

Project Summary

Rocky Mountains Cooperative Ecosystem Studies Unit

Project Title: Big Gypsum Valley Rare Plant Study in Colorado

Type of Project: Research
Discipline: Natural Resources
Funding Agency: Bureau of Land Management
Other Partners/Cooperators: University of Northern Colorado
Effective Dates: 9/9/2011 - 9/8/2016
Funding Amount: \$60,000[FY14: \$15,000; FY13: \$15,000; FY12: \$15,000; FY11: \$15,000]

Investigators and Agency Representative:

BLM Contact:

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Project Abstract: *Cryptantha gypsophilia* (the Gypsum Valley Cateye) is a rare member of subgenus *Oreocarya* (Boraginaceae) presently tracked by the Colorado Natural Heritage Program and listed as a sensitive species by the Bureau of Land Management (BLM). It has a global rarity rank of G1G2, indicating that it is critically imperiled due to population occurrence and/or highly restricted range requirements (NatureServe 2011). *Cryptantha gypsophilia* faces threats from OHV use, mining, grazing, and oil and gas development, warranting protection by state and federal landowners. The plant can be found inhabiting light-colored gypsum soils in and around Big Gypsum Valley, San Miguel CO., CO. Often *C. gypsophilia* is the dominant plant at gypsum soil sites. Due to the rarity of gypsum soils within western Colorado, the habitat available to *C. gypsophilia* is incredibly limited, magnifying the effects of disturbances at occupied sites. Knowledge of genetic trends within and among populations, relationship of *C. gypsophilia* to closely related species, and current population estimates will provide managers with necessary data for making land management and species conservation decisions.

The University of Northern Colorado (UNC) will investigate genetic patterns in *C. gypsophilia* and *C. paradoxa* toward the goal of determining levels of genetic isolation/interaction between these species. In the process UNC will identify inter and intra-population variation in the two groups within and around Big Gypsum Valley. Various types of genetic data will be used to assess evolutionary relationships between the two lineages, place these lineages in the context of other *Cryptantha* species in the region, determine the level of genetic diversity within populations, and approximate the degree of recent gene flow between present day populations of these species. The results of this study will provide land managers with a clear determination of whether *C. gypsophilia* represents a distinct evolutionary entity worthy of protection and management. Additionally, data will expand our knowledge of the two species, so their genetic integrity can be maintained in the areas surrounding Big Gypsum Valley. Furthermore, our results will aid in our understanding of the genetic interaction between closely related rare/uncommon species. The Colorado Plateau is a region of the work rife with similar plant relationships, and patterns revealed from this work may inform future research and conservation efforts.

Outcomes with Completion Dates: December 2016

Keywords: *Cryptantha gypsophilia*, genetic patterns, conservation, Big Gypsum Valley, San Miguel CO., CO, Bureau of Land Management, University of Northern Colorado