

Ignacio Chavez Grant

Special Management Area

Rare Plant Survey Report

2017



Prepared
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Introduction

The Ignacio Chavez Grant Special Management Area (IC Grant) is located in McKinley and Sandoval counties of northwestern New Mexico (Figure 1). It has been proposed as a BLM Area of Critical Environmental Concern (ACEC) and consists primarily of two Wilderness Study Areas - the Ignacio Chavez Wilderness Study Area (33,300 acres), and the Chamisa Wilderness Study Area (13,700 acres). The climate in the IC Grant region is semi-arid, with temperate summers and cold winters. The average annual precipitation is 11 inches. Elevation ranges from approximately 6,000 ft to 8,250 ft at the upper elevations. The region lies within the Arizona/New Mexico ecoregion and is primarily composed of Rocky Mountain Lower Montane Forest at the highest elevations, Intermountain Juniper Woodlands at the mid elevations, and Intermountain Dry Shrubland and Grassland, with some Intermountain Saltbrush Shrubland at the lowest elevations (Southwest Regional GAP Analysis). The primary vegetation community at the upper elevations is open Ponderosa pine parks mixed with an oak understory and large open areas of grama and galleta grass. Mid elevations are largely pinion-juniper woodlands, becoming increasingly sparse at the lower elevations.

The primary geological formation within the IC Grant boundaries are coal bearing mudstone, sandstone and shales derived from the Menefee Formation (lower elevations) and basaltic rocks in the upper elevations, above 7,600 ft. The northern section of the WSA is characterized by outcrops of sandstone with lesser amounts of shale that have been subjected to intensive erosion (BLM 1986). Common landforms include mesas, cuernas, rock terraces, retreating escarpments, canyons, and arroyos. The southern portions are composed of basalt plains, cinder cones, exhumed plugs and dikes, and extensive talus slopes. The rims of the eastern side of the IC Grant area are composed of Point Lookout Sandstone outcrops and Mancos Shale extending into the Rio Puerco drainage.

The objective of this survey was to obtain current data on rare plant species within Areas of Critical Environmental Concern and other areas of special concern. Several ACECs have been established within the Rio Puerco Field Office for the protection of rare plants. Additionally, other areas have been identified to potentially contain rare species, but have yet to be inventoried or studied. The primary task was to survey the Ignacio Chavez Grant (proposed ACEC) for rare plant species. Several rare plant species have been documented from the vicinity of the Ignacio Chavez Grant Special Management Area, including Parish's alkali grass (*Puccinellia parishii*), Knight's milkvetch (*Astragalus knightii*), and tufted sand verbena (*Abronia bigelovii*). However, no systematic surveys throughout the area have been conducted for these or other rare plants and their habitat. Additional BLM sensitive species with potential to occur in the area included paperspine cactus (*Sclerocactus papyracanthus*) and Wright's nipple cactus (*Mammillaria wrightii*).

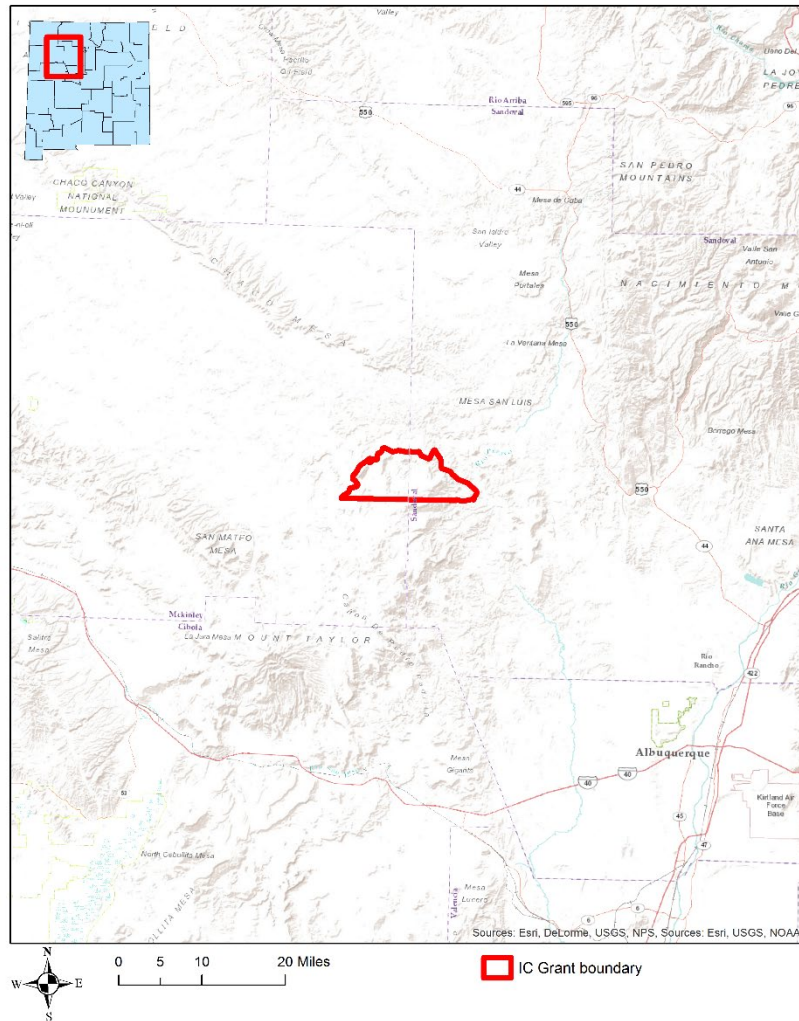


Figure 1. Location of the BLM Ignacio Chaves Grant in McKinley and Sandoval counties, NM.

Methods

Existing locational data from adjacent areas for the five target species were provided by Natural Heritage New Mexico (*Abronia bigelovii*, *Astragalus knightii*, *Sclerocactus papyracanthus*, *Mammillaria wrightii*, *Puccinellia parishii*). To optimize detection of target species during their flowering time, surveys took place in April, May, June and September of 2016, and May 2017. Surveys were conducted by driving and walking, targeting potential habitats (Figure 2). Potential habitat was identified from topographical maps, geology maps, field observations, and ownership boundaries.

Survey focus areas included seeps and springs, intermittent streams, volcanic rock outcrops and ledges, Dakota sandstone outcrops and Mancos shale hills. In addition, the surveys documented the current status of five previously known sites for *Puccinellia parishii*, just outside the boundary (Flowing Well/Rincon Grande, Coal Spring, Ojo Azabache, Ojo Fria, Ojo de

las Yeguas) and surveyed all mapped and accessible potential habitats (seeps, springs, seasonally wet areas) within and just outside the boundaries of the proposed ACEC. Twenty potential habitat areas were surveyed within and adjacent to the IC Grant boundaries, including Barrel Spring, Guadalupe Spring, Chamisa Losa Spring, Ojo de Alamo, Ojo Navajo, Ojo de los Indios, Heifer Tank, Seco Tank, Toro Tank, and Ned Tank (Figure 7).

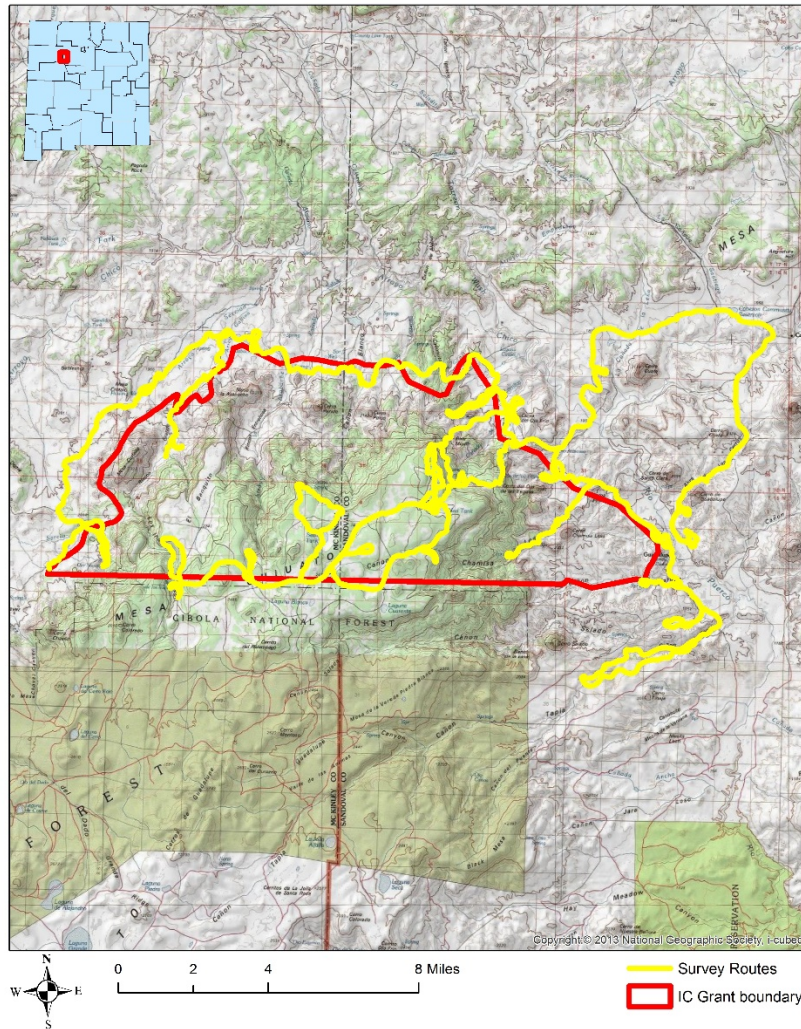


Figure 2. Survey areas in and around the IC Grant 2016 & 2017.

Results

Only *Abronia bigelovii* was found inside the boundaries of the IC Grant area. Rare and sensitive plants found outside the boundaries were *Abronia bigelovii*, *Puccinellia parishii*, and *Astragalus knightii* (Figure 3). No *Mammillaria wrightii* or *Sclerocactus papyracanthus* were observed during the surveys inside or outside the IC Grant area.

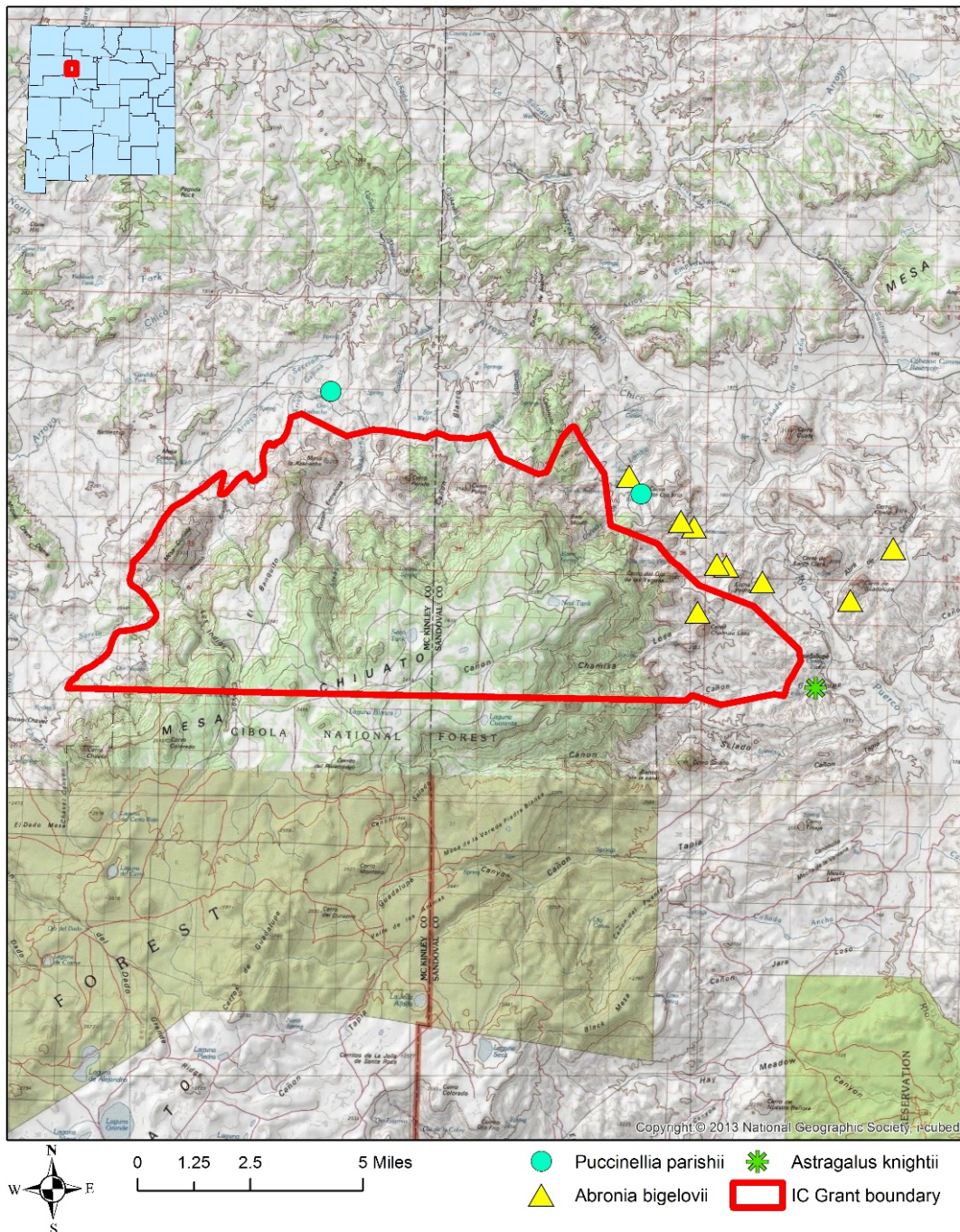


Figure 3. Location of BLM sensitive species found in 2016.

Tufted sand verbena (*Abronia bigelovii*)

Abronia bigelovii is endemic to New Mexico where it occurs on gypsum hills and ridges of the Todilto Formation, between 5,700 and 7,400 ft (NMRPTC 1999). It is ranked G3/S2 (vulnerable/imperiled) by NatureServe and is considered a Species of Concern by the U.S. Fish and Wildlife Service and the State of New Mexico. In addition, it is listed as a BLM Sensitive Species. It is ranked *Under Conserved* by the New Mexico Plant Conservation Scorecard, primarily due to its documented threats, weak protection, and the lack of information on its abundance, potential threats, and population trends (EMNRD - Forestry Division 2017; East and Muldavin 2017). It is historically known from 21 locations in New Mexico, 23% of which are reported from BLM managed lands.

Abronia bigelovii was the only BLM sensitive species documented within the boundaries of the Ignacio Chavez Grant. A total of 10 sites were documented from Mancos Shale outcrops along the eastern and northeastern side of the IC Grant area, including one on the north side of Cerro Chamisa Losa in the eastern section of the IC Grant (Table 1; Figures 3 & 4). Additional populations were documented outside the boundaries, near Cerro del Ojo Frio, Loma Padre, Ojo Atascoso, Cerro de Guadalupe, and Cerro Chafo. Only one of these sites was previously documented. Plants are highly localized in small scattered populations of few to up to 100 plants.

Abronia bigelovii is poorly documented from Mancos shale outcrops and is generally thought of as a Todilto Limestone endemic. There is significant amount of Mancos shale on the east side of the IC grant and throughout the general region east of the IC Grant area, where it is occasionally found in small, highly localized populations. It is likely that future surveys will document additional populations on Mancos shale throughout the area.

Table 1. *Abronia bigelovii* survey results.

SITE NAME	2016 NUMBER OF PLANTS
Cerro Chamisa Losa	Few
Ojo Atascoso - 1	12
Ojo Atascoso – 2a	50 - 75
Ojo Atascoso – 2b	4
Cerro de Guadalupe	Frequent
Cerro del Ojo Frio - 1	Few
Cerro de Guadalupe	No info
Cerro Chafo	6
Loma Padre - 1	No info
Loma Padre - 2	No info
Loma Padre - 3	50



Figure 4. *Abronia bigelovii* plants and habitat

Knight's milkvetch (*Astragalus knightii*)

Astragalus knightii is endemic to the middle Rio Puerco Valley in Sandoval County, NM. It is restricted to outcrops of the Dakota Sandstone Formation where it occurs in juniper savannah and grassland communities between 5,700 to 5,900 ft in elevation (NMRPTC 1999). *Astragalus knightii* is ranked G2/S2 (imperiled) by NatureServe and is considered a Species of Concern by the U.S. Fish and Wildlife Service and the State of New Mexico. In addition, it is listed as a BLM Sensitive Species. It is ranked *Under Conserved* by the New Mexico Plant Conservation Scorecard, primarily due to its limited distribution, lack of protection, and the lack of information on its abundance and threats (EMNRD - Forestry Division 2017; East and Muldavin 2017). It is historically known from 6 locations in New Mexico, 40% of which are reported from BLM managed lands of the Rio Puerco Field Office.

No Dakota sandstone is found within the boundaries of the IC Grant area, but one new populations was found south of the ghost town of Guadalupe, in Cañon Guadalupe, east of Guadalupe Springs (Figure 3). This population of approximately 25 flowering plants was highly localized at the base of a sandstone cliff (Figures 5 & 6).

Attempts were made to locate some of the historically known populations of *Astragalus knightii* on BLM lands, without success. Although the Dakota Formation is limited in its extent and distribution to areas east and southeast of the IC Grant boundaries, historic mapping was too general to pinpoint and locate populations of this cryptic *Astragalus*.



Figure 5. *Astragalus knightii* at Cañon Guadalupe, Sandoval County, NM.



Figure 6. Habitat of *Astragalus knightii* at Cañon Guadalupe, Sandoval County, NM.

Parish's alkali grass (*Puccinellia parishii*)

Puccinellia parishii is a rare annual grass which occurs in alkaline springs, seeps, and seasonally wet areas at the heads of drainages or on gentle slopes between 2,600 and 7,200 ft (NMRPTC 1999). The species is ranked G2/G3/S1 (imperiled/critically imperiled) by NatureServe, is listed Endangered by the State of New Mexico, and is considered a Species of Concern by the U.S. Fish and Wildlife Service. In addition, it is listed as a BLM Sensitive Species. It is ranked *Weakly Conserved* by the New Mexico Rare Plant Conservation Scorecard, primarily due to its limited habitat, documented threats, and lack of protection (EMNRD - Forestry Division 2017; East and Muldavin 2017). It is historically known from 16 locations in the State of New Mexico, 35% of which are reported from BLM managed lands.

A total of 20 potential habitat sites were searched for the presence of *Puccinellia parishii*, inside and adjacent to the IC boundaries, including 5 previously known sites (Figure 7). No *Puccinellia parishii* was found inside the IC grant boundaries.

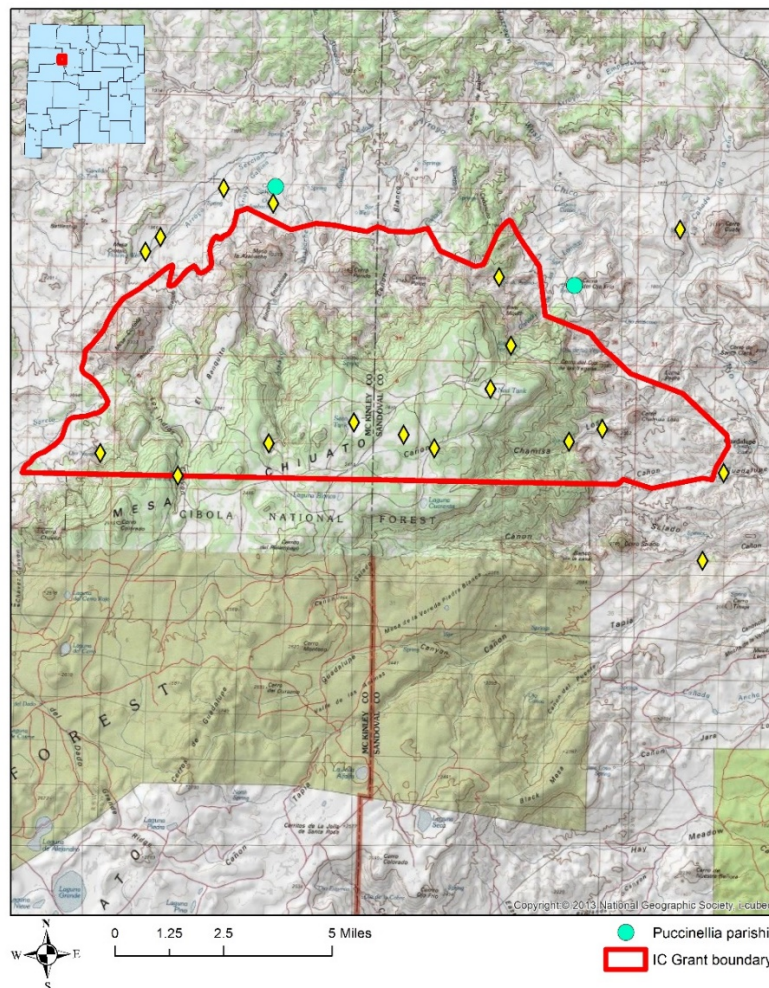


Figure 7. Potential habitat areas surveyed for *Puccinellia parishii* inside and adjacent to the IC Grant.

Only two of the 5 previously documented sites for *Puccinellia parishii* still contained plants, at Coal Spring and Ojo Frio Spring (Table 2; Figures 7 - 11). The two extant populations are in poor condition; fences are breached and the small habitat patches still occupied by *Puccinellia parishii* are severely trampled (Figures 9, 10, 11).

Two previously documented sites near Ojo Azabache and Ojo de las Yeguas had dried up and no longer provided habitat for this species. Both sites were initially documented in 1995. The Ojo de las Yeguas had more than 100 plants in 1995, but only 4 plants were found in 2005. None remained in 2016. In 1995, the Ojo Azabache site supported less than 30 plants in a small area of wet soil in front of the spring house. No plants were found during 2005 or 2016 surveys and the habitat had completely dried up. The Azabache Flowing Well site was documented in 2000 but we have no information on the number of plants found at this site (Milford et al. 2001). Although this location is within an enclosure, the site is apparently regularly dredged and excavated to maintain pools.

Additional seeps, springs, and seasonally wet areas (tanks, arroyos) within and adjacent to the IC Grant boundaries were surveyed, but no additional populations were found. No suitable habitat was found within the boundaries of IC Grant for *Puccinellia parishii*. Springs, seeps, and seasonally wet areas were either too high in elevation or lacked the alkalinity required. *Puccinellia parishii* is a very rare species and extant populations are severely impacted by livestock and water management practices. Enclosures designed to protect seep and spring areas are either defunct or are managed for other purposes, which can be detrimental and lead to local extirpation.

Table 2. Historic and current *Puccinellia parishii* populations adjacent to the IC Grant area.

SITE NAME	PREVIOUS SURVEYS/ SOURCE	PREVIOUS PLANT NUMBERS	2016 PLANT NUMBERS	2016 CONDITION
Ojo de las Yeguas	1995 (Sivinski) 2005 (Sivinski)	100 4	0	Dried up
Ojo Azabache	1995 (Sivinski) 2005 (Sivinski)	< 30 0	0	Dried up
Coal Spring	1995 (Sivinski) 2005 (Sivinski)	Several hundred Several hundred	200 - 300	Site fenced, but breached; trampled
Ojo Frio	1995 (Sivinski) 2000 (NHNM) 2005 (Sivinski)	Several 1000 Unknown Few 1000	500 - 600	Site fenced, but breached; trampled
Azabache Flowing Well/Rincon Grande	2000 (Milford et al.)	unknown	0	Site fenced, but severely manipulated to create pools



Figure 8. *Puccinellia parishii*



Figure 9. *Puccinellia parishii* habitat condition, Coal Spring



Figure 10. *Puccinellia parishii* habitat condition, Ojo Frio.



Figure 11. *Puccinellia parishii* habitat condition, Ojo Frio.

Conclusion and Management Recommendations

The primary objective of this project was to inventory, monitor, research, and plan for rare plant conservation within the BLM Rio Puerco Field Office, with a priority emphasis on Areas of Critical Environmental Concern. The long-term goal is to develop specific vegetation management guidelines for these sensitive areas. Data will be used to aid habitat management planning and inform multiple-use land use decisions. Furthermore, the development of ACEC Protection Plans and rare plant conservation strategies calls for identification and delineation of rare plant populations as well as identification of threats and development of management recommendations to conserve these species.

The purpose of this project was to evaluate the IC Grant area for potential rare plant habitat and survey identified habitats for rare plant occurrences. This included making the determination of focal species based on habitats present as well as the current federal endangered plant list, BLM sensitive plant list, and New Mexico State endangered plant list. Survey results will be used to develop species conservation strategies, aid in project planning and design, and inform land use decisions.

The IC grant area provides only limited habitat for regional rare and sensitive plants, primarily at the lower elevations, based on geology (*Abronia bigelovii*). Sensitive plant habitats in this region are primarily found on Manco Shale outcrops, the Dakota sandstone Formation, and alkaline seeps and springs.

Management Recommendations

To meet the long term goal of developing specific vegetation management guidelines for the management of sensitive areas, it is highly recommended to continue collecting baseline information on the status, distribution, abundance, and threats of BLM sensitive species. Emphasis should be on those species identified by the New Mexico Rare Plant Conservation Strategy Plant Conservation Scorecard to lack sufficient data to determine a conservation status and those that are considered *Weakly* or *Under Conserved* (EMNRD - Forestry Division 2017; East and Muldavin 2017).

Species specific management recommendations for the five target species of this survey are as follows:

- *Puccinellia parishii* – protect occupied habitat, maintain fences, conduct population trend monitoring. Collect seeds for ex-situ conservation.
- *Astragalus knightii* – conduct surveys on status, distribution, abundance, and threats on BLM lands. Collect seeds for ex-situ conservation.
- *Abronia bigelovii* - Collect distribution data. Collect seeds for ex-situ conservation.
- *Mammillaria wrightii* – determined to be too widespread to warrant rarity status by the NMRPTC and NNNM (AZ, NM, TX). Consider removing from BLM RPFO list.
- *Sclerocactus papyracanthus* – determine the current status of known historic populations on BLM lands. Collect seeds for ex-situ conservation.

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