Demographic and Habitat Selection Patterns of Small Mammals in Native and Non-Native Grassland

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Introduction

Imperiled Grasslands

- **Global** temperate grasslands, savannahs, and shrublands: 45.8% converted
  4.6% protected[1]
- **WY** Prairie: 1.3% protected[2]


Michael Light


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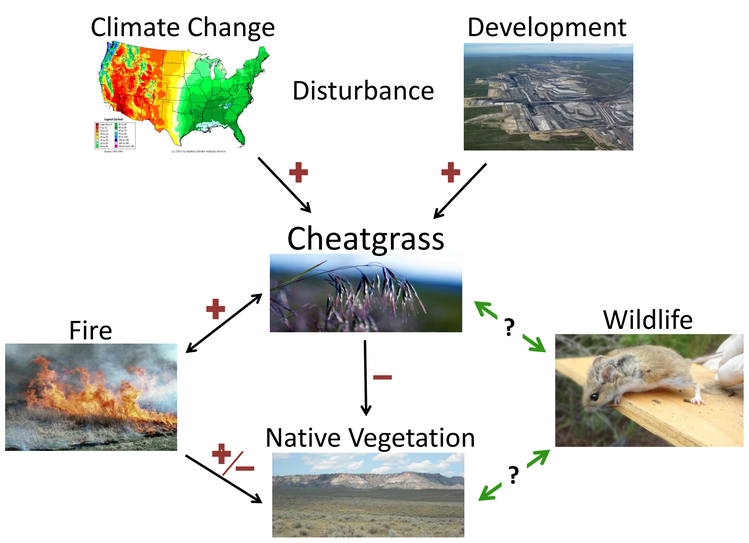
- Persistent threats from agriculture, development, climate change, and…

Invasive Species

- Significant driver of grassland alteration
- Same factors that threaten native species may create favorable conditions for invasives
- Occupy 1.2 million acres in Wyoming
- Cheatgrass is the most pervasive
  - Listed as "increasing" by USFS and a "high" habitat threat by WGFD
- Cheatgrass alters native plant and animal communities

Why is cheatgrass thriving and how is it impacting wildlife?



[1] Hoekstra et al. 2004. *Confronting a biome crisis: global disparities of habitat loss and protection*. Ecology Letters.
[2] Pocewicz et al. 2009. *The state of habitat protection in Wyoming*. The Nature Conservancy.
[3] WY Game and Fish Department. 2010. *State Wildlife Action Plan.*

Study Design

Research Questions

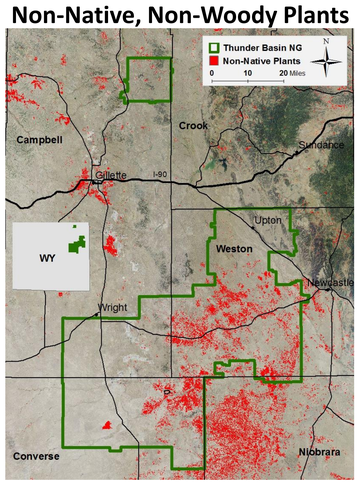
1) What is the influence of invasive plants on grassland small mammal communities?
2) What habitat is selected by rare and subdominant species under conditions of reduced competition?

3) Does trapping technique significantly influence abundance and distribution estimates for grassland small mammals?

Study Area

- **Thunder Basin National Grassland, WY**
  - 572,000 acre mixed grass prairie
  - Extensive native vegetation
  - Cheatgrass is the dominant invasive

Non-Native, Non-Woody Plants



Focal Species

- Grassland small mammal Species of Greatest Conservation Need (SGCN)

Focal SGCN

Species	Ranking
plains pocket mouse	Tier III
hispid pocket mouse	Tier II
silky pocket mouse	Tier II
olive-backed pocket mouse	Tier II
plains harvest mouse	Tier II

- No ongoing efforts to delineate important habitat in WY
- Population trends are poorly understood[3]

Funding: Wyoming Game and Fish Department (WGFD)
Cooperators: Martin Grenier (WGFD)

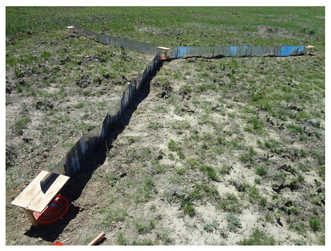
Field Methods

Question 1: Native Vegetation vs. Cheatgrass

- Mark-recapture (robust design)
- Paired trapping grids: native vegetation vs. cheatgrass
- Powder tracking and vegetation surveys

Question 2: Competition and Habitat Selection

- Remove deer mice in subset of grids
- Powder track before and after removals



Question 3: Trapping Technique

- Grids: 2/3 Shermans, 1/3 Havaharts
- Pitfalls with drift fences

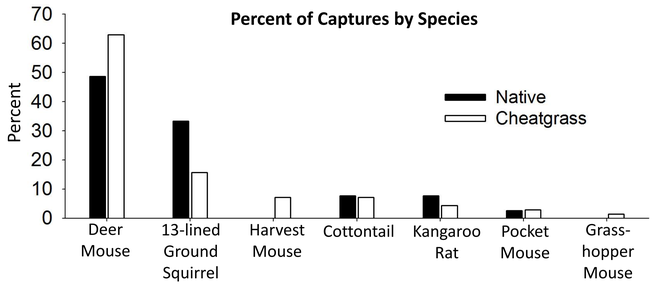
2013 Preliminary Results

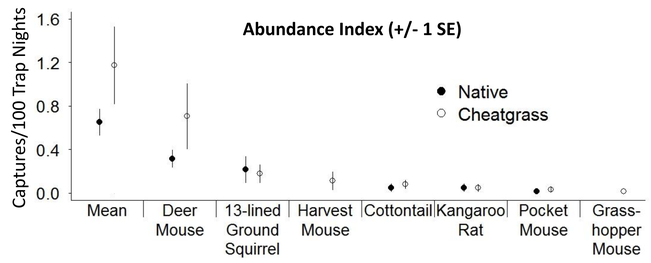
Trapping Grids

	Control	Removal
Native	7	0
Cheatgrass	7	0

Captures Without Recaps

Native	39
Cheatgrass	73





2014 Field Work

- Re-trap same paired grids; powder track
- Remove deer mice if capture rate increases
- Additional field experiments to test *why* captures are higher in cheatgrass grids