BORDERLANDS RESTORATION NETWORK
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NEWSLETTER

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BRN staff. Photo: Bill Steen.

Borderlands Restoration Farm Purchase

By: **Francesca Claverie, Native Plant Program Director**

We are thrilled to announce that Borderlands Restoration Network (BRN) has finalized the purchase of the 60-acre farm we were previously renting portions of in Patagonia from Native Seeds SEARCH (NSS)! This purchase was made in collaboration with NSS, our previous landlord, and The Nature Conservancy (TNC), which holds the conservation easement over the land.

This purchase would not be possible without the generous support of Valer Clark, Loretta and Chris Stadler, and the Carroll Petrie Foundation. We would also like to thank everyone who has contributed to the visioning and efforts of this farm throughout the last decade, including the Patagonia community, our native plant program volunteers, past and present leadership and staff at BRN, our impassioned native plant and seed customers, and our restoration partners over the years. We have spent years negotiating this acquisition with these fantastic, like-minded partners and organizations and are happy to celebrate this achievement throughout the year.

Over the past decade, BRN has built a renowned regional center for native plant and seed production on the 10-acre conservation farm in Patagonia, AZ. BRN's Native Plant Program was founded in 2012 when a group of restoration practitioners identified and responded to the need to promote and protect biodiversity by providing individuals, communities, and land managers access to restoration-quality plant materials and guidance for effective use. We offer frequent public workshops and training, youth programming through our facilities, as well as organically grown plants and seeds specific to the Madrean Archipelago's semi-arid highlands to support local restoration efforts and for retail sale.

We are working to expand the current wild native seed fields to increase production capacity and fill growing needs for locally adapted seed for ecological restoration projects in the region, which will also expand our educational and job training opportunities. Expanding production is crucial for providing native seed for projects aimed at improving degraded

BRN seed fields in Patagonia.

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Last aerial photo of the 60-acre farm taken in 2019.

A view of the BRN 60-acre farm.

Borderlands Earth Care Youth on the farm seed fields.

ecosystems and for post-fire reseeding efforts. Currently, BRN is using five acres of the farm for six nursery container plant greenhouses, as well as our current seed fields, where we grow 15 species of native plants on two acres, producing hundreds of pounds of seed annually. In 2022, we started renting an additional five acres, including a 3,000 sq ft seed storage and processing facility, with large drying racks for our farmed seed collections and climate-controlled storage.

Since NSS fallowed their operations on the farm in 2017, BRN has envisioned the farm as an incredible opportunity to expand our native seed and plant production and educational programming. The sale will also benefit NSS by expanding its operations in Tucson with the proceeds.

The newly acquired Borderlands Restoration Farm is located near the confluence of Sonoita and Harshaw Creeks, which provides beautiful, well-draining alluvial soils and creates some of the best farmland in Southern Arizona. The fields have likely been farmed for thousands of years, first by native peoples, including the Tohono O'odham, then for alfalfa production in the 1950s, heirloom domesticated native crop seed in the early 2000s, and now for wild native seed for ecological restoration.

Owning the farm eliminates our lease insecurity and allows us to expand the production and sale of native seeds and grow our educational programming on the site. It will take us many years to establish the whole farm with a diversity of wild native perennial species suitable for restoration in our region. Once the farm is established, it will be time to return to our early fields and re-plant. Perennial farming of wild plants requires little irrigation (we establish our plants on a drip and then wean them off over the next few years once the roots develop). We hope to support this trend throughout our larger communities and learn from our farm so that fields of wild native seed are achievable in increased acreage in both the United States and Mexico.

Native Plant Propagation class participants at the nursery.

BRN Native Plant Program staff plants thousands of native milkweeds in the expanded acre of growing space on the farm for seed production.

Exciting highlights from the BRN Seed Farm

By: **Perin McNelis, Native Plant Program Manager**

It has been a big year for the BRN Native Plant Program's farmed seed project. Between purchasing the farm on which we operate this past spring, expanding our growing area by an acre over the summer, and making record harvests in the fall, it has been a year of great success! Here are some highlights:

For our project "Expanding Seed Sources and Creating Pollinator Corridors in the Madrean Archipelago," funded by the National Fish and Wildlife Foundation's Monarch and Pollinators Conservation Fund, we made significant headway on expanding our farmed seed plot to include numerous native milkweed species. We added an additional acre of growing space for milkweed seed production under landscape fabric to mitigate weed pressure and drip irrigation to support these sensitive herbaceous plants to thrive. We planted 4,000 milkweeds into this plot with the help of two incredible teams from the AmeriCorps National Community Conservation Corps program between May and August. We plan on putting nearly 10,000 milkweeds in this plot by the end of 2025, so we are right on track to reach our goals to support milkweed seed production for monarch habitat restoration projects for years to come.

Our farmed plot has also continued to produce seed for numerous contracts, nursery production, and public sale. We harvested grass seed from our Sand Dropseed plot, which we established through a contract with the Institute for Applied Ecology and has continued to thrive with minimal irrigation in its sixth harvest year.

Our rows of Blue Grama for the Petrified Forest National Park also continued to thrive in their sixth year and we increased our harvest amount from our commercial rows significantly. Additionally, we made our first harvests of species added to the farm plot with the 2023 Borderlands Earth Care Youth (BECY) cohort for retail and nursery production, including Beardlip Penstemon and Beebalm/Wild Bergamot. Although these species took a whole year to produce flowers, they were worth the wait!

We had an incredible bloom event from our Beardlip Penstemon row, which attracted hundreds of bumblebees, hummingbirds, and other pollinator species with its vivid flowers and sweet nectar. This row allowed for a large harvest of a species that would otherwise be difficult to collect in abundance from the wild. The Beebalm is also a species that we usually have to travel further in order to make wild collections, so harvesting a good amount of seed on-site is both economically beneficial for our program as well as beneficial in terms of reducing pressure on wild populations from harvest. Plus, it helps make our field season just a little bit easier.

Looking forward, we hope to rapidly expand grass seed production on the farm, finish planting our milkweed plot, and scheme about what other cool native wildflower species we can add to our farm plot in 2025!

Bumble bees on the blooming Beardlip Penstemon row.

Blooming Beebalm in the seed production plot at the BRN farm.

BECY 2024:
A successful season comes to an end

By: **Nicholas Botz, BECY Program Coordinator**

This June brought the 2024 season of Borderlands Earth Care Youth (BECY) to a close. BECY took place over multiple sessions, with two weeks of work during spring break and weekends in March-April and another five-week segment over summer break that concluded in the June graduation. This year's interns — representing both high school and university students from both sides of the border — completed a wide variety of work projects restoring the watershed, ecosystem, and community of the Borderlands. Here's a look into what BECY was up to this summer!

For their first project of their summer session, the crew improved the Patagonia Butterfly Garden by cleaning leaves for donation to the town's Community Gardens, reinforcing fences that had been damaged by javelina, and planting native pollinator flowers sourced from BRN's native plant nursery, Borderlands Nursery & Seed. Next, we toured The Canelo Project — a permaculture demonstration site near Elgin — and learned about natural building and farming techniques with Bill Steen.

Bill and Athena Steen's work is featured in some structures at Borderlands Earth Care Center (BECC), BRN's permaculture farm, and the location of BECY's next work project. Formerly Deep Dirt Farm, BECC is undergoing a transition to involve new programming since BRN acquired it last year. To prepare the site for the upcoming events season, our interns turned garden beds, prepared compost, and harvested crops and seeds with the organic farming group Women Grow Food. Also joining us was the University of Arizona Field Studies in Creative Writing fellows Dillon Clark and Claire Taylor, who led a workshop in which our interns produced an 8-page pop-up book envisioning future uses for BECC.

In the second week of summer, BECY joined the conservation group Friends of Sonoita Creek in a survey of watershed health indicators, starting at Patagonia Lake. The lake is an endpoint of Sonoita Creek, and it will carry water from South32's Hermosa mine during their dewatering operations. The BECY interns measured pH, dissolved oxygen, and turbidity and used field microscopes to measure the biodiversity of microbes and larvae from both water samples. Next, the crew participated in a wet/dry mapping study of Harshaw and Sonoita Creeks, starting at the top of the watershed in the Patagonia Mountains and taking GPS points of all dry and flowing stretches. The data from both studies will be used as a baseline for measuring any future impacts the Hermosa mine will have on Patagonia's water cycle.

This year's BECY curriculum included an environmental literacy exercise centered on the mine. Our interns met with Carolyn Shafer, co-chair of Patagonia Area Resource Alliance, to discuss the group's research and concerns surrounding mining activity in the Patagonia Mountains. Later, we toured the Hermosa mine with community and natural resource specialists from South32, allowing interns to see the project's progress and ask questions about the company's plans for mitigating environmental risk and restoring the affected area. By getting up close to the project and talking with specialists representing multiple perspectives, our interns were empowered to learn about the issues faced by their own community and seek information from diverse sources.

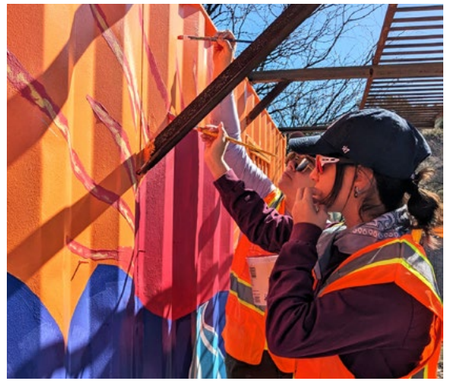
BECY interns collaborated with the Friends of Sonoita Creek on projects related to the health of the Sonoita Creek watershed.

BECY intern working on BECC garden beds.

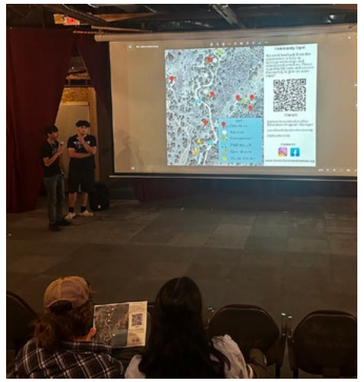
After their work in the Sonoita Creek watershed, the BECY crew transitioned to helping with BRN's Native Plant Program. The interns cleaned Blue Grama grass seed at the seed lab and created grow pellets out of clay, compost, and a native grass mix to restore native habitat at heavily eroded sites. The seed balls protect their contents from predation and dissolve into a puddle of earth, seed, and nutrient-rich compost with the monsoon rains. BECY also transplanted 268 Palmer's Agave at the nursery, a vital food plant for migrating nectar-feeding bats in the Sky Islands.

For the ecology unit of our curriculum, BECY hiked the Borderlands Wildlife Preserve with Cholla Duir from the Northern Jaguar Project and Eamon Harrity from Sky Island Alliance as their guides. Interns identified native fauna's scat and tracks and saw glimpses of wildlife, including the North American jaguar, taken from Cholla's wildlife cameras in the Sky Islands region. We also heard from Patagonia local Dr. Jason Botz for a career conversation about entomology and how healthy ecosystems and agriculture depend on insects.

BECY featured another career presentation with staff from the National Park Service at Tumacácori National Historical Park, where we completed four days of agricultural land restoration. The interns maintained a historical orchard of Spanish food trees, removed 1,132 gallons of trash from the Santa Cruz River, pulled 1,000 feet of dilapidated fence, and took 167 GPS points of cultural and natural resources on the park.



A glimpse at the mural paintwork by the crew in BECC.



Interns presenting their final reflection projects during the graduation ceremony.

The crew helping with BRN's Native Plant Program seed cleaning activities.

Our final BECY project occurred over four days at The Nature Conservancy (TNC) Sonoita Creek Preserve. The interns removed a patch of Vinca by hand and prepared a patch of Tree of Heaven for upcoming chemical removal. Next, the crew planted 30 pollinator plants in TNC's visitors center garden, watered by a reclaimed irrigation system that the interns repaired and installed. By managing invasive species and planting native pollinator food, our interns helped to ensure that the preserve's future stays biodiverse and beautiful.

We finished the season in Patagonia's Tin Shed Theater with a graduation ceremony attended by community partners, friends, and family of the interns. Each intern received a certificate of technical experience in restoration and delivered their final reflection project: a creative presentation showing what they learned throughout the internship. These included a nine-minute video documentary, an introductory brochure for BECC, and an educational presentation on the Sky Islands' endangered animals. Our facilitators were impressed with the crew's passion and curiosity and look forward to seeing what the next season of BECY brings. Congrats, BECY graduates!

Apex VS. Mesopredators

A pair of coyotes (*Canis latrans*) seen at one of the wildlife drinkers.

White-nosed Coati (*Nasua narica*) drinking water at the preserve.

By: **Aspen Thies, Watershed Restoration Project Manager**

Most often, apex predators like mountain lions, bears, and wolves dominate the news. That is because they dominate the food chain. Virtually the only thing that hunts these large predators are humans and their own kind. They are larger than life, equipped with sharp teeth, tough hides, strong muscles, and incredible athleticism. Their size, power, and threat to humans are captivating.

But what about the predators with the same set of tools, only in miniature? These animals are more commonly seen, like bobcats and coyotes, and are categorized as mesopredators. Mesopredators can be described as carnivores or omnivores that prey upon other animals, but they are also threatened by apex predators as a source of food or competition for resources. There is not an end-all-be-all definition for this ecosystem role, but they are often medium-sized in stature and occupy the middle or near the top of the food chain.

Southern Arizona is home to many mesopredators, thanks to the incredible diversity that the Sky Islands harbor. Not only do we see bobcats and coyotes, but four species of skunks, the gray fox, and three species of Procyonidae: the ringtail, raccoon, and coati, which all prey on small mammals, birds, amphibians, and reptiles. Mesopredators play a vital role in maintaining prey populations like rodents, and they help stabilize apex predator populations.

Bobcat (*Lynx rufus*) on the move at the Borderlands Wildlife Preserve.

Gray fox (*Urocyon cinereoargenteus*) staring at one of the wildlife cameras at Borderlands Wildlife Preserve.

Historically, apex predators like wolves, grizzly bears, and mountain lions were heavily hunted due to fears of predation on livestock and competition with humans for game species. This led to significant declines in their populations across the United States, including Arizona. Government-led predator control programs were established in the 19th and early 20th centuries, and bounties were offered for shooting or poisoning these critical creatures. Bear, wolf, and other predatory pelts were sold for high prices. The insatiable need to kill off carnivores was thoroughly instilled in white colonists of the West. Wolves were labeled as vermin and pests, and many people, even those we view as iconic conservationists like Aldo Leopold, thought it was their duty to kill every last wolf. They pictured forests full of deer, a never-ending supply of food, and hunting trips.

As environmental legislation was first passed in the 1960s and conservationists began understanding population and ecosystem dynamics, large predator populations remained low as human development fragmented habitat and restricted the movement of these predators, who often require large tracts of connected, undisturbed land to survive. Fear and misunderstanding about apex predators continued to lead to targeted killing, even after their legal protection.

This culmination of fear, ignorance, and an unrelenting need to conquer the wilderness over a century isolated apex predator populations and made them highly vulnerable to extirpation. This gap in the food chain led to a spike in prey populations and allowed mesopredators to thrive.

With the decline of apex predators, mesopredators experienced a release from predation pressure and no longer had to compete with them for prey resources. This allowed their populations to increase, leading to imbalances within the food chain that had cascading effects throughout entire ecosystems. For example, increased predation pressure from mesopredators can impact the populations of smaller prey species, which in turn affects vegetation dynamics and other trophic levels. Additionally, as mesopredator populations increase and prey populations are depleted, individuals must find other sources of food. As curious animals like raccoons, skunks, and coyotes search for their next meal, conflicts with humans may arise, particularly in urban and suburban areas where these animals may come into closer contact with humans.

A lot has changed within the last five years, let alone the last century. Arizona lost its last grizzly bear in the 1930s, mountain lion populations plummeted, and the Mexican wolf was extirpated from the state altogether. While the grizzly bear will never see the White Mountains again, black bears have maintained a healthy population throughout the state. Mountain lions and even jaguars are expanding back into their historic habitat ranges. The Mexican wolf population is on the rise after a captive breeding program released 11 individuals from a small population in northern Mexico into Arizona and New Mexico in 1998. There are now at least 257 individuals, and the population has shown continuous growth over the past eight years.

Reinstating the role that these large predators play will help balance food webs, increase biodiversity, and keep mesopredators and prey populations in check. In turn, the entire ecosystem will thrive, and people will have the opportunity to view the landscape as it once was.

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