CELEBRATING 4 YEARS OF STRATEGIC ACCOMPLISHMENTS

In 2017, non-profit and agency partners collaborated on a 5 year outlook for the development of native seed material for restoration in the Madrean Archipelago eco-region of southeastern Arizona. Non-profit partners included Borderlands Restoration Network (primary author)(formerly Borderlands Restoration L3C) and Gila Watershed Partnership (contributing editor). Agency partners included the National Park Service and the Bureau of Land Management (contributing editors). Informed by a “seed summit” meeting of over 25 participant organizations and agencies and a thorough survey of more than 50 stakeholders, the document laid out strategic objectives that would move this incredibly biodiverse eco-region forward in the field of ecological restoration. With incredible progress made, this document aims to review and highlight success stories and report on steps taken towards achieving each objective.

Why A Seed Strategy?

The Madrean Archipelago Seed Strategy followed the recognized need in the region for coordination around the development of high-quality native plant materials for a growing restoration market. The National Native Seed Strategy for Rehabilitation and Restoration was released by the BLM in 2015, outlining the need for genetically appropriate native seed for use in restoration projects, succinctly stating the need for “the right seed in the right place at the right time”. The national strategy also details the role of a network of native seed reserves in providing plant materials for rehabilitation of degraded lands, as well as pollinator support. The regional seed strategy mirrors the national strategy while providing regionally specific goals. The strategy outlines target species and a strategy for the collection, research, and curation necessary to address restoration goals specific to the region over a 5-year period.

In A Seed Strategy for the Madrean Archipelago, partners identified five primary objectives for expanding the availability and use of native plant materials during the next five year period. This report will review the main objectives outlined in the strategy and highlight the accomplishments of participant regional organizations in meeting these goals.

1. Support ongoing collection of genetically appropriate ecotypes for a range of target species
2. Increase local cleaning and storage capacity, and expand potential for information sharing
3. Build a balanced market by connecting producers and users of container plants, seed, and hay, and inform ordering and production timelines
4. Nurture collaboration and expand networks to avoid duplication of efforts and redundancy across the southwest
5. Support the growing economic base by practicing effective restoration strategies.
BRN: Expanded Seed Collection Services

BRN has received continually expanding interest in its seed collection services. A team of 2 individual collectors in 2015 has grown to 1 professional botanist and a seasonal crew of up to 10 individuals, resulting in annual harvests of over 100 lbs. Large harvest projects are specifically designed to accommodate this growing base of seasonal seed collectors, BRN completed The BRN Seed Lab Manual in 2020 to outline collection protocols in detail.

Collaborators: BRN and all funding partners (see below)
Funding partners: Bureau of Land Management (Arizona State Office), U.S. Forest Service (Coronado National Forest), National Park Service (SEAZ Parks, Petrified Forest National Park, Gila Cliff Dwellings National Park), Sky Island Alliance, RECON Environmental Inc., Great Bear Native Plants

BRN: Expanded Nursery Offerings

Increased collection activities have allowed the BRN Native Plant Nursery to expand offerings significantly. The nursery now regularly offers over 175 species, a 245% increase from 2015 levels (~51 species offerings). Production levels have similarly increased with a doubling of physical propagation and storage capacity, and now the nursery produces and distributes over 100,000 native plants annually. A diverse set of partners have provided support for this expansion through grow-out contracts and capacity building support.

Collaborators: BRN, Borderlands Restoration L3C

GWP: Expanded Capacity

GWP hired two full time employees to manage the nursery and seed collection operations. Steve Plath was hired in 2018 to be Nursery Manager and brought over 20 years of native plant nursery experience and expertise that enabled GWP to expand native plant offerings to partners and the general public. GWP also hired Kara Barron to be the Science and Outreach Manager in 2019 to curate and expand our seed collection efforts as part of her responsibilities. Before her arrival, seed collection was done opportunistically and inconsistently. Seed collections efforts are now targeted and volunteers are recruited and trained to assist with collection.

Collaborators: GWP, Americorps, National Civilian Community Corps, Eastern Arizona College
Funding Partners: Walton Family Foundation, Bureau of Land Management

Objective 1: Support ongoing collection of genetically appropriate ecotypes for a range of target species
BRN: Infrastructure Improvements
The BRN Seed Lab has seen significant expansion recently. Help from public agency (USFS, NPS) and corporate partners (Waste Management) has secured a Seed Blower, Brush Machine, and Clipper to allow for efficient cleaning of bulk seed lots. This capacity was developed concurrently with the increasing need for native seed. Thanks to help from the Biophilia Foundation and USFS, storage was expanded from household refrigeration units to an 84 ft² walk-in cooler.

**Funding partners:** BRN, U.S. Forest Service, Southwest Seed Partnership, The Biophilia Foundation, Waste Management Inc.

GWP: Volunteer Engagement
GWP realizes that volunteerism is an important component to building the capacity and sustainability of a nonprofit, and initiated a volunteer program in 2019 that includes training for seed collection and cleaning to interested volunteers. This program has significantly increased seed cleaning capacity and efficiency.

**Collaborators:** GWP, Eastern Arizona College
**Funding Partners:** Individual donors, Walton

BRN: The Seed Lab Manual
The BRN Seed Lab management based all recent improvements on the practices of the U.S. National Seed Laboratory in Dry Branch, Georgia. Staff was trained in the industry standards for seed storage, seed analysis, germination and viability testing, bringing these experiences back to the BRN Seed Lab to provide expanded services and provide a higher standard of seed quality to partners. Protocols and methods were adapted to meet the needs of a smaller, non-certified seed lab and were recorded in *The BRN Seed Lab Manual* completed in spring 2020.

**Funding partners:** BRN, The Biophilia Foundation
Objective 3: Build a balanced market by connecting producers and users of container plants, seed, and hay, and inform ordering

GWP: Regional and Local Collaboration

Since the development of this strategy, GWP has worked with a variety of agencies and organizations to develop both small- and large-volume contract grow-outs of plant material for targeted habitat restoration and conservation projects.

Collaborators: Freeport McMoRan, Southwest Monarch Study, Bat Conservation International, University of Arizona Cooperative Extension Offices in Yuma, AZ, the Treehouse Project, Bureau of Land Management, Arizona Game and Fish, San Carlos Apache Tribe, Arizona State Parks, National Park Service


BRN, USFS and NPS: Native Seed Production Partnerships

Thanks to persistent presence at regional conferences and available land resources, BRN was able to partner with multiple federal agency partners in the elapsed period of this strategy to produce native seed for restoration projects. Grow-out projects for the Tonto National Forest and Petrified Forest National Park allowed for expansion of the production field to a current total of 0.75 acres. The BRN farm project lead, Travis Gerckens, through this process developed acumen for agronomic production methods for perennial native species and has begun to imagine a more regenerative, healing future for seed production. BRN actively seeks production partnerships to continue to build seed knowledge and resources for the arid Southwest.

Collaborators: BRN, Southwest Seed Partnership, U.S. Forest Service (Tonto National Forest), National Park Service (Petrified Forest National Park)

Funding partners: National Park Service, U.S. Forest Service, Southwest Seed Partnership

BRN and The Nature Conservancy: Native Hay Distribution Trial

BRN sees the production of native hay as a potential restorative, perennial “crop” for degraded agricultural lands. 2019 saw the first steps towards native hay production in the Sonoita Creek watershed with a series of collaborative meetings with The Nature Conservancy to dream up production-restoration potentials on preserve-managed areas surrounding the Native Seed/SEARCH farm. These meetings culminated in a small hay sales/distribution trial that quickly sold 50 bales of hay provided by the Cobra Ranch. The trial revealed a potential market for native hay in both restoration and animal feed markets, but also the challenges of transport and distribution that require substantial infrastructure.

Collaborators: BRN, The Nature Conservancy

Funding partners: BRN, The Nature Conservancy, The Biophilia Foundation
Objective 4: Nurture collaboration and expand networks to avoid duplication of efforts and redundancy across the southwest

BRN and GWP: Regional and International Outreach

BRN and GWP have prioritized connection with regional networks to share knowledge and resources, evidenced through the 2015 MAPP Initiative agreement and recent collaborations with the Southwest Seed Partnership and other organizations. Stateside collaborations have been steadily increasing since 2015, allowing BRN to focus on outreach and partnership development in Mexico. Internationally, BRN seeks to provide guidance and training and helped to successfully launch the Colectivo Sonora Silvestre, a conservation science and restoration organization with a nursery based in Hermosillo, Sonora. Future planned collaborations include development of native plant production in Mexico partnership with both the Colectivo and the American-based Cuenco Los Ojos.

GWP offers support and guidance to organizations in the region that are doing similar work. Examples of this include working with the Sonoran Seed Collaborative as they develop native seed production protocols to increase availability of locally adapted plant materials for parks and preserves throughout Maricopa County and consultation with the Salt River Pima Maricopa Indian Community as they develop a tribal nursery and greenhouse.

Collaborators: BRN, Southwest Seed Partnership, Colectivo Sonora Silvestre, Cuenco los Ojos; GWP, Sonoran Seed Collaborative (includes Arizona Columbine Garden Club, Tovrea Carraro Society, Central Arizona Conservation Alliance, and City of Phoenix Parks and Recreation), Strategic Habitat Enhancements, Salt River Pima Maricopa Indian Community

Funding partners: Bat Conservation International, Bureau of Land Management; Garden Club of America, Nina Mason Pulliam Charitable Trust, Salt River Pima Maricopa Indian Community
Objective 5: Support the growing economic base by practicing effective restoration strategies.

BRN, GWP and Bat Conservation International: Agaves for Bats Campaign

The nascent partnership between BRN, GWP, the Colectivo Sonora Silvestre, and Bat Conservation International (BCI), following BCI’s commitment to planting one million Agaves to support endangered species of nectar feeding bats, has been an accelerator for regional habitat and watershed restoration projects. Seed collection, propagation, salvage, and out-planting of native Agave palmeri, A. parryi var. huachucensis, and other species is supported by BCI planners and scientists to increase probability of effective results. Current accomplishments include 50 lbs of seed, over 10,000 plants propagated, and 1,750 plants planted on public and private lands since 2015 thanks to a broad funding support base. The partnership is currently developing bilingual informational materials to support Agave propagation and restoration in both the U.S. and Mexico.

Collaborators: BRN, GWP, Colectivo Sonora Silvestre, Bat Conservation International

GWP: Restoring Habitat for Wildlife

The Gila River in Graham County is almost a monoculture of Tamarix sp.in many areas. It is also home to the endangered Southwest Willow Flycatcher. The Flycatcher has adapted to nesting in the Tamarix due to loss of its preferred Salix exigua habitat. Because of this, the release of the tamarisk leaf beetle as a biological control for Tamarix now poses a threat to the endangered Flycatcher as experts predict the beetle will expand its range to this part of the southwest. Gila Watershed Partnership secured funding to create habitat islands in preparation for the arrival of the beetle we are working with many partners to increase the effectiveness of our efforts.

Collaborators: GWP, RiversEdge West, SWCA, Freeport McMoRan Inc., Private landowners.

BRN and Wildlife Corridors: The Borderlands Wildlife Preserve

BRN and Wildlife Corridors officially incorporated the Borderlands Wildlife Preserve in 2019, demonstrating a commitment to acquiring conservation easements and preserving over 800 acres (and growing) of grassland, riparian, and oak woodland habitat adjacent to the Santa Rita Mountains (and Important Bird Area) of the Coronado National Forest. Over $400,000 in restoration has been accomplished on the property over the past 5 years, including multiple planting and seeding projects using locally-adapted plant materials. The preserve and adjacent community forest also provide an important source of native seed, harvested by BRN seed collection staff and offered commercially to the public.

Collaborators: BRN, Wildlife Corridors LLC
Funding partners: U.S. Fish & Wildlife Service, Arizona Department of Fire & Forestry, Arizona Game & Fish Department
MOVING FORWARD: GOALS FOR 2020 AND BEYOND

1. Continue to build seed production knowledge base: focus on regenerative seed production research & development.
2. Revisit & redesign a regional Target Species List, identifying and filling gaps in current plant materials offerings.
3. Engage partners in monitoring the success of seed and seedling establishment.
4. Develop publicly available protocols for propagation of native plant species commonly used in restoration.
5. Support national efforts to collect, bank, and grow seed of wild crop relative species.

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