2025 Rare Plant Collection and Monitoring Updates at IAE

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FOR THE NM RARE PLANT TECHNICAL COUNCIL

Demographic Monitoring Basics

- Data collection began 2017
  - 115 plots, including macroplots
  - Annual reports
- Our crew monitors 10 species
  - Plus 1 helping Katie Sandbom, FWS
- Goals:
  - Standardized protocol for fine-scale demographic data collection.
    - *Measuring and Monitoring Plant Populations* Elzinga et al. 1998
  - Extrapolate results throughout our range.
  - Answer basic life-history questions.
  - Population viability analyses.

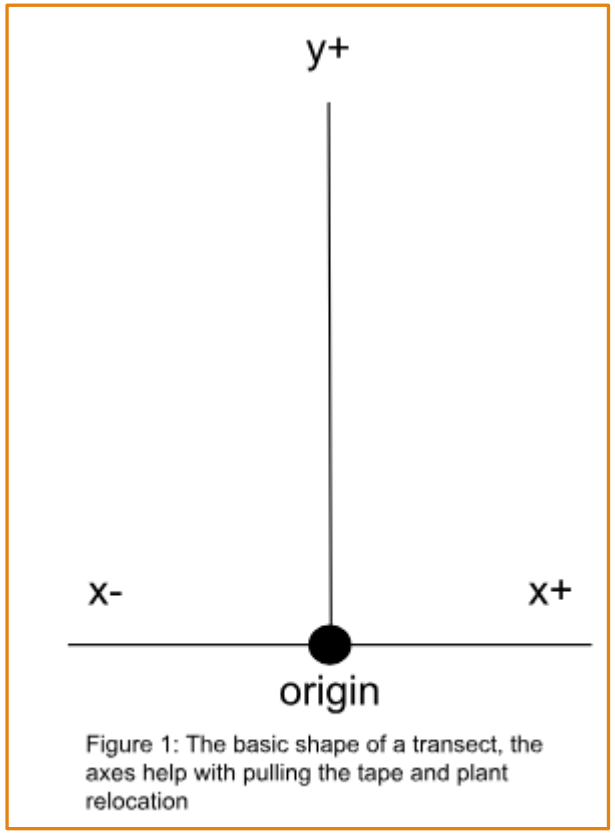


Figure 1: The basic shape of a transect, the axes help with pulling the tape and plant relocation

We also incorporate Dr. Carril's pollinator studies

Transition Matrix Modeling

Table 7. Stage Class Definitions for *Townsendia gypsophila*

Stage Classes	Definitions
1	Seedling
2	Vegetative Adult
3	Reproductive Adult, 1-5 Reproductive Structures
4	Reproductive Adult, 6+ Reproductive Structures

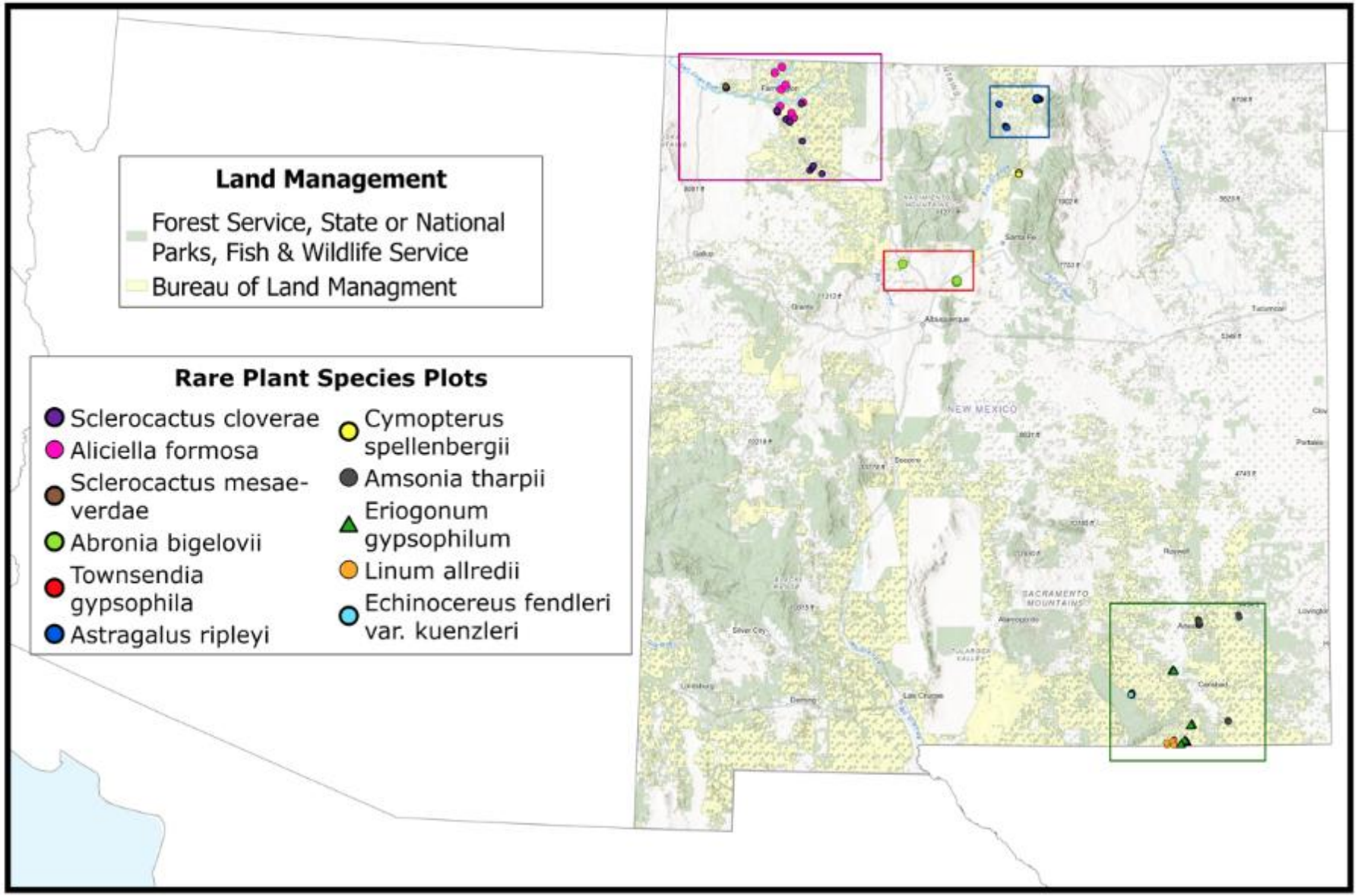
Based on:
- Life history
- Observations
- Distribution

Vital Rates for *Townsendia gypsophila*

		From			
To		1	2	3	4
	1	0.0000	0.0000	1.1645	1.9556
	2	0.1769	0.1956	0.0729	0.0457
	3	0.4615	0.3448	0.5101	0.3436
	4	0.1667	0.0749	0.2726	0.4707

Improves with more data

Study Areas

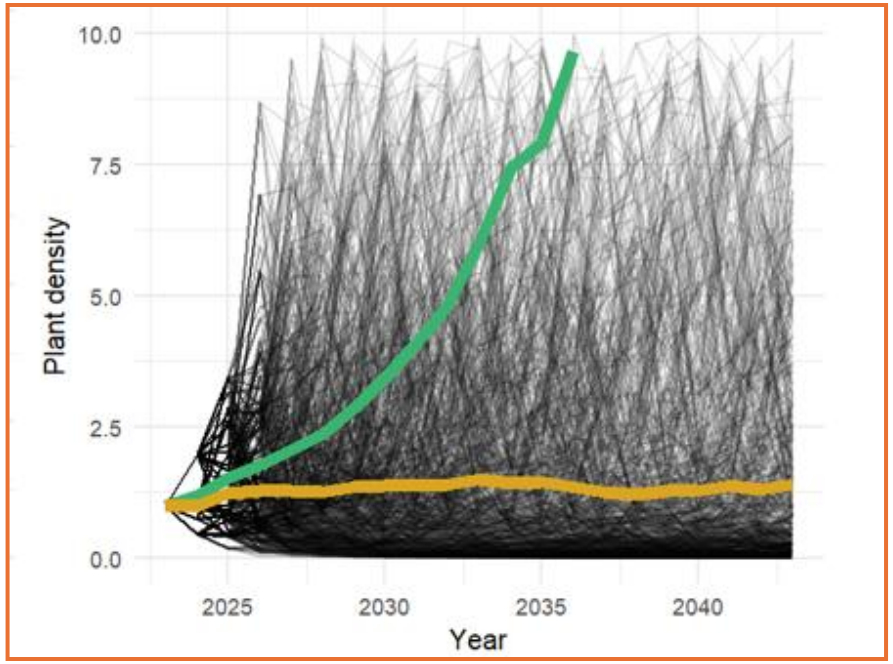


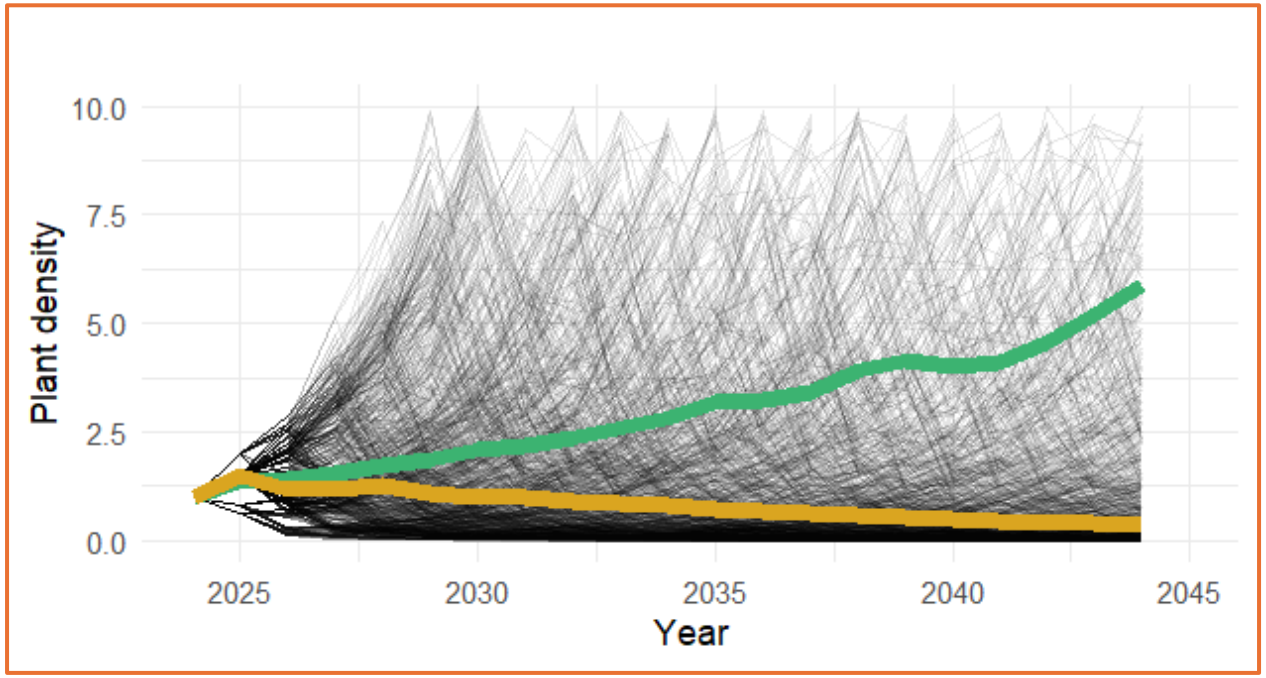
Rare Plant Species
Sclerocactus cloverae
Aliciella formosa
Sclerocactus mesea-verdae
Townsendia gypsophila
Astragalus ripleyi
Cymopterus spellenbergii
Amsonia tharpii
Eriogonum gypsophylum
Echinocereus fendleri var. kuenzleri
Abronia bigelovii
Linum alredii
Amsonia fugatei

Townsendia gypsophila

Townsend's gypsum aster (Asteraceae)

Photo from 2023 monitoring report

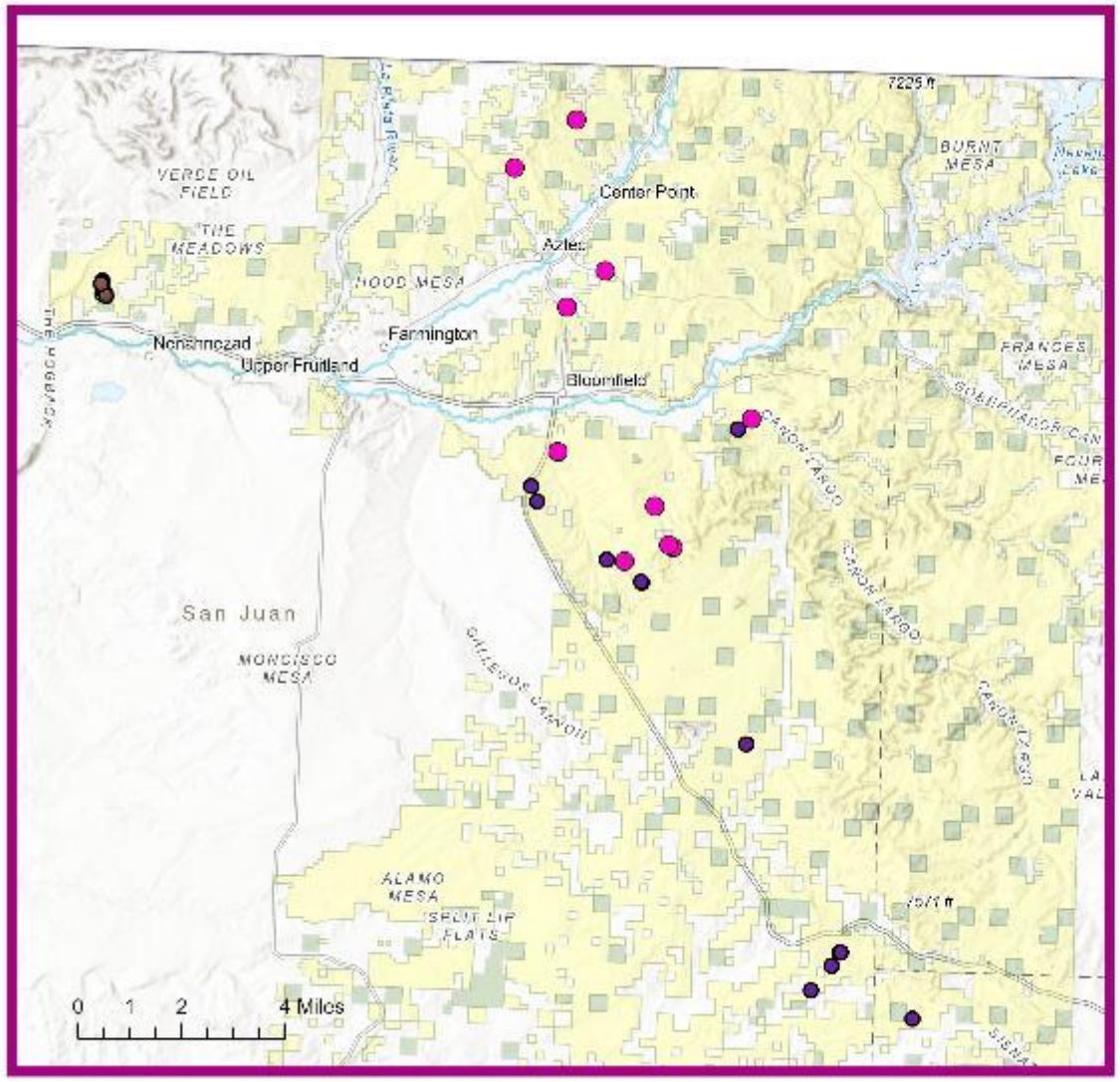


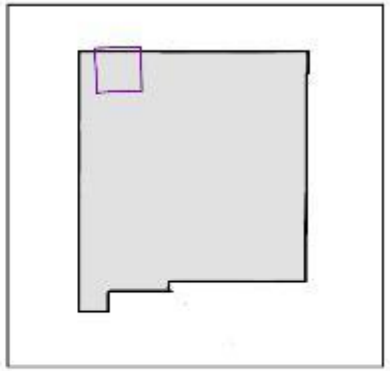


Abronia bigelovii

Galisteo sand-verbena (Nyctaginacae)

Farmington BLM Field Office





Rare Plant Species Plots

- Sclerocactus cloverae
- Aliciella formosa
- Sclerocactus mesae-verdae

Land Management

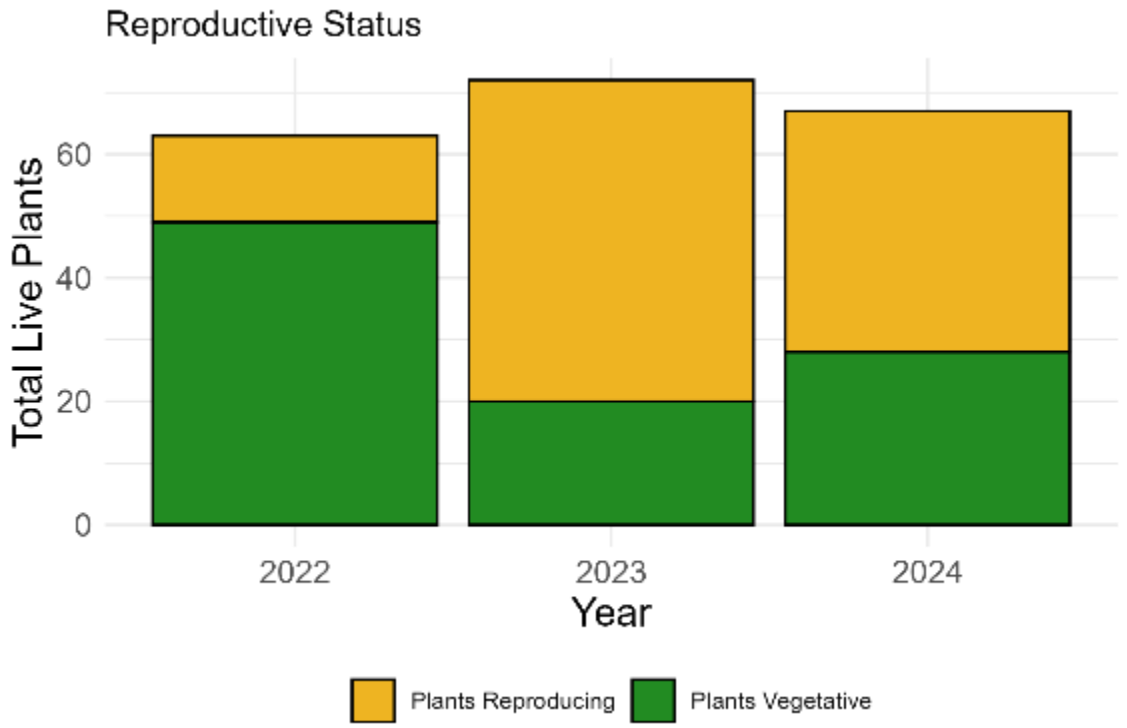
- Forest Service, State or National Parks, Fish & Wildlife Service
- Bureau of Land Managment

Species	# of Monitoring Plots
Sclerocactus cloverae	21
Aliciella formosa	10
Sclerocactus mesae-verdae	9

Sclerocactus mesae-verdae

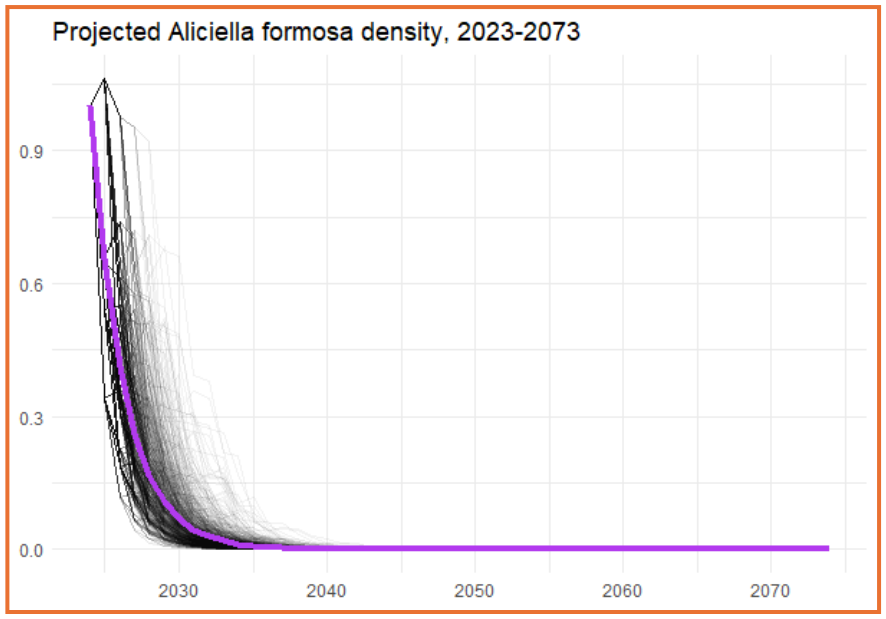
Mesa Verde cactus (Cactaceae)

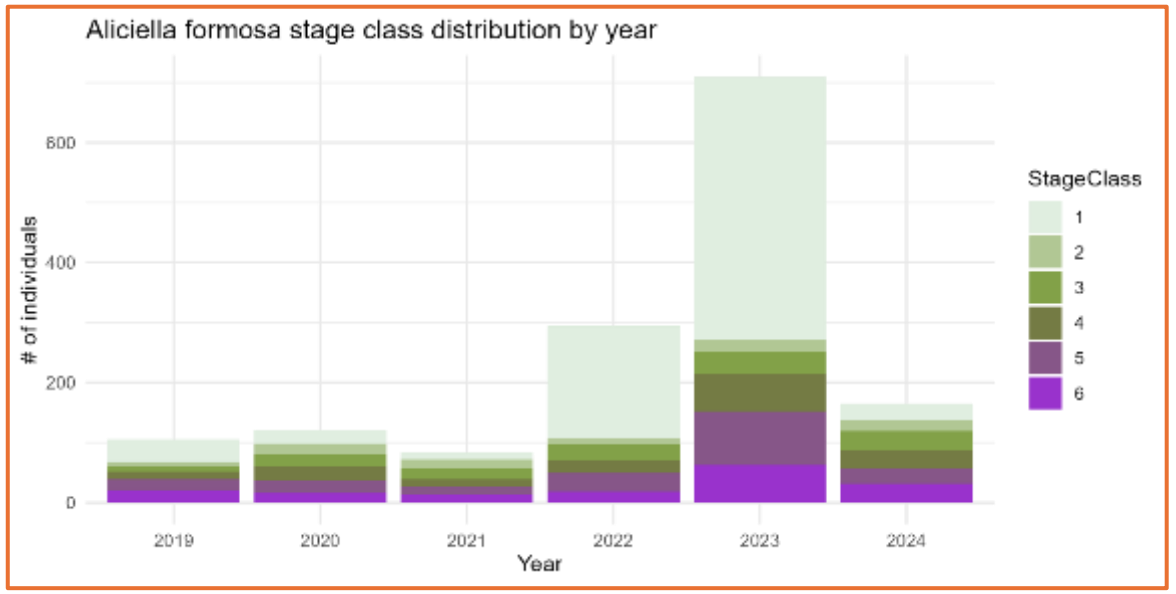
Year	Median plant density (live plants/m^2)	Interquartile Range
2022	0.14	0.07-0.31
2023	0.17	0.09-0.35
2024	0.18	0.06-0.36



Aliciella formosa

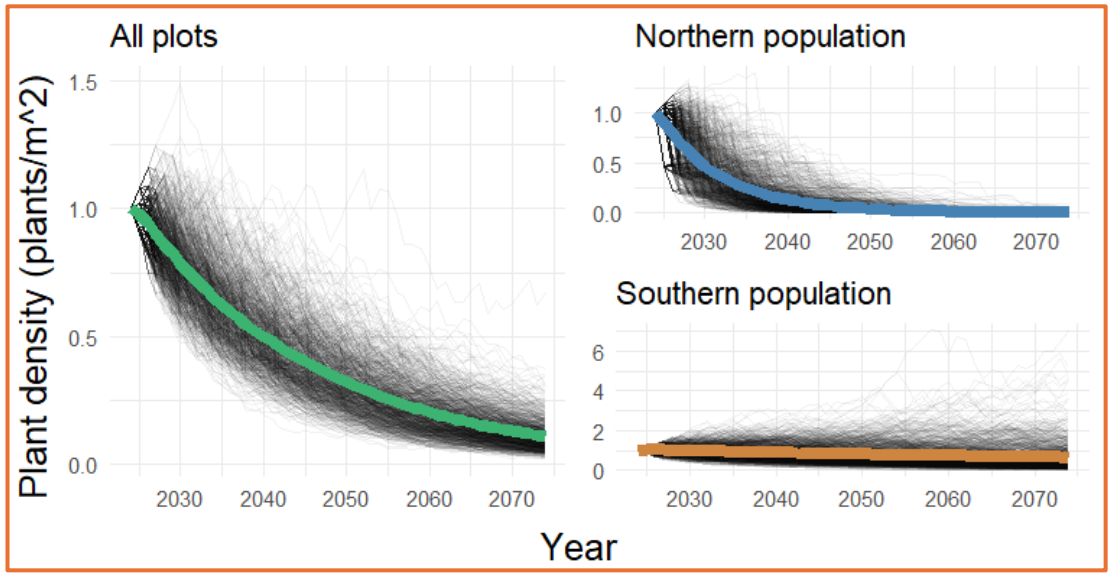
Aztec gilia (Polemoniaceae)

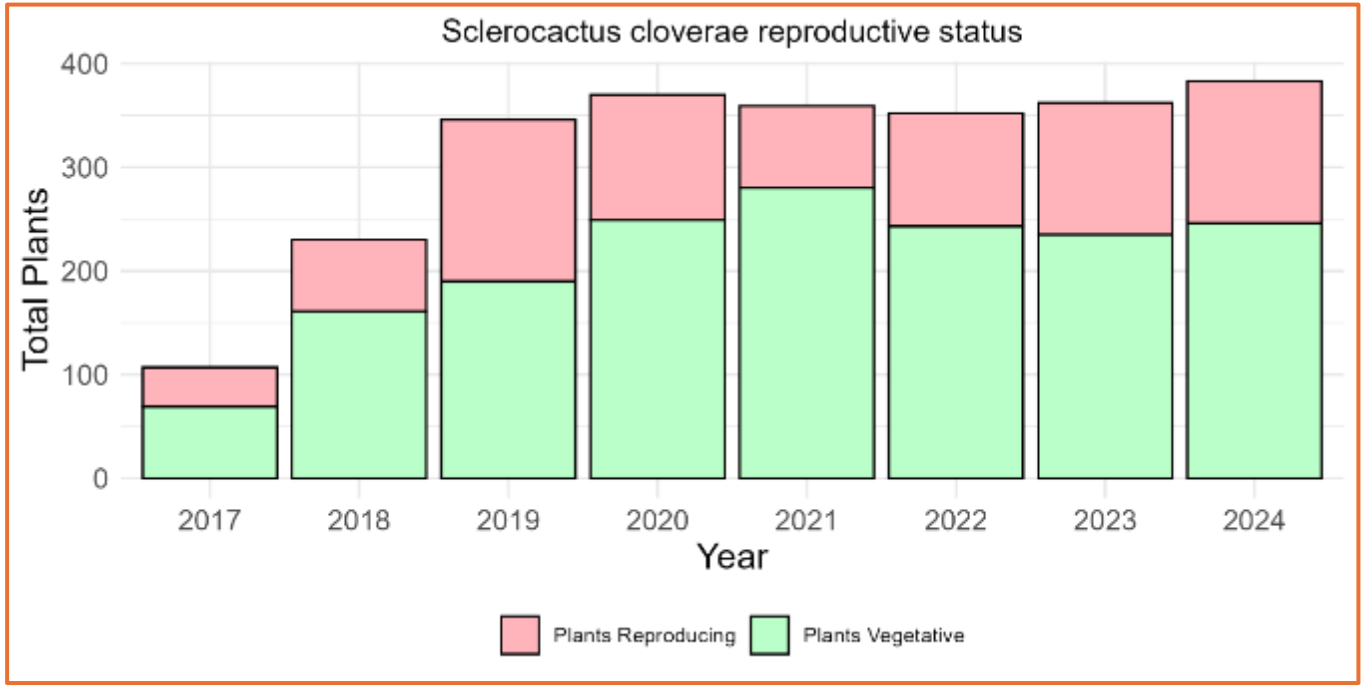


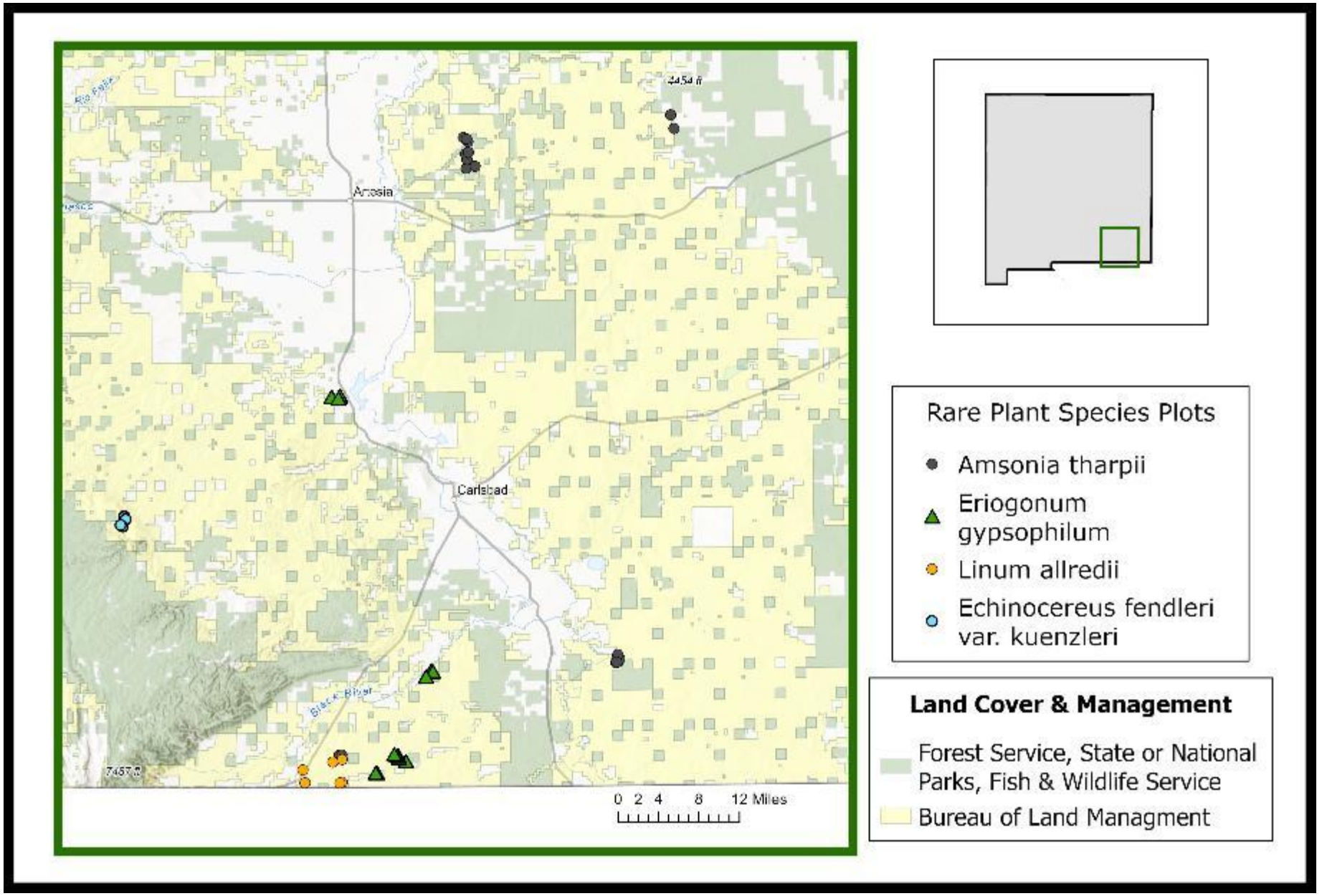


Sclerocactus cloverae

Clover's fishhook cactus (Cacteaceae)







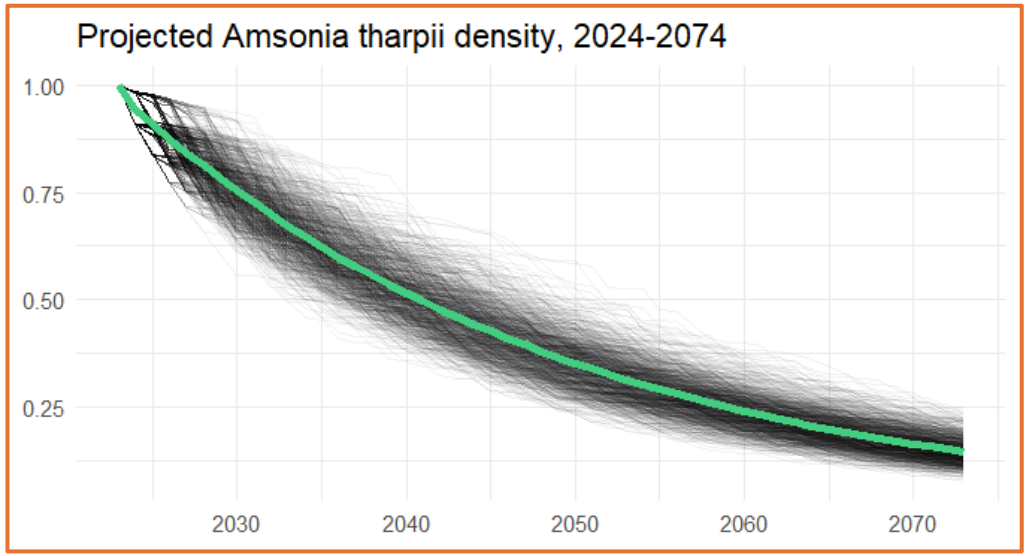
Carlsbad BLM Field Office

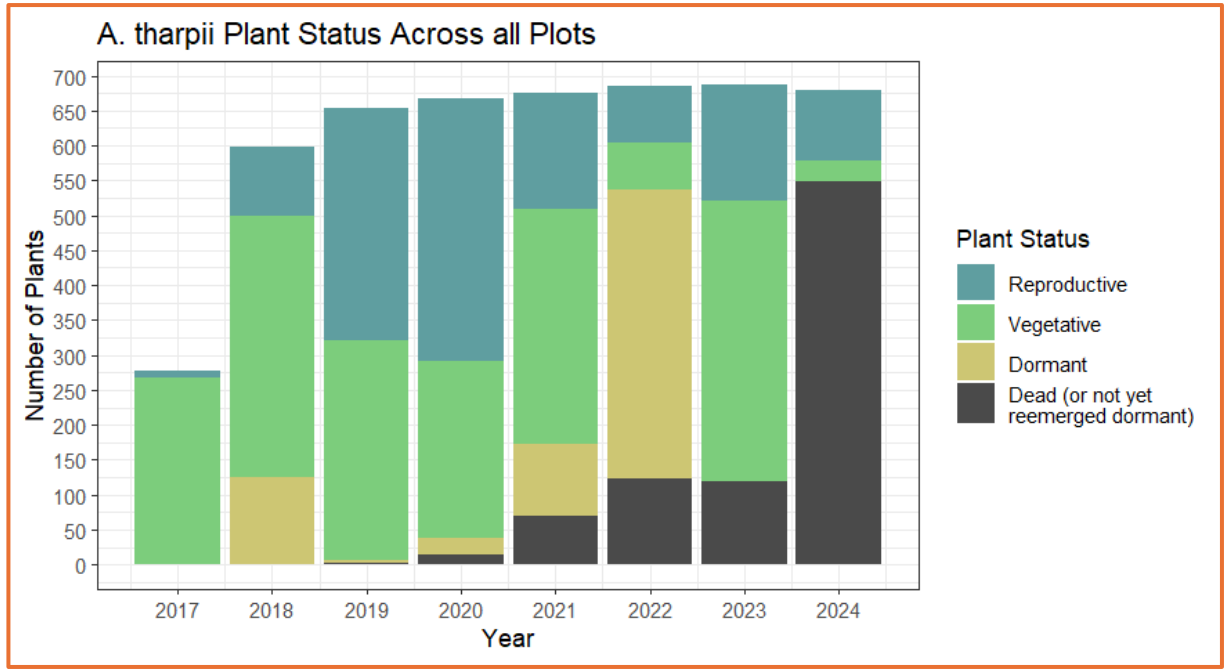
Species	# of Plots
Amsonia tharpii	22
Eriogonum gypsophyllum	20
Echinocereus fendleri var. kuenzleri	5
Linum alredii	6

Amsonia tharpii

Tharp's bluestar (Apocynaceae)

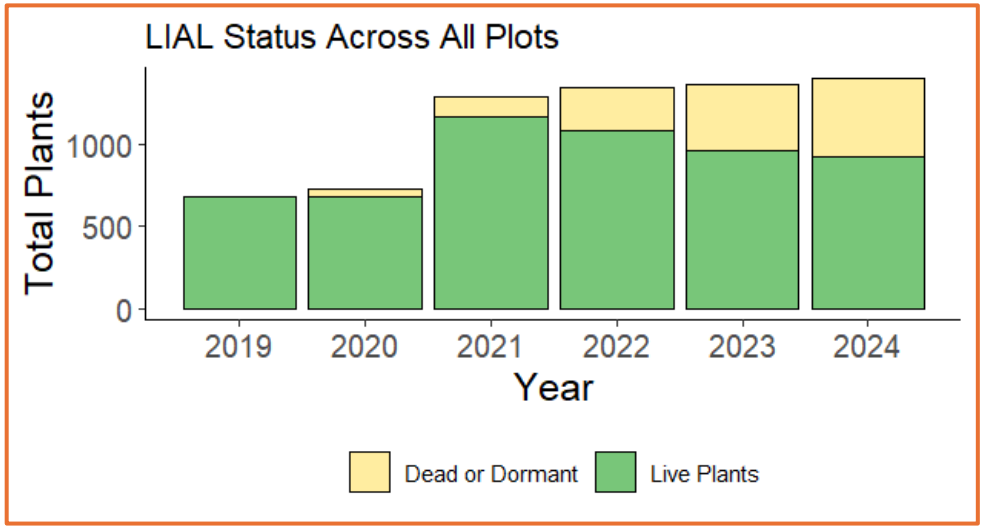
Photo from 2023 monitoring report

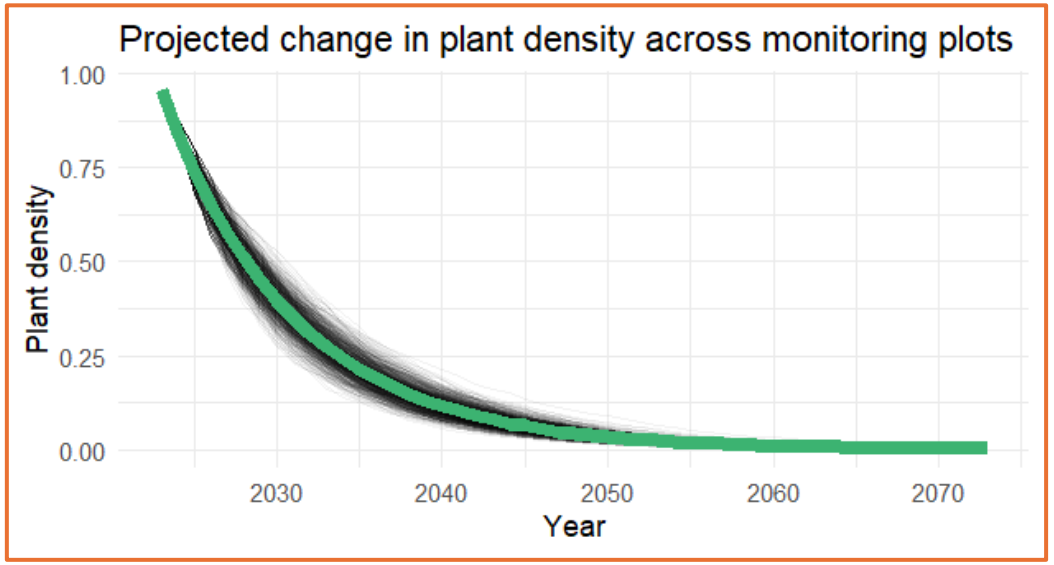




Linum allredii

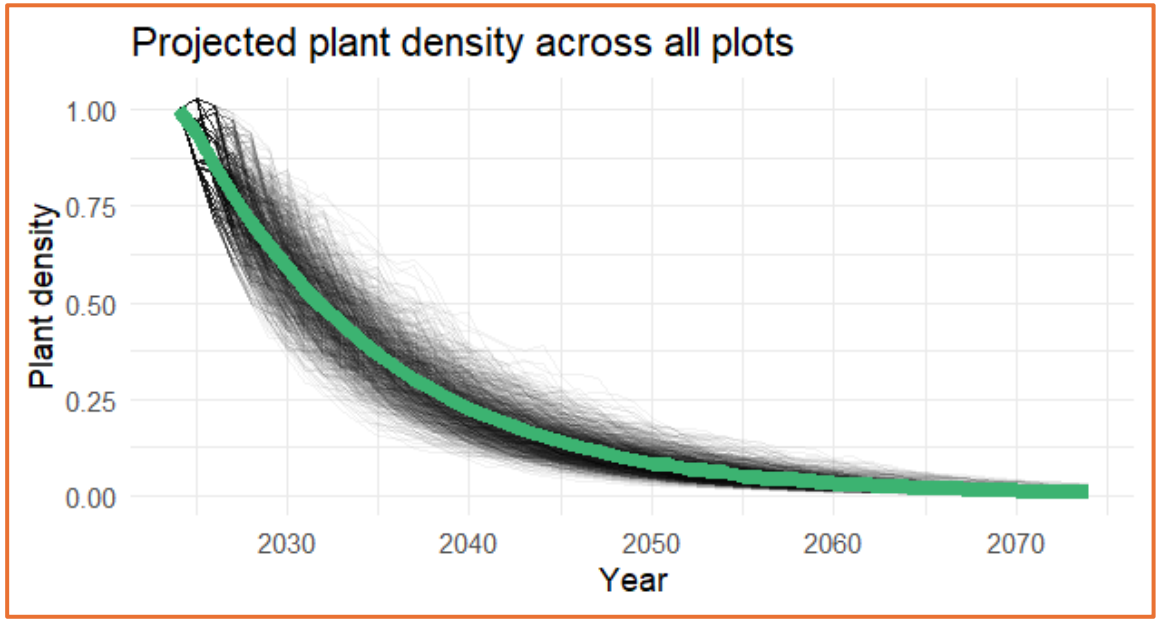
Allred's flax (Linaceae)



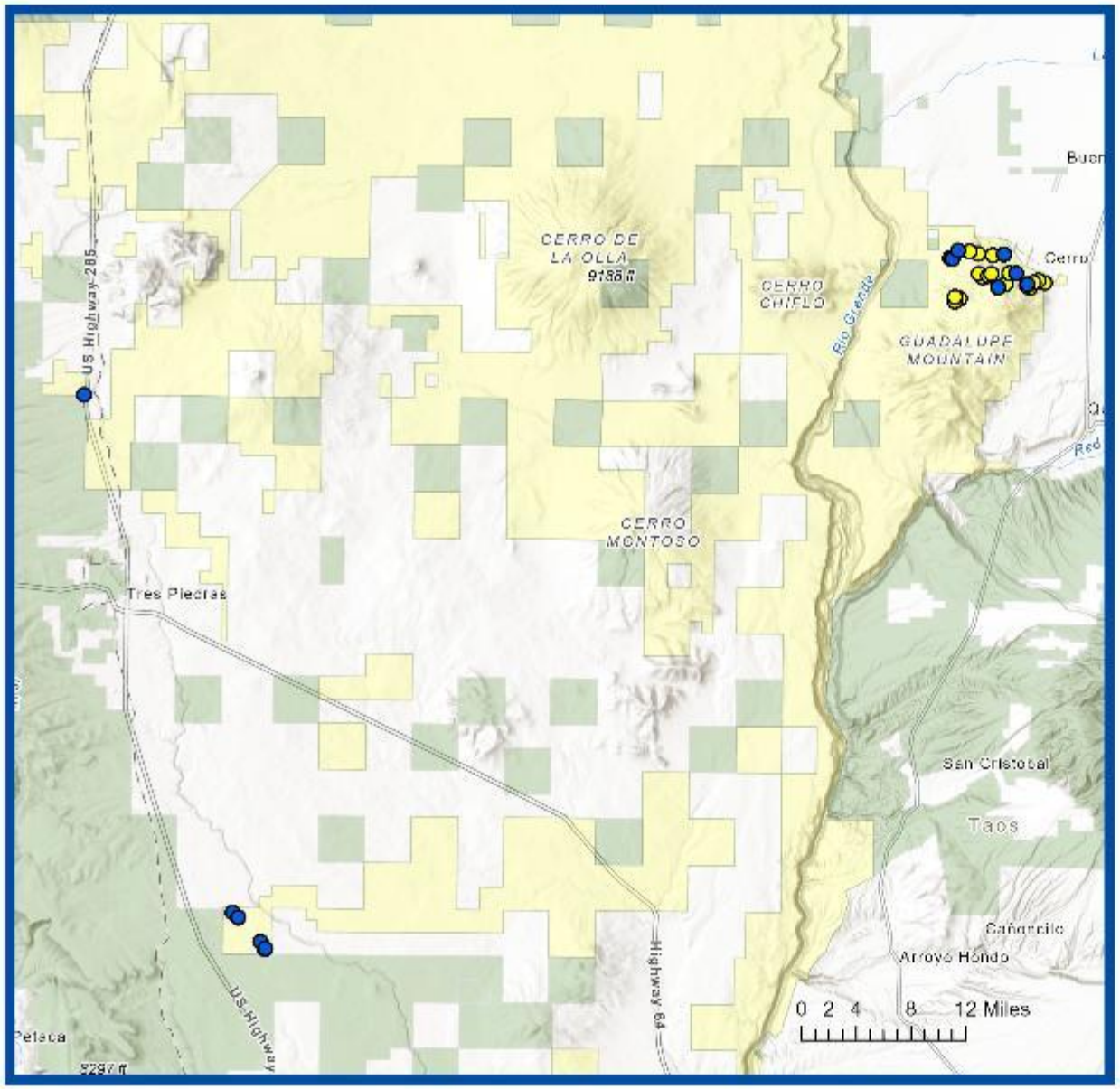


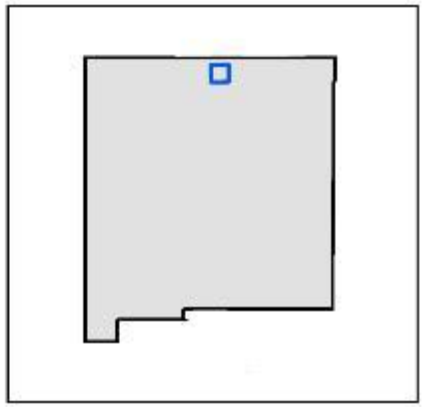
Echinocereus fendleri var. kuenzleri

Kuenzler's hedgehog cactus (Cactaceae)



Taos BLM Field Office





Rare Plant Species Plots

- Astragalus ripleyi
- Cymopterus spellenbergii

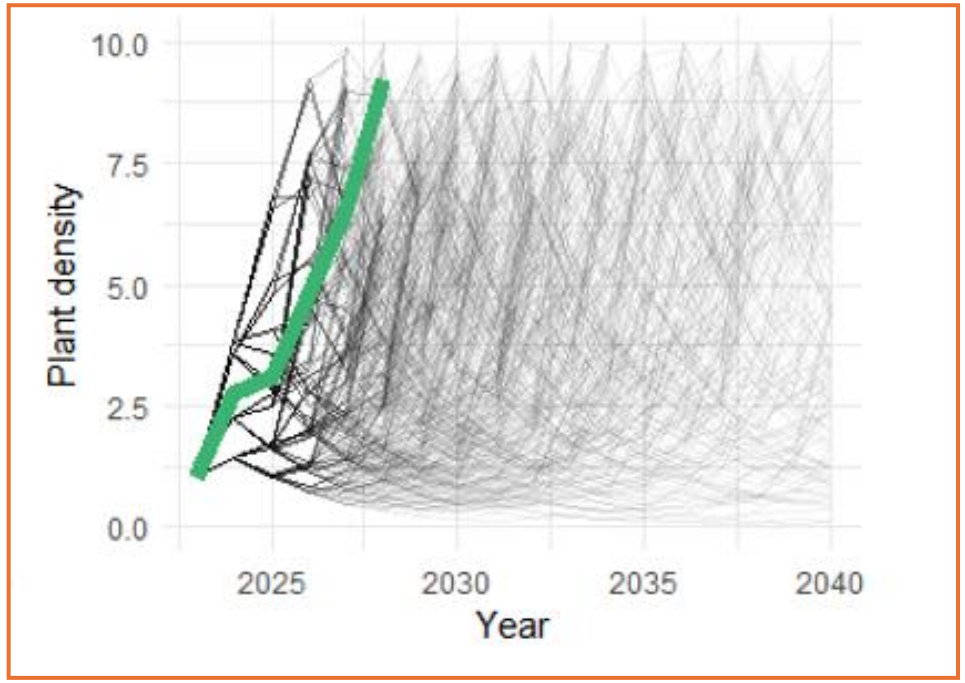
Land Cover & Management

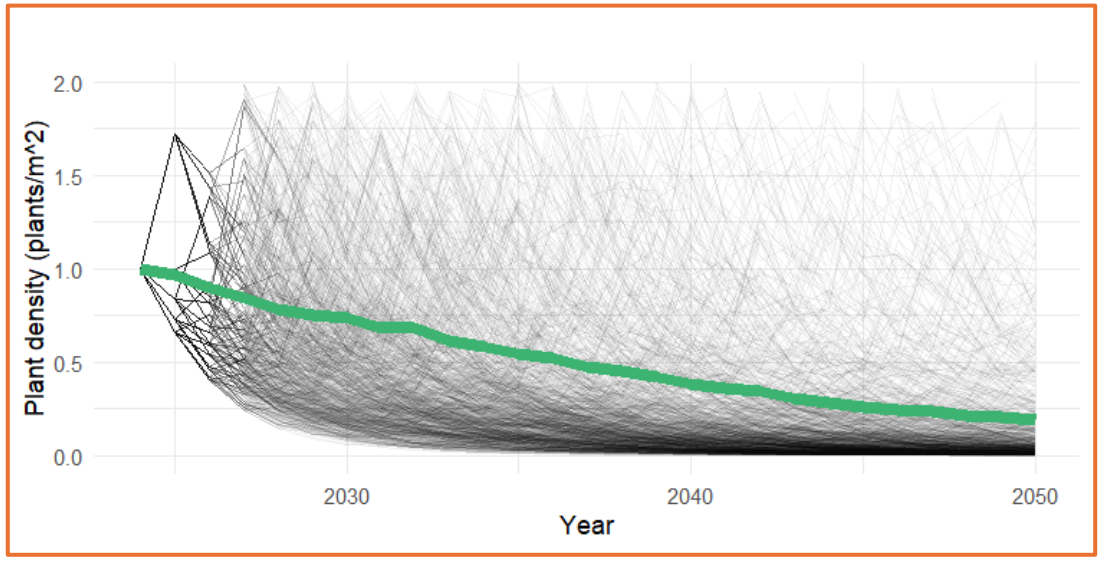
- Forest Service, State or National Parks, Fish & Wildlife Service
- Bureau of Land Managment

Species	# of Plots
Astragalus ripleyi	14
Cymopterus spellenbergii	18

Astragalus ripleyi

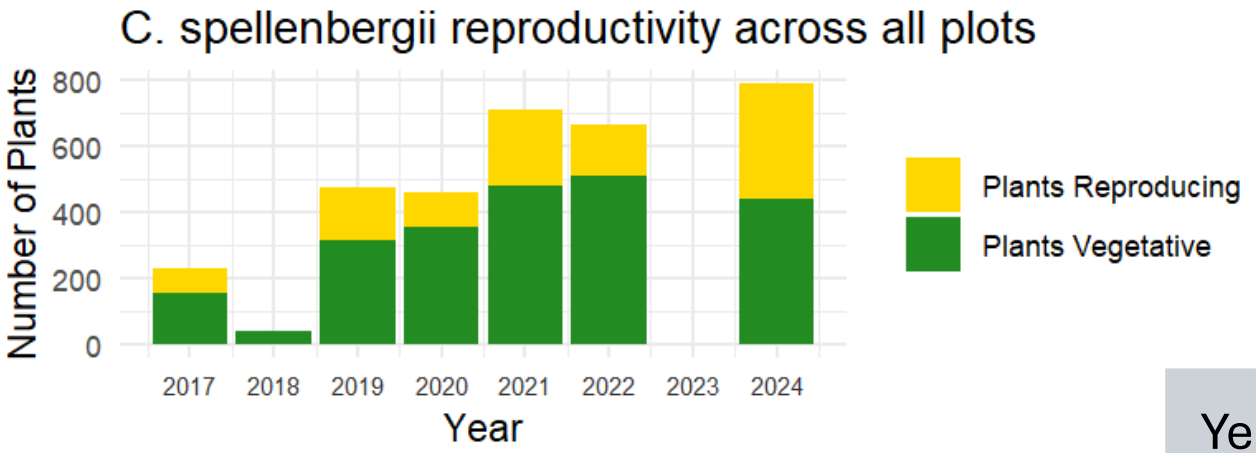
Ripley's milkvetch (Fabaceae)





Cymopterus spellenbergii

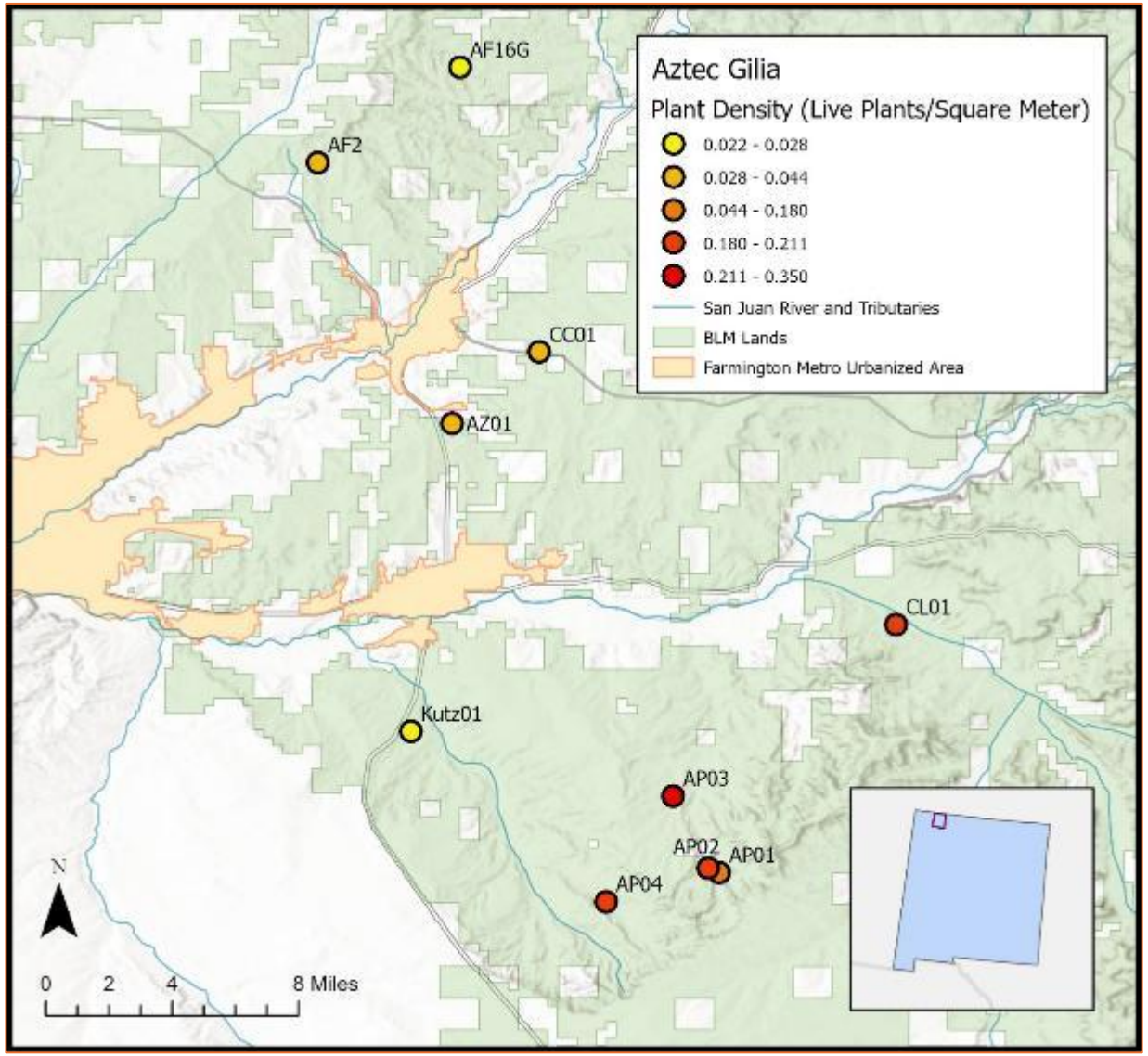
Taos springparsley (Apiaceae)



Year	Median density (plants/m^2)	Quartiles
2017	0.67	0.64-0.69
2018	0.13	0.10-0.17
2019	0.59	0.53-0.98
2020	0.69	0.34-0.90
2021	0.76	0.65-1.05
2022	0.72	0.66-1.04
2024	0.96	0.57 -1.38

Future Directions: Analysis

- More advanced climatic and spatial analysis
- Cancellation of IAE funding for the project
- Native Plant Society funding for 2025 reports



Map 3. *A. formosa* plots mapped, and colored by density

2025 Seed Banking

Species Collected:

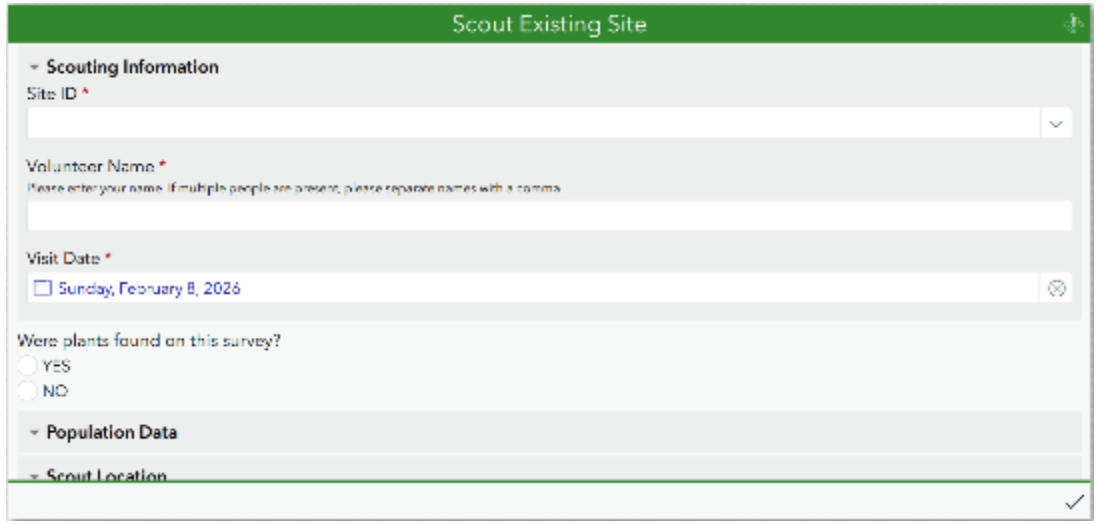
- *Cymopterus spellenbergii* (2 collections)
- *Delphinium sapellonis*
- *Mentzelia springeri*
- *Atriplex griffithsii*
- *Astragalus puniceus* var. *gertrudis*
- *Salvia amissa*

2026 Seed Banking

- Species targeted:
  - *Cymopterus spellenbergii*
  - *Mentzelia springeri*
  - *Pediomelum pentaphyllum*
  - *Oenothera organensis*
  - *Scrophularia laevis*
  - *Erigeron acomanus*

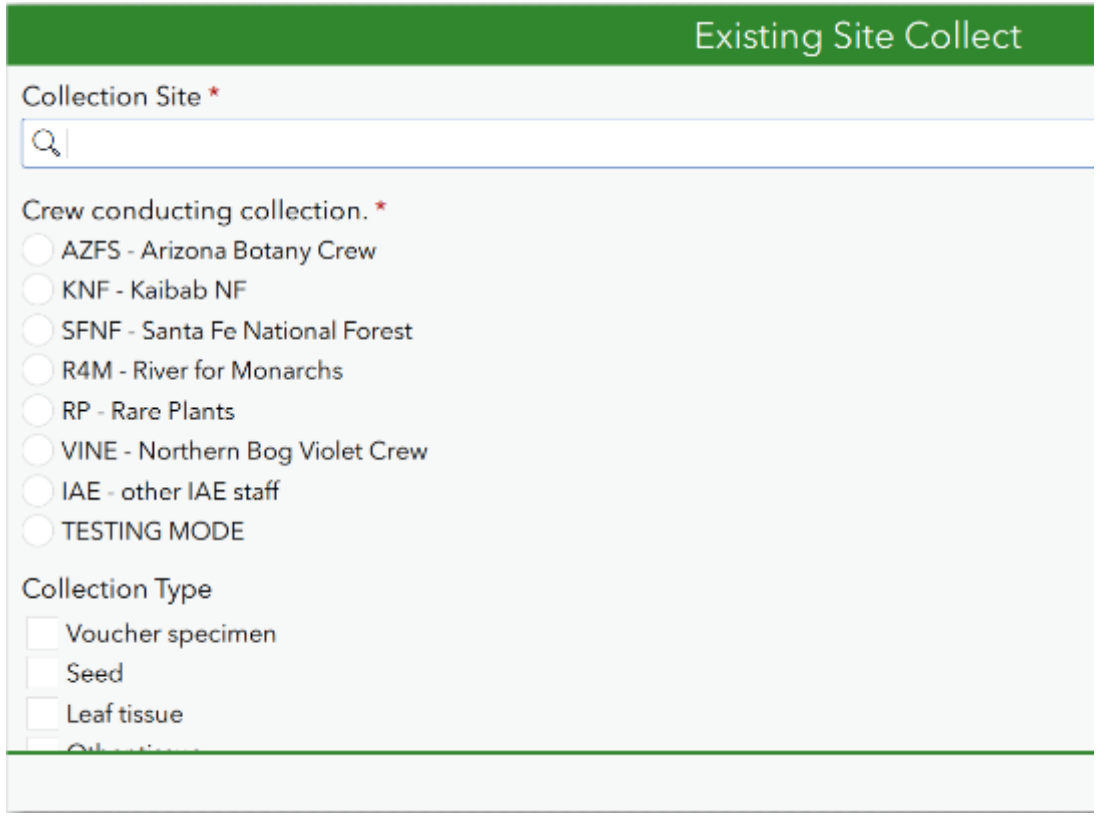
Rare Plant Watch

- Collection platform developed by IAE
  - Land managers (BLM, USFS, USFWS, SLO, EMNRD) will have view access
- IAE coordinating trainings and implementation of program



Collections Tracking

- Tracks rare plant collections
- Can be implemented across agencies for rapid assessment of permitted areas and where collections have occurred



Thanks to:

- Bureau of Land Management
  - Maria Mullins
  - Sam Reiss
  - Zoe Davidson
- Institute for Applied Ecology
  - 2025 technicians: Lasya Fiuty and Aluna Olaniyi
  - Katy Silber
  - Melanie Gisler
- And special thanks to:
  - NM Native Plant Society
  - Erika Rowe, EMNRD
  - Katie Sandbom, FWS
  - Olivia Carril
  - Dan Hughes

Questions?