

Cheatgrass in the sagebrush: Implications of habitat loss and conversion on sagebrushdependent species, using the Greater Sage-Grouse and Mule Deer as indicator species

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#### PROBLEM

- Unmatched impact on wildlife habitat
- Projected to increase
- Growing gap in capacity and infrastructure

#### 1986 - 1990

#### Ecostates

A: Good condition shrubland
A-C: Intermediate condition shrubland
B: Good condition grassland
B-D: Intermediate condition grassland
C: Poor condition shrubland
D: Poor condition grassland
Juniper: low-mid cover
Juniper: high cover
70
10





#### **Annual Grass**

Wildfire

### Impacts to Wildlife

Invasion of annual grasses following wildfire corresponds to maladaptive habitat selection by a sagebrush ecosystem indicator species

Brianne E. Brussee<sup>a</sup>, Peter S. Coates<sup>a,\*</sup>, Shawn T. O'Neil<sup>a</sup>, Michael L. Casazza<sup>a</sup>, Shawn P. Espinosa<sup>b</sup>, John D. Boone<sup>c</sup>, Elisabeth M. Ammon<sup>c</sup>, Scott C. Gardner<sup>d</sup>, David J. Delehanty<sup>e</sup>

Acute and lagged fitness consequences for a sagebrush obligate in a post mega-wildfire landscape



growth in a peripheral population of sagegrouse

Lee I. Foster<sup>2</sup> | Christian A. Hagen<sup>3</sup> | Katie M. Dugger<sup>1</sup>

Large-scale wildfire reduces population

Ian F. Dudley<sup>1,2,3</sup>, Peter S. Coates<sup>1\*</sup>, Brian G. Prochazka<sup>1</sup>, Shawn T. O'Neil<sup>1</sup>, Scott Gardner<sup>3</sup> and David J. Delehanty<sup>2</sup>

#### Wildfire immediately reduces nest and adult survival of greater sage-grouse

Emmy A. Tyrrell<sup>1,2</sup>, Peter S. Coates<sup>10</sup>, Brian G. Prochazka<sup>1</sup>, Brianne E. Brussee<sup>1</sup>, Shawn P. Espinosa<sup>3</sup> & Joshua M. Hull<sup>2</sup>



Check for updates











### **Greater Sage-grouse**

- Classic sagebrush 'obligate' species
- Umbrella species
- Approximately 11.5 million acres classified as Priority Habitat Management Area" (PHMA), of which ~25% has burned since 1995



### **Greater Sage-grouse**

- Anthony et al. (2021) reported reduced adult female and chick survival and annual population decline during 3 of 6 years following wildfire compared to average rates across their distribution
- Dudley et al. (2021) found a 16% decrease in lambda at leks compared to controls, and reported a 98.5% probability this was attributed to a recent wildfire
- Tyrrell et al. (2023) documented a 40% reduction in adult survival and a 79% reduction in nest survival within areas affected by wildfire
- Brussee et al. (2023) found that chick survival within burned areas decreased as annual grass cover increased



### Sage-grouse response after Rush Fire (2012)



Dudley, I.F., Coates, P.S., Prochazka, B.G., Davis, D.M., Gardner, S.C., and Delehanty, D.J. 2022. Maladaptive Nest Site Selection and Reduced Nest Success in Female sage-grouse following wildfire. Ecosphere 13(12): e4282.

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### **Range-wide Declines**

 Coates et al. (2022) report cumulative population declines of 41%, 65%, and 79.6% during the short (19 years), medium (35 years) and long (55 years) temporal periods analyzed





Coates, P.S., Prochazka, B.G., Aldridge, C.L., O'Donnell, M.S., Edmunds, D.R., Monroe, A.P., Hanser, S.E., Wiechman, L.A., and Chenaille, M.P. 2022. Range-wide Population Trend Analysis for Greater Sage-grouse (*Centrocercus urophasianus*) – Updated 1960-2022. U.S. Geological Survey Data Report 1175, 17 p., <u>https://doi.org/10.3133/dr1175</u>.

### Mule Deer

- Fire has altered 6 million acres of crucial or transitional habitat for mule deer
- Equates to loss of ~30% of the 20 million acres classified as 'important' habitat
- Lower elevations often more challenging to restore

   these are predominantly winter areas for deer
- Area 6 mule deer crucial winter habitat reduced from ~184,320 acres in the early 1960s to about 22,400 acres by 2004 due to wildfires (Wasley, 2004)





#### Mule Deer Migration Strategies

- There Are Six Main Migration Routes:
- South Tuscaroras
- Sheep Creeks
- Izzenhoods
- Snowstorms
- South Fork Owyhee River
- Bruneau River



















Since 1988, about 2.9 million acres of mule deer winter range has burned in NV, this equates to about 21% of the total winter range available to mule deer (about 13.9 million acres) based on our most recent mapping efforts

#### Statewide Mule Deer and Sage Grouse Trends (1996-Current)



MULE DEER FAWNS PER 100 ADULTS

#### DOES CHEATGRASS/INTRODUCED SPECIES OFFER ANY POSITIVES FOR WILDLIFE?



### **Use of Desirable Non-Native Species**

- Rehabilitating and stabilizing the site
- "Hedge betting"
- Providing wildlife forage values
- Habitat loss > Habitat restored better to stabilize sites and establish with desirable non-natives then to lose all functionality to cheatgrass and weeds
- Cheatgrass continues to spread and we aren't serving the public or wildlife by allowing large-scale conversion of sagebrush in the Great Basin



## Use of Desirable Non-Native Species

- Immigrant and Snowstorm Forage kochia
  - High protein content and provides high quality forage for wildlife
  - Establishes readily and adapted to drought conditions
  - Kochia can reduce fire intensity and often used in green strips or fuel breaks.
  - Kochia can resprout after a fire has provided crucial forage when nothing else is available
- Perennial bunchgrasses and forbs
  - I.e. Siberian wheatgrass, blue flax, small burnet, clover
  - Many native forb species are cost prohibitive

DIRECTION 11S 422104 ACCURACY 5 m 255 deg(T) DATUM NAD83 4364100

Snowstorm kochia draw fire 2023-06-29 10:12:51-07:00

#### PRONGHORN WINTER UTILIZATION

#### ARGENTA RIM - SEEDED VS UNSEEDED





# Thank you! Questions?