

# Factors Affecting Space Use of Sharp-tailed Grouse in Mixed Grass Prairies



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## Introduction

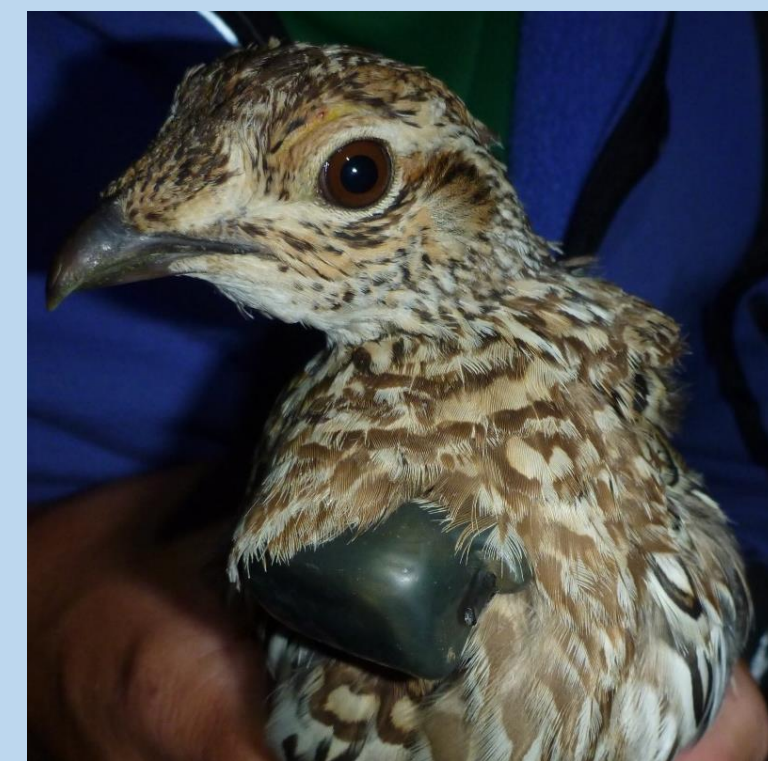
- Temperate grasslands, particularly mixed grass prairies, suffer high levels of habitat loss and degradation
- Sharp-tailed grouse (*Tympanuchus phasianellus*) are an ideal umbrella species for mixed grass prairies
  - Large home ranges
  - Require a variety of different habitats

## Objectives

- Assess space use by female grouse in relation to rangeland management, lek sites, local habitat conditions, and anthropogenic development

## Methods

- Monitored radio-marked females  $\geq 3$  times/week Apr. – Aug. 2016 and 2017
- Measured habitat variables using GIS
- Calculated 95% fixed kernel home ranges
- Evaluated second-order habitat selection
  - Linear models
    - Habitat features at home range centroid
  - Compositional analysis



### Questions?



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### Acknowledgments

- PR Grant #W-162-R-0
- IACUC Protocol #2016-01
- All the ranchers whose cooperation have made this study possible
- Kyla Bos, Adam Bradley, Adrian Cain, Drew Howing, John Landsiedel, Joshua Luft, Chris Smith and Skyler Vold

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## Results

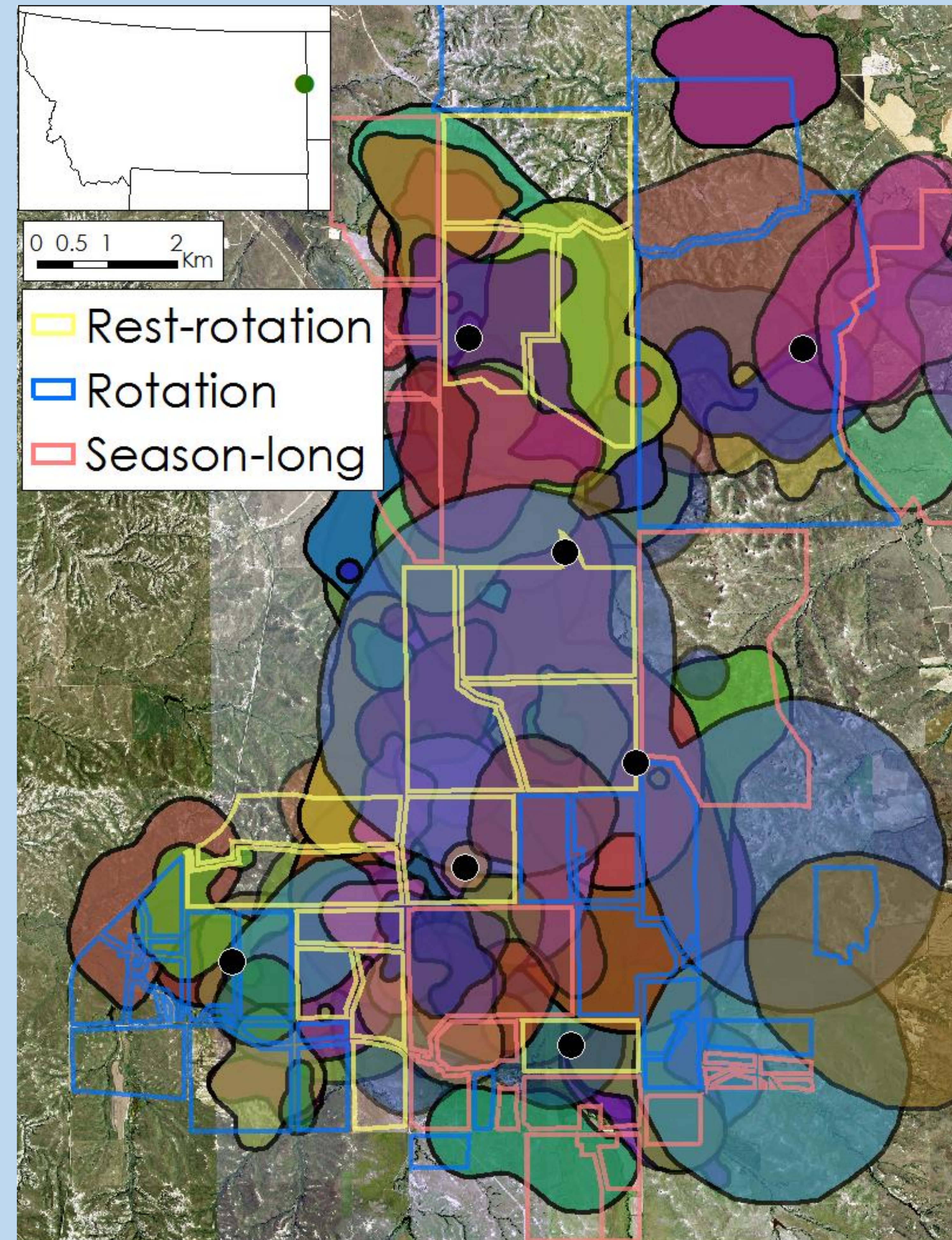


Figure 1. Study area with 95% kernel home ranges. Capture leks and grazing treatments are shown for reference.

Table 1. Support for candidate models predicting home range size.

Model	K	AIC <sub>c</sub>	ΔAIC <sub>c</sub>	AIC <sub>c</sub> w <sub>i</sub>	LL
Dist. to Grassland Edge	3	1436.62	0.00	0.26	-715.18
<b>Null</b>	<b>2</b>	<b>1437.02</b>	<b>0.40</b>	<b>0.21</b>	<b>-716.44</b>
Dist. to Lek	3	1437.66	1.04	0.15	-715.70
Nest Outcome	4	1438.28	1.66	0.11	-714.91
Year	3	1438.66	2.04	0.09	-716.20
Dist. to Road	3	1438.97	2.35	0.08	-716.35
Dist. to Oil Pad	3	1439.12	2.50	0.07	-716.43
Grazing System	5	1443.16	6.54	0.01	-716.23

### Home Range

- 93 homes ranges calculated for 80 females
- Average: 503 ± 56 ha
- Range: 64 – 3716 ha
- Distance to grassland edge was best predictor of home range size
- Grouse selected for mixed grass prairie
- No difference in home range size between grazing treatments

Table 2. Simplified ranking matrix based on comparing proportional habitat use within home ranges with proportion of available habitat types.

	Mixed grass prairie	Close grown crop	Shrubland	Introduced upland perennial grasslands	Wheat	Developed ruderal grasslands	RANK
Mixed grass prairie	0	+	+++	+++	+++	+++	1
Close grown crop	-	0	+	+	+++	+++	2
Shrubland	---	-	0	+	+++	+++	3
Introduced upland perennial grasslands	---	-	-	0	+++	+++	4
Wheat	---	---	---	---	0	+++	5
Developed ruderal grasslands	---	---	---	---	---	0	6

## Discussion

- Large variation in home range size
- Grazing and anthropogenic disturbance weren't important predictors of home range size
- Female grouse exhibited strong selection for mixed grass prairie over other cover types, even when mixed grass prairie dominated the landscape
- Future analyses
  - Resource utilization functions to examine third order habitat selection