2019 Funded Section 6 Plant Proposals - AZ

Note: Summaries of all section 6 plant proposals funded since 2004 are available on-line at https://cals.arizona.edu/herbarium/content/previous-awards

This year we received 12 section 6 grant proposals totaling $198,905. We were able to fund 7 proposals in full with the $113,785 we had available to distribute as of July, and another 3 proposals in full and 1 proposal in part with the additional $48,800 made available on August 12th, 2019 and another partial proposal with an additional $16,232.78 was made available on August 28, 2019. Therefore all 12 proposals were funded in full or in part, by the end of August, 2019 for a total of $178,817.78.

The Section 6 Committee (Fish and Wildlife Service and the University of Arizona members) ranked the 12 proposals based on merit (e.g. the priority of the species for FWS work, the track record of the PI(s), clarity of the proposal, if the proposed work aids in species recovery, appropriateness of the budget, if the species is a listed entity, etc.) and incorporated feedback from species leads, who were given the opportunity to review all proposals associated with their species. The proposals are listed below in order of ranking.

1) **Enhancing recruitment to promote recovery of *Amsonia kearneyana* (Kearney bluestar) Woodson**

Principal Investigators: **Sara Souther and Clare Aslan**, Northern Arizona University
Federal Share: $23,371

Project Description: This project has three specific research objectives aimed at identifying the causes of recruitment failure in this Endangered species, where no recruitment has been documented in decades and population levels are in decline. Objective 1. Perform a breeding system assessment of *A. kearneyana*, in order to determine whether inbreeding reduces seed quality. Objective 2. Conduct a structured seed augmentation experiment to identify extrinsic factors that limit germination and establishment of *A. kearneyana*. Objective 3. Test for genetic differentiation among *A. kearneyana* individuals sourced from distinct sites, in order to inform best practices for potential seed and pollen augmentation conservation efforts.

2) **Furthering our knowledge of Ecology and Population Dynamics of *Pediocactus peeblesianus* subsp. *peeblesianus* (Peebles Navajo Cactus) through concurrent range-wide surveys, updated monitoring, and pollination studies**

Principal Investigators: **Kirstin Olmon Phillips, Dr. Barbara G. Phillips, and Janice Busco**, Museum of Northern Arizona
Federal Share: $23,611

Project Description: The objectives of this project are to provide updated surveys and monitoring analyses, to continue to track the success or decline of the cactus for the 2022 US Fish and Wildlife Status Review by: 1) continuing the long-term monitoring of Peebles Navajo Cactus in permanent plots near Joseph City established in 1985 and 1986; 2) statistically analyzing additional years of demographic data of these populations; 3) surveying and mapping the distribution of the populations in the Joseph City monitoring plot area and other BLM lands with GPS, in coordination with BLM personnel; 4) surveying for new populations of Peebles

Navajo Cactus on public land in Holbrook area to replace permanent plot on private land; 5) surveying for new populations of Peebles Navajo Cactus on Petrified National Forest; and 6) conducting pollination studies on plants within the greater population of the taxon.

3) Seed collections of rare and threatened *Pediocactus* (pincushion) for conservation

Principal Investigators: **Sheila Murray and Kris Haskins,** The Arboretum at Flagstaff

Federal Share: $10,082

Project Description: The objective of this project is to collect seed from *Pediocactus sileri*, *P. bradyi*, and *P. peeblesianus* var. *peeblesianus* for future genetic research and reintroduction for conservation purposes. This is a multi-year seed collection effort that will result in a genetically and geographically diverse seed bank.

4) Reproductive biology and pollination ecology of *Sphaeralcea gierischii* (Gierisch globemallow)

Principal Investigator: **Wendy McBride,** McBride BioTracking LLC

Federal Share: 19,412

Project Description: The central objectives of this study are to examine the breeding system and pollination ecology of the newly listed Endangered, *Sphaeralcea gierischii*. In particular, important pollinators of *S. gierischii* will be determined as well as pollinator environment described. In addition, an assessment of self-compatibility vs. outcrossing success will be conducted as well as an assessment of seed set in the wild.

5) Update and upgrade *Purshia subintegra* (Arizona cliffrose) monitoring statewide

Principal Investigators: **Frank W. Reichenbacher and John Anderson**, private

Federal Share: $10,826

Project Description: The researchers will acquire journal notes, color slides, field datasheets, maps, and other potentially useful data sources. The researchers will revisit all monitoring plots and transects, repeating monitoring, reinforcing or modifying markers where needed, GPSing all plot markers and photopoints, and attempting to repeat imagery. Acquired images will be scanned with high resolution.

6) Monitoring and Survey for *Allium gooddingii* (Goodding onion, Liliaceae) in the White and Chuska mountains of Apache County, Arizona.

Principal Investigator: **Glenn Rink**, Far Out Botany

Federal Share: $7,456

Project Description: *Allium gooddingii* is a rare species that has been impacted negatively by the 2011 Wallow Fire. Six populations monitored within the fire perimeter have decreased; this proposal is to investigate known locations of this species outside of the influence of the Wallow Fire to see if healthy populations can be located. When plants are located, location, associated species, number of plants and reproductive condition, impacts, and potential impacts will be noted.

7) Surveys for *Tumamoca macdougalii* (Tumamoc globeberry) in western Sonora, Mexico

Principal Investigators: **José Jesús Sánchez-Escalante,** Universidad de Sonora

Federal Share: $22,710 requested; $19,027 made available and proposal adjusted to 20 days of field work.

Project Description: The purpose of this project is to revisit a selection of 89 quadrats containing the rare plant *Tumamoca macdougalii* that were established from the late 1980's to the mid-1990s in Sonora, Mexico. Comparison of results with original data will give an idea if populations are declining in Sonora, as they are in several locations in southern Arizona, or are stable or expanding. This information will assist in determining if *T. macdougalii* warrants further investigation for possible future listing of the species under the Endangered Species Act.

8) Heritage Data Management Abstracts Update

Principal Investigator: **Teague Embrey**, Ignem Feram, LLC

Federal Share: $8,706

Project Description: The purpose of this project is to update Arizona Game and Fish Department Heritage Data Management System rare plant abstracts for 60 of 335 total available abstracts. Data obtained from literature review, reports submitted to USFWS, and herbarium specimen, will be used to update the abstracts, which are available on-line and are used by land managers, researcher, and the public.

9) Revisiting the Tumamoc globeberry (*Tumamoca macdougalii*)

Principal Investigator: **Frank W. Reichenbacher**, private

Federal Share: $17,367

Project Description: The purpose of this project is to continue monitoring select population of *Tumamoca macdougalii*, a rare plant with declining numbers, that have been monitored periodically since 1984. In addition, monitoring will be expanded to include revisiting sites that were previously documented to contain *T. macdougalii* and determine current status of the plant at these locations. Further, nectar production, pollination, and germination studies will be conducted. A population viability analysis using all 34 years of current data and data extrapolated from greenhouse study of flower and seed production will be created.

10) Survey for *Hexalectris parviflora* (coral-root), a Species New to the Flora of Arizona and the United States

Principal Investigator: **Teague Embrey**, Ignem Feram, LLC

Federal Share: $12,213

Project Description: The purpose of this project is to conduct surveys for *Hexalectris parviflora*, the rarest of four *Hexalectris* species in Arizona, with two known locations in the state. The surveys will help land managers and biologists understand if this species is restricted due to rarity or the result of its cryptic habit.

11) Development of a citizen science-based rare plant monitoring program for northern Arizona

Principal Investigators: **Kirstin Phillips and Sheila Murray**, Museum of Northern Arizona and The Arboretum at Flagstaff

Federal Share: $29,304 requested; $10,514 made available and proposal adjusted to a single trip.

Project Description: This pilot project proposes to develop a long-term, permanent citizen science rare plant monitoring program for northern Arizona. The objectives of this one-year project are to: 1) Gather current knowledge on 10 rare plants occurring on the San Francisco Peaks and Mt. Elden areas that haven't been collected recently, 2) Develop and train a pool of at

least 10 citizen scientists to survey for rare species and gather basic population information that is compatible with USFS data systems, and 3) Establish a seed bank of select rare plants

12) Long-term monitoring of *Erigeron rhizomatus* (Zuni fleabane) and targeted surveys for undocumented populations on the Navajo Nation

Principal Investigator: **Wendy McBride,** McBride BioTracking LLC

Federal Share: $17,336 requested; $16,233 made available and proposal adjusted to include additional in-kind match.

Project Description: Researchers will establish permanent monitoring plots within five documented subpopulations of *Erigeron rhizomatus* on the Navajo Nation. In addition, all documented subpopulations will be revisited to assess population trends since the last monitoring 15 years ago. Distribution models and previously recommended survey sites will be used to guide surveys for undocumented populations. The FWS, Navajo Natural Heritage Program, and the New Mexico Natural Heritage Program have jointly identified this data collection as needed.