

2004 Funded Section 6 Plant Proposals – AZ

The following proposals were funded in 2004 (Segment 7). Award does not include administrative costs.

1) Surveys of *Dalea tentaculoides* and other rare plants in northern Sonora

Principal Investigator(s): **Dr. Thomas Van Devender, Arizona-Sonora Desert Museum**

Award: \$19,875

Objective(s): To assess the distribution, abundance, and status of *Dalea tentaculoides* in Sonora through field surveys from the Sycamore Canyon area southeast to the Huásabas area. Surveys would be in appropriate habitats and vegetation communities and during the primary reproductive season. A secondary objective is to record various other rare plants encountered during the surveys.

Final Report Abstract: In 2005, 26 sites in eight mountain ranges in northern Sonora were visited (25 days on seven trips) in search of *Dalea tentaculoides* in appropriate habitat. Additional information was obtained through interviews with local residents and ranchers. The locations of *D. tentaculoides* populations were recorded with GPS coordinates and evaluated for presence of threats and appropriate protective measures to be taken. In each *D. tentaculoides* population, the height of each individual was measured and a detailed list of associated species was made. A total of 624 plant collections were made on the survey trips, many of them from previously uncollected areas. Additional populations may be found in the mountain ranges between the Sierra de la Madera and Cruz del Diablo, but potential habitats are isolated, scattered, and most likely grazed by cattle. Access to the 1200-1500 m elevation zone in the mountains is difficult due to locked gates or lack of roads. In summary, *D. tentaculoides* is a rare Sonoran plant that occurs in Sonora at least three healthy, unthreatened populations in oak woodland at 1095 to 1403 m elevation.

2) Geographic distribution and DNA analysis of *Coryphantha robustispina* ssp. *robustispina*

Principal Investigator(s): **Dr. Marc Baker**, private

Award: \$26,750

Objective(s): To define the geographic distribution of *Coryphantha robustispina* ssp. *robustispina* and determine if it is sympatric with that of *C. R. ssp. uncinata*. In addition, there will be some assessment of population densities and a record made of ecological and morphological attributes.

Final Geographic Distribution Report Abstract: Fieldwork was conducted in southeastern Arizona and northern Sonora and was designed to estimate the geographic distribution and relative densities for individuals of *Coryphantha robustispina* ssp. *robustispina*. No populations of *C. robustispina* ssp. *robustispina* were found to the east of the eastern edge of

their historic distribution indicating a gap of allopatry 100km in width between *C. robustispina* ssp. *robustispina* and its closest relative *C. robustispina* ssp. *uncinata*. In general, individuals of *C. robustispina* ssp. *robustispina* occurred between 800 and 1185 m in elevation where *Cylindropuntia fulgida*, *Larrea tridentata*, and/or *Prosopis velutina* were the dominant or co-dominant woody perennials. Average tree/shrub cover was 17.0% and the average herbaceous cover, including grasses, was 5.1%. General soil characteristics included silt to clay-silt originating from multiple bedrocks, primarily red-brown in color, with a cover layer of surface gravel averaging 23.4%. All individuals were recorded from slopes of 3% or less (average 1.1%), mostly on plains or lower bajadas, and a few on low ridges.

Final DNA Report Abstract: This preliminary study indicates that AFLP technology will be useful in comparing DNA sequences of *Coryphantha robustispina* and *C. posegeriana* individuals within and among populations. Total genomic DNA was successfully extracted from over 200 accessions of *Coryphantha* using Qiagen DNEasy extraction kits for 0.1g of material. Approximately 200 ng of DNA was digested (cut) using two restriction enzymes - EcoRI and MseI, each restriction cutting the DNA at sites with a specific DNA sequence. A further PCR reaction was undertaken using selective primers that had an extra three nucleotides added. Final data gathering for several *Coryphantha* samples using an Applied Biosystems 377 sequencing machine was been successfully undertaken and alternate cost options are discussed in order to process the remaining samples of DNA.

- 3) Locating and quantifying populations of Huachuca water umbel (*Lilaeopsis schaffneriana* var. *recurva*) in the upper San Pedro River watershed, Sonora, Mexico**
Principal Investigator(s): **Gretta Anderson**, private
Award: \$3,567

Objective(s): To quantify the presence of Huachuca water umbel in the Upper San Pedro watershed in Sonora, Mexico. This will be accomplished by revisiting previously identified populations of the taxon in Sonora, as well as identifying potential areas within the watershed that might serve as habitat. The project will also initiate monitoring in appropriate areas, as well as build conservation relationships with land owners.

Final Report Abstract: The study provides a baseline for future studies, which may help to document the effects of conservation strategies, various land uses, and vegetation changes in response to climate and other factors. Of the nineteen sites surveyed for Huachuca water umbel within the San Pedro watershed, Huachuca water umbel was extant at nine. Five of these sites were previously known; four were new localities. Two of these newly discovered occupied sites were on the Rio San Pedro mainstem, one was in the Casa Blanca creek drainage farther east of previous surveys, and was on the Rancho Los Fresnos in La Cieneguita. The remaining five occupied localities were previously documented, but of these, three had never had specimens taken and collections made.