



Dung Beetle Functional Traits Related to Restoration Management Practices in Tallgrass Prairie

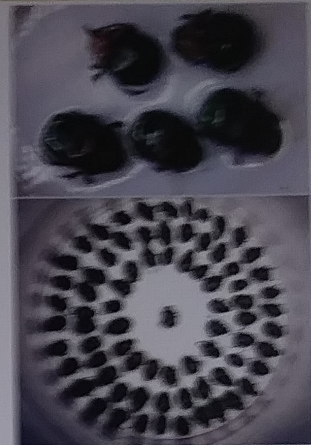
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Objective Investigate how prairie restoration and management (bison grazing and prescribed fire) affect functional diversity of dung beetle community and ecosystem function of dung decomposition

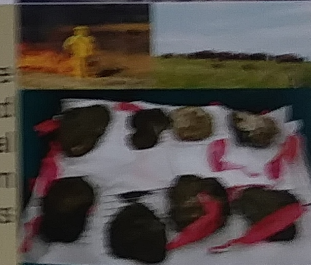
Background

- Ecosystem restoration aims to reinstate biodiversity and ecosystem functions. One way to evaluate the efficacy of restoration is through measuring community functional traits.¹
- Dung beetles are vital to the ecosystem functions of decomposition, soil rotation, nutrient cycling/sequestration, and pest control.²
- Dung beetles and the ecosystem functions they facilitate may be affected by management techniques employed in ecosystem restoration.³



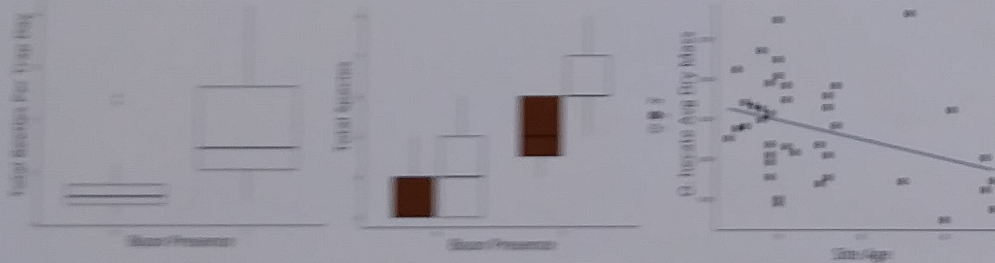
Study Site & Methods

We compared 20 sites at Nachusa Grasslands that differed in age, bison presence, and fire history. We used baited pitfall traps to collect dung beetles, which were then sorted and identified in the lab. Representative beetles were then dried and weighed (supplemental functional traits will be measured under the microscope). We evaluated the ecosystem function of dung decomposition using an assay of bison dung pats left in the sites for 3 weeks to decompose. Pats were dried in the lab, and percent dry mass lost was calculated.



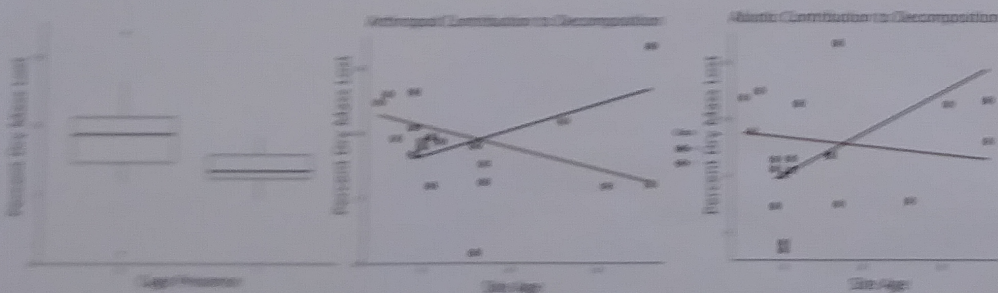
Findings

Beetle Community



- Bison sites have greater beetle abundance and species richness
- Burned sites have greater beetle species richness
- Site age may affect beetle functional traits (e.g. dry mass)

Dung Decomposition



- Arthropods contribute to dung decomposition/removal
- Site age and bison presence interact to affect dung decomposition



Conclusions

- Bison and prescribed fire as restoration management tools interact to affect the dung beetle community and some functional traits of the beetles. Restoration age is also a significant driver of functional diversity.
- Site age contributes to dung decomposition functioning; while our results indicate presence of bison decreases dung decomposition, this is likely due to an excess of resource in bison sites rather than an actual detriment to function

Acknowledgments

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Literature Cited

Baroncelli, 2002, *Ecog* 111:121-131; Van Nieuwenhuis, 2015, *Biological Reviews* 90:347-368; Williams et al., 2009, *Biological Conservation* 111:1481-1474.