

Speaking Notes for April Progress Report
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- Introduce self and title

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- Positive interactions take many forms.
- Pathways
- Mutualism vs facilitation

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- When a species facilitates many other species in an ecosystem and becomes a dominant species, it's known as a foundational species. Shrub species documented as the most common benefactor plant species globally (above is *Ephedra californica*).

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- Double mutualism;
- Birds pollinate plant, then disperse the seed
- Makes bird vectors for sexual reproduction of plants.
- Most common in "harsh" climates: islands/deserts.
- Cacti, being foundational spp in deserts, may be utilizing double mutualism...

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- So what is an advantageous adaption for cactus? Showier displays (more flowers) attract more pollinators/seed dispersers. Higher inflorescences attract more pollinators/seed dispersers (flying individuals).
- Foragers in patchy ecosystems function under marginal value theory where they will forage in one spot until the resource availability at that spot is equal to/lower than the entire habitat's resource availability (then they will move on). This value is known as Giving Up Density (GUD). This leads us to believe cacti will produce many flowers/fruits, and be very tall. However, this isn't the whole picture...

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- Tradeoffs. Finite amount of money, have to allocation funds to rent and food, but you might have to make compromises (close to subway, hard wood floors, big windows, safe neighborhood versus fresh fruits/veggies, lots of food, name brand). Plants also make these tradeoffs with their energy.

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- We believe plants will make these tradeoffs to maximize pollinator/seed disperser interactions.

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- Give audience a moment to read slides. TLDR: Is allocation theory justified in Cactaceae?

9-11

- Slide

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- Fruit is the most frequently reported reproductive structure, but I believe adding “Flower” to search terms will drastically increase the number of reported flowers

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- Cacti are native to western hemisphere (except for one species in Africa), but introductions have created invasive species, and agricultural products have made the family present globally.

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- Most studies are relevant to agricultural and ecological sciences, but there is little overlap in subdisciplines. From the systematic review, methodology differs significantly between disciplines. With this part of my project, I’d like to work towards bridging the gap between these two fields.

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- Give audience a moment to read the slides. TLDR: Describe the interaction between birds and *C. acanthocarpa*.

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- Give audience time to read slides. TLDR: next slide

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- Remember this? We hypothesize that this is the trade off we will see.

18-20

- Slide

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- Monitor to determine link between flowers and fruit (same individuals)

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- *C. Acanthocarpa* was most dense

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- Slide

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- *C. Acanthocarpa* had the widest size classes. This is important bc it may more clearly translate to how birds are viewing differences in size

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- Slide

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- We need abundance for replications in May and August, size to translate to birds, and health to encourage strong flowering

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- Mega bloom year bc high rain means lots of cactus flowers, some cool opportunities in that
- Follow up with pollinator facilitation experiments by Jenna two years ago during last mega bloom, but now during cactus blooming instead of annual blooming
- Map all cacti and shrubs at Sunset cove (undergrad help)

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- Deserts are diverse (not wastelands) in decline bc climate change, human development, and invasive species. All Cactaceae are listed on CITES Appendix II, with several spp on Appendix I.
- This project will help us understand how positive interactions influence habitat structure, and therefore combat habitat loss.
- Restoration work has primarily focus on abiotic factors of habitat structure, but if we can identify biotic vectors of habitat creation and maintenance, this project potentially has the capacity to revamp the toolbox available to practitioners.

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- Let's chat!