Sage Grouse and Cheatgrass in the Great Basin

A Manager's Perspective

Ted Koch, USFWS, Nevada

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Keep It Simple

- Albert Einstein:
  - "Anyone who cannot explain what it is they do to an eight-year-old is a charlatan."
- P.T. Barnum:
  - "If you can't fit your idea on the back of a business card, you don't have a clear idea"

Sage Grouse Conservation Needs

- FWS sage grouse COT Report: "Stop the decline."
- In Great Basin: **stop the spread of cheatgrass** (& other invasives)
- 50% loss of grouse range; fragmentation of remaining habitat; trend continues
- ESA purpose: protect the ecosystems upon which species depend

Threats to Sage Grouse

- Main threat
  - Fire and invasive species (cheatgrass)
- BLM GBRI:
  - Great Basin on the verge of "ecological disaster" because of fire and cheatgrass
  - 4,000 acres/day lost to invasive species in the west
- 822 acres/day burned of just sage grouse habitat, just in Nevada in 2012
- 20,000 km^2 of Great Basin is cheatgrass

Sage Grouse and Cheatgrass

- Bloomberg et al. (2012):
  - Conversion from sagebrush to exotic grassland interacts with climatic variability and depresses vital rates [of sage grouse] even in the presence of otherwise favorable environmental conditions.
- Knick et al. (2005):
  - Dramatic declines in populations of Greater Sage-Grouse were correlated with habitat losses from a 2,000% increase in fire incidence in Idaho and subsequent conversion of Wyoming big sagebrush communities to cheatgrass habitats. (Crowley and Connelly, 1996)

Sage Grouse and Cheatgrass

- Fire is big
- Is managing fire our main opportunity to control cheatgrass?
- "Pre-fire burn resiliency" assessment
- Cheatgrass is a disturbance-loving species
  - Are there other sources of disturbance that may be important?

Non-Native Grazers and Cheatgrass

- Aldo Leopold, 1949
  - Cheat Takes Over:
    - The cause of the substitution is overgrazing.
    - There is, as yet, no sense of pride in the husbandry of wild plants and animals, no sense of shame in the proprietorship of a sick landscape.

Non-Native Grazers and Cheatgrass

- Billings (1951):
  - Another and more complex ecologic result of overgrazing has been the invasion of annual Mediterranean grasses under the shrubs as replacements for the weakened native perennials. The principal invader has been cheatgrass.

Non-Native Grazers and Cheatgrass

- Knick et al., (2005)
  - Livestock grazing over the past 140 years is the single most important influence that has changed sagebrush habitats and influenced fire regimes throughout the Intermountain West.
  - The combination of fire, livestock grazing, habitat management practices, other disturbance, and climate conditions have most rapidly facilitated the heavy dominance by cheatgrass in sagebrush ecosystems.

Non-native grazers and cheatgrass?

- BLM Tech. Ref. 1730-2, 2001; Biological Soil Crusts: Ecology and Management
  - Over 30 studies on four continents document that livestock grazing, vehicle use, and human trampling dramatically reduce lichen/moss cover and species richness of crusts.

Do We Have A Problem?

- And can we explain it to an eight-year-old?
  - We have declining and fragmented sagebrush and expanding cheatgrass; we need to avoid soil disturbance and restore native species

Ideas For What To Do About Cheatgrass?

- Prevention:
  - Avoid soil disturbance and seed transport
- Suppression:
  - Use selective herbicides, biocides, strategic fire suppression, fuels reduction
- Restoration:
  - Cultivate and deploy native species from geographically proximal sources (including non-vascular soil crust species)

Cheatgrass Prevention

- Maintain native perennial grasses
  - Blank and Morgan (2012):
    - Cheatgrass reduced by 3480 times in presence of healthy, unclipped native perennials
    - Cheatgrass reduced by 242 times in presence of healthy, clipped (= grazed) native perennials

Cheatgrass Prevention

- Maintain microbiotic crusts
  - Deines et al. (2007)
    - The effects of lichen crust on germination and root penetration resulted in an overall reduction in cheatgrass seedling establishment of 85%

Cheatgrass Suppression

- Use specific herbicides
- Graze it heavily
- Prioritize fire suppression in areas with greatest threat of spread of cheatgrass
- Use “greenstripping” in key locations
- Use prescribed burns strategically
- Develop fungal control agents
- Develop bacterial control agents

Cheatgrass Restoration

- Reseed with native plant species cultivated locally
  - Leger (2012); most seeds sources from outside Nevada in areas with much higher precipitation
- Mimic natural succession
  - Leger (2012); Amsinkia tesselatta reduces cheatgrass by 7 times, and diminutive native poas by 5 times
- Avoid grazing soon after restoration

Is Management For Grouse Necessary Everywhere?

- Fire effects:
  - Trees > Sagebrush = Good
  - Sagebrush > Sagebrush = Neutral
  - Cheatgrass > Cheatgrass = Neutral
  - **Sagebrush > Cheatgrass = Bad**

Do What, Where?

- What?
  - Avoid soil disturbance
  - Restore areas
- Where?
  - Generate map prioritizing areas for Prevention, Suppression and Restoration
  - Regenerate map periodically to measure progress
  - Pre-fire burn resiliency mapping

We've Known These Things: What's Stopped Us?

- I don't know…
- Is there a need for greater Vision, Leadership, Communication and Commitment at the right levels?
- NASECA (WAFWA)