



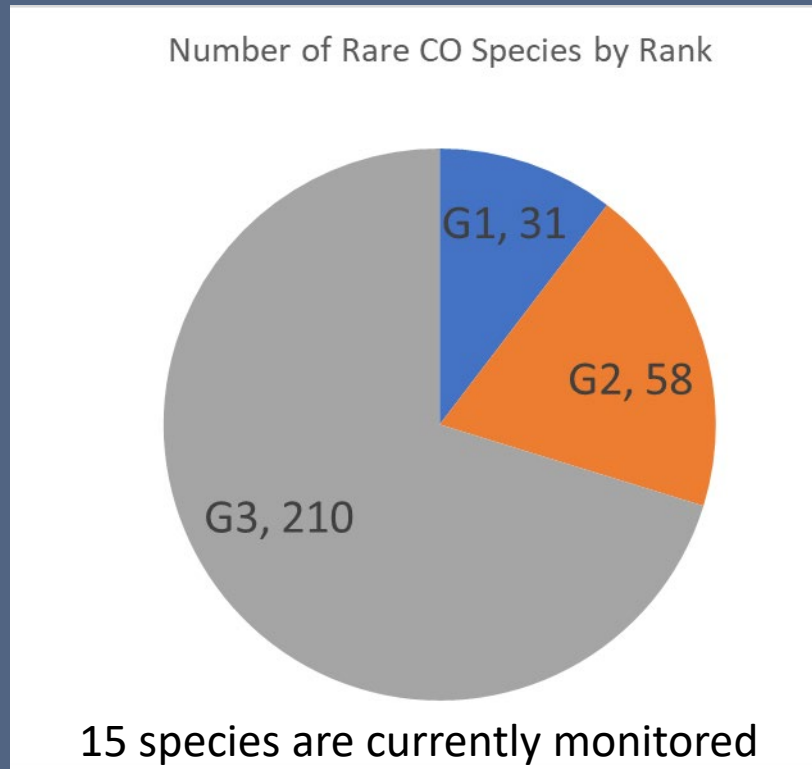
Botanical Niche Models for Rare Plants:

A concept to expedite monitoring study designs

Renee Rondeau

Primary Goal

- Develop a group of distinct botanical niche models that help streamline monitoring, research, conservation and recovery plans.



The Need

- USFS, BLM, USFWS demand trend data for funding conservation effort.
- Monitoring is required for trend data
- While we monitor a small portion of our G1-G2 species, we seldom monitor G3 species
 - There is a high likelihood that some of our G3 species will become G1-G2 species. It is always best to catch a downward trend early as more conservation options may be available
- If we classify our rare plants into botanical niche models, it is likely to produce a set of a dozen niches.
 - It is much easier to develop a baseline monitoring protocol for a dozen niches than for 300 species

Botanical Attributes

Longevity (short-lived vs long-lived
(>3 yrs))

Roots (Shallow vs deep rooted)

Succulent vs non-succulent

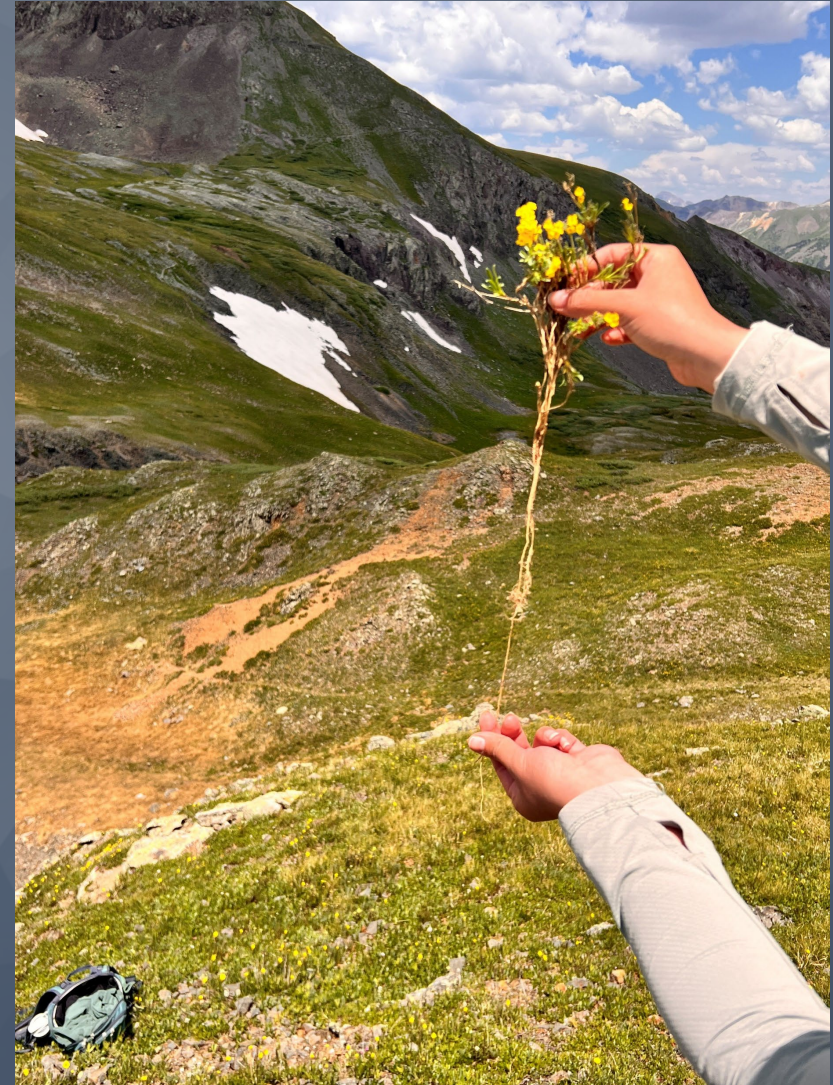
Erosion adapted vs Not erosion
adapted

Dormancy

Wetland vs Upland

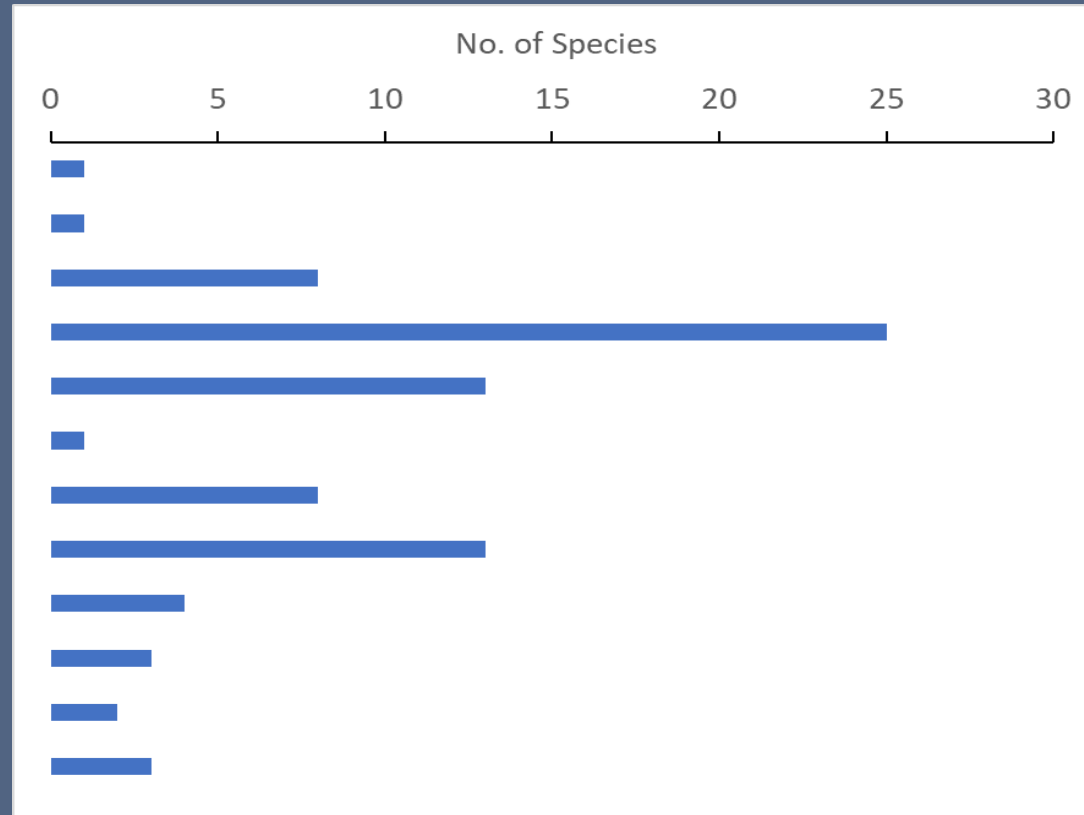
Sexual vs non-sexual (e.g.,
rhizomatous)

Ease of distinguishing individual



Results From Scoring 82 Rare Species

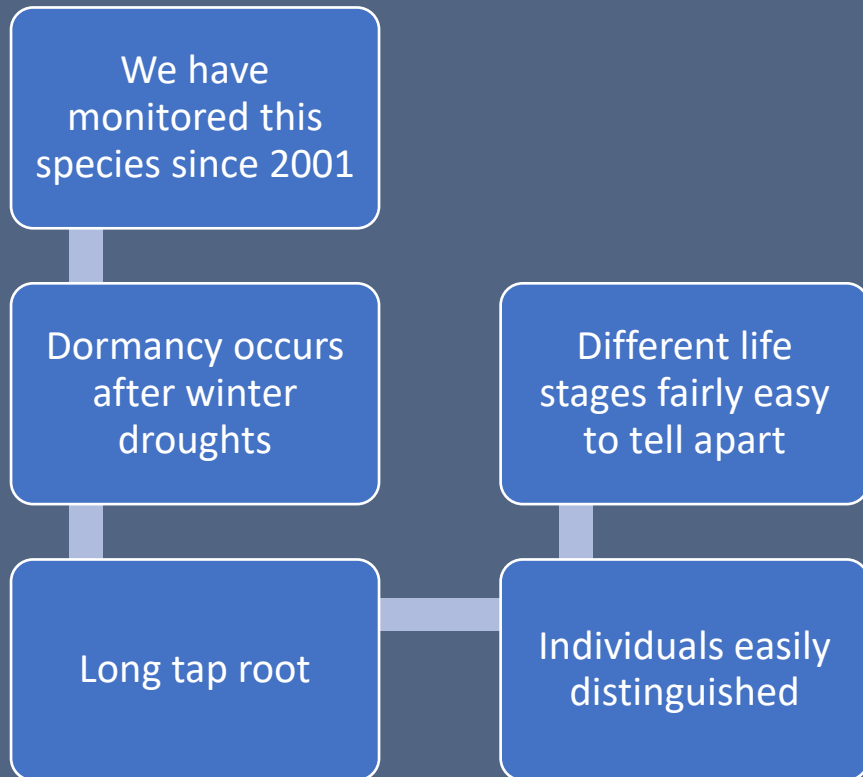
NICHE MODEL	no. of Species
Cliff & Canyon, long-lived	1
Cliff & Canyon, short-lived	1
Crack specialist	8
Erosional specialist, long-lived	25
Erosional specialist, short-lived	13
Long-lived, shallow-rooted, rhizomatous	1
Non-eroding, long-lived, w/ dormancy	8
Non-eroding, long-lived, w/o dormancy	13
Non-eroding, short-lived	4
Rim rock	3
Seeps & Springs	2
Succulent	3



One Case Study: *Astragalus schmolliae* and *A. tortipes*

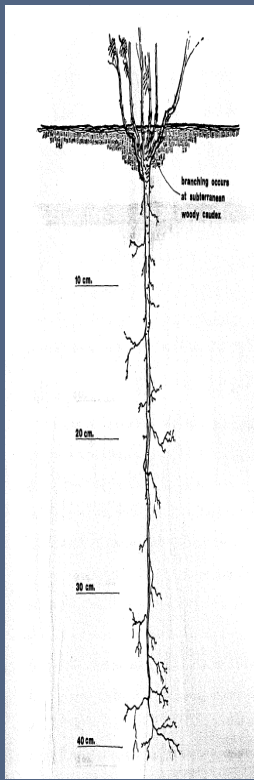
“Non-eroding soils, long-lived, w/dormancy”

Astragalus schmolliae



Astragalus tortipes

- This species shares *A. sch* traits
- Working with UMU, we developed a monitoring protocol based off of *Ast sch* monitoring
 - 2 x 50 m permanent belt transects
 - Data collected: age class, height, no. of flowers, no. of fruit, browse
 - Obtain plants/sq m by age class
 - Developed 1m² demography plot to determine seedling success and age to maturity, longevity, and annual dormancy rate
- All in all, it worked well and required much less time than starting from scratch
- Eliminated pilot year(s)



What's Next

- Is this concept worth pursuing?
- If so, what ideas do people have?
- Does anyone know of a similar project?
- How could we test this idea?
- Please contact Renee Rondeau at Renee.Rondeau@colostate.edu



Thanks

*Special thanks to all the ologist that have listened to my ramblings
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