Wildfires and Invasive Plants in the Great Basin: Conserving Sagebrush Ecosystems

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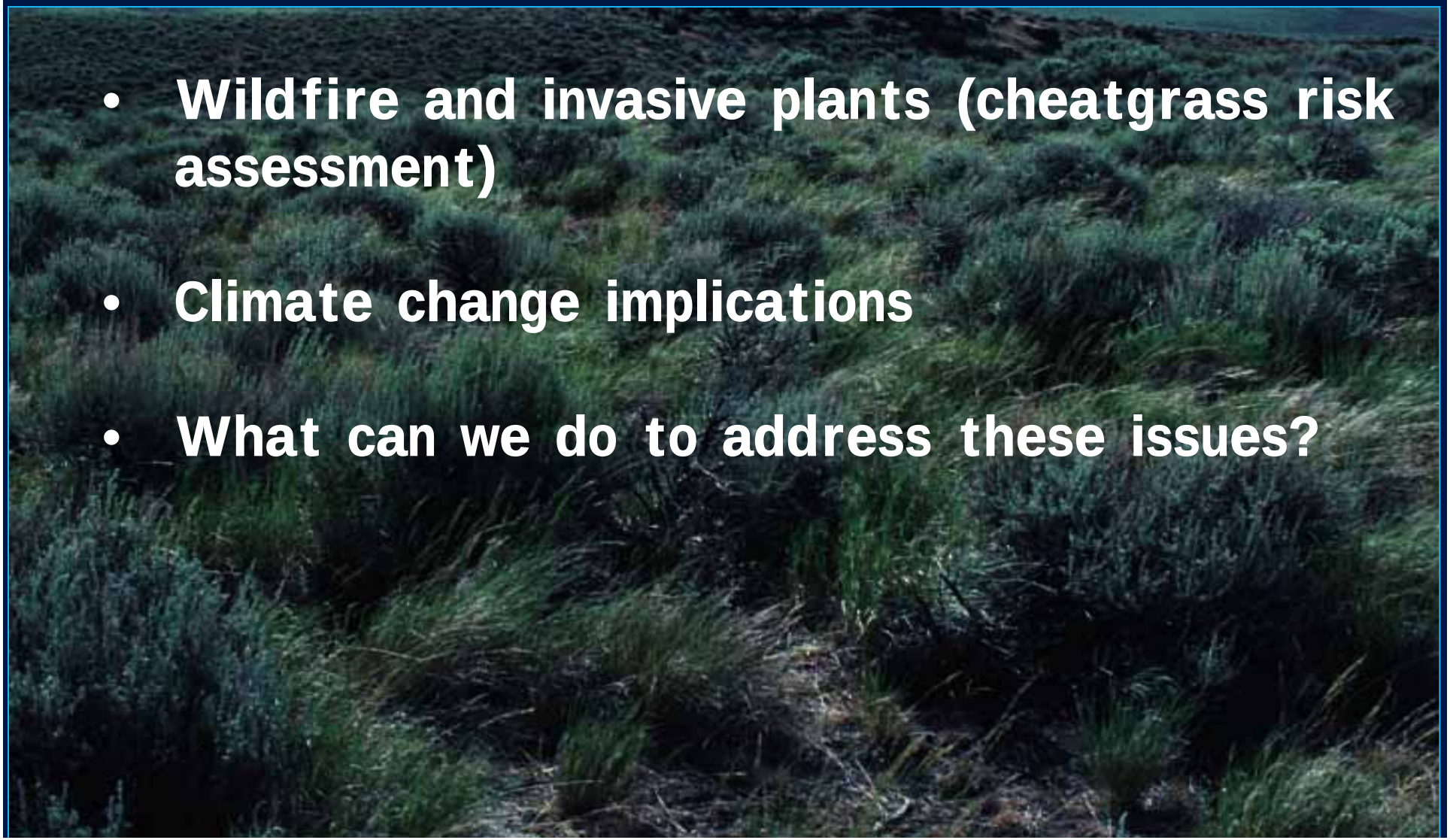
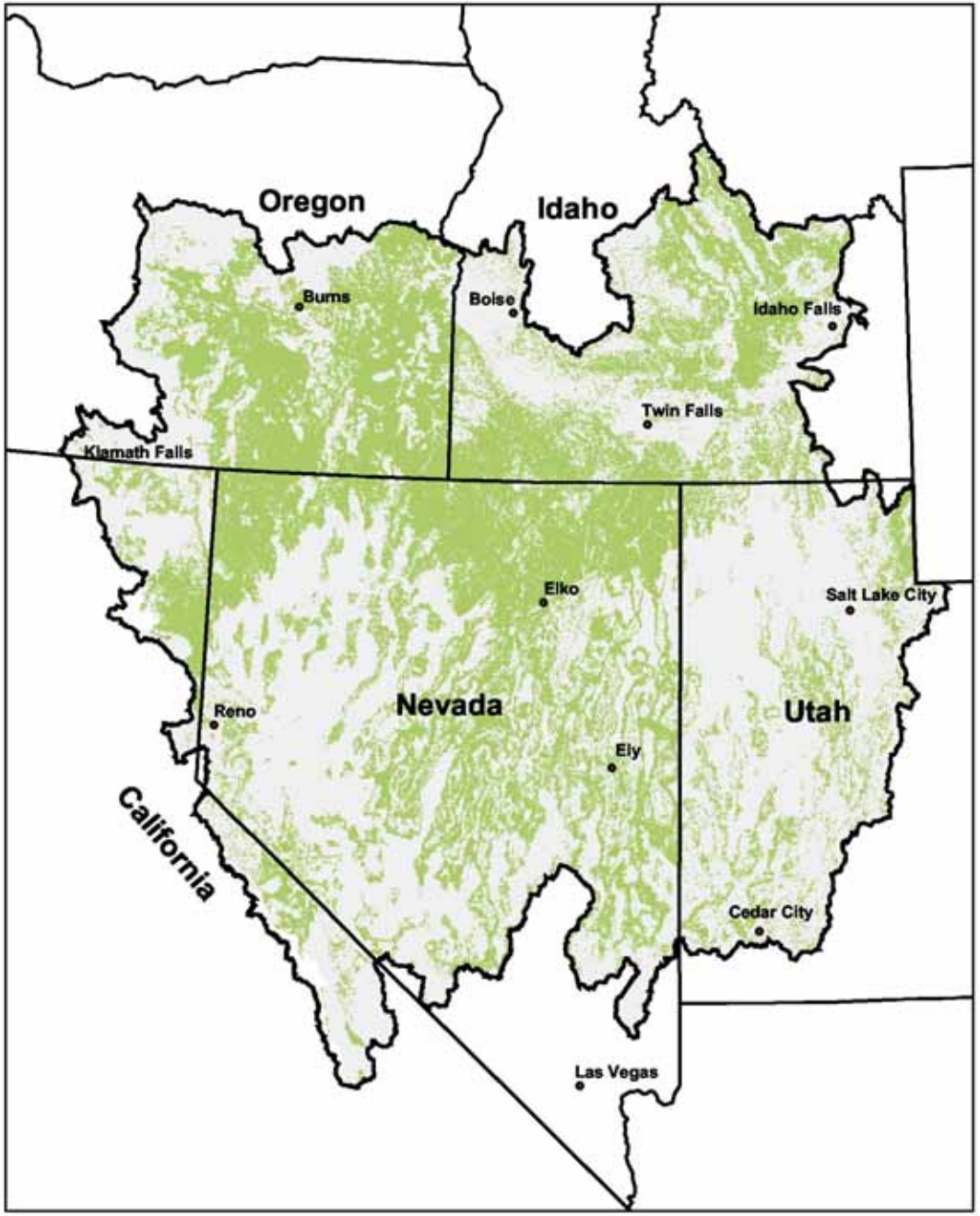
Presentation Organization



- **Wildfire and invasive plants (cheatgrass risk assessment)**
- **Climate change implications**
- **What can we do to address these issues?**

Sagebrush in the Great Basin

- 57 million acres of sagebrush in the Great Basin (54% of total remaining)
- Rapidly disappearing biome –invasive plants & wildfires



Wildfires and invasive plants are two of the biggest threats to Sage-Grouse

Greater Sage-Grouse: Ecology and Conservation of a Landscape Species and It's Habitats (2011)

Wildfires Are the Symptom…. Invasive Plants/Loss of Land Health is the Illness

Invasive species:

- Flammable exotic annual grasses
- Exotic annual or perennial forbs
- Juniper encroachment

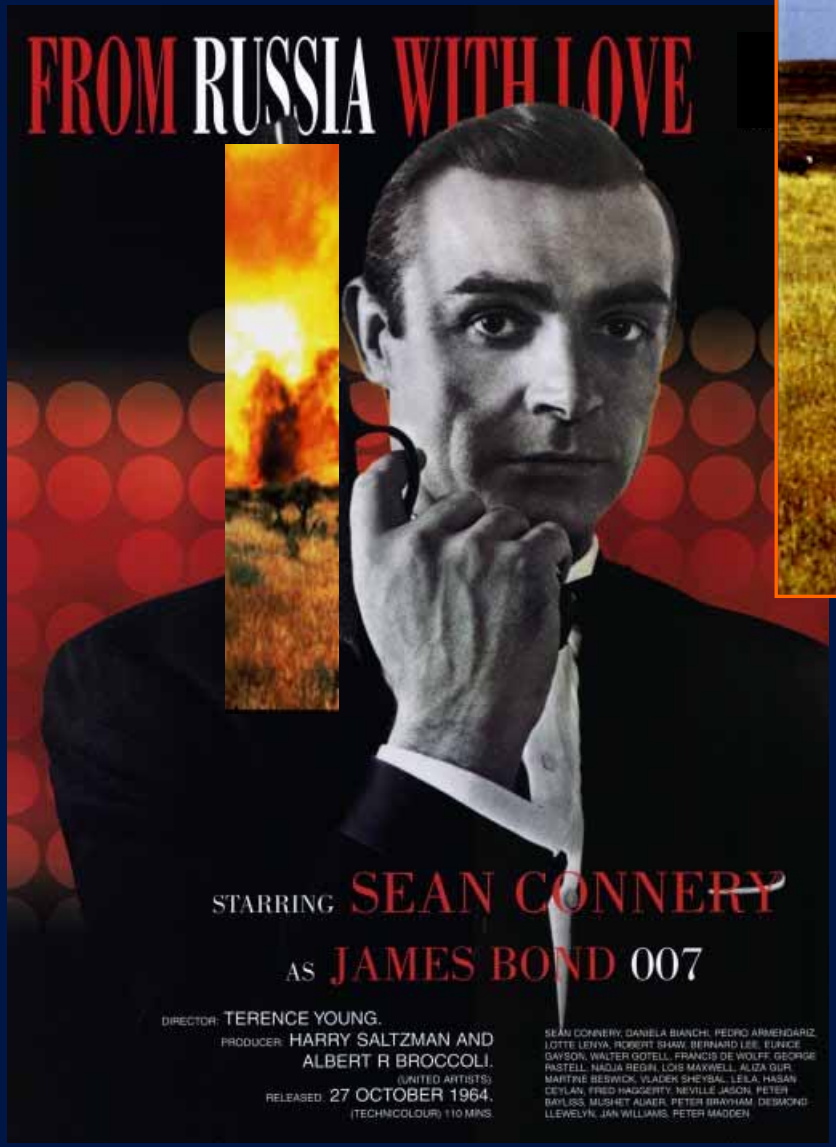
Juniper Encroachment

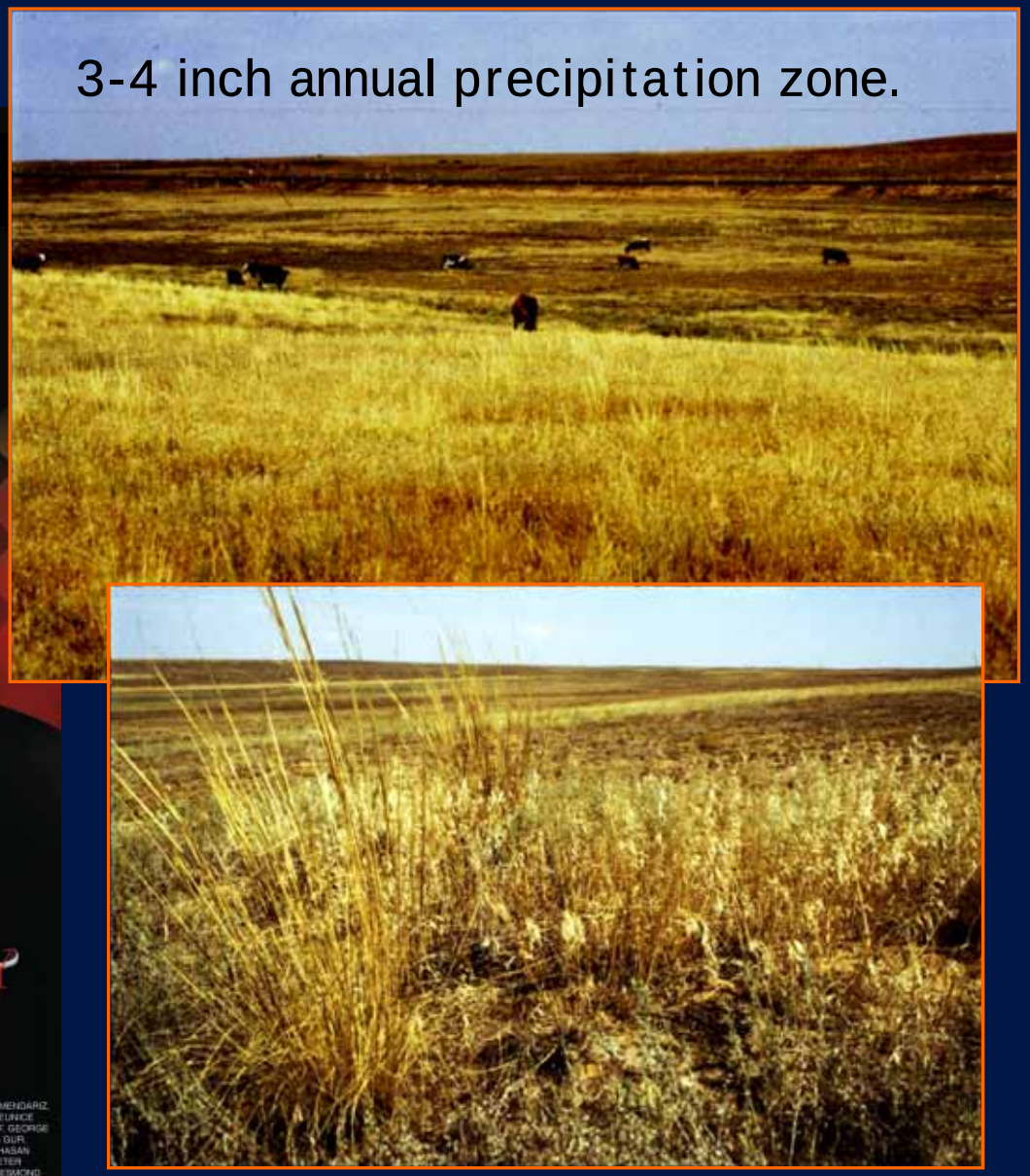
Exotic Forbs

Yellowstar thistle invading cheatgrass

Cheatgrass Introduction

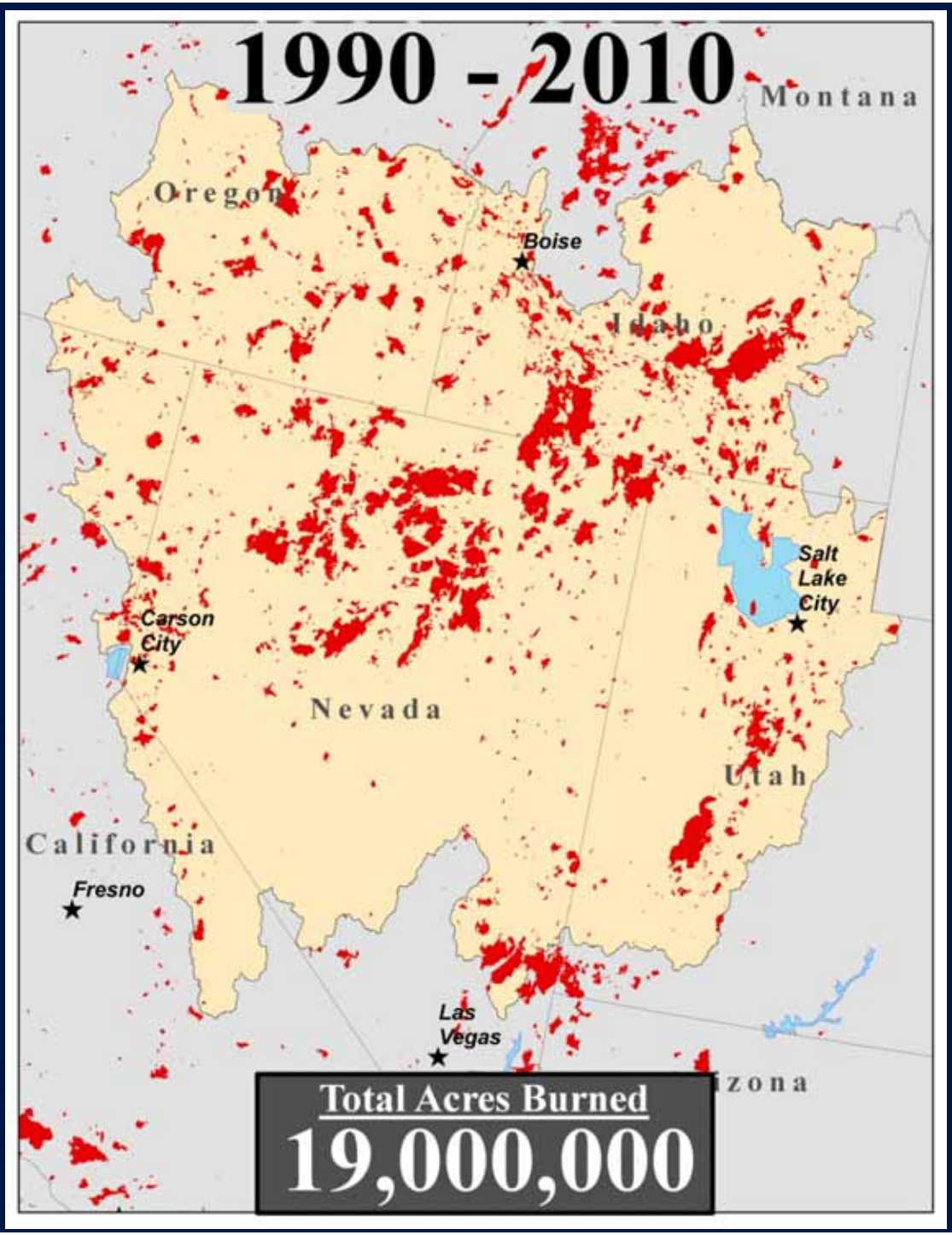
Russia (Near Caspian Sea)





Cheatgrass- Occupying New Environments

The Cheatgrass-Wildfire Cycle


1990 - 2010
Montana
Oregon
Boise
Idaho
Salt Lake City
Carson City
Nevada
Utah
California
Fresno
Las Vegas
Total Acres Burned
19,000,000

N. Great Basin Cheatgrass Risk Model

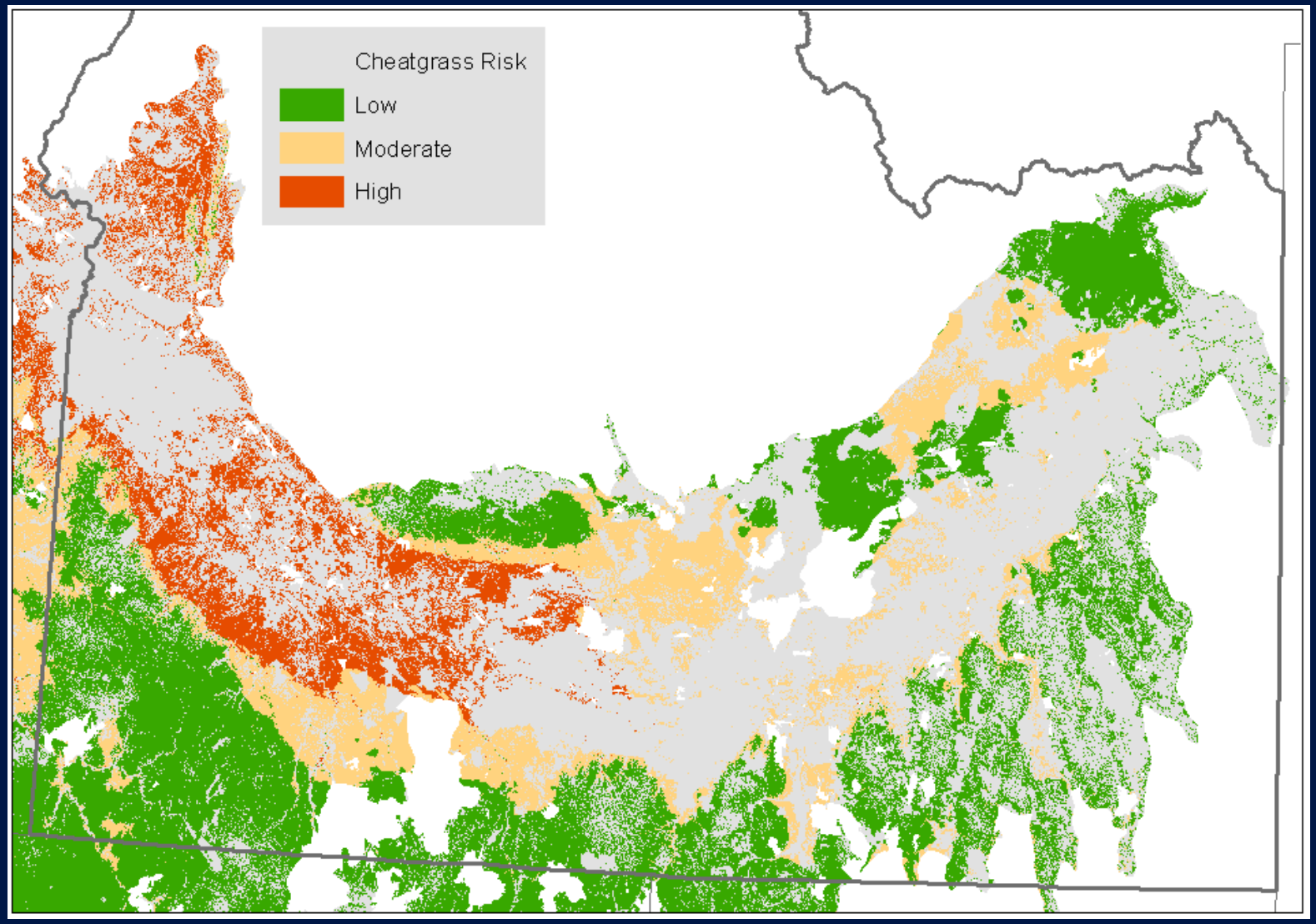
Don J Major

Idaho BLM & Great Basin Restoration Initiative

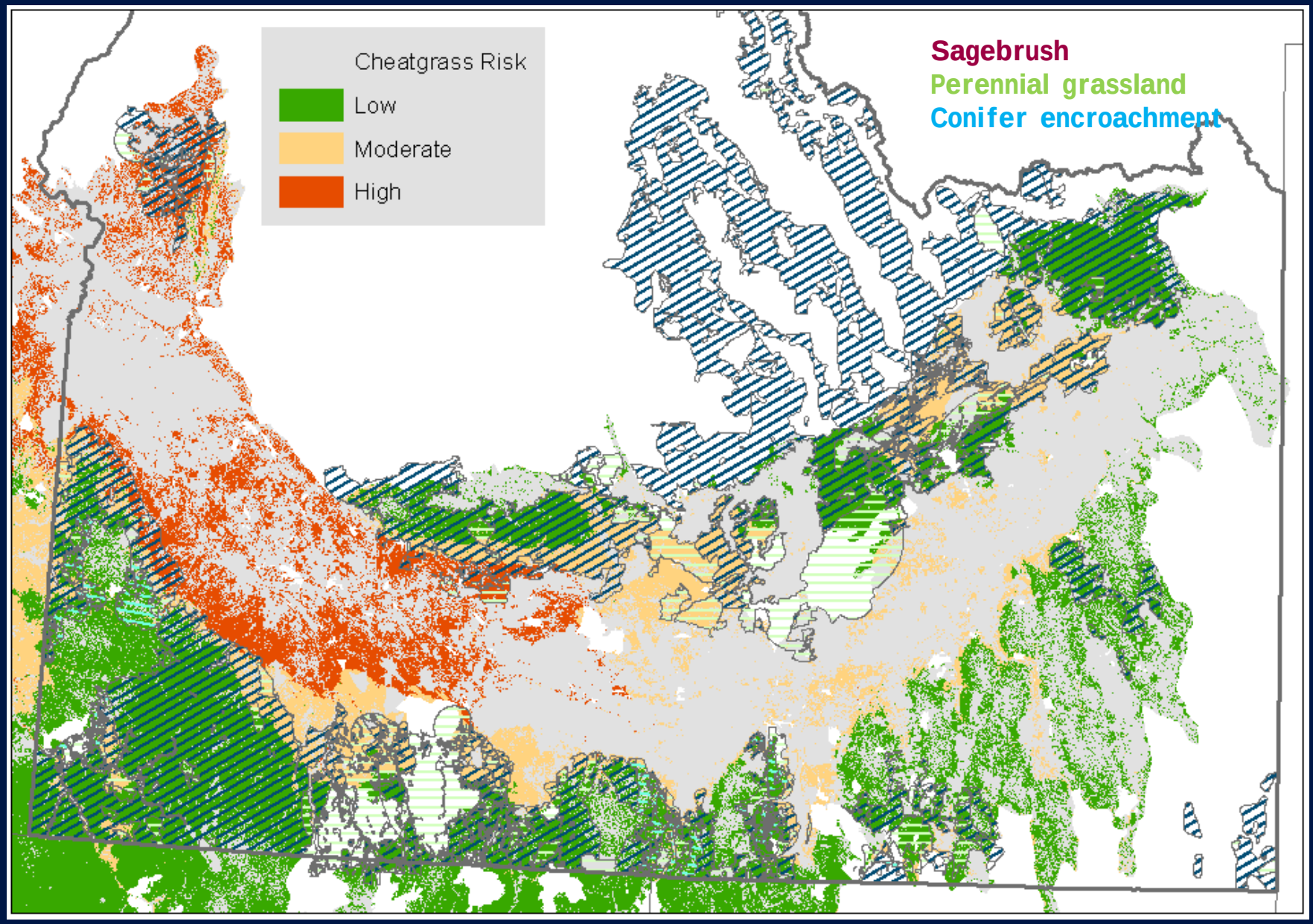
Wisdom et al. 2005 –Physical Environment Model

"Risk" determined by slope, elevation, & aspect associated with current cheatgrass occurrence

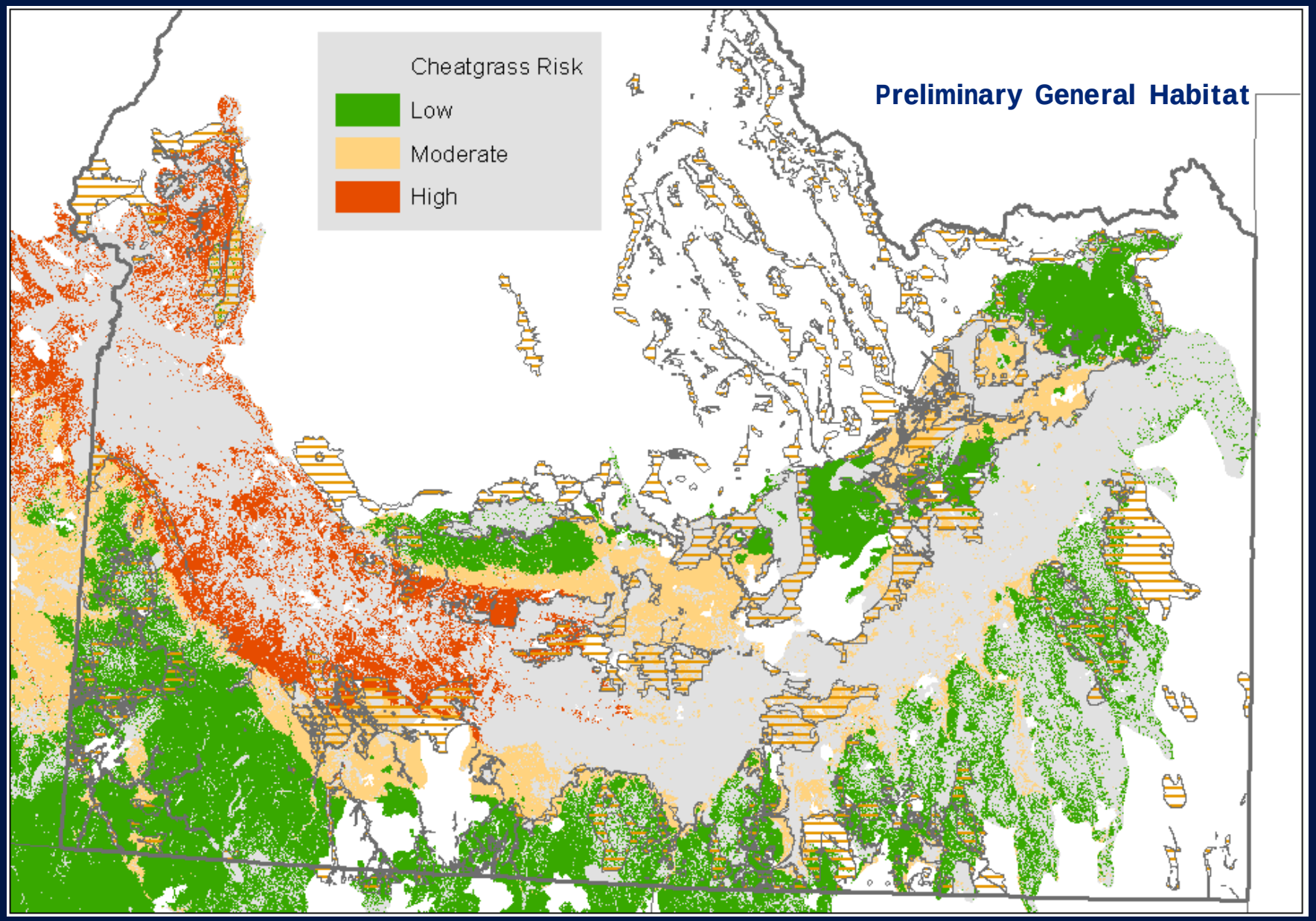
Northern Great Basin Rapid Ecoregional Assessment



Cheatgrass Risk – GSG Preliminary Priority Habitat



Cheatgrass Risk – GSG Preliminary General Habitat

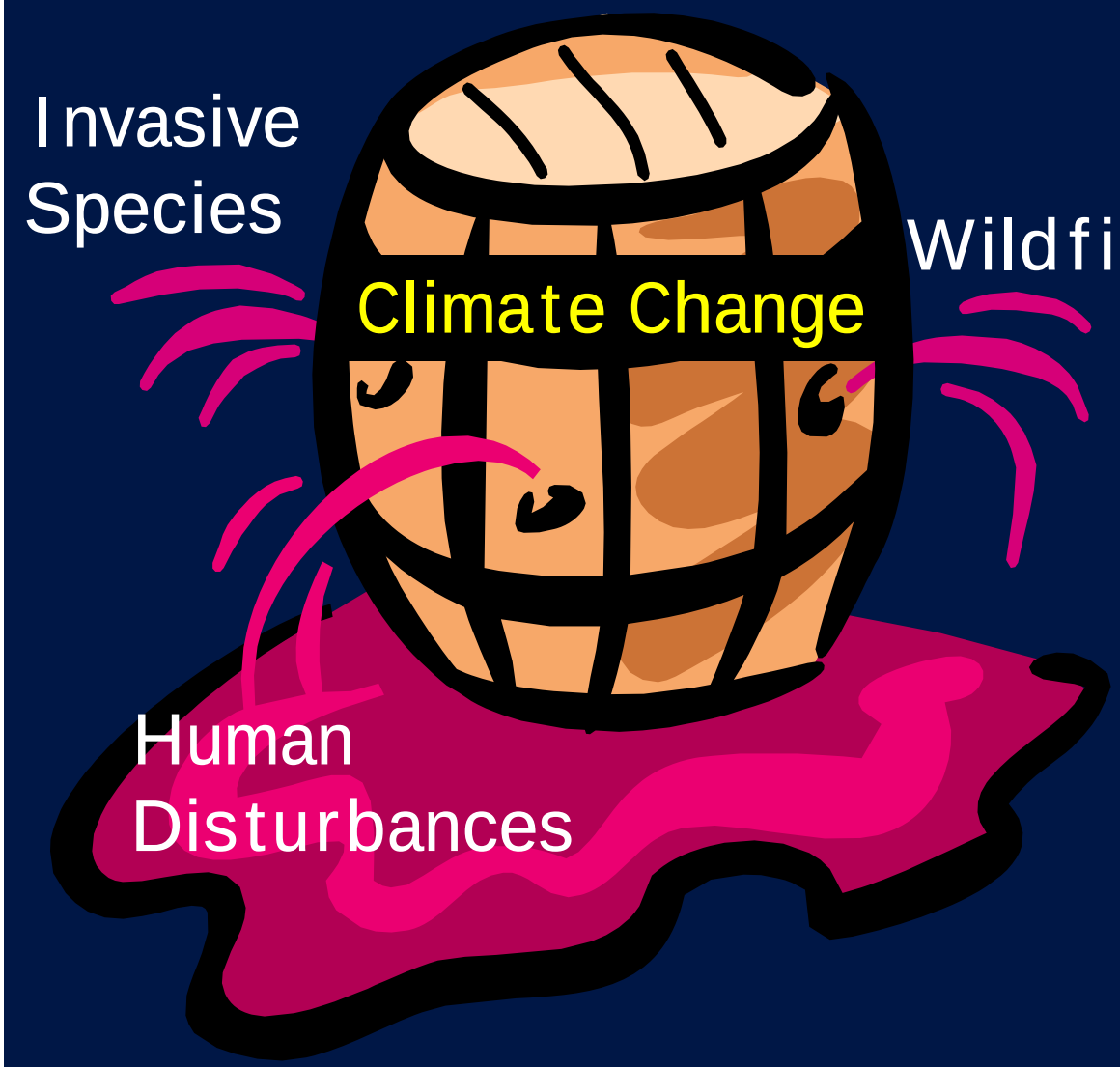


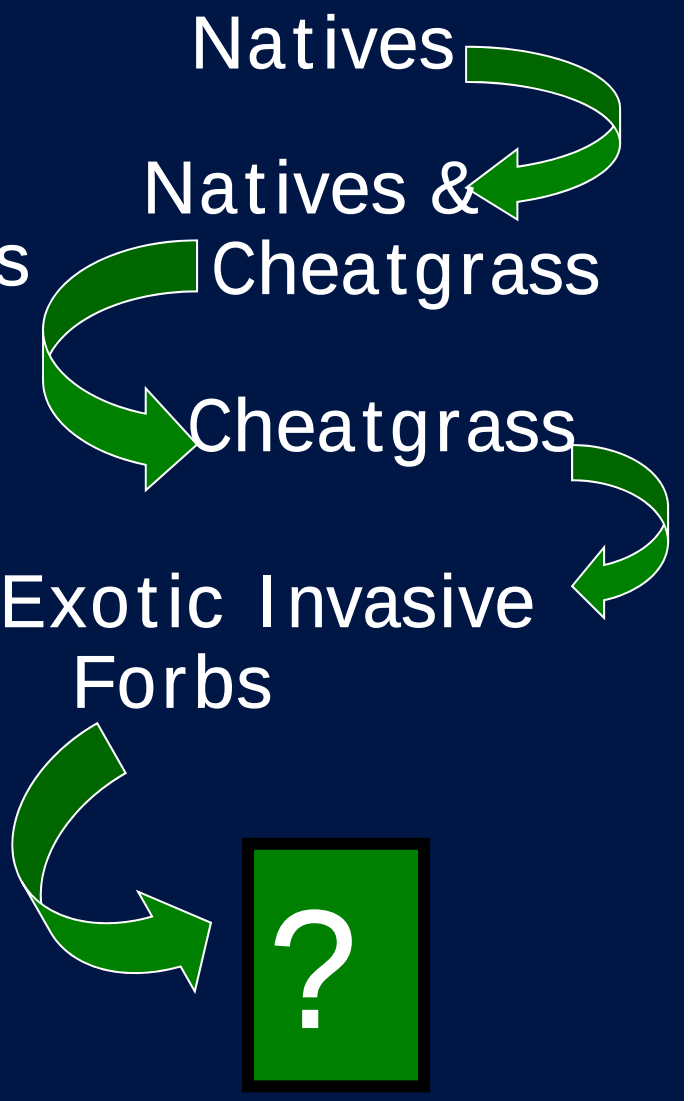
Other Exotic Annual Grasses of Concern

Medusahead Wildrye

North Africa Grass
(*Ventenata dubia*)

Invasives and Wildfires---What Does the Future Hold?





Presentation Organization

- Intro to the fire and invasive issues
- Climate change implications
- What can we do to address these issues?

Temperature-Already Rising

http://www.nrdc.org/globalWarming/west/contents.asp

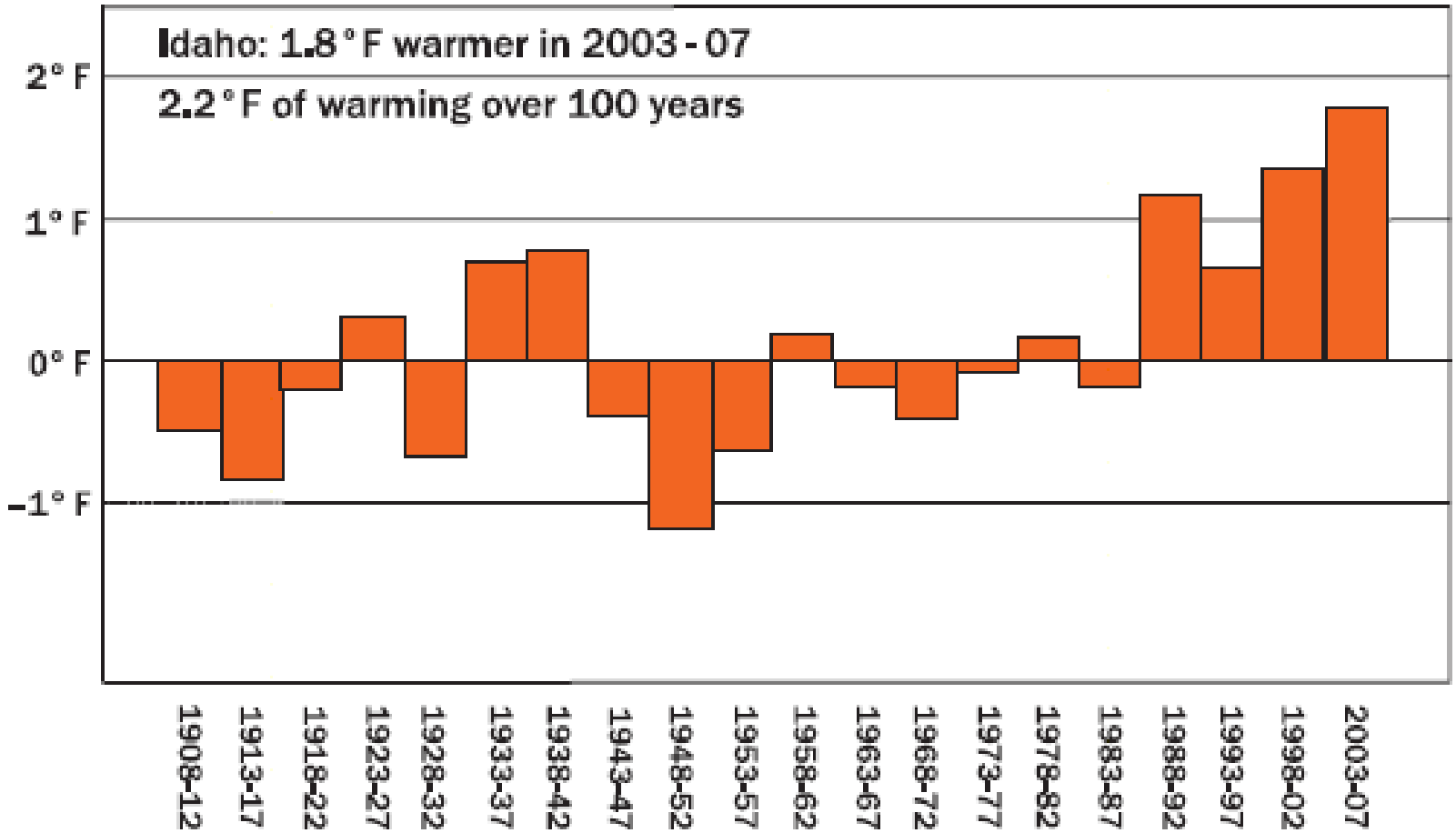
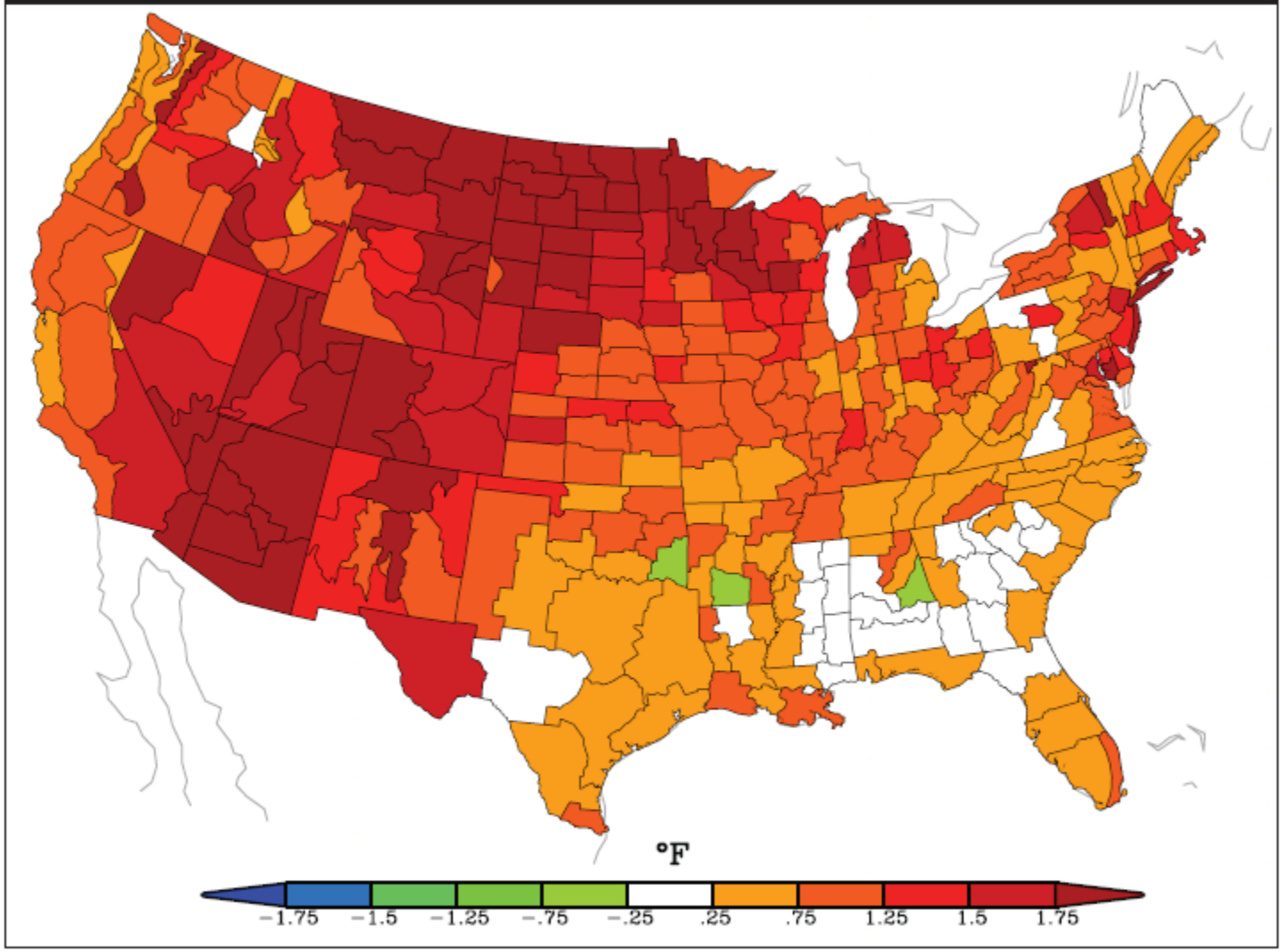


Figure 3. The Interior West: Epicenter of Warming in the Contiguous U.S. (2000 - 2007 Average Temperatures Compared to 20th Century Averages)



Average temperatures in 2000 - 2007 compared to averages for 1901 - 2000. Source: Dr. Martin Hoerling, National Oceanic and Atmospheric Administration.

Climate Change- Increased CO_2

Rising CO_2 is predicted to increase the production of exotic annual grasses (Smith et al. 1987) and increase lignin content reducing the palatability of cheatgrass (Ziska et al. 2005)….more fires?

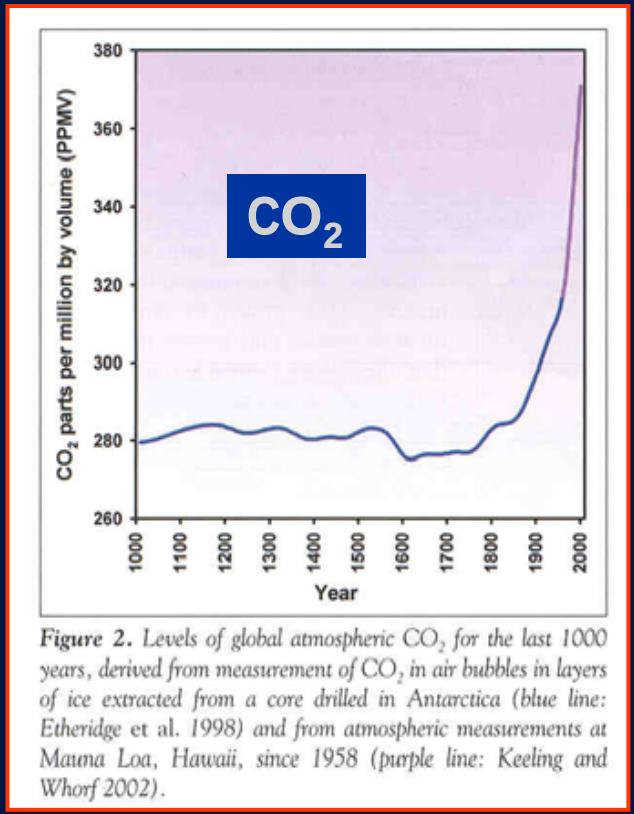


Figure 2. Levels of global atmospheric CO_2 for the last 1000 years, derived from measurement of CO_2 in air bubbles in layers of ice extracted from a core drilled in Antarctica (blue line: Etheridge et al. *1998) and from atmospheric measurements at Mauna Loa, Hawaii, since 1958 (purple line: Keeling and Whorf 2002).*

Cheatgrass Die-off in the Great Basin

-USGS-EROS
-Rocky Mtn. Res. Sta.

Integrated Cheatgrass Die-off Project
Great Basin Restoration Initiative

Background

Cheatgrass (*Bromus tectorum*) invasion and expansion in sagebrush ecosystems of the Great Basin has been well documented. Less understood are the various biotic/abiotic stressors (climate, pathogens, insects, etc.) that influence or control established cheatgrass stands. Historically, periods of multi-year drought could result in relatively large die-offs of cheatgrass. However, in recent years, cheatgrass die-off has been documented during periods of reduced (or no) drought and in patterns that

Figure 1. Mature cheatgrass (reddish purple tones) and cheatgrass die-off areas in yellow-browns to gray in the Winnemucca area in northern Nevada

are not easily explained by weather in Northern Nevada (Figure 1). An initial estimate of the affected area in the general vicinity of Winnemucca, NV is ~500,000 acres. However, actual extent of the phenomenon could be considerably larger as die-offs are occurring in smaller areas across portions of the Northern Great Basin. Given the current extent of rangelands largely dominated by cheatgrass (Bradley and Mustard 2005) (Figure 2), the potential for additional die-off areas may be significant. Possible explanations of the observed die-offs include pathogens (viral, fugal, etc), soil chemistry changes, insects (army cutworm), and climate change.

Figure 2. Distribution of areas dominated by cheatgrass (Bradley and Mustard 2005)

Issues & Opportunities in Cheatgrass Die-Off Areas

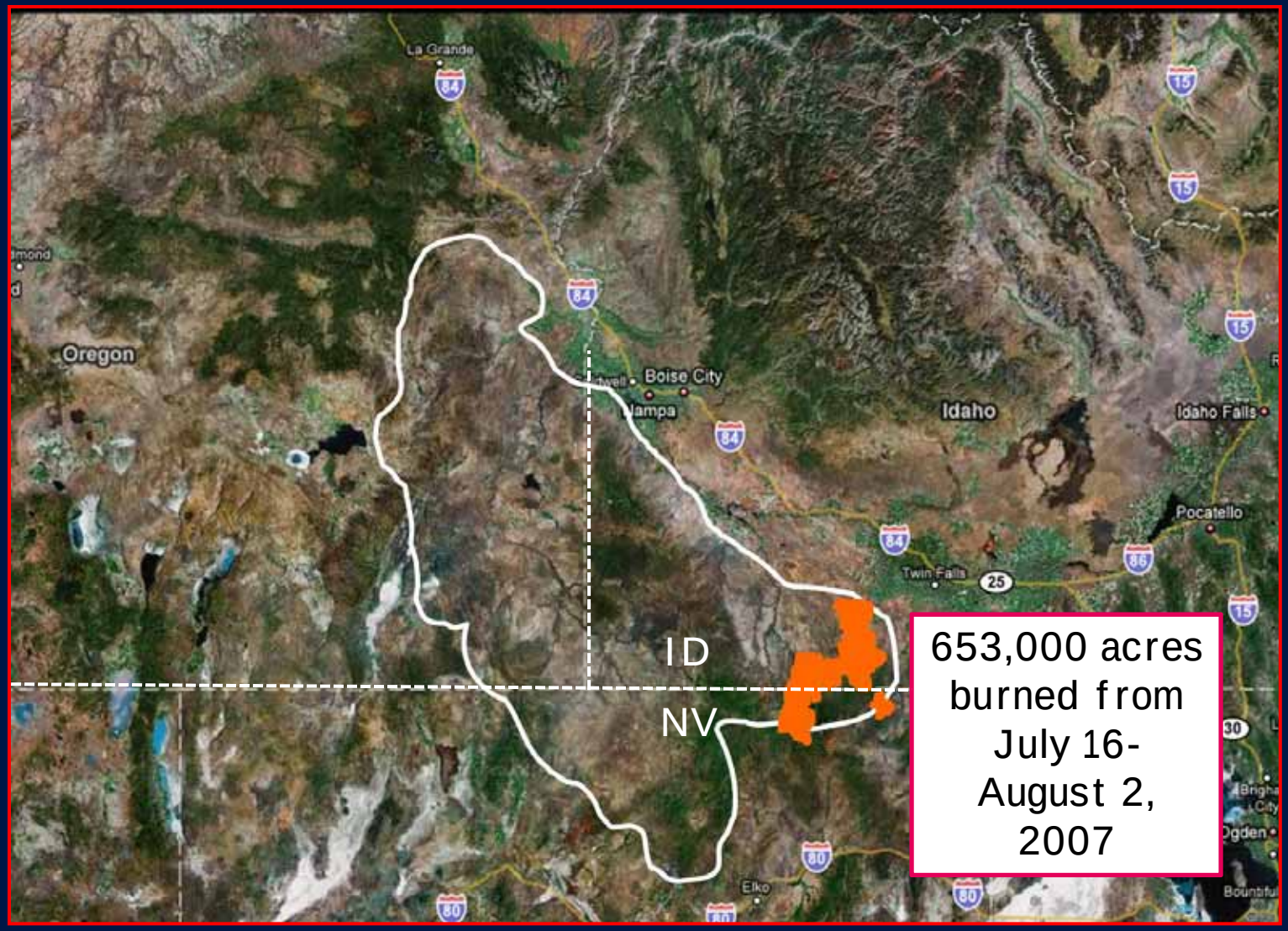
There are potential management opportunities associated with areas where cheatgrass mortality

Temperature/Vegetation Changes

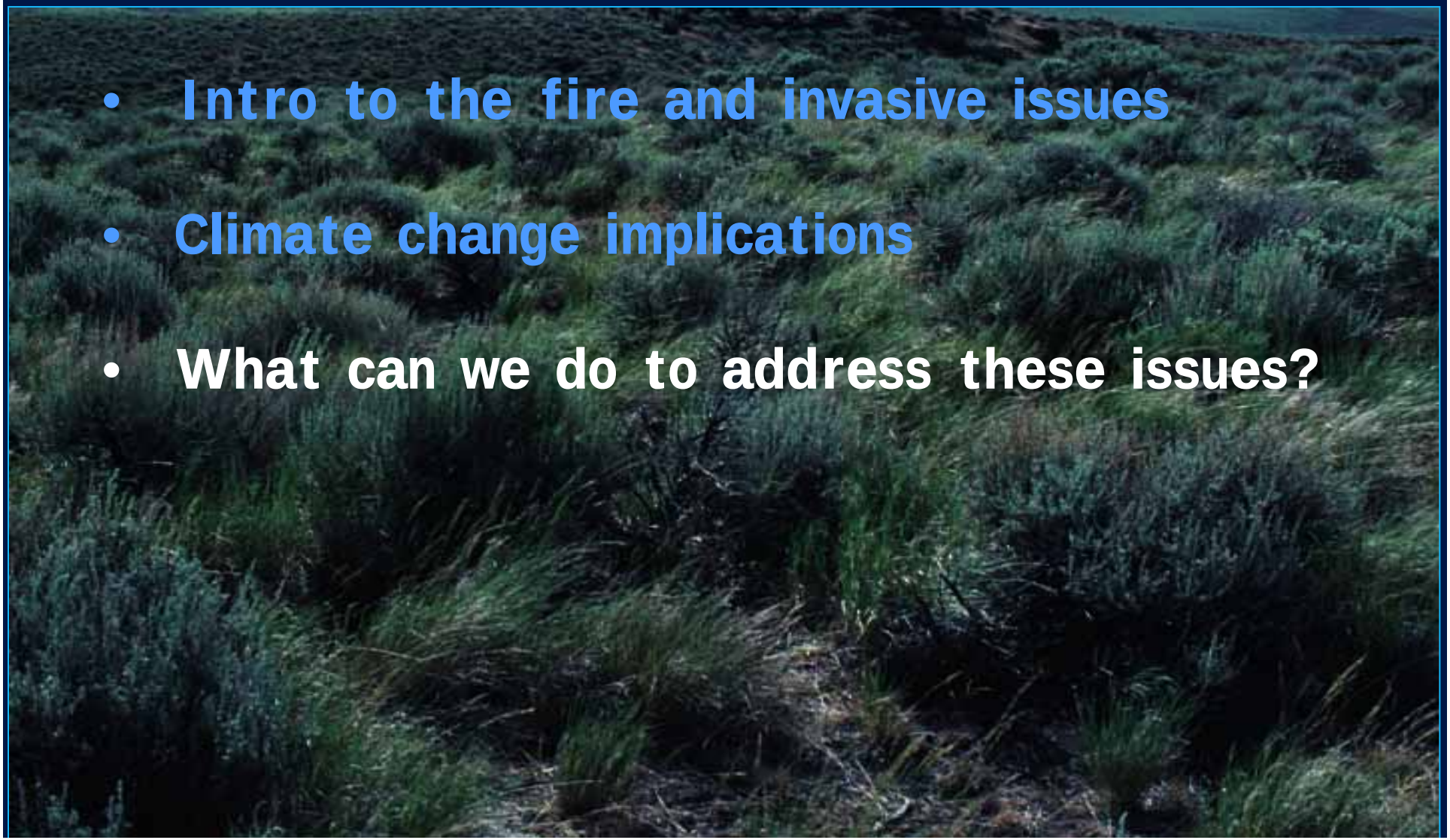
Nielson et al. (2005) predicts a 12% loss of sagebrush for each 1^0C increase in temperature. Sagebrush could be replaced by more xeric shrubs from the Mojave desert.

Entering the Mega-Fire Era

2007 Murphy Complex Fire



Presentation Organization



- Intro to the fire and invasive issues
- Climate change implications
- What can we do to address these issues?

The wildfires of 1999 (1.7 million acres burned) served as a wake-up call to the plight of the Great Basin.

GREAT BASIN
Restoration Initiative

What are we doing now?

Traditional Reactive Approach = **Treat, Attack, or <u>Repair:</u>**

- Weed Control
- Wildfire Suppression then
- Wildfire Rehabilitation

Is there a better approach?

Implement Proactive Approach- **Restoration:**

- Minimize undesirable disturbances (fuel mgt.)
- Improve resiliency and/or resistance to disturbance(s)

Proactive Strategy

First-Maintain

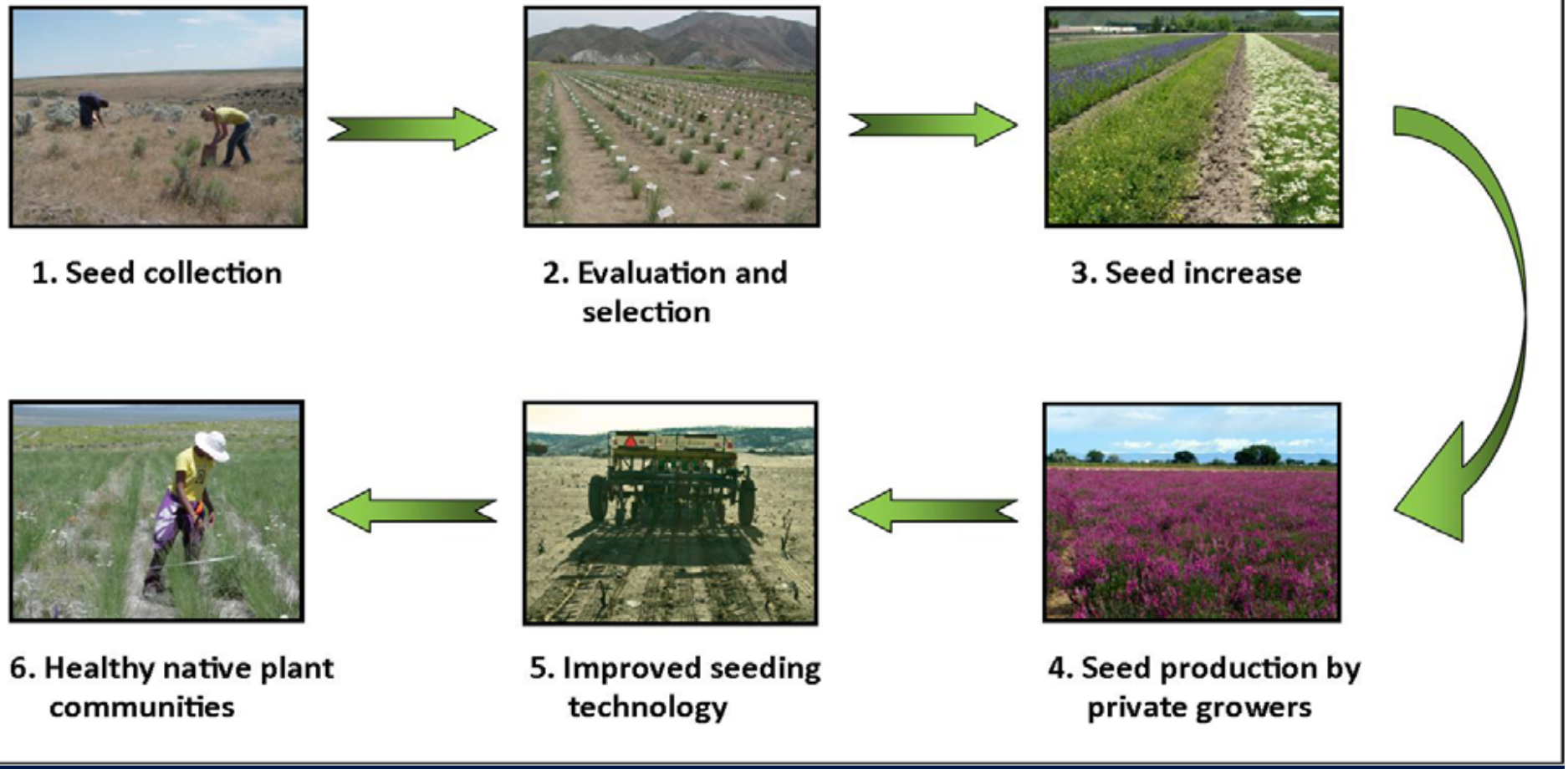
Proactive Strategy

Then-Restore Strategically

The Great Basin Native Plant Selection & Increase Project

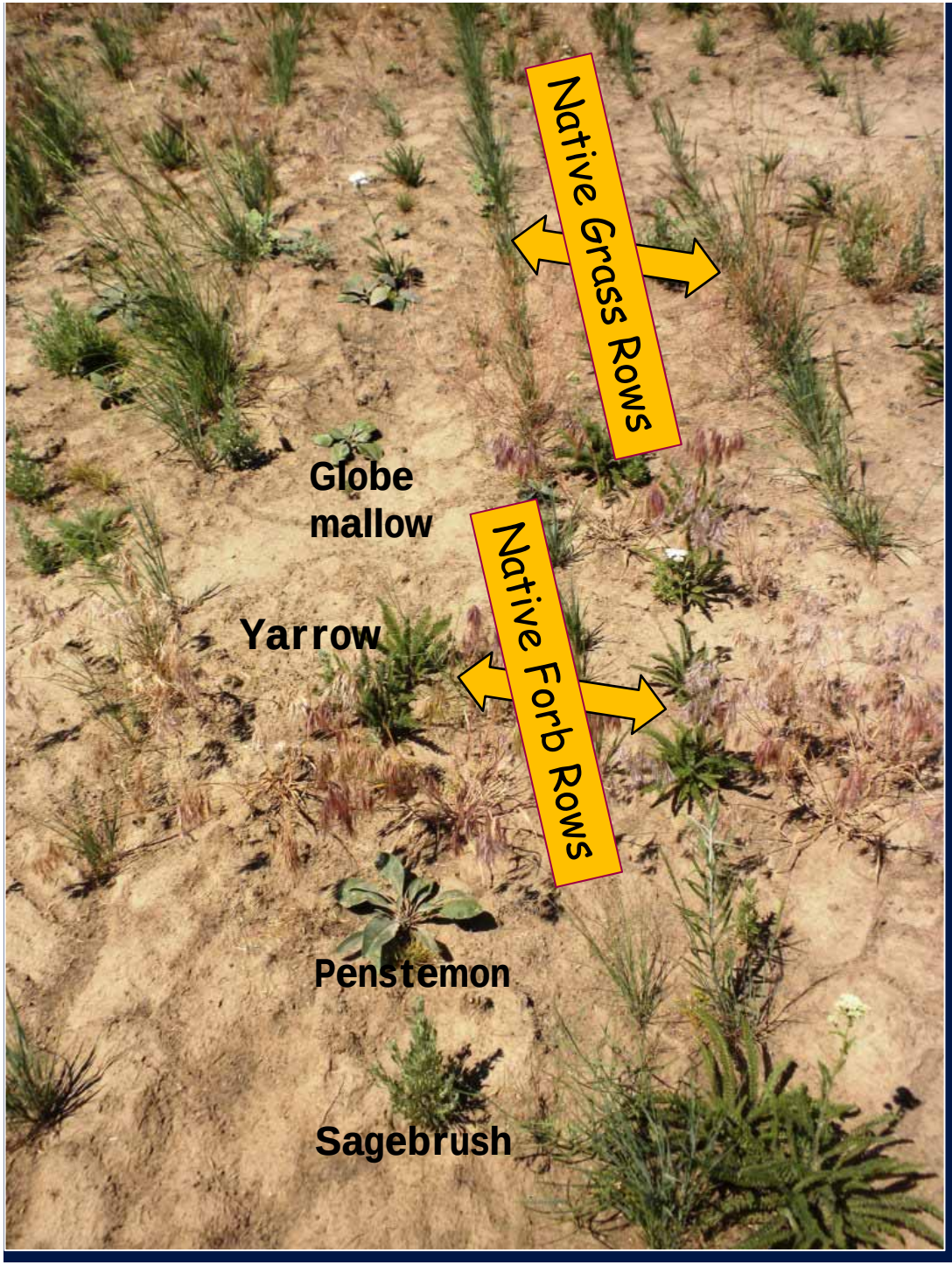
http://www.fs.fed.us/rm/boise/research/shrub/greatbasin.shtml

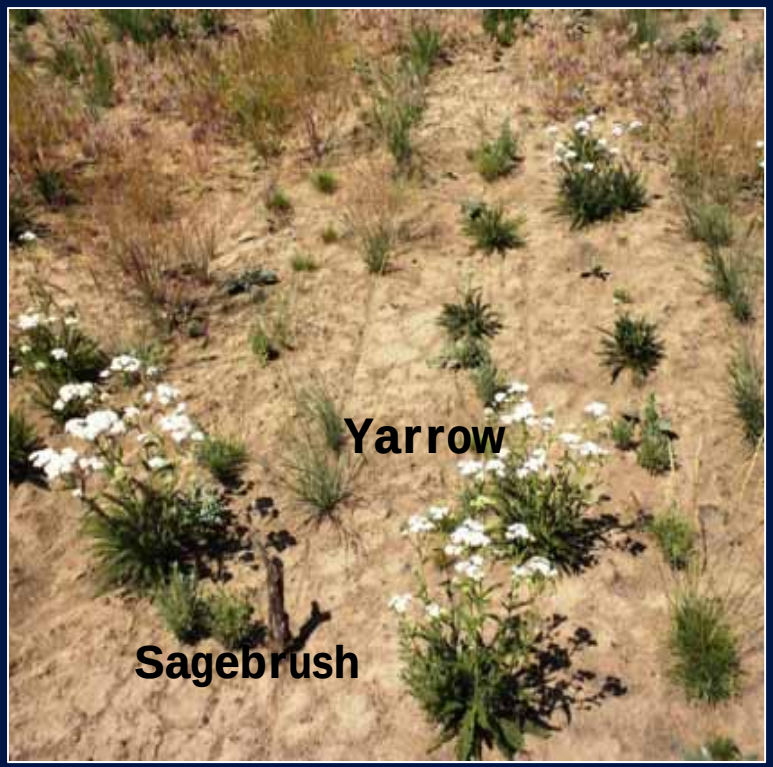
Mike Pellant, BLM GBRI, Boise, ID
Nancy Shaw, USFS Rocky Mtn. Research Station, Boise, ID



Drill Comparison Study

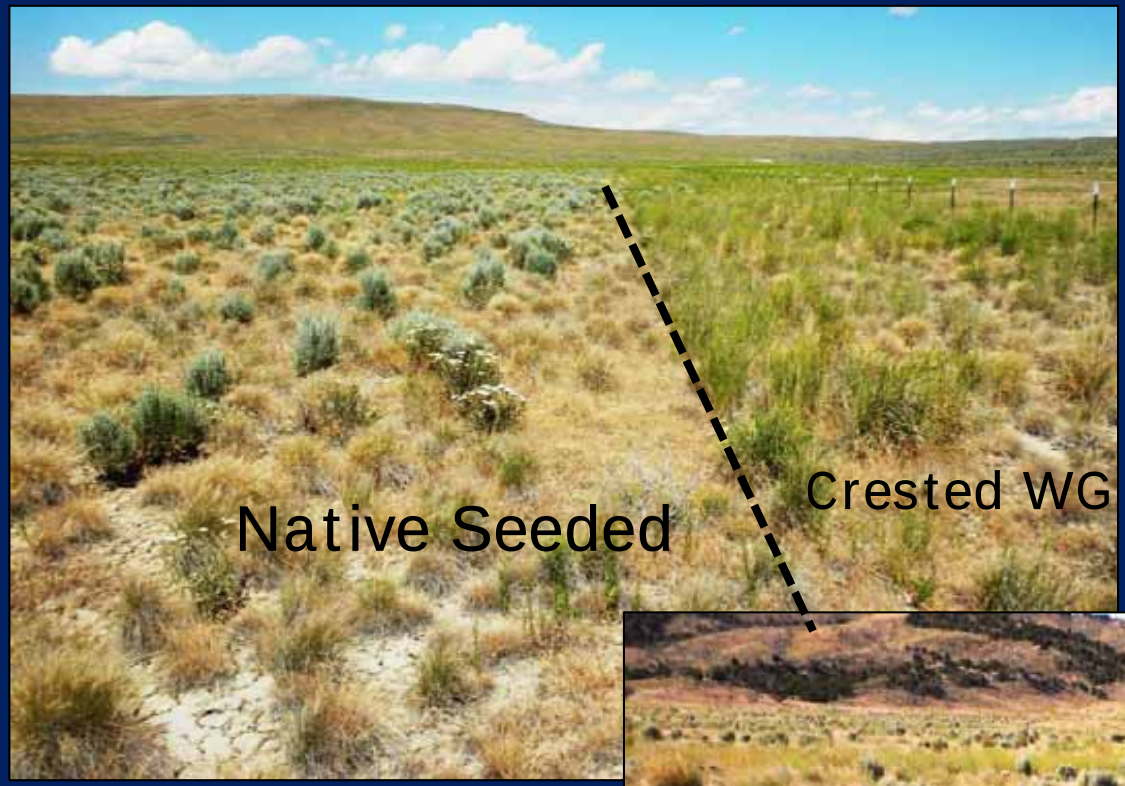
Saylor Creek, ID
2010 Seeding

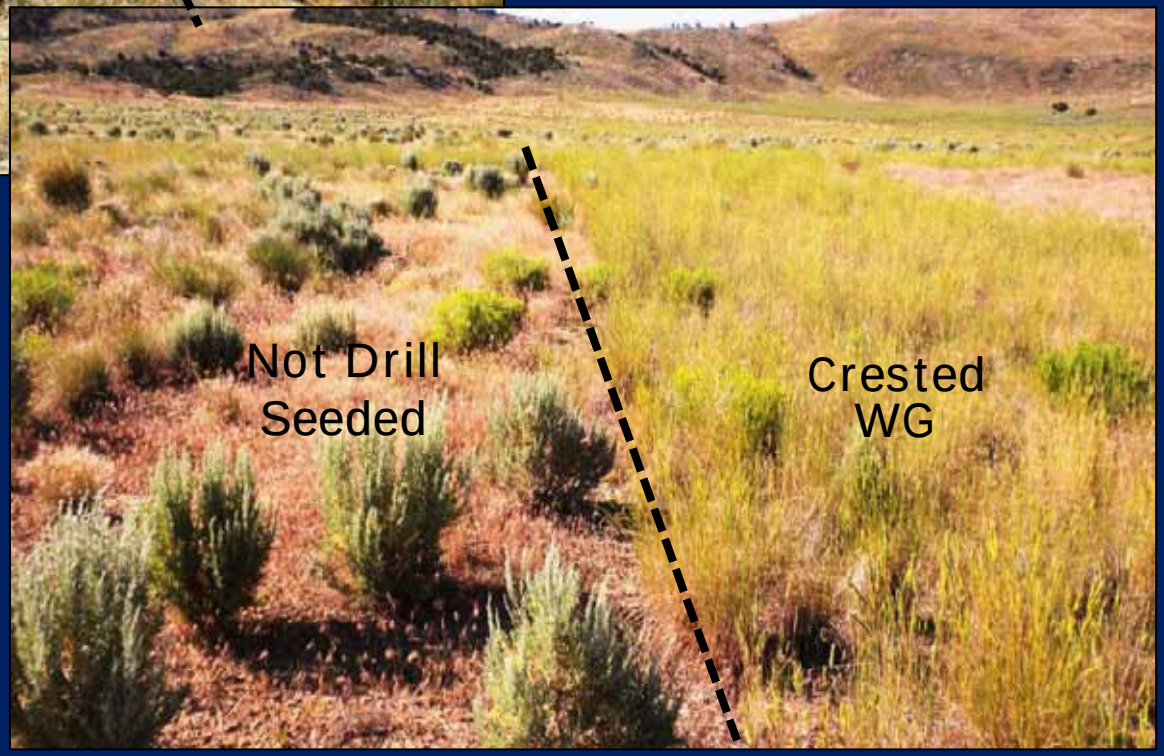




Humbolt Fire Seeding Trial
South of Elko

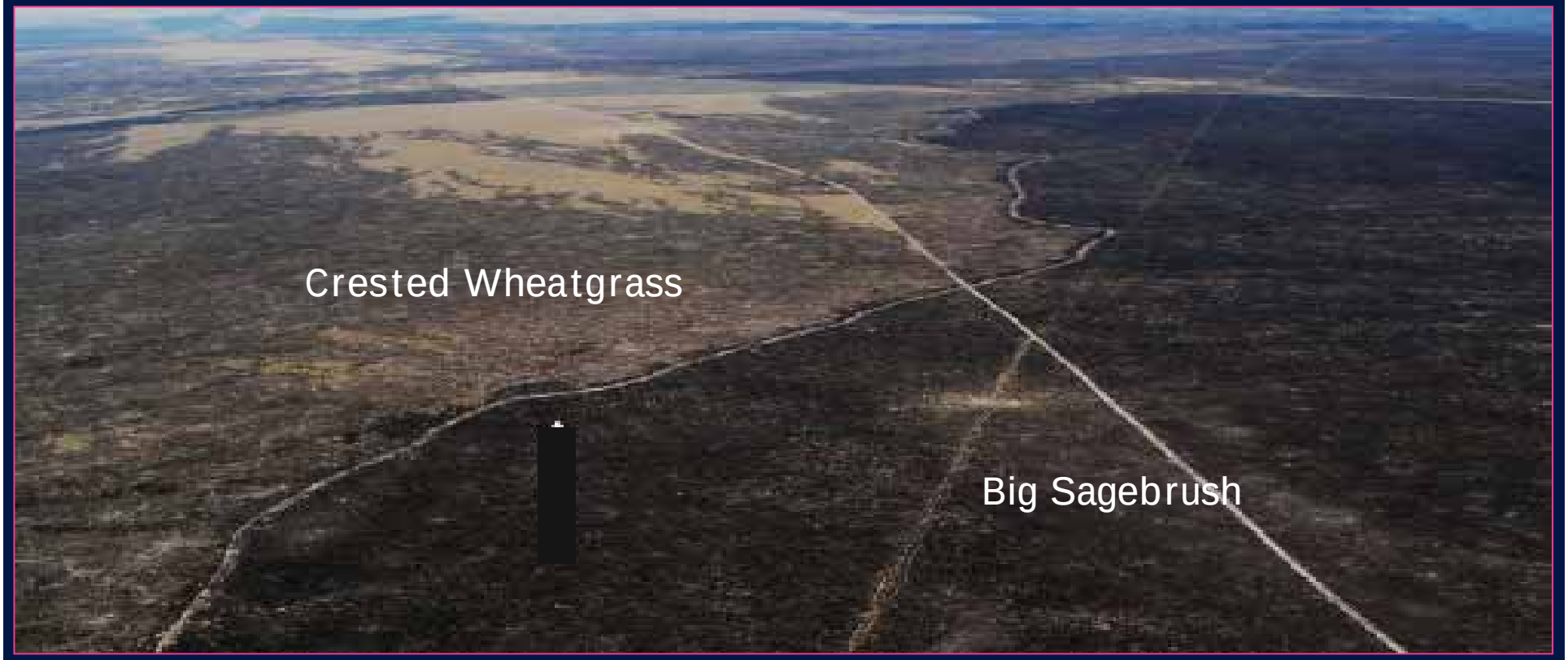
Seeded in 2006
Pictures taken in 2011





Restoration of Sagebrush Ecosystems Course
Boise, ID—October 15-19, 2012

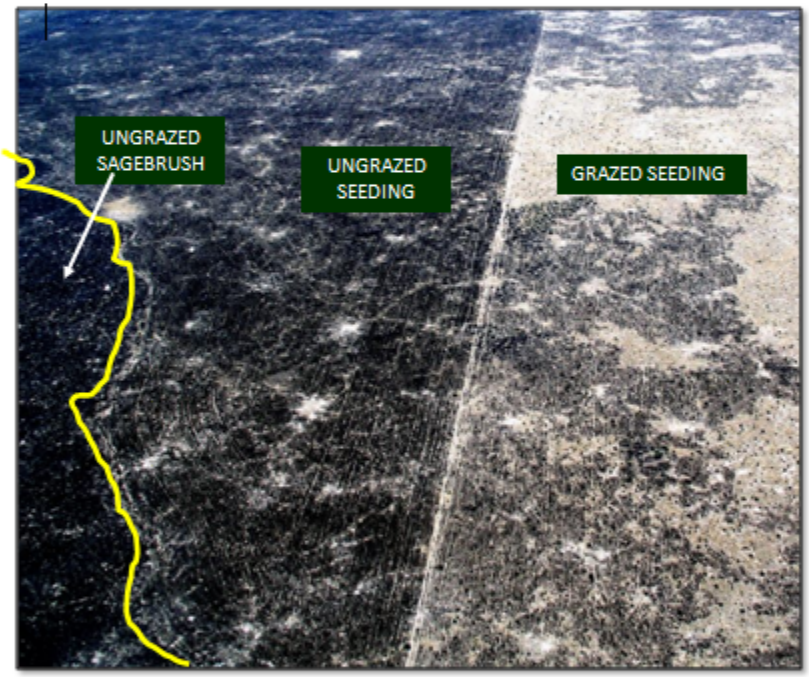
Murphy Complex Fire-August 2007



The scale of wildfires must be matched by the scale of strategically placed fuel management projects on the landscape!

We need a system not a project approach… **strategic** and **targeted** program!

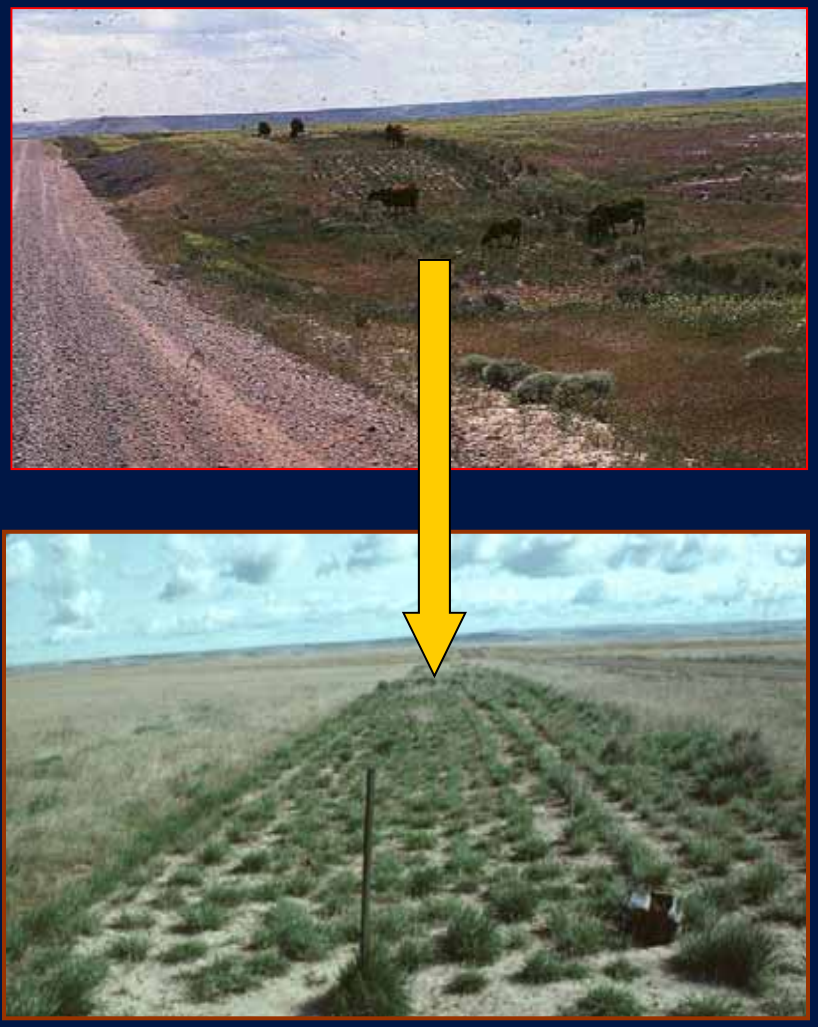
Considerations for Strategically Reducing Fuels and Wildfires on Public Lands in the Great Basin with Targeted Grazing

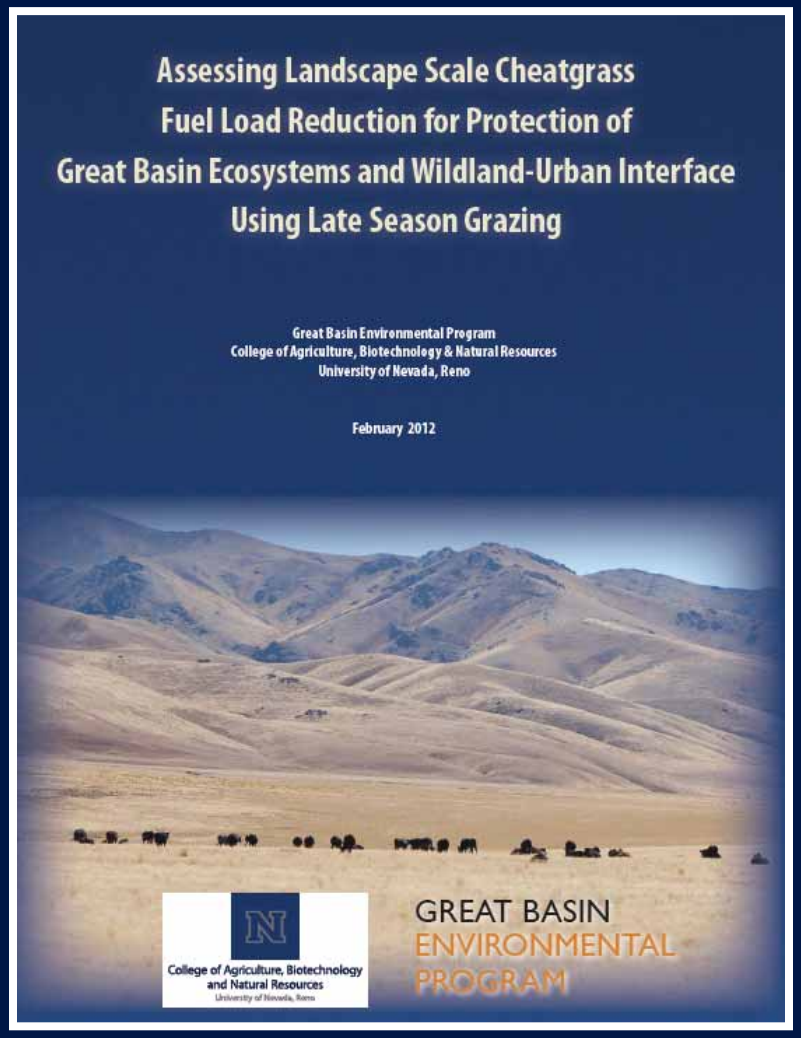


Prepared by
Great Basin
Restoration Initiative Workgroup
January 2010

BLM
Idaho State Office

Livestock Grazing & Greenstrips—1+1=3





Nevada Congressman Amodei

- What is needed to address wildfires and invasives to conserve sage-grouse?
  - Suppression
  - Rehabilitation
  - Restoration
- Great Basin Issue


“We are confronted by insurmountable opportunities”
Pogo

Presentation Organization

- Intro to the fire and invasive issues
- Climate change implications
- What can we do to address these issues?
- NTT conservation measures

Putting it all together- conserving sagebrush habitat and sage-grouse…

National Technical Team:

1. Policy Recommendations

2. Conservation Measures

Policy Recommendations Related to Invasives and Wildfires

- Off-Site Mitigation: Better guidance to implement off-site restoration.
- Fire Rehabilitation: Longer timeframe to implement projects and more flexibility to reestablish functioning sage-grouse habitat.
- Fuels Management: More funding emphasis outside the Wildland/Urban interface emphasizing the "footprint of projects not the acres treated.
- Soil Surveys & Ecological Site Descriptions: Complete and update across sage-grouse habitat.

Conservation Measures- Habitat Restoration

Cross-Cuts All Programs

- Prioritize restoration in “limiting factor” sage-grouse habitats where potential for success is acceptable.
- Require use of native seed based on availability, adaptation, and probability for success (climate change).
- Ensure that post-restoration management is compatible with habitat sustainability.
- Manage to maintain important wildland harvested seed sources (e.g., sagebrush).
- Monitor and control invasive plants on all projects.

Conservation Measures

Fuels Management

- Minimize impacts to sage-grouse habitat with fuel treatments.
- Design fuel treatments to strategically and effectively reduce wildfire threats to the greatest area.
- Consider the utility of using livestock to manage fine fuels in fuel management projects.

Fire Operations

- Prioritize suppression in priority sage-grouse habitat after life and property.

Conservation Measures
Fire Rehabilitation (ES&R)

- Prioritize native seed allocation to sage-grouse habitat in years of limited seed selection and quantities.

Range Management

- Prioritize land health assessments in priority sage-grouse habitat and take appropriate action to meet sage-grouse habitat needs.

- Implement good post-drought management to maintain integrity of priority sage-grouse habitat.

- Implement treatments that conserve, enhance, or restore sage-grouse habitat