Targeted Cattle Grazing to Enhance Sage-Grouse Brood-Rearing Habitat

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RESULTS

Suboptimal brood-rearing habitat often limits greater sage-grouse (Centrocercus urophasianus) populations in western North America. In many mountain big sagebrush (Artemisia tridentata ssp. vaseyana) brood-rearing habitats, sagebrush is too dense (>10-25% canopy cover) and limits the understory forbs and arthropods that sage-grouse eat during summer. We investigated whether protein supplementation could concentrate cattle grazing or trampling during late fall to reduce mountain big sagebrush canopy cover and increase the diversity and abundance of forbs and arthropods.

Study Area

Location: Beaverhead Mountains of southwestern Montana
- Habitat type: Mountain big sagebrush/Idaho fescue (Festuca idahoensis)
- Ecological site: Loamy (38-48 cm annual precipitation)
- Elevation: ~2100 m
- Slope: 4-10%
- Aspect: NE

Study Design

Randomized Complete Block in a Split-Split Plot Design
- Three, contiguous ~715-ha pastures (Fig. 1)
- One, 4-ha macroplot (i.e., block) per pasture; each macroplot with ≥ 30% canopy cover of mountain big sagebrush
- Eight, 7.5-m² circular microplots (5-m radius) per macroplot; 4 untreated microsites and 4 microsites treated with protein supplement (Fig. 2)

Grazing Application Fall 2015
- Three pastures grazed simultaneously for 14 days in mid-October
- 190-210 cows per pasture
  - Light stocking rate (0.12 AUM/ha)
- 14 supplement tubs per macroplot (Fig. 3)
  - Supplement tubs ~200lbs, 30% CP Crystalyx Biobarrels
  - Cattle introduced to supplement upon entering pastures, thereafter no herding (Fig. 4)

Objectives

Evaluate Cattle Response
- Cattle diet composition (Bite Count Method and fecal microhistology)
  - Perennial bunchgrass utilization (Grazed Class Method)
- Supplement intake (before and after tub weights; Fig. 5)

Evaluate Vegetation Response
- Herbaceous canopy cover and composition (Daubenmire Canopy Coverage Method; Fig. 6)
- Herbaceous diversity (species richness and Shannon Index)
- Shrub canopy cover (Line-Intercept Method)
- Ground cover (Point-Intercept Method)

Evaluate Arthropod Response
- Arthropod density (vacuum sampling and pitfall traps; Fig. 7)

CONCLUSIONS

First-year results indicate that protein supplementation can concentrate cattle trampling and enhance sage-grouse brood-rearing habitat. Sagebrush canopy cover was reduced to brood-rearing was more limited than vegetation response. However, the density of Lepidoptera, which are important for sage-grouse chick survival, trended greater in supplement sites.