



PRIORITIZING FLORA FOR SEED BANK COLLECTION IN THE MISSOURI OZARK HIGHLANDS

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CURRENT CONSERVATION NEEDS

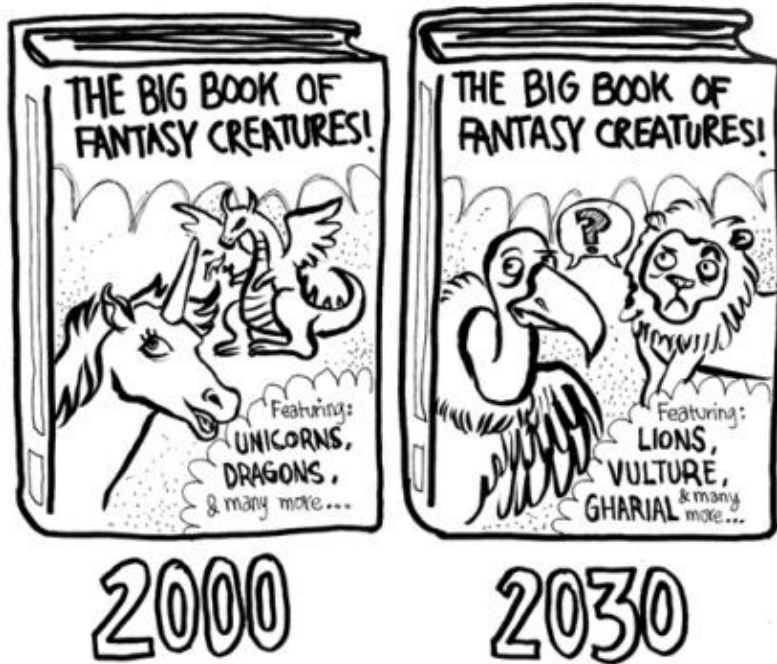


WHAT IS A SEED BANK?

- Exactly like what it sounds!
- Long-term preservation of seeds
- Stored at low temperatures (-18°C / 0°F)



BENEFITS OF SEED BANKING



- Conserve Species
- Conserve Space

- Long-term preservation of genomes to prevent genetic diversity loss
- Collaboration
- Source for future biological research
- Source for future conservation efforts

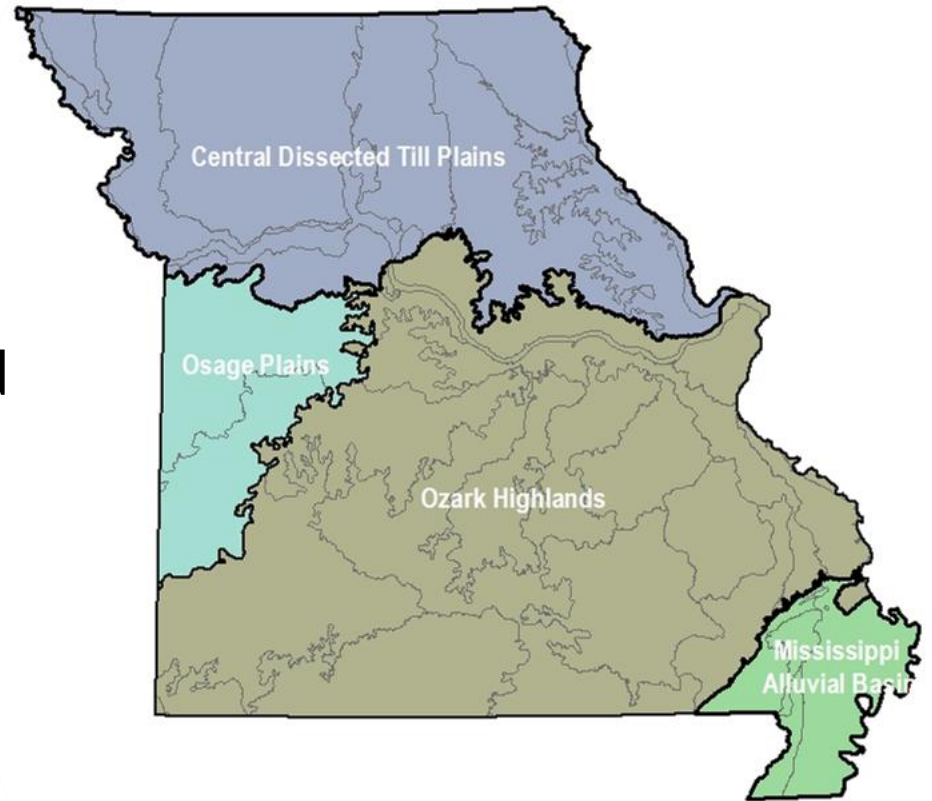


THE SHAW NATURE RESERVE SEED BANK



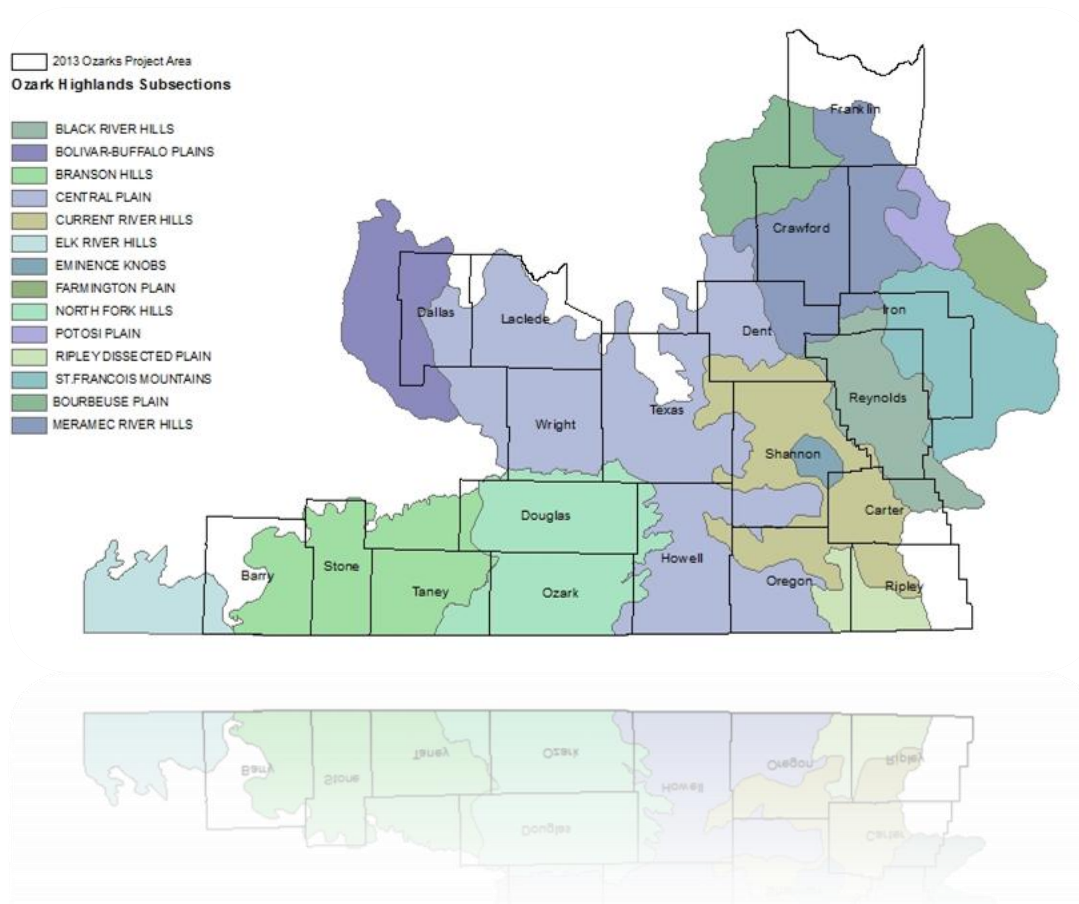
A SHORT HISTORY OF MISSOURI

- Glacial refuge
- Sea Levels
- Some areas never exposed to either
- Many endemic species



OZARK HIGHLANDS: THE FIRST PHASE OF COLLECTION

Most Diverse Region of Missouri



QUESTION...

What species should take priority when deciding where and when to collect seeds?

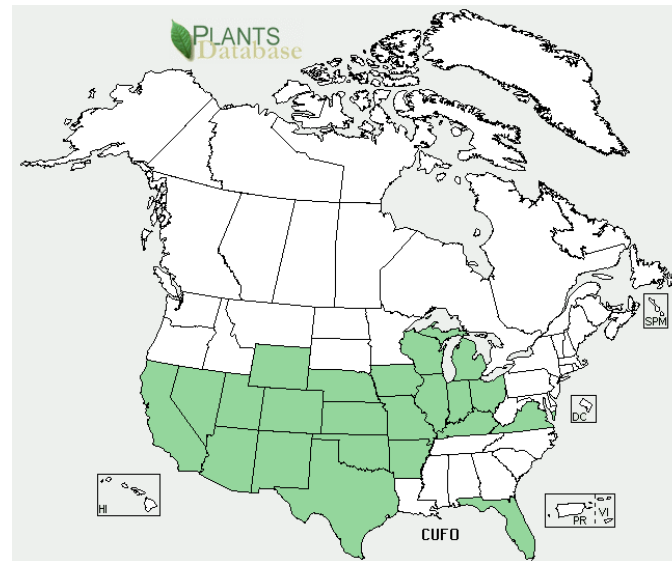


(> 2,000 Native Flowering Plants in Missouri)





- Full list of Missouri's native flowering plants
- Species distribution information
 - Weighed on a scale from 0 – 10 (19 = 10)



- Updated Coefficients of Conservatism
 - Estimated based on:
 - Tolerance to disturbance
 - Frequency
 - Amplitude
 - Fidelity
 - Assigned an integer from 0 – 10
(10 = highly conservative species)
- Weighed on a scale from 0 – 10



○ Conservation Status

- State Rankings

- Weighed on a scale from 1 – 10
- SH = 10, S₁ = 8, S₂ = 6, ...

- Global Rankings

- Weighed on a scale from 1 – 10
- G₅ = 0, G₄ = 2, G₃ = 4
- Note: G₁ and G₂ species removed





- All data merged into one spreadsheet using Microsoft Excel
- Topics Database used to resolve taxonomic conflicts.
- The Missouri Department of Conservation's Species of Concern Checklist (Jan 2013 issue) used to fill in missing data.

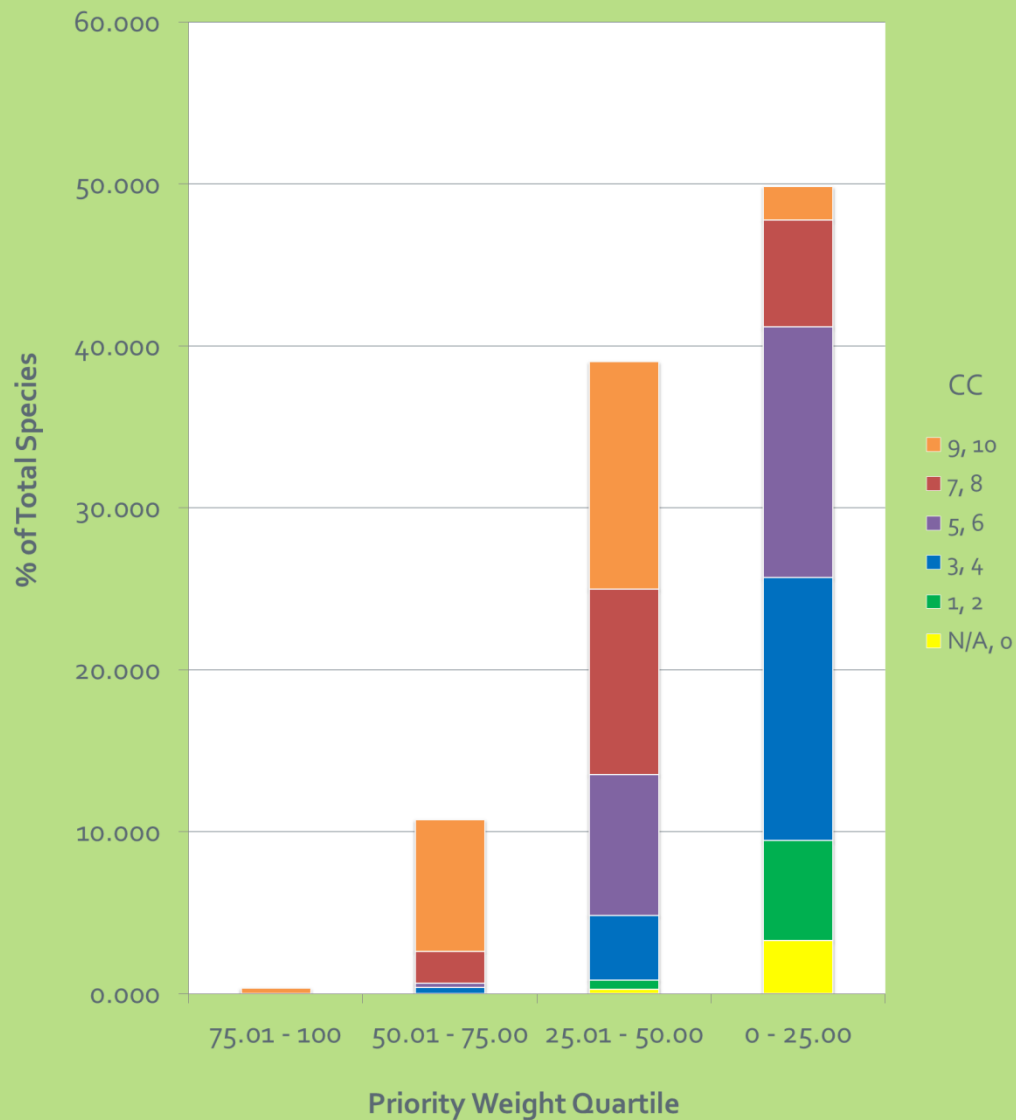


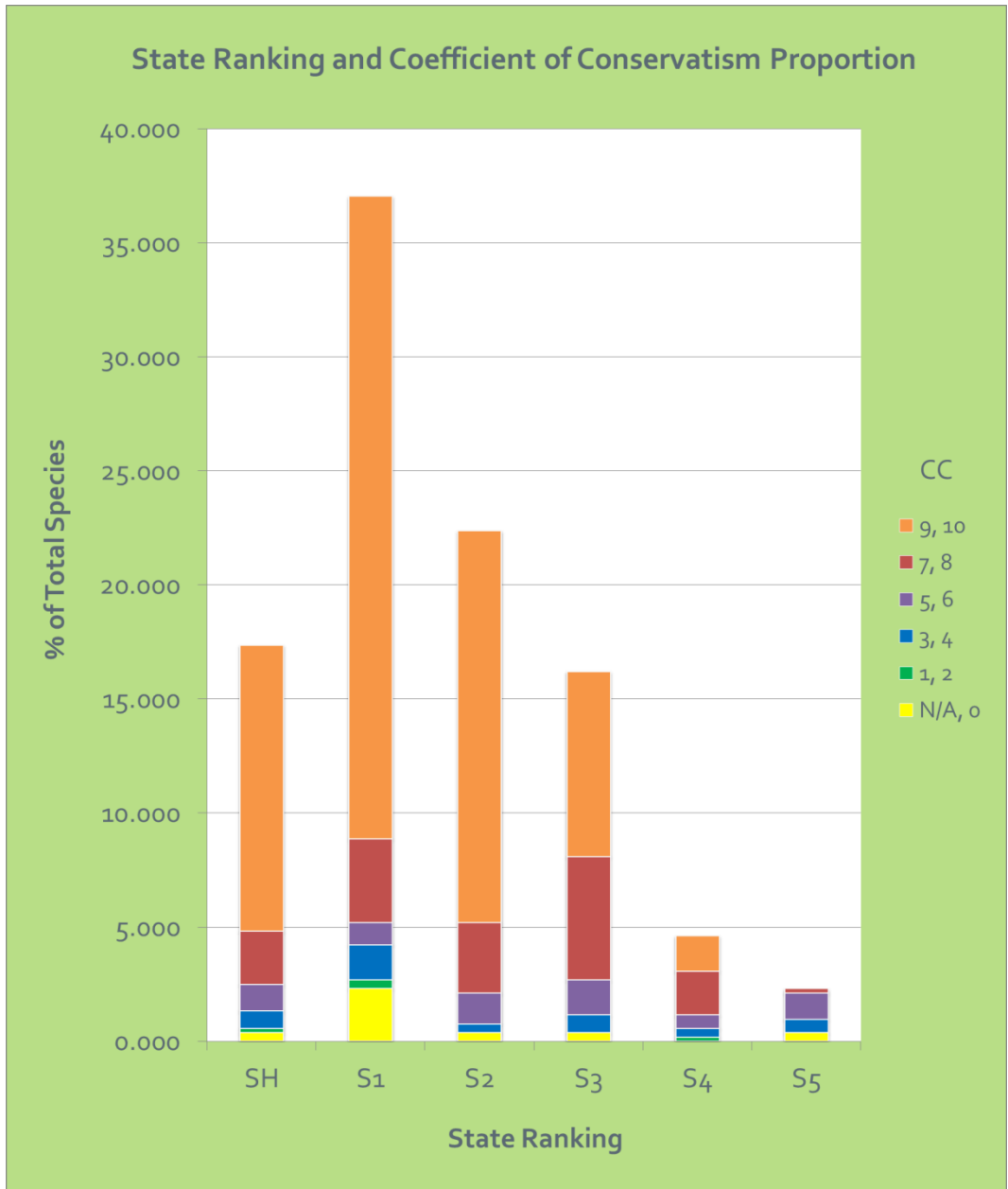
SNAPSHOT OF THE SPREADSHEET

Sample Spreadsheet of 2,008 Species												
Scientific Name	Common Name	CC	Weight	TotalCtyof19	Weight	Scaled Weight	S-rank	Weight	G-rank	Weight	Total Weight	Priority Rank
<i>Callirhoe triangulata</i>	Clustered Poppy-mallow	10	10	1	19	10	SH	10	G3	4	34	85.00
<i>Calopogon oklahomensis</i>	Oklahoma pink Orchid	10	10	1	19	10	SH	10	G3	4	34	85.00
<i>Eleocharis equisetoides</i>	Horsetail Spikerush	10	10	1	19	10	SH	10	G4	2	32	80.00
<i>Zizania palustris var. interior</i>	Interior Wild Rice	10	10	1	19	10	SH	10	G4G5	1	31	77.50
<i>Echinodorus tenellus</i>	Dwarf Burhead	9	9	1	19	10	S1	8	G3	4	31	77.50
<i>Schoenoplectus etuberculatus</i>	Canby's Bulrush	10	10	1	19	10	S1	8	G3G4	3	31	77.50
<i>Juncus brachyphyllus</i>	Shortleaf Rush	10	10	1	19	10	SH	10	G5	0	30	75.00
<i>Lyonia mariana</i>	Staggerbush	10	10	1	19	10	SH	10	G5	0	30	75.00
<i>Mimulus glabratus</i>	Roundleaf Monkey Flower	10	10	1	19	10	SH	10	G5	0	30	75.00



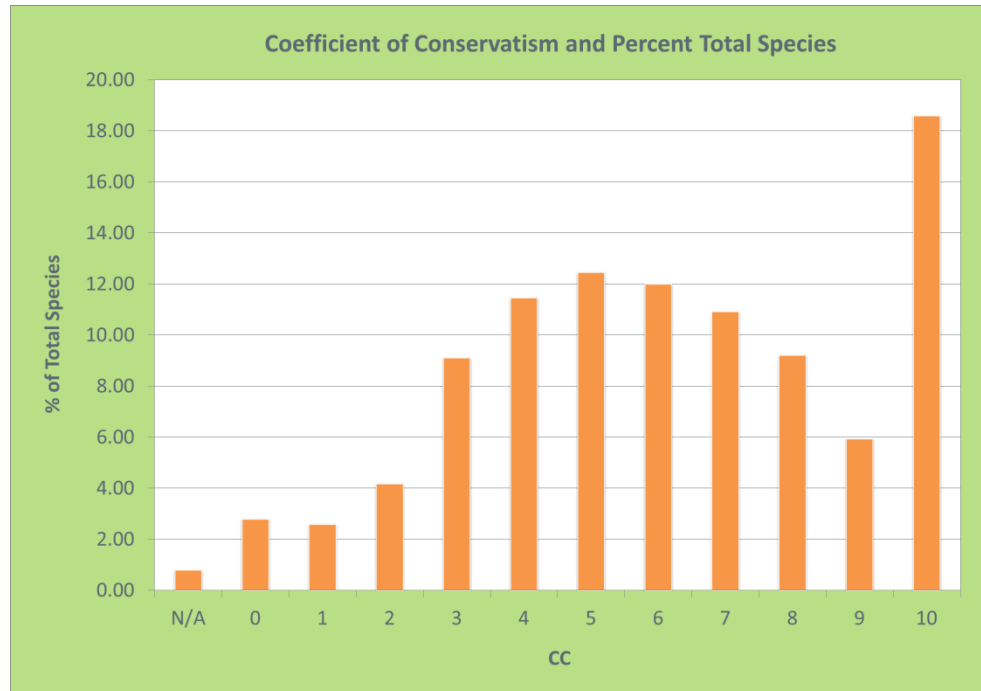
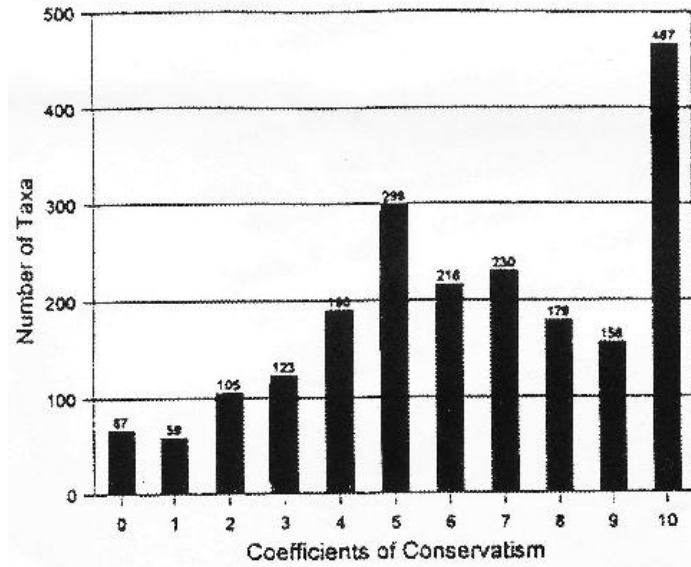
Priority Weight Quartile and Coefficient of Conservatism Proportion

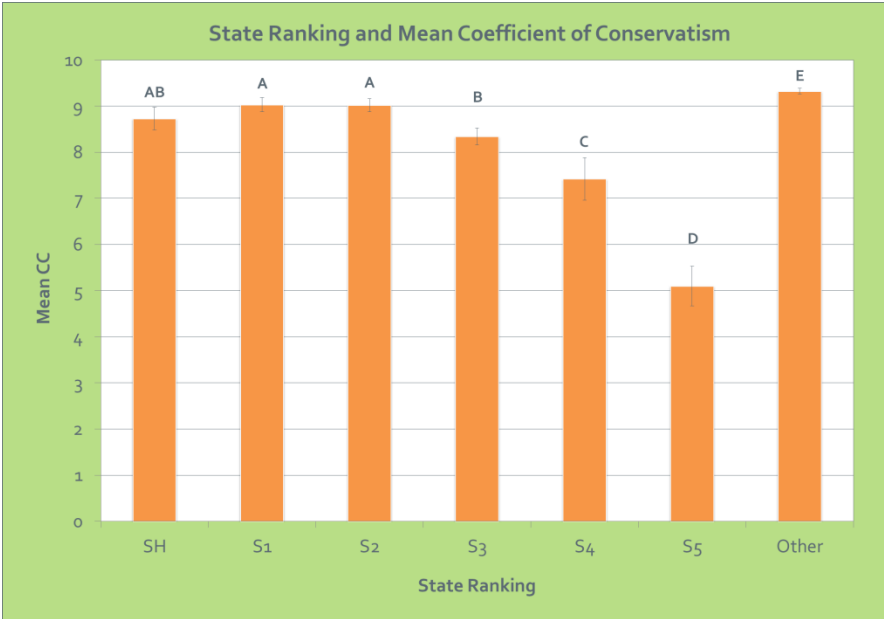
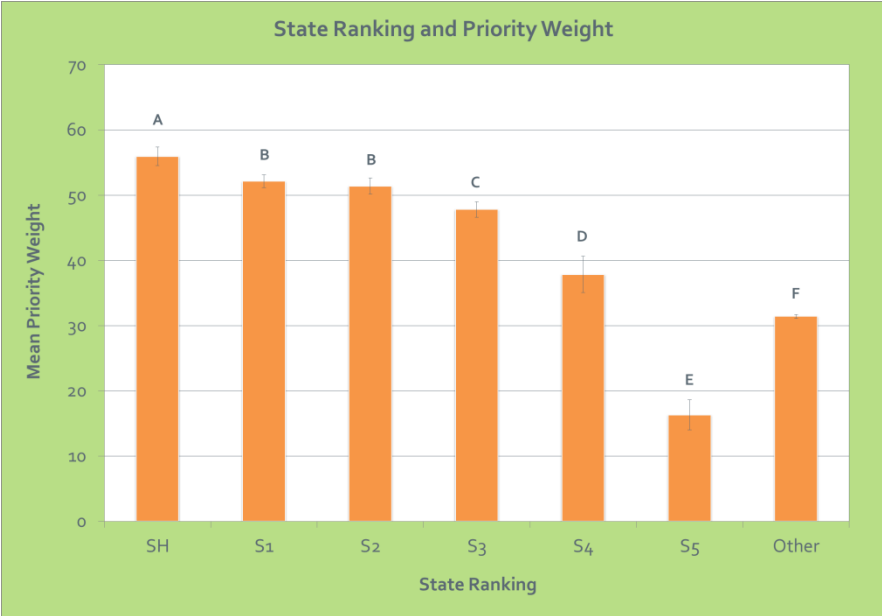




*Note: "Other" state rankings removed







WHAT WE NOW HAVE:

- Methodology for prioritizing within the remaining eco-regions
- A resource that encourages collaboration
- A more focused project



FUTURE OF THE SHAW NATURE RESERVE SEED BANK

- Identification of the first county for collection
- Collection, processing, storage and curating!

Ginger needs more interns!! ;)



FINAL CONSIDERATIONS



○ Ethics:

- Seed collection proportionate to population
- Seed usage must be well researched and planned before use

○ Challenges:

- Avoiding a “bottle neck” effect
- Proper preparation for storage

○ Key elements of successful *Ex Situ* program:

- Collection from different populations and micro-habitats
- Detailed collection notes
- Proper storage, planning, and precautions.
- Viability assessed at regular intervals



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The Nature Conservancy 



LITERATURE CITED AND CONTACT INFORMATION

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