Background

A) What determines plant community diversity and composition?

- Less than 1% of tallgrass prairie remains
- Seed sowing in former agricultural land is a common restoration approach with the following goals:
  1) diverse prairie plant communities
  2) dominated by native, not exotic species
  3) that exhibit improved ecosystem functioning and services, including habitat for at-risk animal species.

What drives these outcomes?

- Outcomes are unpredictable because they are influenced by a wide range of factors
- Managers control seed mix design and prescribed fire
- Uncontrolled environmental factors may also influence restoration outcomes.

Here, we summarize our efforts to identify the main drivers of restored:

A) Plant community diversity and composition (sown and exotic species)

B) Ecosystem function and services

Study System

- 29 restored prairies across 500 mi² in southwest Michigan
- Established 2003-2008
- Formerly agriculture: row crops, hay and pasture, and old fields
- 0.5 – 96 acres
- Sown with between 8 to 71 species (grasses and forbs)
- Variable prescribed fire history (burned 0-4 times)
- Plant community sampled in 2011 and 2013
- Functions sampled in 2013 and 2014

Conclusions

- Restoration of diverse target communities (sown species) is predictable in large part
- Investment in diverse, forb-rich seed mixes increases chances of restoration success
- Exotic and invasive species, however, were not limited by restored diversity
- Site selection, based on land use history, may be effective in limiting invasive species
- Site selection and management for one service may increase some services but may require tradeoffs with other services

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References: ¹Grman et al. 2013, Journal of Applied Ecology,
²Grman et al. 2015, Restoration Ecology