Greater sage-grouse Update for States

May 18, 2015

Goals for Today

- **Recent Species Report Chapters**
  - Free-roaming Equids
  - Contaminants
- **Genetics Report is Available**
- **Agricultural Conversion Models**

Free-roaming Equids

- **Equids forage differently than cattle.**
- **Free-roaming equids can seriously degrade sage-grouse <u>habitat at local scales</u> through:**
  - decreasing grass cover,
  - fragmenting shrub canopies,
  - altering soil characteristics,
  - decreasing plant diversity, and
  - increasing the probability of incursion of invasive plants. riparian

Free-roaming Equids

2010

- 36,000 free-roaming equids occurred in 10 Western States on BLM-managed lands.
- Impact was 12% of the sage-grouse's range.
- Free-roaming equid population on BLM-managed lands was higher than the recommended maximum appropriate management level (AML).
- Grazing has the potential for population-level impacts.

Conservation

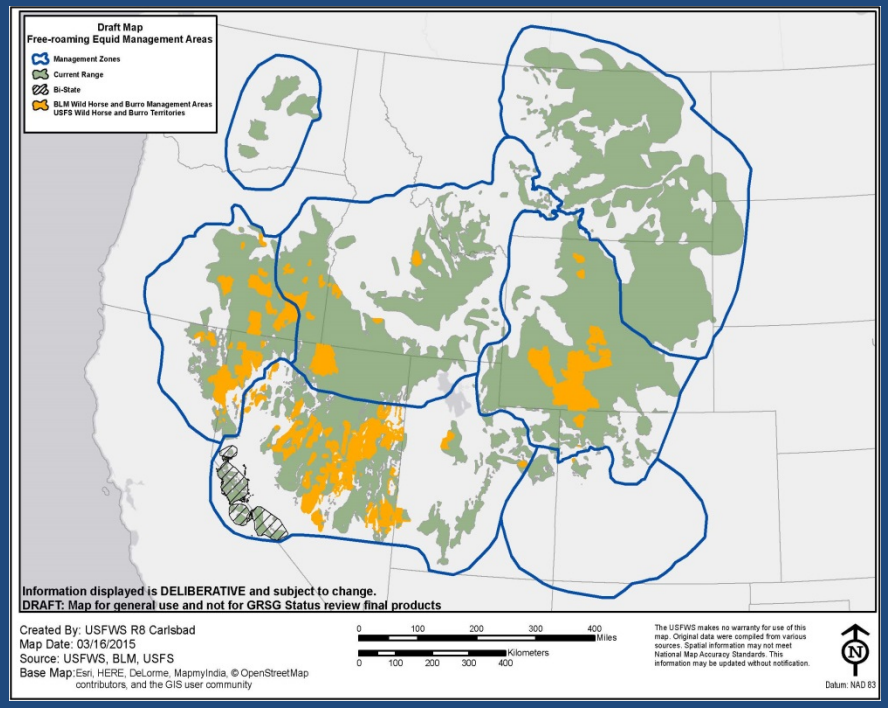
- Two horse gathers (2,957 equids) were reported.
- 13,919 acres of brood-rearing areas were fenced to exclude equids.

Free-roaming Equids

Current:

- Continue to impact 12% of the sage-grouse's current range (as in 2010).

- Current BLM- and FS-managed equid population is above recommended amount.



- MZs II, III, V are more heavily impacted (NV is home to half of half of the free-roaming equids.

Free-roaming equids are <u>likely to have impacts at local levels.</u>

Contaminants

Contaminants in GRSG range include:

Pesticides (herbicides, insecticides)

Oil and gas, drilling chemicals

Mining materials and fluids

Nuclear materials and waste

Garbage

Animal/Human waste

Fire Retardants

- **Direct exposure can cause mortality, abnormal behavior, and increased risk of predation of individuals**
- **Exposure of GRSG habitat may result in:**
  - increased loss of sagebrush, forbs, and grasses,
  - reduced insects, and
  - degraded water sources

Contaminants

2010

Identified as continuing indefinitely, but no evidence that contaminants resulted in local or range-wide declines

Conservation

- **Proper placement and management of sources of contaminants (oil and gas, agriculture, infrastructure, development, wildfire) outside of GRSG habitat**

Current

- **Impacts individuals sporadically at a local scales**
- **Unlikely that contaminants cause widespread mortality or declines in sage-grouse populations across management zones (MZ).**

Genetics Workshop Report

- **October 22-23, 2015**
- **Purpose:** New Science, barriers to gene flow, other genetics issues
- **Participants:** Genetics or sage-grouse experts

Genetics Workshop Report

Report is Now Available on our website: fws.gov/greatersagegrouse/status.php

- **Summary Report**
- **Appendices include:**
  - Planning Documents
  - Agenda
  - Selection Criteria
  - Pre-work and ground rules
  - Workshop bibliography
  - Presentations
  - Notes

Summary Report: Workshop for Experts on the Genetics of the Greater Sage-Grouse

Held at the USGS Fort Collins Science Center in Fort Collins, Colorado, on October 22 and 23, 2014

Prepared by the Workshop Planning Team

Executive Summary

The greater sage-grouse (*Centrocercus urophasianus*) is one of the most intensively studied upland game bird in North America. Ongoing research continues to improve our understanding of genetic diversity across the species' range including the degree to which observed differences represent distinct or isolated populations. Techniques and metrics used to evaluate and describe genetic isolation, divergence, and diversity have also evolved and improved since previous genetic studies were published in 2005 and summarized in 2011 (Oyler-McCance *et al.* 2005; Oyler-McCance and Quinn 2011). Since then, new research on the genetics of sage-grouse has been completed while other studies are now in progress.

In 2010, the U.S. Fish and Wildlife Service (Service) determined the greater sage-grouse warranted protection under the Endangered Species Act (ESA or Act) but that listing was precluded by higher priorities. Habitat loss and fragmentation due to a variety of factors were cited as the primary threats to the species. Fragmenting habitats can isolate or reduce the size of populations, which may be more vulnerable to population declines, reduced genetic diversity, and potentially extinction. We used this workshop to better understand the latest science regarding sage-grouse genetics and any potential risks associated with isolation and small populations.

The Service is currently assessing the status of the greater sage-grouse and is gathering the best available scientific and commercial data to inform a status determination by September 30, 2015. While a rider to the Fiscal Year 2015 Omnibus Appropriations Bill will prevent the Service from writing or publishing a proposed rule, it does not relieve the Service from completing a status review to determine whether the species still warrants protection under the Act.

As the Service gathers the best available information on sage-grouse genetics, the Service partnered with the U.S. Geological Survey (USGS) to organize a workshop to elicit information from scientific experts about recent developments in the field of sage-grouse genetics. The workshop explored the characteristics of gene flow across the range, including potential impediments, or barriers, to gene flow and any implications of genetic divergence across the range of the greater sage-grouse. The workshop also explored potential interactions between threats and genetic processes, and provided an opportunity for scientific experts to discuss ongoing and upcoming research on sage-grouse genetics. The workshop was structured to elicit information from the scientific experts that could later help the Service identify genetic differentiation across the range, populations with low genetic diversity, or populations with unique genetic characteristics.

Greater Sage-Grouse 2015 Status Review, Genetics Workshop Summary Report
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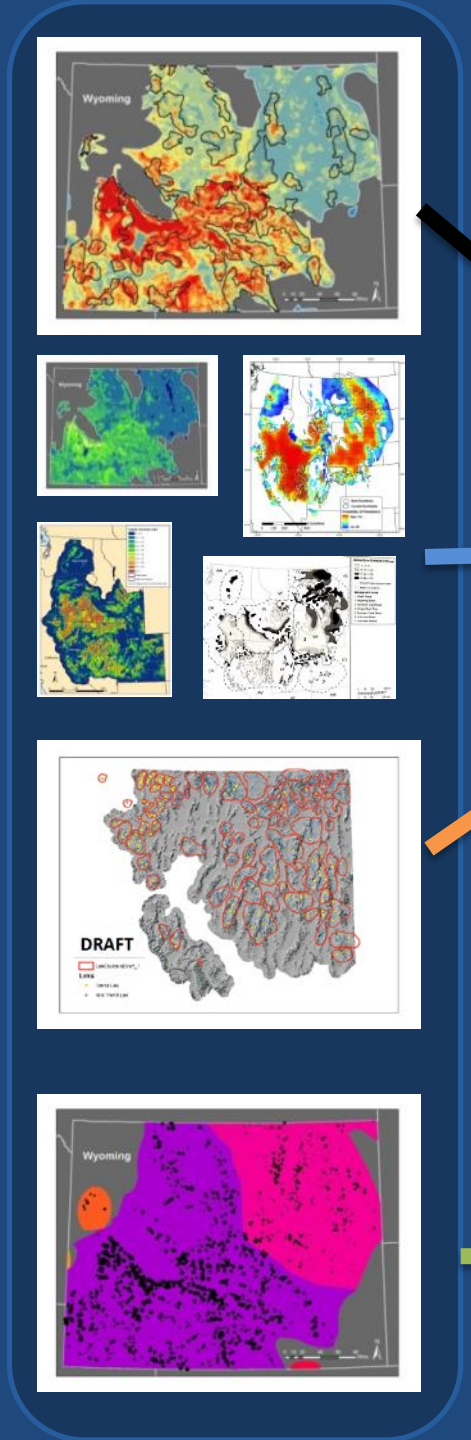
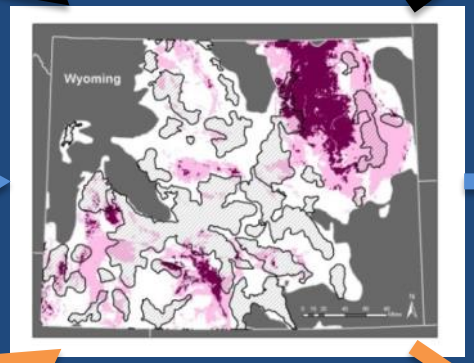
Agricultural Conversion Modeling



Integrate through spatial overlap with 4 Risk Models

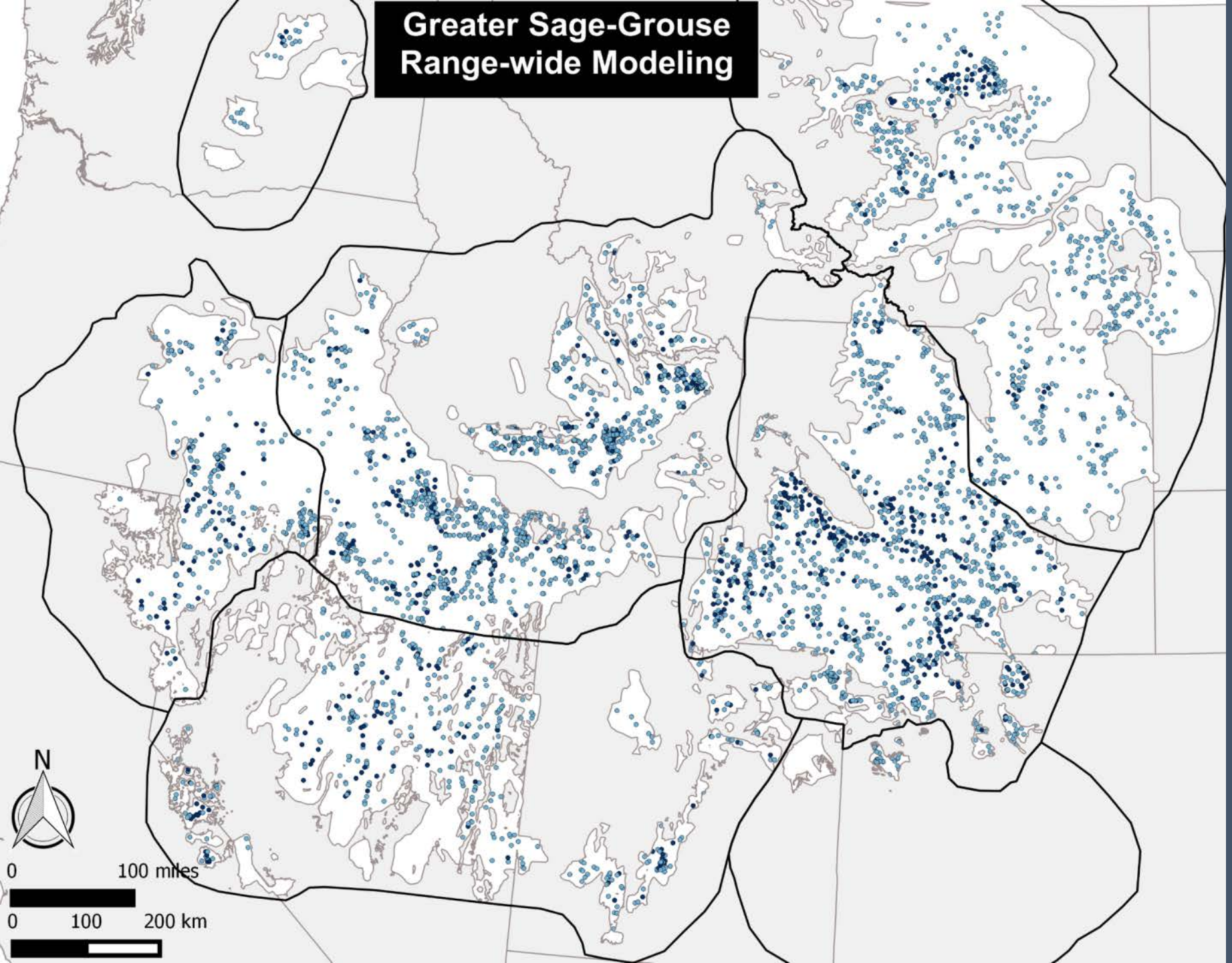


Projected Relative Abundance

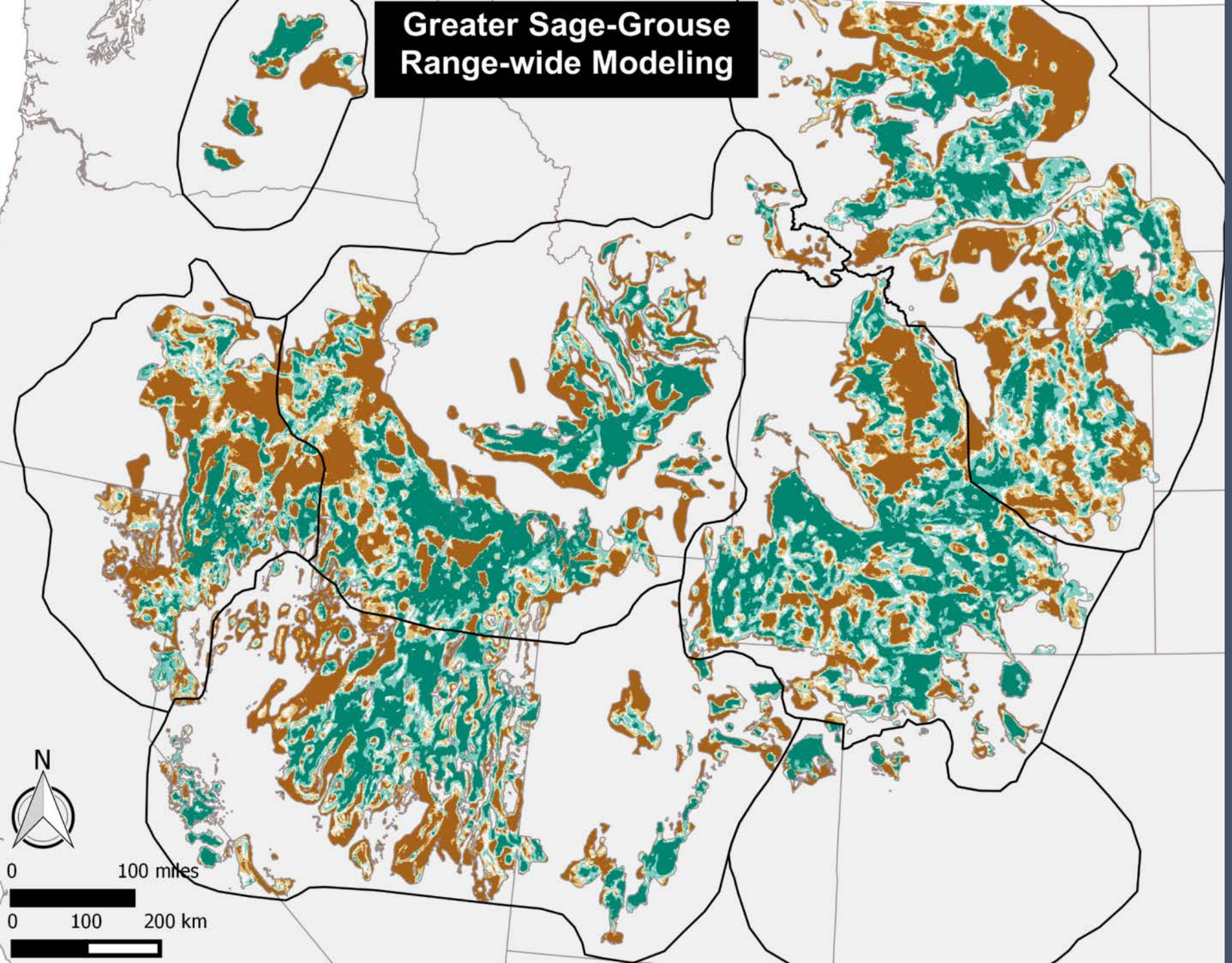
Projected Distribution

Projected Population Trends

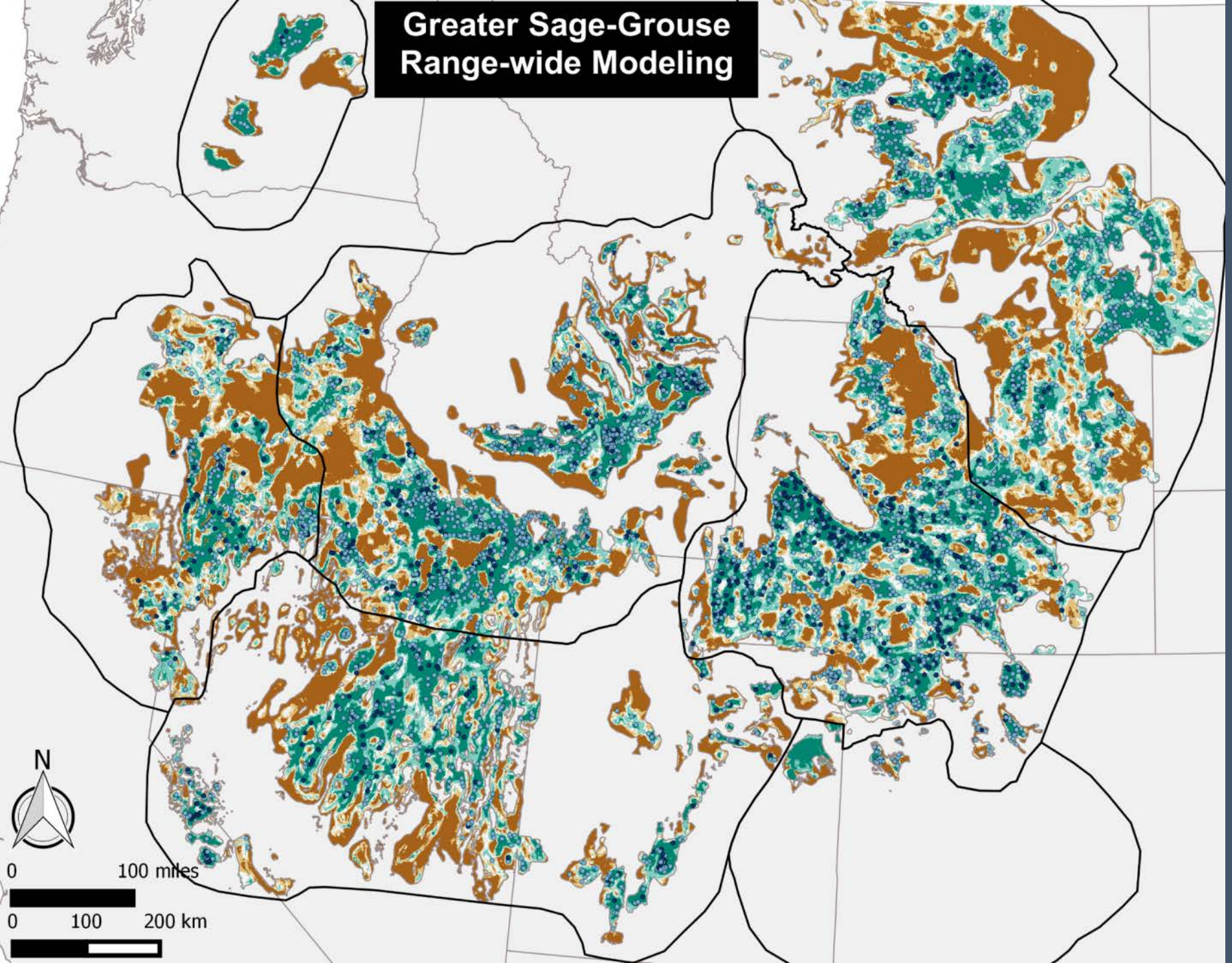
Current Population Trend recent period



- Worked with WAFWA & States on Greater Sage-grouse Lek Data:
- Analyses Structured by Management Zone
- Produce 2 Metrics:
  - Modeled Probability of Occupied Breeding Habitat
  - Relative Population Index



- Breeding Distribution Model
- Predictive Model Linked to Habitat Metrics
- Good Model Fit and Cross-fold Validations Statistics



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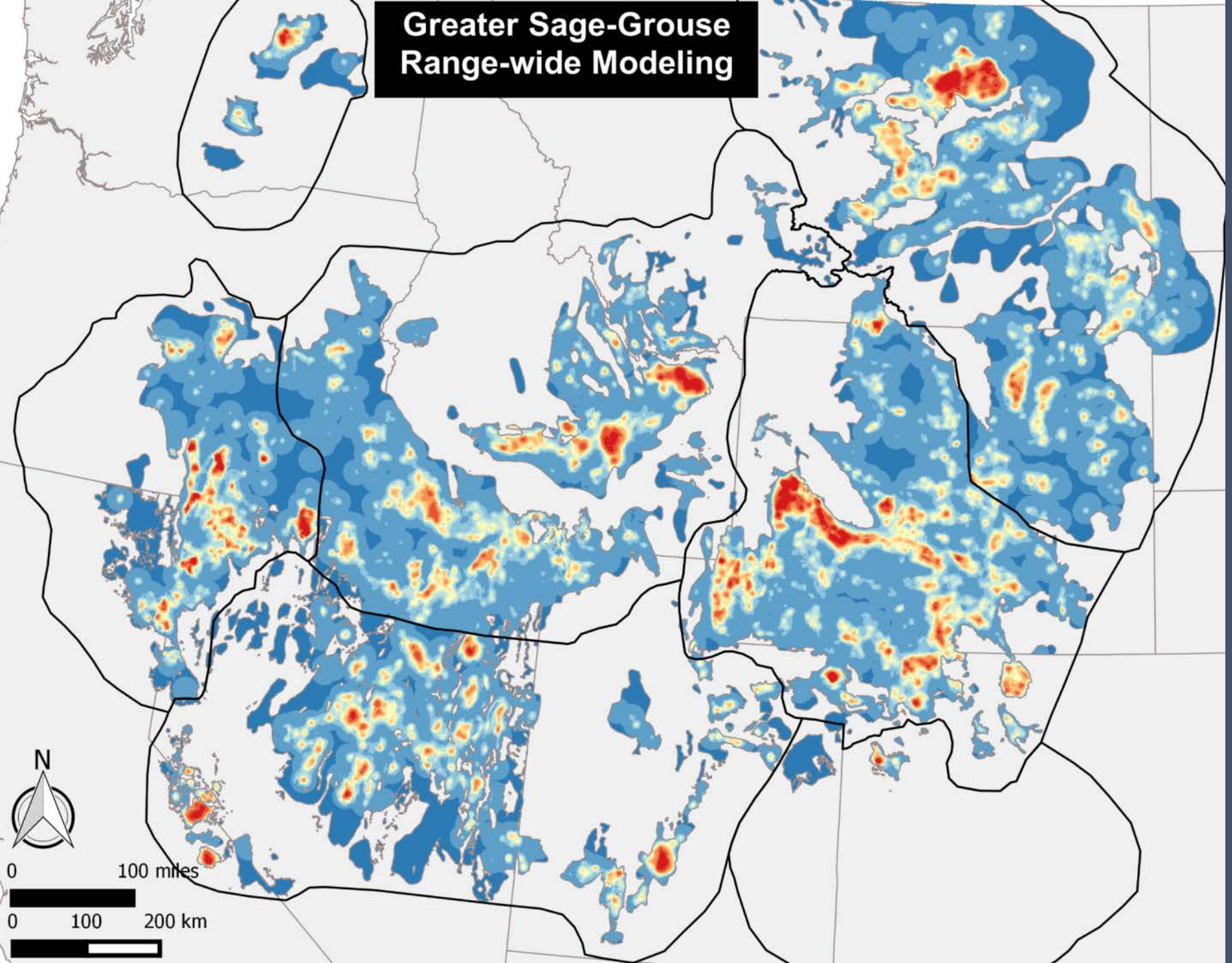
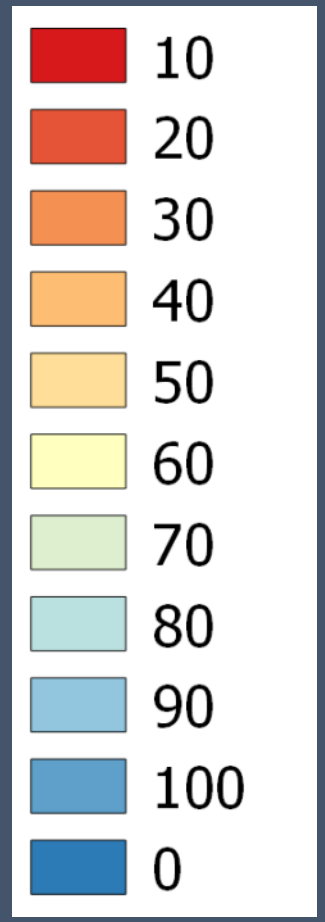
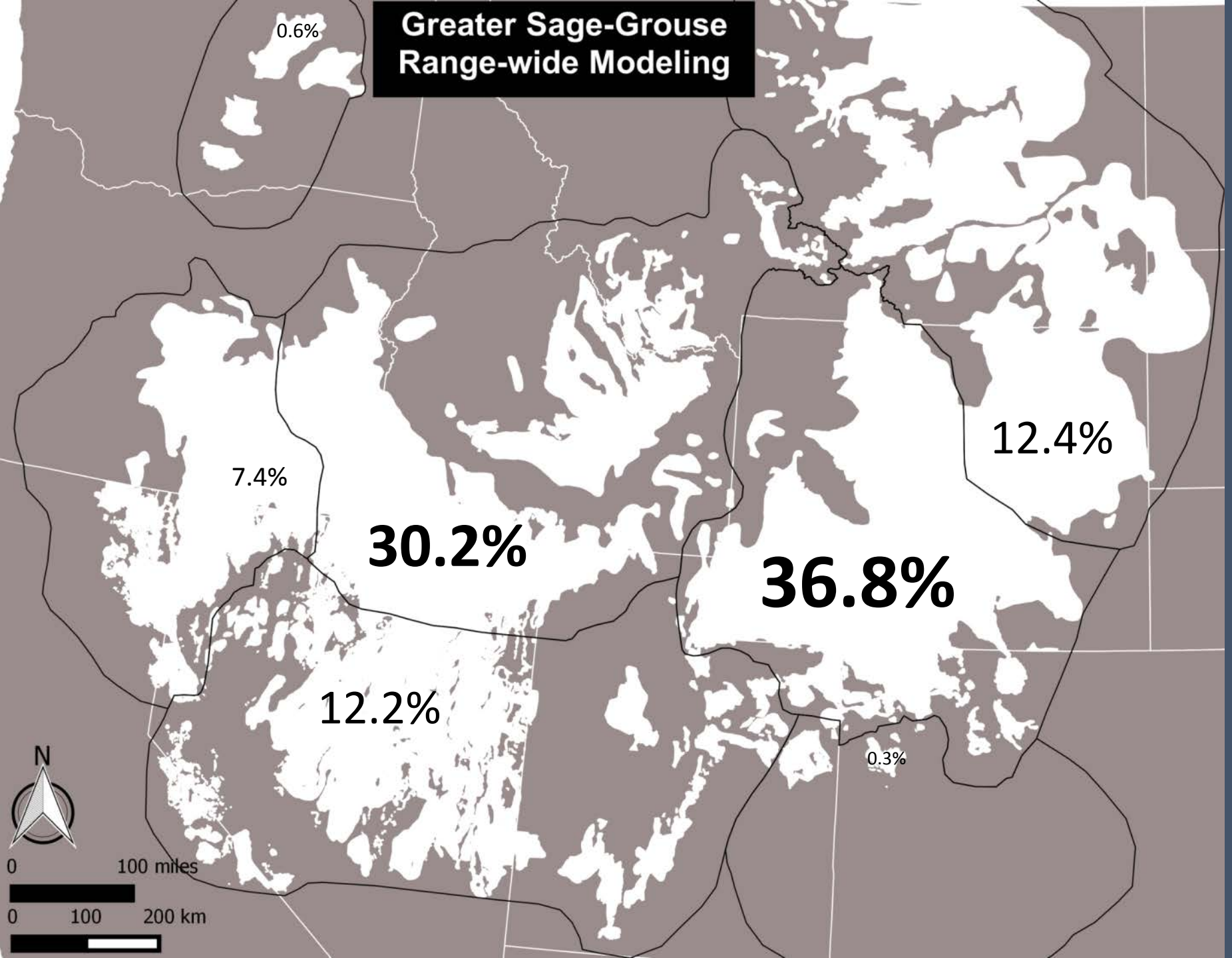


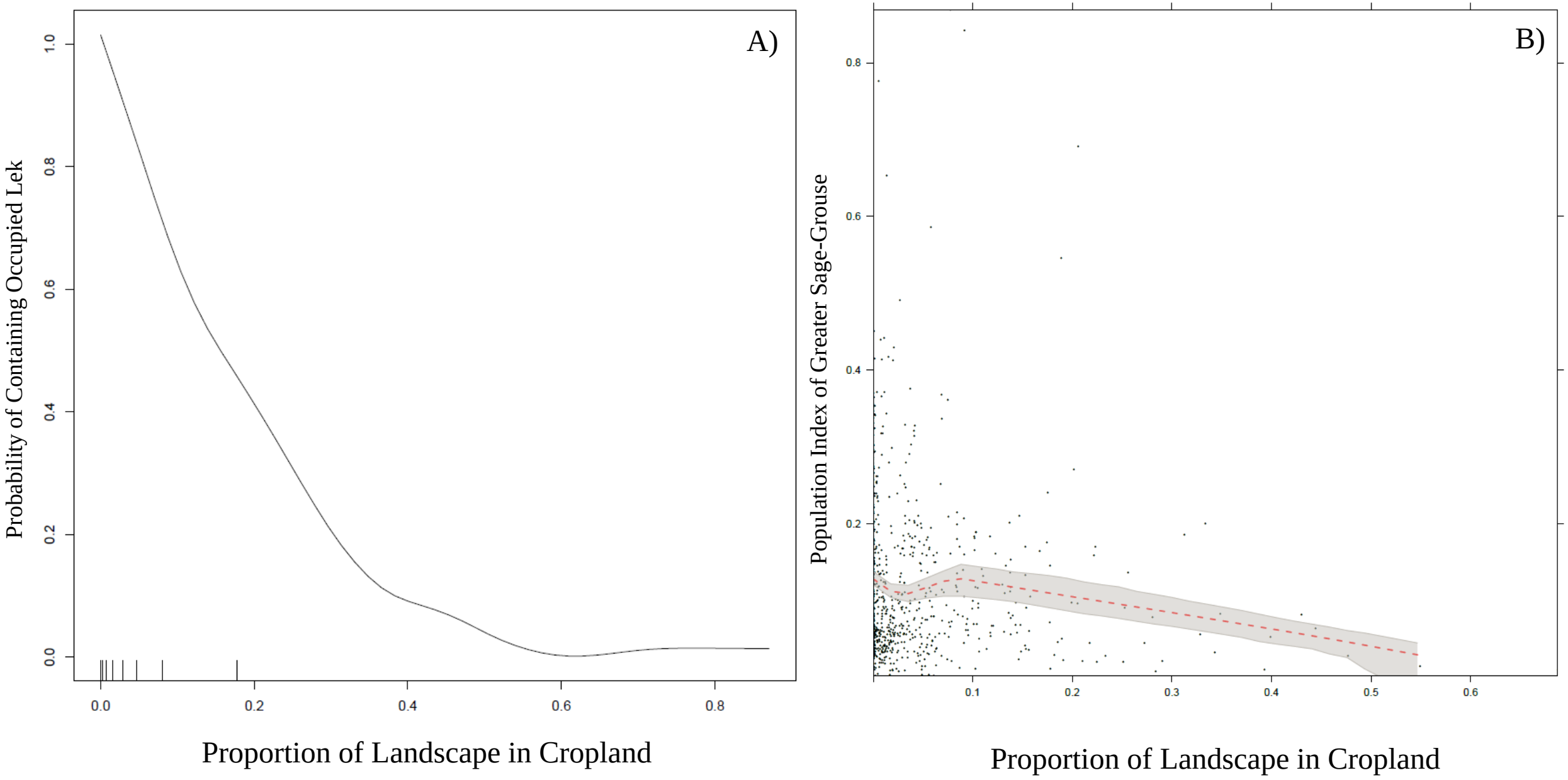
- Relative Population Index by Sage-grouse Management Zone
- Colors Represent Relative % Populations

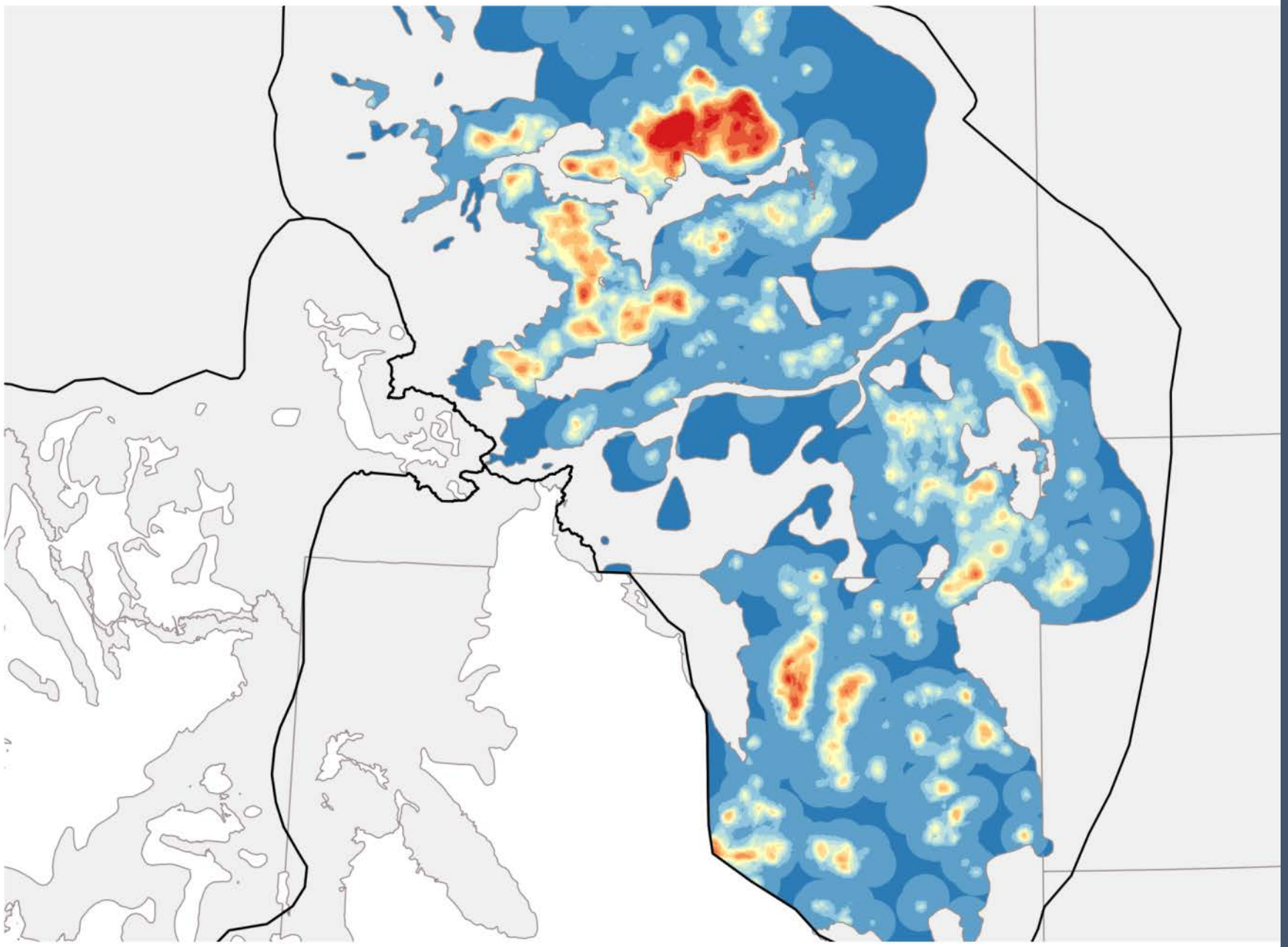




- Worked with WAFWA & States on Greater Sage-grouse Lek Data:
- Analyses Structured by Management Zone
- MZ population index is taken by summing the mean counts at leks from 2010-2014

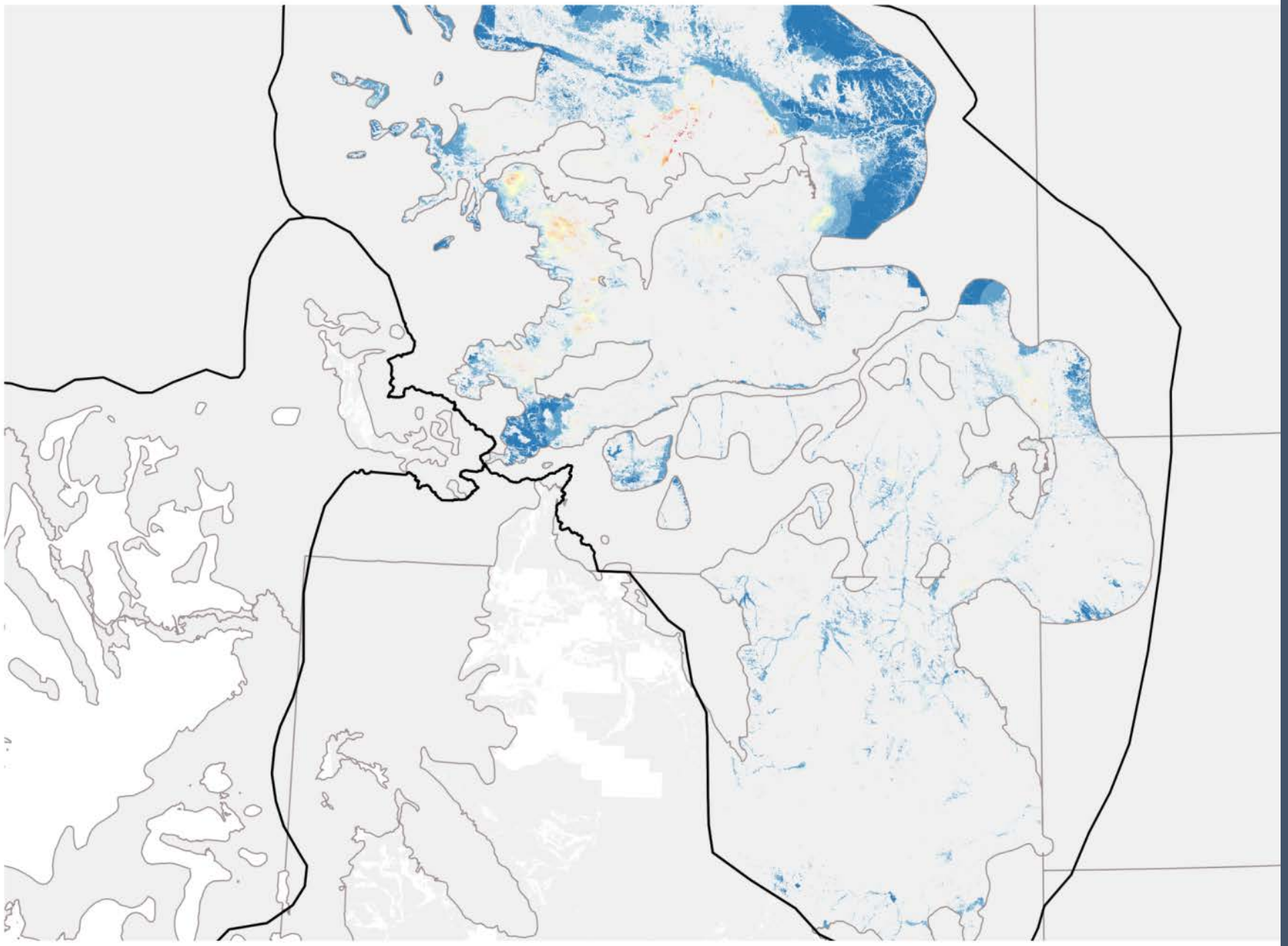
Risk Modeling Framework: *Agriculture Conversion*


A)
Probability of Containing Occupied Lek
0.0
0.2
0.4
0.6
0.8
1.0
0.0
0.2
0.4
0.6
0.8
Proportion of Landscape in Cropland
B)
Population Index of Greater Sage-Grouse
0.2
0.4
0.6
0.8
0.1
0.2
0.3
0.4
0.5
0.6
Proportion of Landscape in Cropland

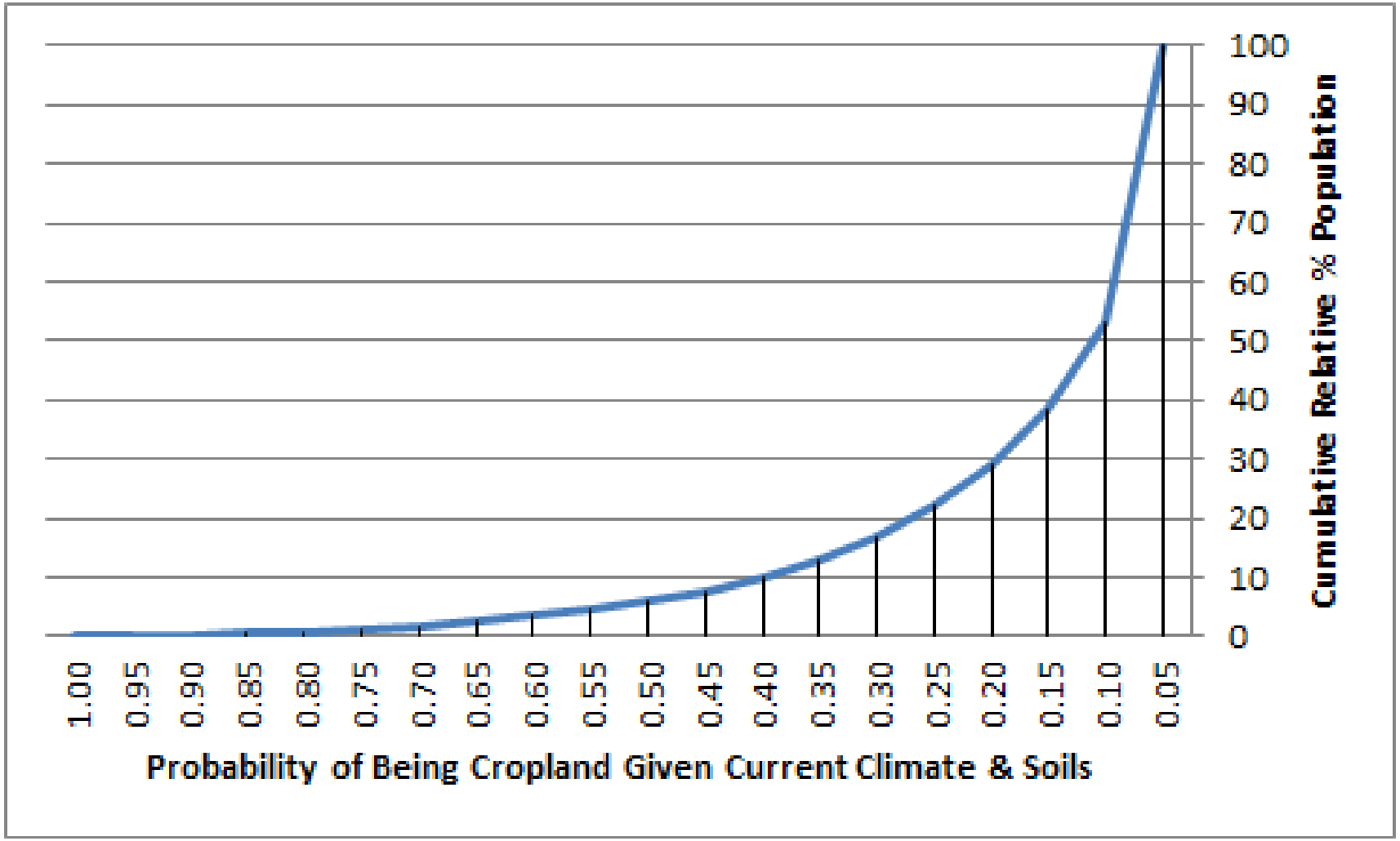


❖Cropland Risk within MZ I

Grey Areas = Very Low Probabilities of Cropland Risk

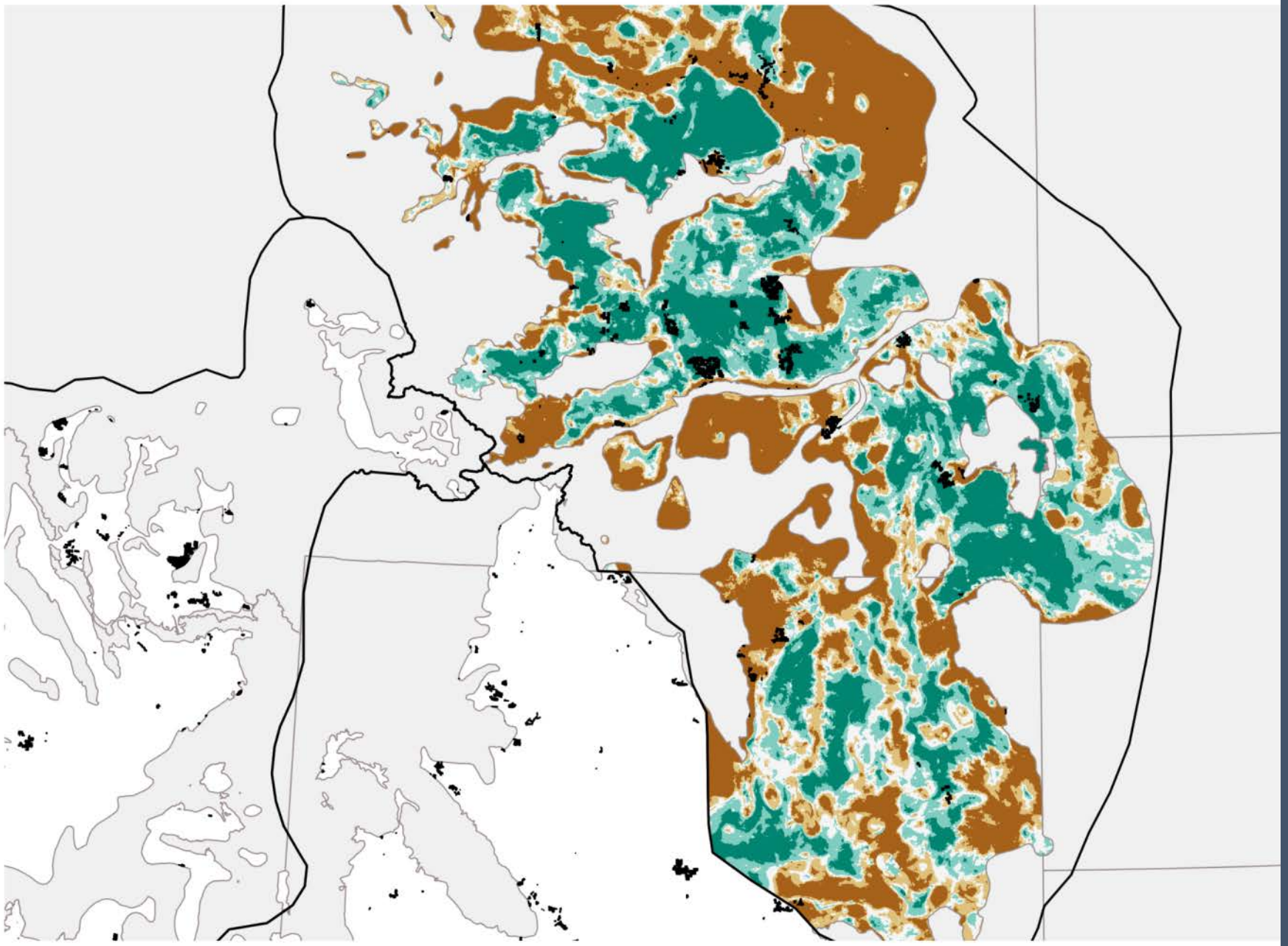


- Cropland Risk within MZ I
- Areas covered by grey have cropland probability < 0.33



- Cropland Risk within MZ I
- Vast Majority of SG populations are in areas with low suitability for cropland

❖Cropland Risk within MZ I

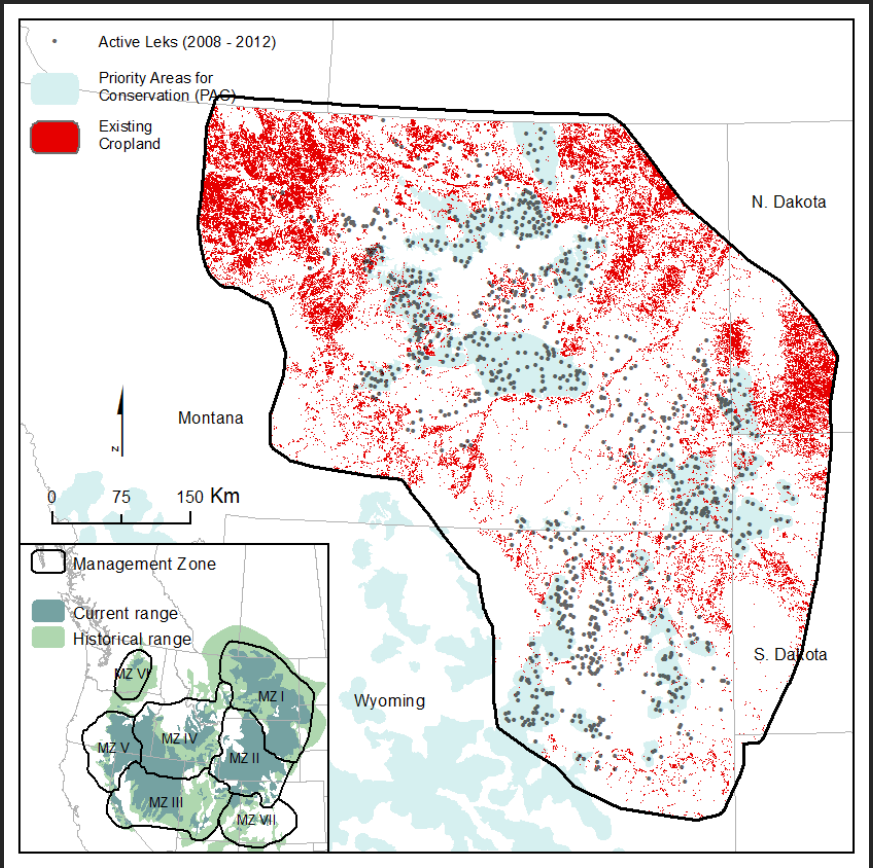


Reducing cropland conversion risk to sage-grouse through strategic conservation of working rangelands

J. T. Smith, J. S. Evans, S. Baruch-Mordo, J. M. Kiesecker and D. E. Naugle

Study area: Management Zone 1

- 70% private ownership
- 8% of MZ1 already converted
- Conversion ongoing *"the slow bleed"*

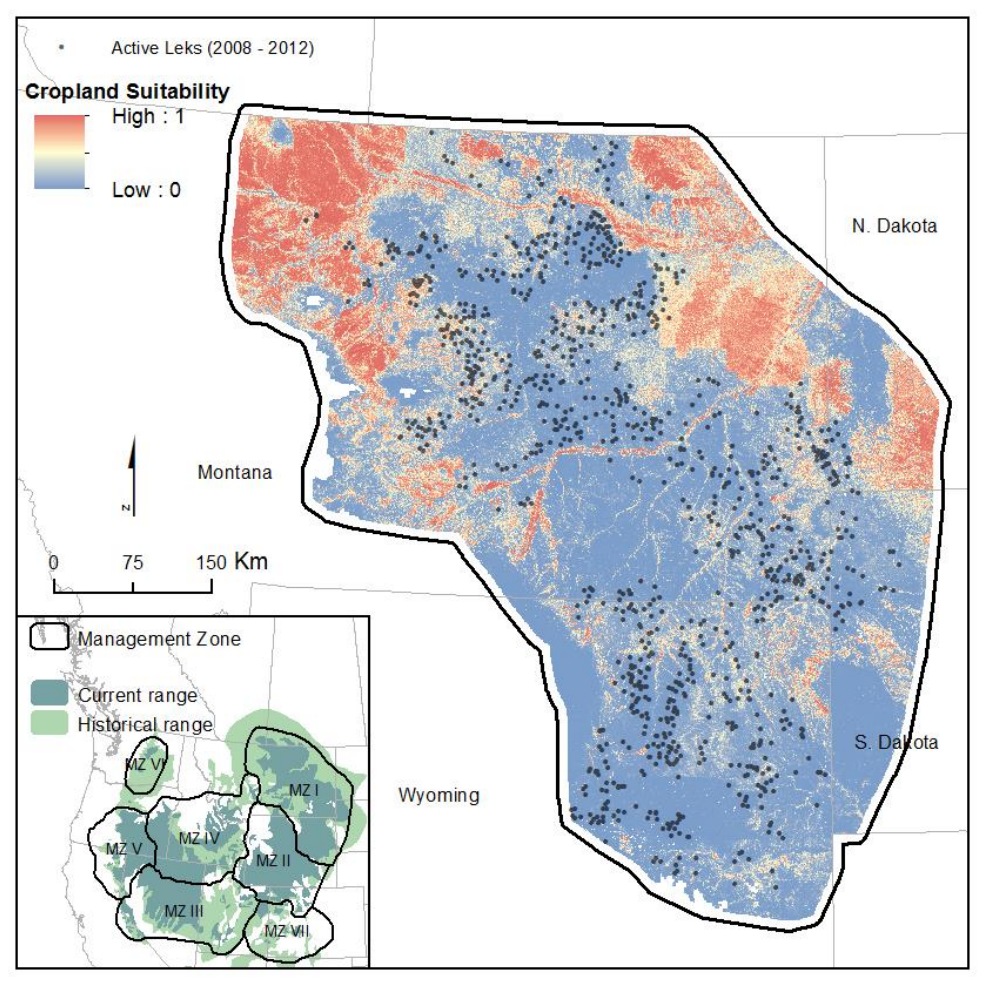


Study objectives

1. Identify spatial scale of cropland effect
2. Assess severity of cropland conversion on lek distribution at relevant spatial scale(s)
3. Estimate proportion of known population vulnerable to future conversion
4. Quantify conservation outcomes of new Sodsaver provision, pending state lands policy, and targeted easement acquisition

Stochastic Buildouts

- Use continuous cropland suitability surface to iteratively “build out” cropland.
- Re-attribute leks and use model to determine which ones are extirpated.



Prioritizing easement placement

Criteria

Risk: crop suitability

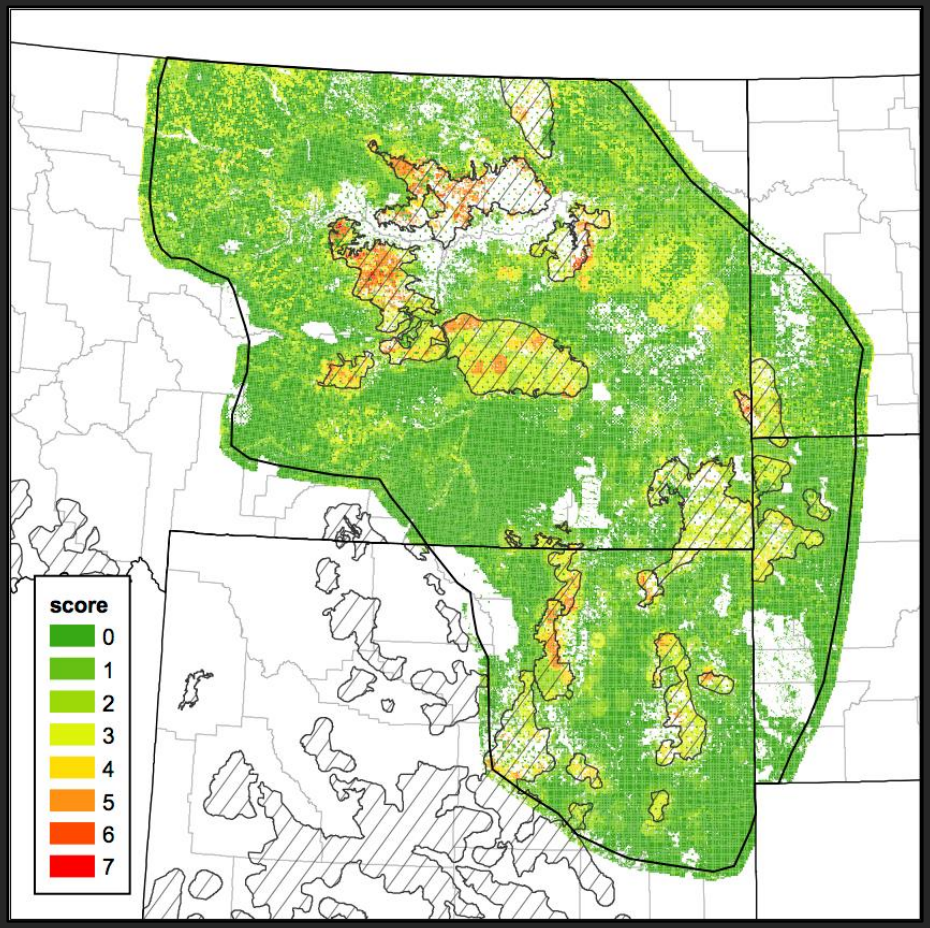
- 0: Negligible
- 1: Low
- 2: Moderate
- 3: High

Biological value: males within 2 miles

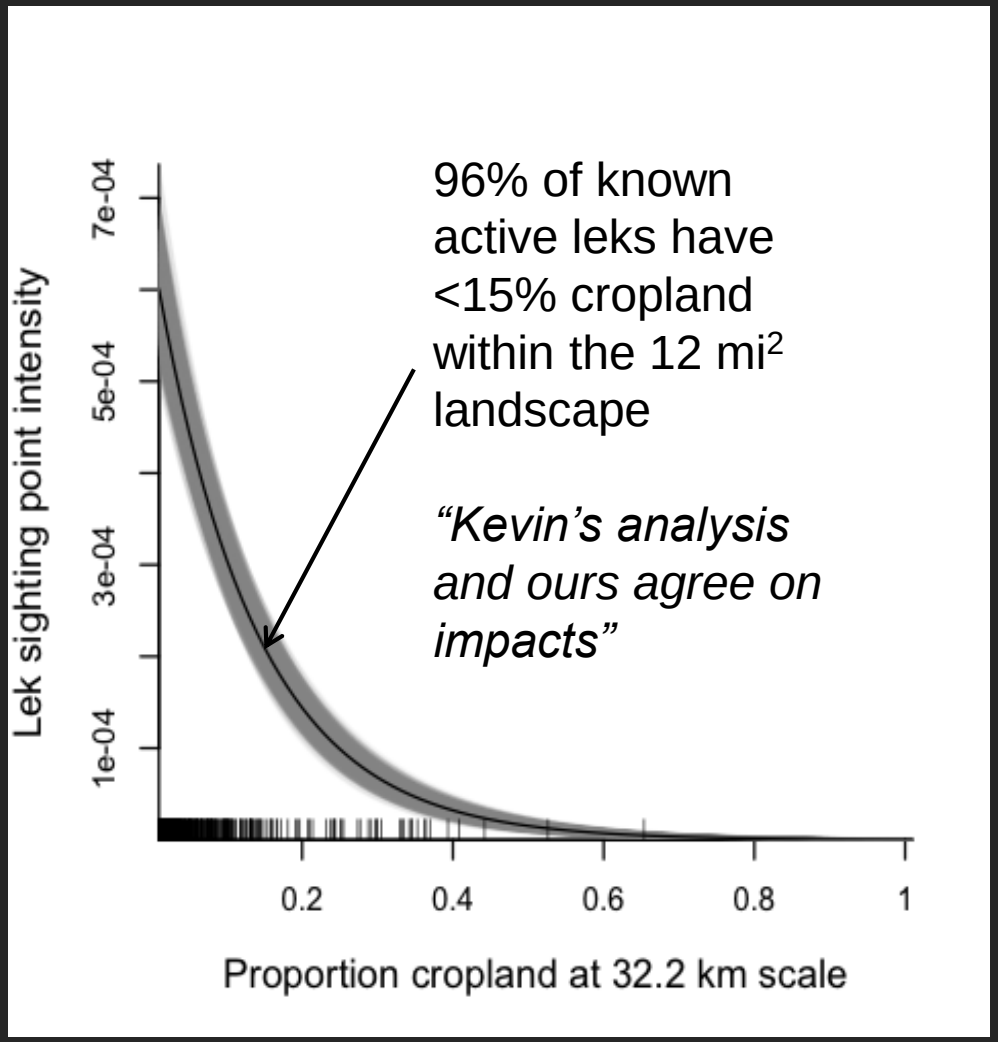
- 0: 0
- 1: 1-25
- 2: 26-50
- 3: 51+

PAC proximity

- 0: > 2 mi
- 1: < 2 mi
- 2: Inside



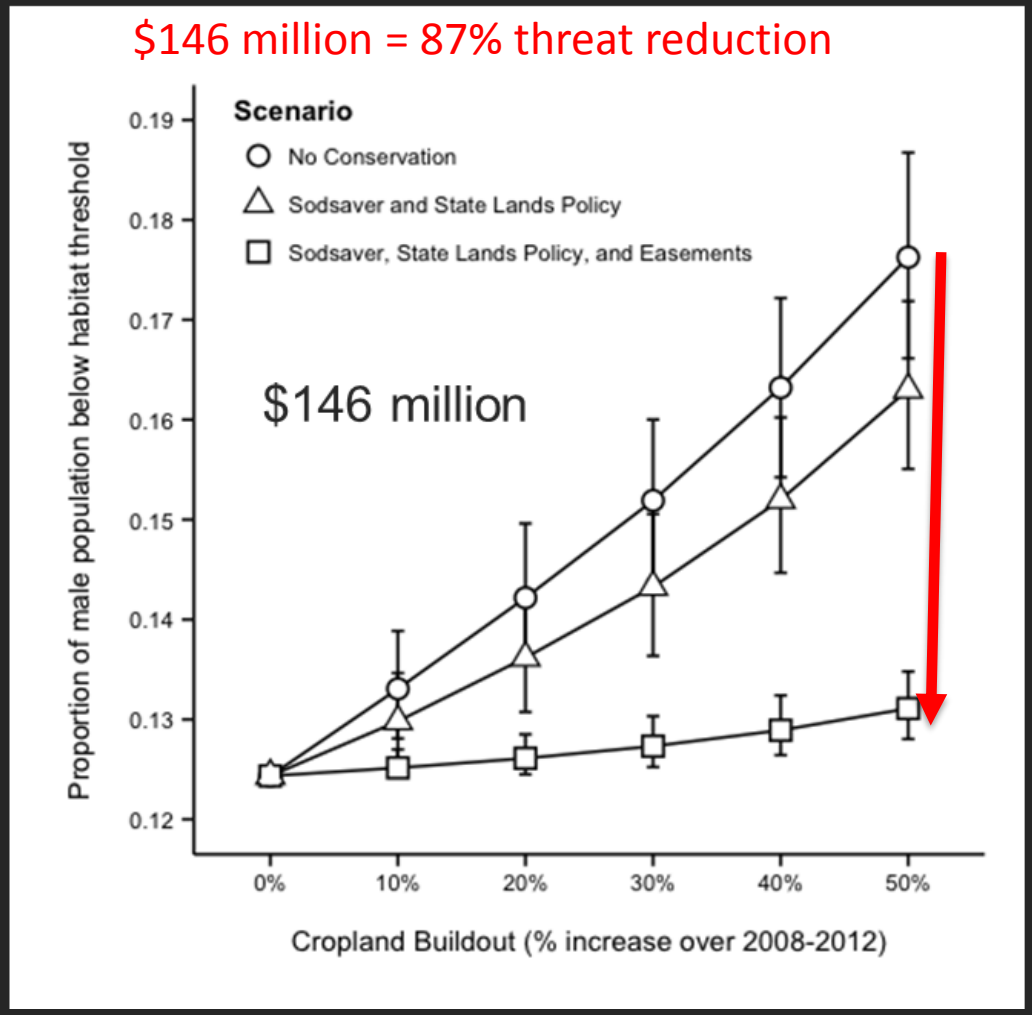
Model output



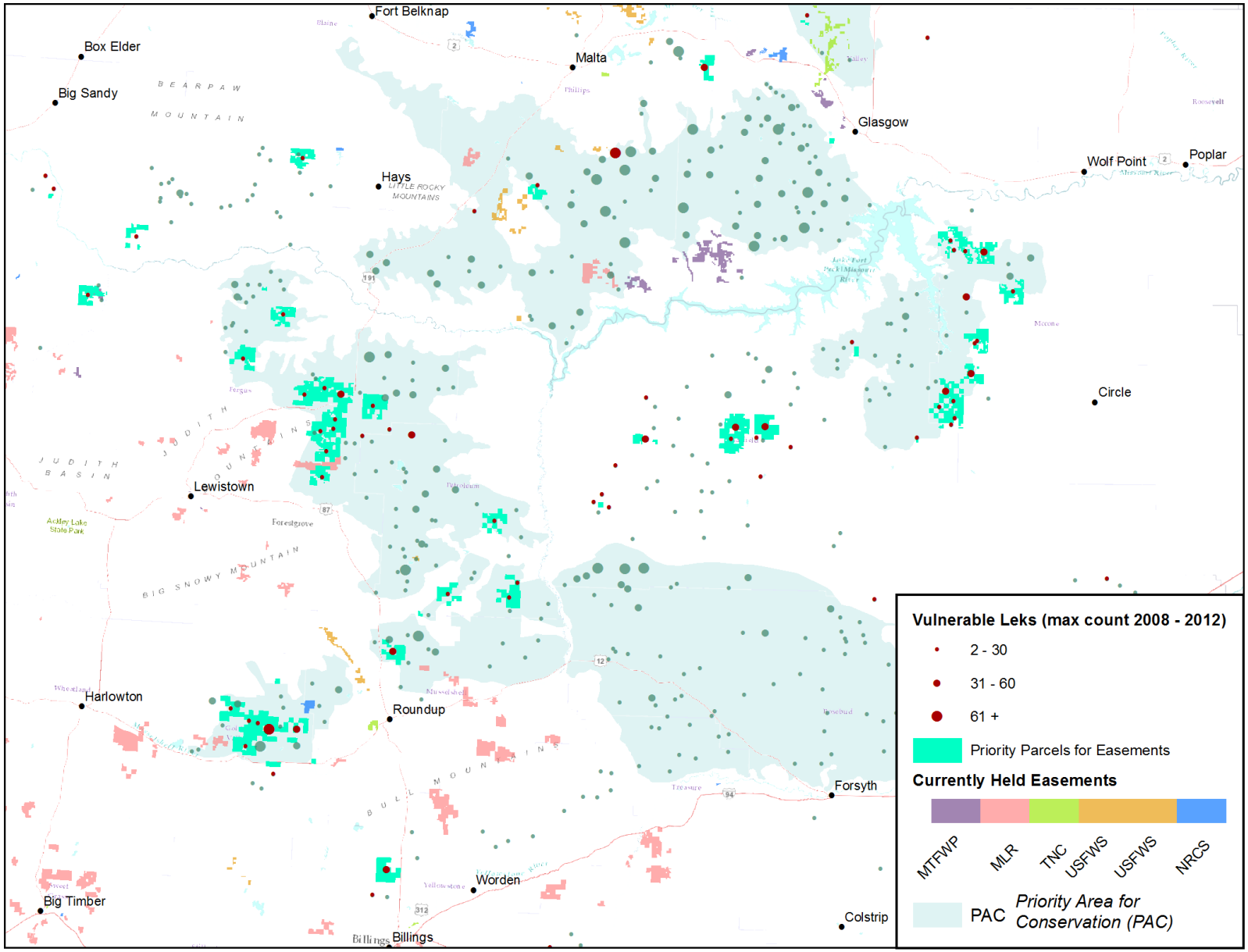
96% of known active leks have <15% cropland within the 12 mi^2 landscape

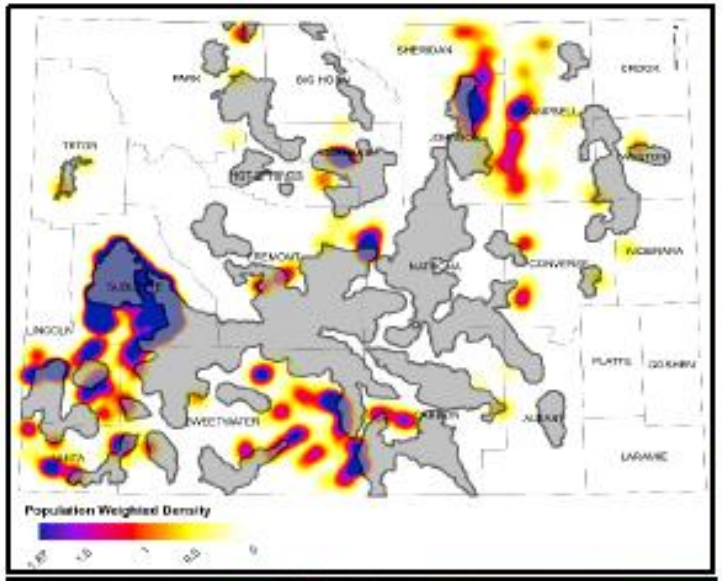
"Kevin's analysis and ours agree on impacts"

Conservation outcomes



Implementation





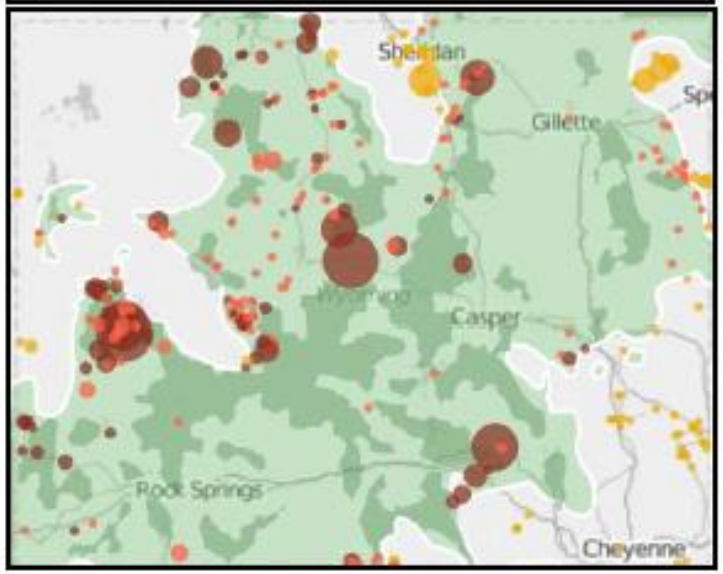


Figure 4. Top shows priority areas in need of conservation easements to reduce ex-urban development (blue is highest need; modified from Copeland et al. 2013).

Bottom shows NRCS-sponsored easement acquisitions in Wyoming during SGI (brown) and before SGI began (pink).

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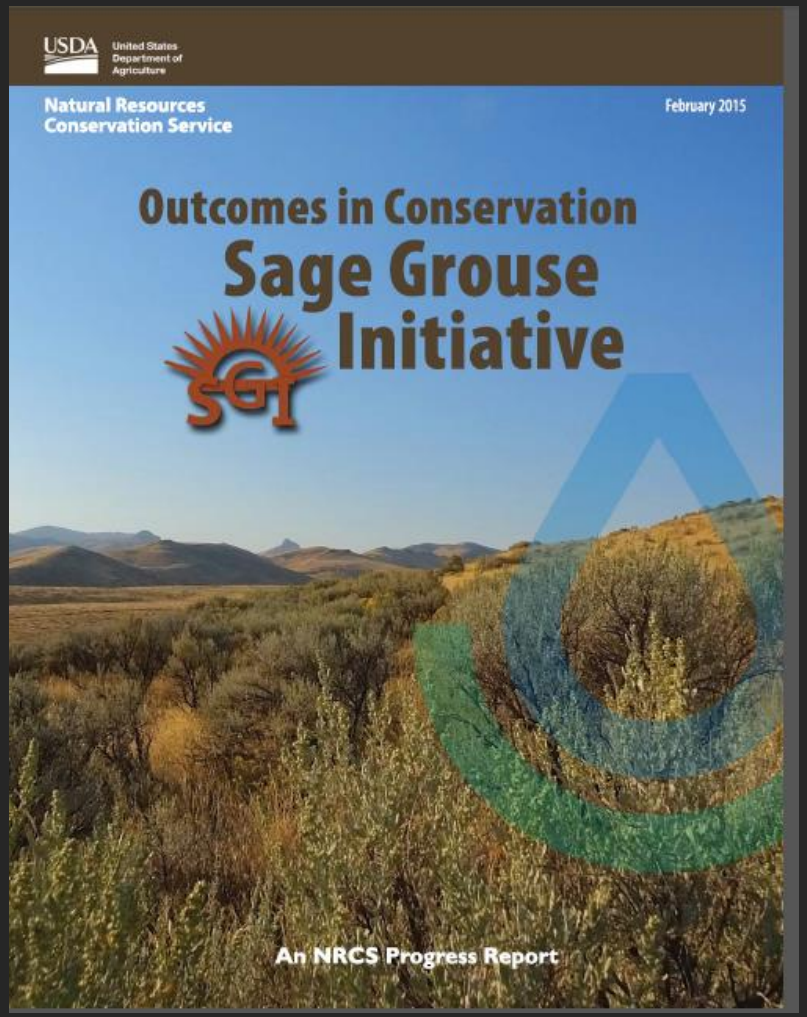
Measuring the Effectiveness of Conservation: A Novel Framework to Quantify the Benefits of Sage-Grouse Conservation Policy and Easements in Wyoming

Holly E. Copeland[1*], Amy Pocewicz[1], David E. Naugle[2], Tim Griffiths[3], Doug Keinath[4], Jeffrey Evans[5], James Platt[6]

1 The Nature Conservancy, Lander, Wyoming, United States of America, 2 Wildlife Biology Program, University of Montana, Missoula, Montana, United States of America, 3 Natural Resources Conservation Service, Bozeman, Montana, United States of America, 4 Wyoming Natural Diversity Database, University of Wyoming, Laramie, Wyoming, United States of America, 5 The Nature Conservancy, Laramie, Wyoming, United States of America, 6 The Nature Conservancy, Minneapolis, Minnesota, United States of America

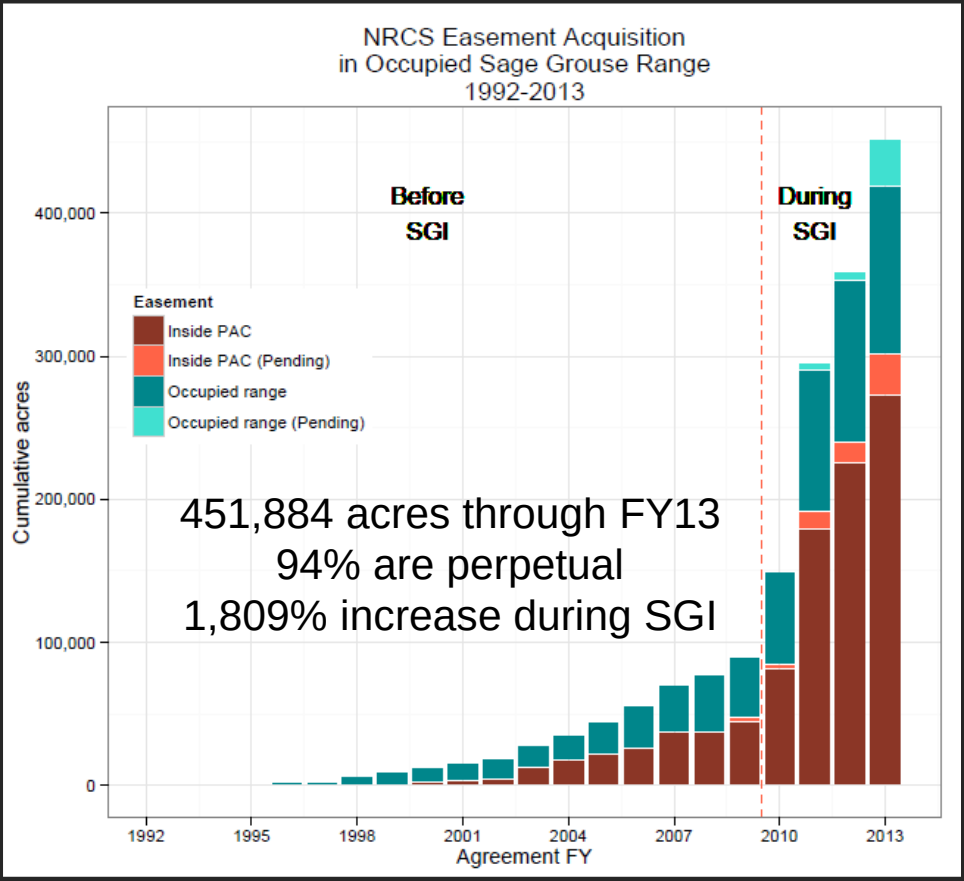
Abstract

Increasing energy and housing demands are impacting wildlife populations throughout western North America. Greater sage-grouse (*Centrocercus urophasianus*), a species known for its sensitivity to landscape-scale disturbance, inhabits the



Track Record

$250M goal in Wyoming is 60% complete with $147M on-the-ground



Set Weather

OREGONLIVE
The Oregonian

9 comments

Sage grouse protection work gets 4-year, $200 million commitment from USDA

Questions

This presentation is posted under the Status Review section of the national greater sage-grouse website.

http://www.fws.gov/greatersagegrouse/status.php