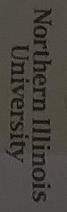


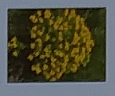
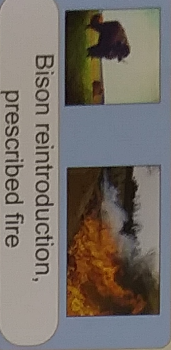
ReFUGE Project: Restoring Function in Grassland Ecosystems

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We have spent the past two years studying how prairie restoration, including fire and bison reintroduction, impact plant communities, small mammal functional traits, and ecosystem functioning at Nachusa Grasslands.

Management Drivers



Small mammal body mass, niche width; Plant evolutionary relatedness



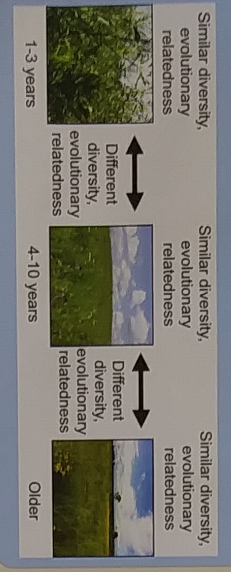
Decomposition, soil nutrients

Community Traits

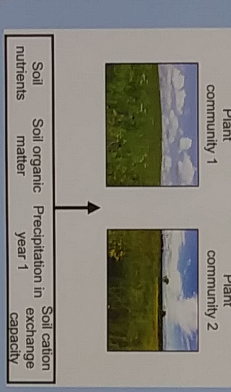
Ecosystem Function

Plant community composition

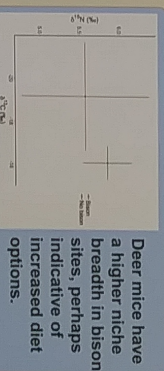
Restoration age explains plant composition and the evolutionary relatedness of those communities.



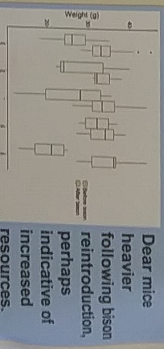
Soil characteristics influence which plant species occur, but this isn't reflected by plant evolutionary relatedness.



Small mammal functional traits

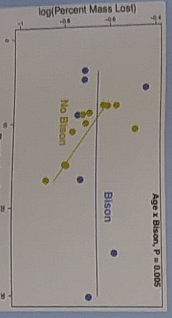


Deer mice have a higher niche breadth in burned sites, perhaps indicative of increased diet options.

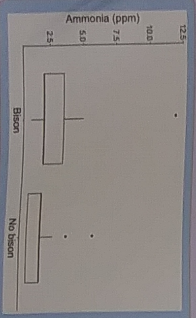


Deer mice feed at a higher trophic level and have greater niche breadth in burned sites, which could indicate higher invertebrate availability.

Ecosystem functioning



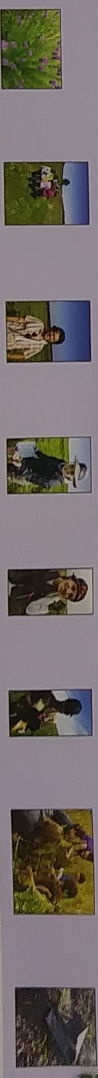
Leaf litter from older restorations tends to decompose more slowly than in younger sites, but the presence of bison eliminates this trend.



In 2017, soil ammonia (pictured) and phosphorous were higher in the bison unit; soil calcium and magnesium were lower.

Conclusions/Future work

- We have data on plant biomass, C:N, and niche width of ground beetles and spiders. We will use Structural Equation Modeling (SEM) to see which community-trait-function relationships drive the patterns we see.
- Our work shows that traditional measures of mammal community composition (diversity, abundance), are less important than functional traits for describing responses to management.
- Bison are being reintroduced to many other tallgrass prairie restorations – our work can help managers predict potential impacts.



Partners and Support

