Mitigating threats to Greater sage-grouse through shrub-steppe habitat manipulations

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Sage-grouse status

- Sage-grouse occupy an estimated 56% of the potential habitat of pre-European settlement

- USFWS ESA
  - Warranted but precluded

- Management plans and local working groups

West Box Elder, UT

Courtesy of USGS
Threats to sage-grouse

- Habitat loss and fragmentation
- Disease
- Predation
Threats to sage-grouse

• Wildfires
  – Change in fire regime
  – Increase in junipers
  – Decreases native avian and vegetation species
  – Subsequent spread of invasive spp.

Courtesy of BLM
Research Questions

#1. What effect will the treatments and any observed changes in vegetation have on sage-grouse habitat use patterns?

#2. Do sage-grouse select for certain vegetation characteristics at nest sites and brood sites?

#3. What effect will the treatment have on vegetation composition of sagebrush steppe?
Treatments

Aug 1 – 15, 2010: mastication of trees within greenstrip area
Treatments

Aug 16 – September, 2010: chain harrow greenstrip (seedbed prep/removal of shrubs)
Treatments

✧ Sept 2-Sept 12 Spray Plateau herbicide
  ✧ 5 oz Plateau/acre
  1 qt MSO/acre
  Applied in 10 gal water/acre
Treatments

- December 13-Aerially apply forage kochia seed at a rate of 4.5 bulk/lbs/acre.

Photo: Roger Banner
Identified West Box Elder county as critical habitat for sage-grouse

**Methods**

- Pretreatment data collected Feb-August 2010.
- Post treatment data collected 2011-2012
- Catch sage-grouse using long handled hoop net
- ATS Collars
- Telemetry, get two locations per week
Methods

Vegetation plots:

• 20m x 20m transects for 30 use locations and 30 random locations per month
• 500 meter distance sampling pellet counts
• 30mx30m veg plots for nest locations using line intercept, daubenmire frame and robel pole
• 20mx20m veg plots for brood locations using line intercept, daubenmire frame, and robel pole
• 100 meter line and point intercept transects
#1. Effect of treatment on sage-grouse use habitat patterns?

20m x 20m veg plots
X Random Locations
X Use locations
Methods

Vegetation plots:

- 20m × 20m transects for 30 use locations and 30 random locations per month
- 500 meter distance sampling pellet counts
- 30mx30m veg plots for nest locations using line intercept, daubenmire frame and robel pole
- 20mx20m veg plots for brood locations using line intercept, daubenmire frame, and robel pole
- 100 meter line and point intercept transects
#1. Effect of treatment on grouse use?

500 m pellet count

- **Within treatment**
- **No treatment**
Methods

Vegetation plots:

• 20m x 20m transects for 30 use locations and 30 random locations per month
• 500 meter distance sampling pellet counts
• 30mx30m veg plots for nest locations using line intercept, daubenmire frame and robel pole
• 20mx20m veg plots for brood locations using line intercept, daubenmire frame, and robel pole
• 100 meter line and point intercept transects
#2. Veg characteristics of nest sites?

30m x 30m veg plots
X Nest Sites
Methods

Vegetation plots:

• 20mx20m transects for 30 use locations and 30 random locations per month
• 500 meter distance sampling pellet counts
• 30mx30m veg plots for nest locations using line intercept, daubenmire frame and robel pole
• 20mx20m veg plots for brood locations using line intercept, daubenmire frame, and robel pole
• 100 meter line and point intercept transects
#2. Veg characteristics of brood sites?

20m x 20m veg plots
X Brood Sites
Methods

Vegetation plots:

• 20mx20m transects for 30 use locations and 30 random locations per month
• 500 meter distance sampling pellet counts
• 30mx30m veg plots for nest locations using line intercept, daubenmire frame and robel pole
• 20mx20m veg plots for brood locations using line intercept, daubenmire frame, and robel pole
• 100 meter line and point intercept transects
#3. Effect of treatment on vegetation composition?

100 m line and point int.
- Within treatment
- No treatment
Potential Results and Analysis

Lek attendance ↑

Predation near lek ↑

Analysis will involve ANOVA and logistic regression to analyze the relationship between sage-grouse presence and habitat parameters, and the effect of the treatment on sage-grouse use and vegetation.

Sage grouse may also incorporate forage kochia into their diet.
Acknowledgements

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Questions?