Thank You to our Partners

47 Ranch (47R), Agnes Nelms Haury Program in Environment and Social Justice (Haury), Arevalos Farm (AF), Arizona Department of Environmental Quality (ADEQ), Arizona Department of Forestry & Fire Management (ADFFM), Borderlands Restoration Network (BRN), Borderlands Restoration (BR), City of Douglas (COD), Coronado National Forest (CNF), Cuenca Los Ojos (CLO), Deep Dirt Institute (DDI), Douglas High School (DHS), Harris Heritage Farm (HFF), Home Grown Instruments (HGI), Lush Cosmetics (LC), Madrean Archipelago Plant Propagation Center (MAPP), Malpai Borderlands Group (MBG), Milagros del Desierto (MD), Partners for Fish and Wildlife (PFW), Patagonia Flower Farm (PFF), The Patagonia Museum (TPM), Patagonia Public Library (PPL), Patagonia Union High School (PUHS), Santa Fe Ranch Foundation (SFRF), Southwestern Research Station (SWRS), T4 Ranch (T4R), University of Arizona (UA), U.S. Forest Service (USFS), U.S. Geological Survey (USGS), Wildlife Corridor LLC (WC), Youth Conservation Crew (YCC)

Abstract

The BECY Institute inspires and trains the next generation of land stewards by hiring youth to restore their home watersheds. The 12-person youth crews, located in two border communities, are paid to conduct actual hands-on restoration work in both rural, and semi-urban settings. Interns, between the ages of 15-20, were recruited from local high schools to refill plummeting groundwater tables, stabilize dwindling native pollinator populations, revegetate barren landscapes, arrest erosion, and support sustainable food systems. Each BECY crew was led by two Educational Facilitators, ages 21-26 that live in the same communities as the youth interns. Projects were completed in collaboration with local conservation professionals working in jobs available to youth in each community. Along with tiered-mentorship, BECY crews developed leadership/team-building skills while learning critical concepts in watershed, ecosystem, and food system restoration with daily activities and a structured restoration curriculum. The goal is to set youth up with the skills necessary to pursue livelihoods in conservation. The Patagonia BECY crew participated in workshops with UA Creative Writing graduate students to put words and meaning to their experience. Each crew worked eight hours/day, four days/week, over six weeks accomplishing projects including: water harvesting at the urban and home scale, building erosion control structures in working lands, pond/spring restoration, invasive species removal, native seed collecting/curating, native plant propagation, permaculture design, and assisting farmers and ranchers in daily tasks. Youth interns graduate from the BECY crew by completing a self-led Community Restoration Project and presenting their project at a community graduation ceremony.
Background

The mission of Borderlands Earth Care Youth Institute is to hire culturally diverse youth living on the US/Mexico border to restore the trans-national watersheds they call home. By working as a team, youth conduct hands-on restoration projects and learn marketable job skills while following a structured ecological restoration curriculum, to advance land stewardship for generations into the future. The Borderlands Earth Care Youth (BECY) Institute inspires and trains the next generation of land stewards by working with rock, wood, seeds, hands, and hearts to return flowing waters and riverside ecosystems to the arid borderlands. Youth living in rural communities along the US/Mexico border work closely with conservation professionals to make grassroots systemic change in historically overlooked and underserved communities. Simultaneously, youth acquire leadership skills and are empowered to develop tiered-leadership roles with increased responsibility, accountability, and empathy. By working and playing in the great outdoors, youth develop life-long passion and skills to make positive change in their home communities – supporting the people, plants, and animals that call the borderlands home.

Summer 2019 BECY Institute celebrated the seventh year of programming, which started in 2013 as a brainchild of famed southwestern ethnobotanist Gary Nabhan with 4 PUHS students. By partnering with BRN, CLO, and CNF, the program was able to expand to Douglas, AZ in 2015. The satellite program has successfully been run for four years with plans to continue for a sixth year in 2020. With the 20 interns graduated from BECY Institute 2019, 133 youth have participated in the program throughout its lifetime. Many graduates have been inspired to study conservation-related fields in college. Six previous BECY interns have been hired as Educational Facilitators - employees of BRN - creating a pathway for youth to pursue fulfilling careers in restoration.
Program Structure

In 2019, BECY crews were organized out of Douglas, AZ and Patagonia, AZ. Each crew consisted of two high school "Youth Leaders", eight high school "Interns" (ages 15 to 19), and two adult "Educational Facilitators." For eight hours a day, four days per week, over six straight weeks during the summer, the crews accomplished hands-on restoration projects, participated in leadership development activities, and followed an educational curriculum in core programmatic themes: Watershed Restoration, Ecosystem Restoration, Food System Restoration, and Career Development. At the beginning of each work day, Educational Facilitators conduct a check-in, daily work and safety briefing, and ice breaker/stretching activity. Within each crew, breaks from work are taken throughout the day to conduct leadership and educational activities. At the end of the workday, facilitators lead a guided debrief exercise with the interns and discussed the next day's activities. Each crew camped for at least one week during the program, except for the Douglas program, which camped for four weeks due to the distance of the worksites from town.

BECY 2019 Schedule

For the first week of the program, both crews focused on the principles of watershed restoration first visiting past worksites. At these working ranches, the crews performed regular maintenance while learning from successes and failures. After visiting the previous work at T4 Ranch, the BECY Patagonia crew designed a restoration project in Smith Canyon upstream of the Town of Patagonia. Working alongside BRN Watershed Restoration Program Manager David Seibert, BRN Youth Education Program Manager Caleb Weaver, and BRN Restoration Specialist Zach Farley, the Patagonia crew installed erosion-control structures from rock and wood in Smith Canyon subcanyons. Meanwhile, the BECY Douglas crew conducted farm work (harvesting, cleaning seeds, braiding garlic) at Arevalos Farm and built rock erosion-control structures at a working ranch and member of the Malpai Borderlands Group in Rodeo, New Mexico.

During week two, the BECY Douglas crew joined the Patagonia crew to restore Smith Canyon. In the afternoons, the two crews learn restoration, health, and art skills from local experts including: flute making from locally harvested bamboo with Home Grown Instruments, seed ball making and nursery
management with the Madrean Plant Propagation Center, immune-boosting syrup-making from the native elderberry with Milagros del Desierto, and cut-flower production with the Patagonia Flower Farm. The BECY Douglas crew spend one day on a permaculture-inspired project at Deep Dirt Institute.

The third week of the program brought the BECY Douglas crew into Douglas, where they installed youth-designed infiltration basins, lined with community-painted rock, and planted with native pollinator-attracting plants. This project was coordinated in partnership with the City of Douglas. The BECY Patagonia crew camped at the one-room Lochiel Schoolhouse and conducted habitat restoration projects with elders from the old border town. The crew planted apple trees, connecting irrigation to a cistern, and built water-harvesting features on the property out of rock.

During the fourth week of the program, the Patagonia BECY crew contracted with local landowners on the following restoration projects: erosion control on a steep earthen driveway, grassland revegetation on a working ranch, rock retention wall on a sloping hillside, and construction of a footpath built to minimize erosion and maximize enjoyment. The Douglas BECY crew ventured back into the Chiricahua Mountains, to first build rock structures in Reed Creek and camping at the Southwestern Research Station. Next, the Douglas crew removed invasive horehound (Marrubium vulgare) and planted native pollinator-attracting plants at Ash Spring. The crew assessed the rock erosion-control structures built in the drainage adjacent to Ash Spring during the previous summer.

During the fifth week of the program, the Patagonia BECY crew packed in many activities. They spent two days building rock erosion-control structures in Wildlife Corridor, developing a restoration optimization plan. The Patagonia crew conducted a permaculture-inspired project of their own at Deep Dirt Institute and had their first of two creative writing workshops led by visiting University of Arizona graduate students.

During this same week, the Douglas BECY crew returned to the Chiricahua Mountains. First, the Douglas crew conducted maintenance on erosion-control structures in Pinery Canyon, which had burned a few years prior. Because of that, there were many logs ready to be put to work. Next was a trip to El Coronado Ranch to see what 25+ years of restoration looks like on a landscape. The youth crew encountered lush landscapes teeming with rare plants, deer, turkey, and mountain lion and bear scat.
The BECY Douglas crew finished the program with a return trip to Hermitage Spring in the Chiricahua Mountains to plant native pollinator-attracting flowers. Then, the crew traveled to Cochise Stronghold in the Dragoon Mountains to culminate the program with one enormous structure. One mile up the footpath is Shaw Tank, a multi-acre water source that fills periodically with rainwater runoff to support cattle and wildlife. At its overflow point, a 6-foot primary headcut threatened the existence of this tank. After hiking to the tank, the youth collected roughly 3-tons of rock from as far as 1/2 mile from the tank. This rock was then used to build a substantial Zuni bowl to heal the headcut and protect the tank.

During the final week, the Patagonia BECY crew first healed deep gullies with rock in an eroding slope at Patagonia Union High School. Then the crew completed their second workshop with the UA Creative Writing graduate students, developing a woven poem to describe their summer experience with the BECY crew. Next, the crew assisted in farm tasks (harvesting, weeding, bed prep) at the organic Harris Heritage Growers in Sonoita, AZ. Finally, the crew finished out the program with an erosion-control restoration project at the Santa Fe Ranch Foundation.

For interns to successfully graduate from BECY and receive their certificates, they must design and present their own Community Restoration Project (CRP). The CRP is meant to encourage BECY interns to further explore a restoration topic that piques their interest while simultaneously engaging their community by conducting a project in their hometown. Final projects must include before and after photos, a written report, and a testimonial from a collaborative community member. Some examples of exceptional projects include: backyard pollinator gardens, rainwater harvesting basins, designing and planting a food garden, cistern installation, catalyzing composting in neighborhoods, and planting edible shade trees. The CRP is presented at a graduation ceremony, which culminates the program. Along with presenting the CRP, youth are presented with graduation certificates with a potluck meal in front of their community members.
Case Study

During the summer of 2019, both BECY crews participated in restoring Smith Canyon, a tributary of Sonoita Creek upstream of Patagonia, AZ. This special watershed is part of an important wildlife linkage designated in a 2008 report by Northern Arizona University researchers. Big cats, including the elusive jaguar, are thought to travel between mountains through this canyon. Smith Canyon is made up of around 200 sub-watersheds of similar shape and size, making it a perfect site for experimentation. Thanks to funding from the Arizona Department of Environmental Quality, BRN is researching the impact of various restoration structures on E.coli contamination in Sonoita Creek. The BECY interns built structures in three of the 25 canyons that are part of the scientific experimental design. The rest of the structures will be built with ADEQ and USFS funding.

This photo shows an aerial view of a few sub-watersheds within Smith Canyon. Each point represents one of the 151 erosion control structures built by BECY interns this past summer.
- Working at 47 Ranch for a 3rd consecutive summer - maintaining previously built rock erosion-control structures.

- Weeding, organic pest management, grain and crop processing, and farm tour at Arevalos Farm.

- Forging a new relationship with the Malpai Borderlands Group – building 30+ structures at a working ranch outside of Rodeo, New Mexico.

- Working alongside the Patagonia BECY crew to build rock and wood erosion-control structures as part of a restoration research project in Smith Canyon, upstream of Patagonia.

- Visiting Deep Dirt Institute, helping with a permaculture project.

- Learning land-based skills from local professionals, including: elderberry immune syrup with Milagros del Desierto, native plant propagation with MAPP Center, bamboo flute making with Home Grown Instruments, and native flower farming with Patagonia Flower Farm.

- Building rock detention structures in Pinery Canyon and Reed Creek of the Chiricahua Mountains and Shaw Tank of the Dragoon Mountains.

- Removing invasive horehound and planting native pollinator attracting plants at Ash Spring, Hermitage Spring, and Camp Rucker Spring.

- Teaching watershed restoration techniques to the Youth Conservation Crew.

- Designing and constructing infiltration basins in downtown Douglas in collaboration with the City of Douglas.

- Invasive species removal and restoration tour at El Coronado Ranch.

Achievements:

1. BRN recruited and hired two Educational Facilitators (ages 21-26) and 10 student interns (age 15-20).

2. Maintained 30 previously-built rock erosion control structures at 47 Ranch.

3. Built 68 new rock and wood erosion-control structures with the Patagonia crew in Smith Canyon of the Santa Rita Mountains.

4. Constructed two large basins in downtown Douglas with rocks painted by community members.

5. Built 109 new rock and wood erosion-control structures in the Chiricahua Mountains.

6. Removed invasive species and planted native flowers near mountain springs.

7. Learned skills in sustainable agriculture from 8 local experts, including visiting 4 farms/ranches.
Achievements:

1. BRN recruited and hired two Educational Facilitators (ages 21-26) and 10 student interns (age 15-20).

2. Maintained 8 previously-built erosion control structures at T4 Ranch.

3. Contracted restoration services with 4 local landowners (erosion-control, trail-build, revegetation).

4. Built 125 new rock and wood erosion-control structures in Smith Canyon of the Santa Rita Mountains (including 68 in collaboration with the Douglas crew).

5. Planted apple trees, harvested rainwater, learned from elders at Lochiel Schoolhouse (historic one-room border schoolhouse).

6. Learned skills in sustainable agriculture from 8 local experts, including visiting 4 farms/ranches.

7. Two storytelling workshops with UA Creative Writing master’s students.
Each BECY crew costs $50,000 to run per year. These costs include: youth payments, facilitator salaries, medical training, medical kits, tools, safety gear, restoration materials (plants, rock, seed, mulch, etc.) transportation, liability, coordination costs, and management fees.

The pie charts break down the funding for the programs depending on the location, each slice representing a different funding source. In addition to the direct costs of the program, many conservation professionals volunteered their time to discuss their careers and assist the youth in their tasks.
Each day, the BECY crew participates in an interactive 30-60 minute educational activity. These activities follow information and theory that directly relates to the work the crews participate in. Every BECY intern receives a paper copy of the 62-page Restoration Handbook, which houses these activities. Inside the Restoration Handbook, activities are organized into three categories - the 3 restoration pillars of Borderlands Restoration Network: Watershed Restoration, Ecosystem Restoration, and Community-Based Restoration. To the right you can find a sample of the BECY Restoration Handbook, which includes case studies, text, and a glossary of terms.

Resource Guide

BECY graduates are oftentimes interested in how to turn their newfound passion for the natural world into a meaningful life path. While Borderlands Restoration Network offers 6-month internships, there are many directions that youth can take their passion. Each intern receives a paper copy of the 16-page Resource Guide. This guide has information for those interested in fieldwork after high school, careers with a high school diploma or GED, careers with Associates or Bachelors or Graduate degrees. It also links passions and interests to college degrees or career paths.
- Prioritize community-led projects. Youth gave positive feedback for the collaborative projects with the City of Douglas and The Patagonia Museum. Prioritize collaborations in Douglas and Patagonia.

- BECY interns and facilitators expressed interest in further opportunities outside of BECY. A focus on year-round activities for BECY graduates and young adults in local communities are obvious next steps.

- BECY coordinators create site-specific Emergency Response Plans before facilitator training.

- Center indigenous voices and perspectives in framing of land interactions, include deeper indigenous history of place in curriculum, and include land recognitions and cultural appreciation.

- In facilitator training, include training for trust-filled relationships [based on BRAVING by Dr. Brené Brown.]

- Solicit facilitator feedback with intern feedback – at program midpoint and end of program.

- Update Restoration Handbook based on feedback from interns/facilitators. Accredit curriculum with AZ college.

- Request gender identity, personal pronouns, and t-shirt size in BECY Intern Application.

“This summer not only impacted my knowledge of environmental restoration, but changed how I interact with my community. BECY showed me how we can support our environment, and how that is crucial to our livelihoods. After the program I am excited to continue with restoration efforts, which has turned into a passion of mine.”

- Chesed Chap, 2019 BECY Patagonia Intern