

# Effects of grazing systems on the abundance and diversity of grassland birds in northern mixed-grass prairie habitats



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## Introduction

- Grassland bird populations have seen greater declines than any other guild of birds.
- Most remaining grassland bird habitat is rangeland grazed by domestic livestock.
- Montana FWP implements rest-rotation grazing within conservation easements and Upland Gamebird Enhancement projects (fig. 1).
- Rest-rotation grazing may create patch-size heterogeneity on the landscape, an important requirement of native grassland bird habitat.

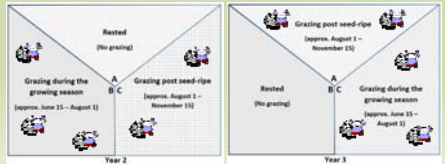
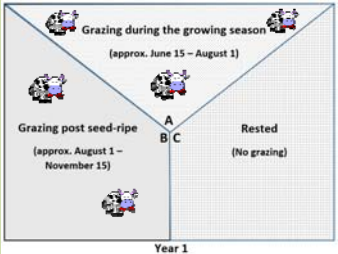


Figure 1: Basic 3-pasture rest-rotation grazing system implemented by Montana FWP

- Research comparing rest-rotation grazing to traditional grazing systems in terms of abundance and community composition of native grassland birds is lacking in the northern mixed-grass prairie.



Questions? Feel free to ask!



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## Methods

- Generated 305 random point count locations across pastures (fig. 2):
  - 150 points on the FWP conservation easement.
  - 155 on adjacent reference pastures in season-long and intensive summer rotational grazing.
- Conducted three 5-min point counts during 31 May - 23 June, 2016.

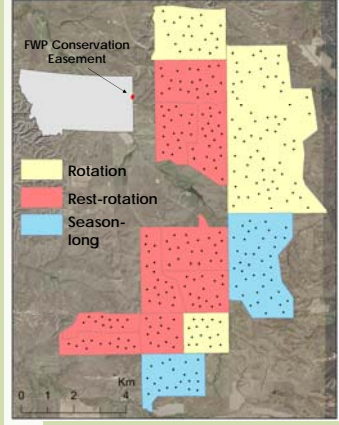


Figure 2: 305 randomly generated point count locations within three grazing treatments



- Recorded all species seen or heard within 100m.
- Established five 20-m habitat transects with 5 subplots per transect within 100m of every bird survey location.
- Measured visual obstruction.
- Measured percent coverage of new growth grass, residual grass, litter, shrub, forb, tree, bare ground, and rock.
- Recorded heights of the grass, shrub, forb, and litter.
- Estimated shrub coverage with line intercept surveys.
- Estimated abundance and detection probability using N-mixture modeling from the pcount function in R package unmarked.
- Visualized avian community composition through a principle component analysis biplot.

## Preliminary Results

- Baird's sparrow, grasshopper sparrow, and brown-headed cowbird show evidence of a difference in abundance between grazing systems (fig. 3).

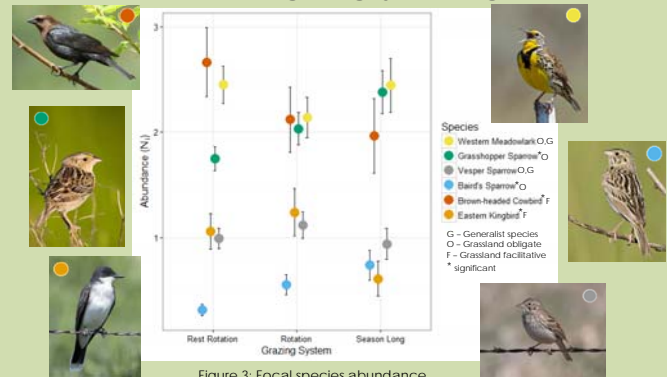


Figure 3: Focal species abundance.

- Rest-rotation and rotational grazing systems show similar community composition; season-long grazing systems show slightly different composition (fig. 4).

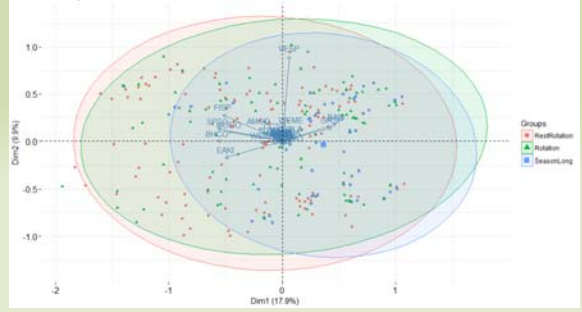


Figure 4: Avian community composition.

## Discussion

- Preliminary evidence of a difference in abundance between easement and reference pastures for four focal species.
  - Grasshopper sparrow and Baird's sparrow abundance highest within season-long grazing system.
  - Brown-headed cowbird abundance highest within rest-rotation.
- Avian community composition is similar between grazing systems.
- Future analyses will include habitat components.

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