LESSER PRAIRIE-CHICKEN NEST SUCCESS AND HABITAT SELECTION RESPONSE TO VARIOUS FIRE AND GRAZING REGIMES IN EASTERN NEW MEXICO

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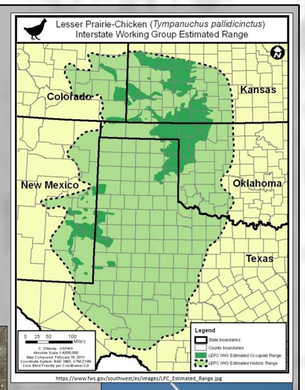
INTRODUCTION

The lesser prairie-chicken (*Tympanuchus pallidicinctus*) is an iconic endemic species of the North American Great Plains

- Currently only occupy < 10 % of their historic range
- Suffered severe population declines



Reductions due to combinations of anthropogenic and natural causes including

- Row-crop agricultural expansion
- Continuous livestock grazing
- Fire suppression
- Invasive species encroachment
- Urban expansion
- Severe drought
- Wind energy development
- Hydrocarbon exploration

Lesser prairie-chickens presently occupy areas of the Sand Shinnery Oak (*Quercus havardii*) Prairie Ecoregion

Dominant vegetation includes:

- Sand shinnery oaks
- Sand sage brush (*Artemisia filifolia*)
- Mixed grass assemblages
- Short grass assemblages

Historical ecological drivers were wildfires and free-ranging herbivores

- Created heterogeneous habitat mosaics
  - -At scales that met annual life cycle requirements of lesser prairie-chickens

Habitat reduction in habitat quality and quantity has increased efficacy and efficiency needs of management actions

- Combinations of prescribed fire and high intensity low duration grazing may be a mechanism to direct plant community composition and improve habitats

OBJECTIVES

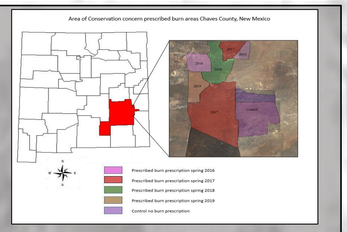
To quantify lesser prairie-chicken habitat selection and nesting success response to various prescribed fire and grazing regimes

- Quantify nesting success
- Estimate habitat selection
- Evaluate herd health and production
- Develop herbaceous biomass production models
- Quantify invertebrate assemblage and biomass response
- Quantify plant community composition and response

STUDY AREA

Research will be conducted on ~15,000 ha of land managed by Bureau of Land Management in Chaves County, New Mexico

- Designated an Area of Conservation and Ecological Concern



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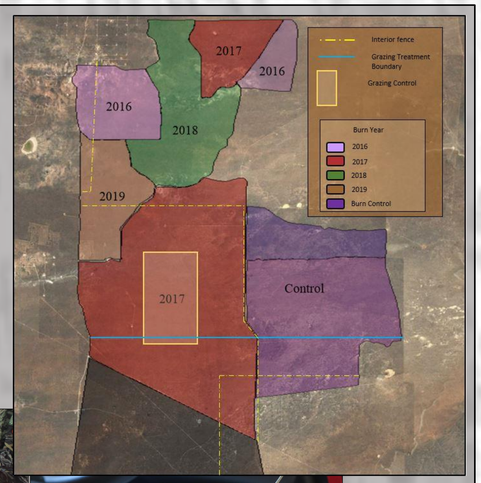
METHODS

Prescribed Burn Treatments

The study area is divided into 5 fire treatments

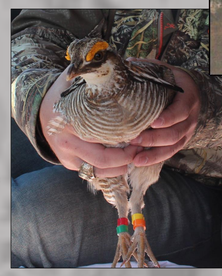
- 1 un-burned and 4 prescribed burn units, spring burn 2016-2020
  - Pre-fire, 2016, and 2017 data previously collected by NMSU



Grazing Treatments

Area will be divided into 2 large grazing units

- Area will be subjected to a high intensity, low duration grazing (except grazing control area) in 2020
  - ~ 70% standing herbaceous biomass reduction



Nesting Success And Habitat Selection

Capture lesser prairie-chickens on spring leks using walk-in funnel traps and drop-nets

Females

- Measure and record morphometrics
- Band with color and aluminum bands
- Outfit with 22g GPS PTT

Males

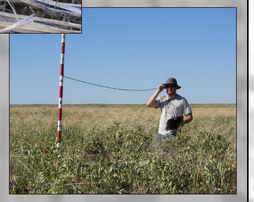
- Measure and record morphometrics
- Band males using plastic color bands
- Collect tissue for parasitology and genetic analysis

Nests

Will be monitored to determine success (≥ 1 egg hatching)

Nest characteristics quantified using

- Distance and height of nearest forb, grass, and shrub species
- Associated plant community composition
- Visual obstruction
- Associated litter depth



Vegetation And Invertebrate Response

Response to prescribed fire and grazing regimes will be quantified using

- Visual obstruction estimates
- Percent cover estimations
- Plant community composition
- Invertebrate assemblage and biomass
- Develop standing herbaceous biomass production models using
  - Visual obstruction
  - Percent cover
  - Species composition
  - Mean plant height

Herd Health And Production

Monitor and quantify

- Cattle body condition
- Availability and Forage quality selection
- Supplemental feeding rates/ratios
- Estimate production
- Monitor cattle movements from water and estimate habitat selection and habitat overlap