montezuma quail habitat degradation. Big thank you to SAQF for providing funding for this important work!

Please note that this opportunity involves some hiking, so close-toed hiking shoes or boots, long pants, a long-sleeved shirt, and sun protection are required.

Please email twagner@borderlandsrestoration.org for more information or to sign-up.

Become a **Legacy Society member**

and leave a **lasting legacy on the borderlands** through your will or living trust by making a charitable bequest to Borderlands Restoration Network.

FULL DETAILS:

www.borderlandsrestoration.org/donate



2022 OPEN DATES, PLANT SALES & WORKSHOPS



Earth Day Plant Delivery & Presentation
@ Elfrida Library
April 22, 10am-noon

In-person Native Plant Propagation Workshop
April 23, 10am-2pm

BN&S Open to the Public
April 23, 8am-2pm

Agave Heritage Festival & Plant Delivery Tucson
@Mission Garden
April 29, 8am-2pm

BN&S Spring Plant Sale
May 7, 8am-4pm &
May 8, 8am-2pm

Virtual Bilingual Plant Propagation Workshop
June 11, 10am-noon

BN&S Open to the Public
June 18, 8am-2pm

Bisbee Farmers Market Vista Park Plant Delivery
June 25, 9am-1pm

Sierra Vista Farmers Market Plant Delivery
July 7, 10am-2pm

BN&S Monsoon Plant Sale
July 16, 8am-4pm &
July 17, 8am-2pm

BN&S Open to the Public
August 13, 8am-2pm

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

www.borderlandsplants.org



Founders Circle

Join our circle of **leadership donors** that help rebuild, restore, and reconnect the borderlands.

Full details:
www.borderlandsrestoration.org/donate

US Nonprofit
PAID
Permit #4
Patagonia, AZ

SUPPORT THE BORDERLANDS

YES, I WANT TO SUPPORT THE ECOLOGICAL WELL-BEING OF THE BORDERLANDS!

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

NAME: _____ Please do not publish my name.

ADDRESS: _____

EMAIL: _____ ST: _____ ZIP: _____

Please send my acknowledgment via email to save paper and postage costs.

I WOULD LIKE TO:

MAKE A ONE-TIME GIFT \$ _____

Restoration
MONTHLY GIVING SOCIETY
Partners

Join the RESTORATION PARTNERS monthly giving society
www.borderlandsrestoration.org/donate



Founders
Circle

Join the FOUNDERS CIRCLE special giving society for donors contributing \$1000 or more annually
www.borderlandsrestoration.org/donate

I'm interested in contributing a major gift, please contact me.

I'm interested in making a legacy gift through a bequest, please contact me.

QUESTIONS?

Sarah Taylor, CFRE Development & Communications Director
E: staylor@borderlandsrestoration.org P: (520) 216-4148

AZ Gives Day

April 5-6

[www.azgives.org/
BorderlandsRestorationNetwork](http://www.azgives.org/BorderlandsRestorationNetwork)

Spring Plant Sale

May 7, 8am-4pm &
May 8, 8am-2pm

Borderlands Nursery & Seed
42 San Antonio Road
Patagonia, AZ

Restoration Partners
& Founders Circle
giving society
members receive
10% off purchases
at **Borderlands**
Nursery & Seed

borderlandsplants.org