Reflections on 30+ Years of Tackling the Cheatgrass/Wildfire Cycle in the Great Basin

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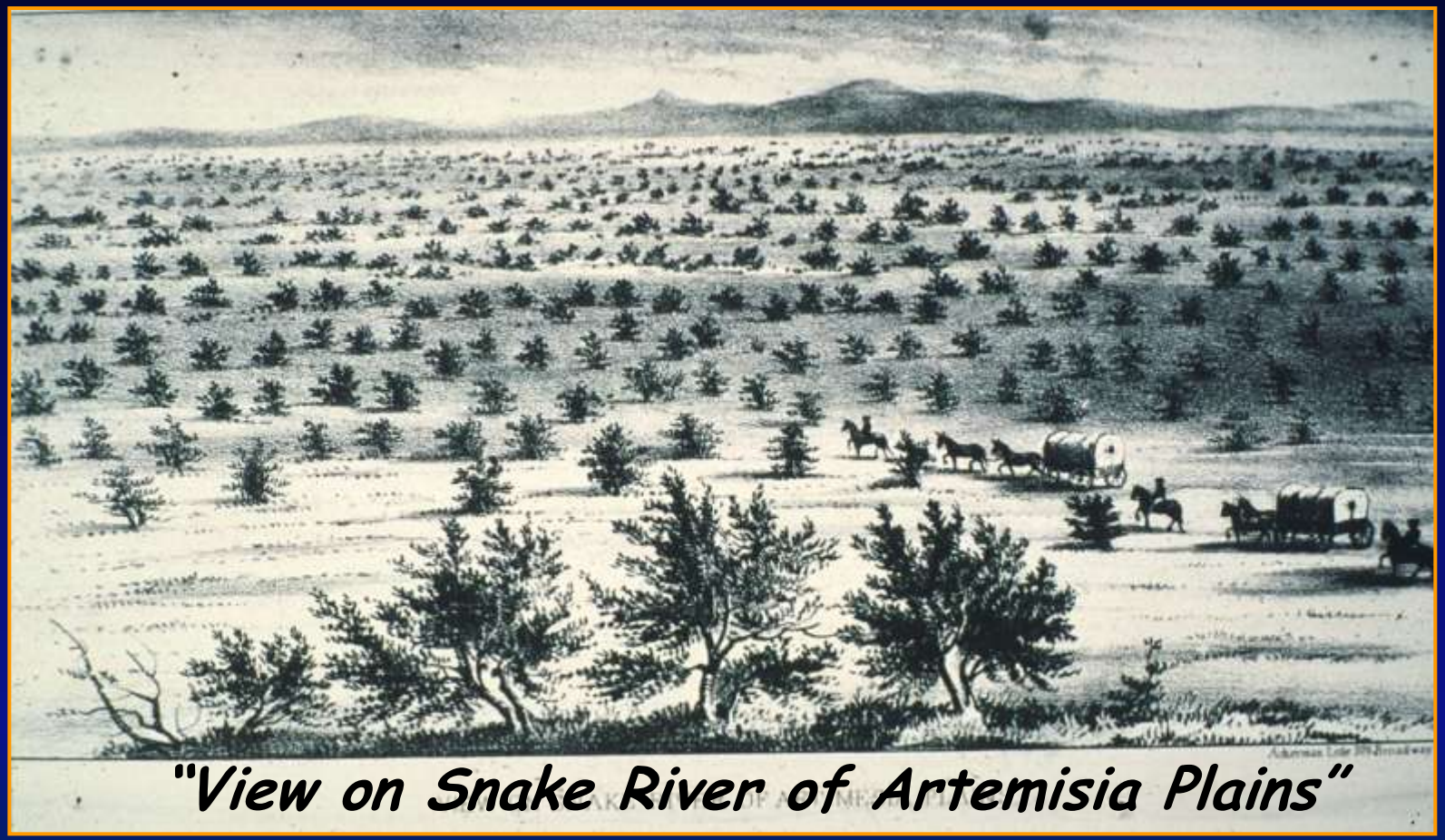
Great Basin Restoration Initiative Coordinator

Topics

- Past→Present→Future
- Breaking the Cheatgrass/Wildfire Cycle
  - Post-Fire Rehabilitation
  - Managing Fuels to Reduce Fires
  - Restoration

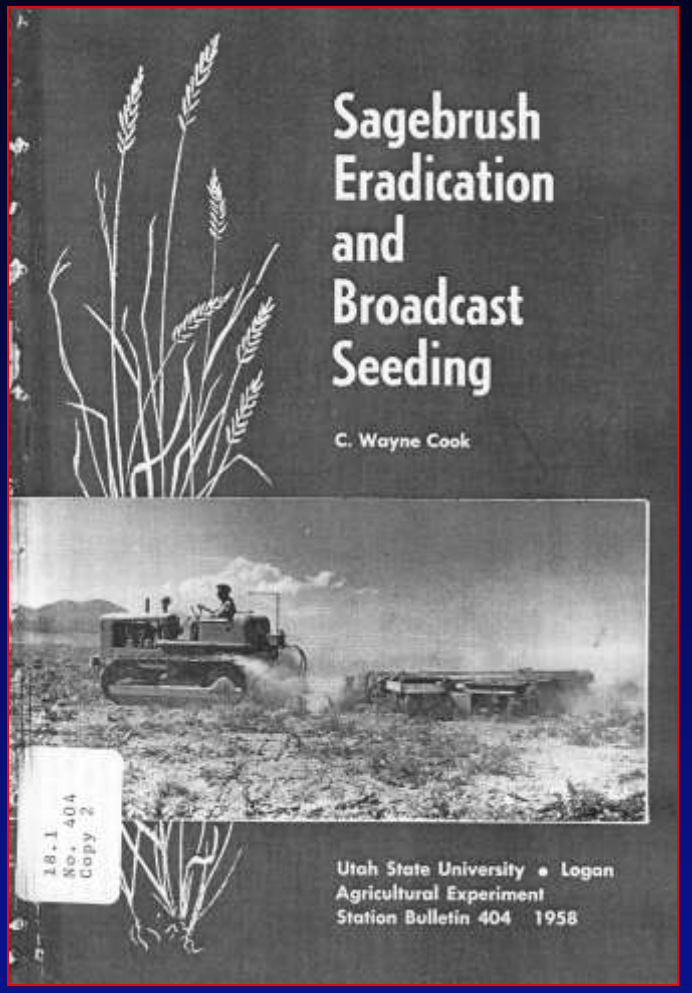
Sagebrush (*Artemisia spp*) Steppe

"*No wood, no water, no grass, the gloomy artemisia the prevailing shrub*" (John C. Freemont, 1845)

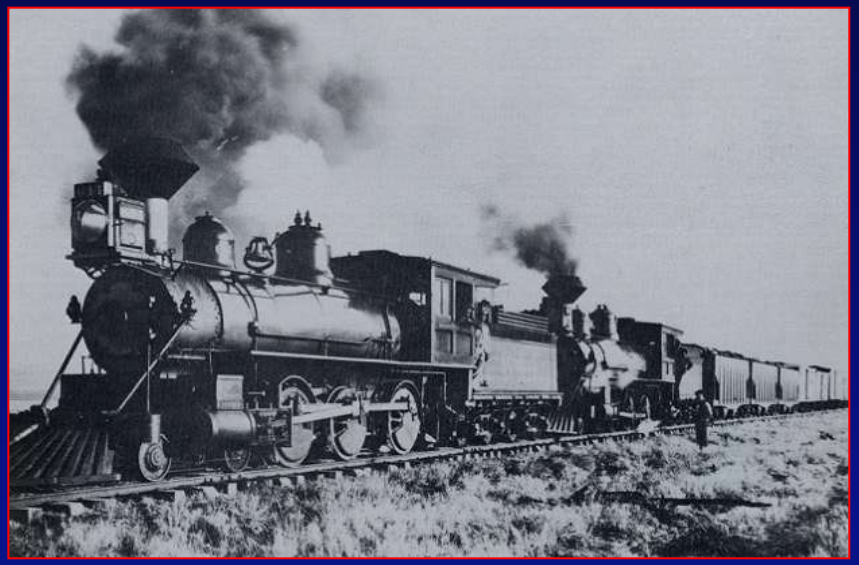


"View on Snake River of Artemisia Plains"

1950's- Sagebrush was abundant and grass was scarce



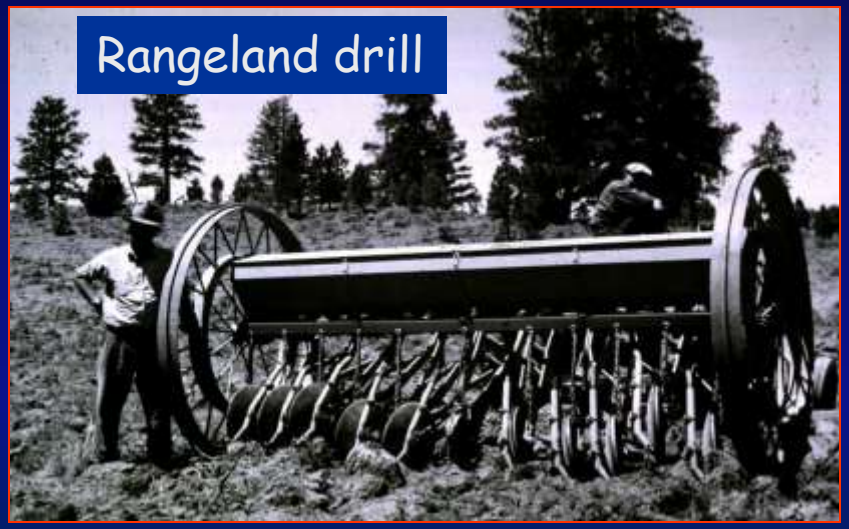
Cheatgrass Introduced in GB in Late 1800's-Early 1900's

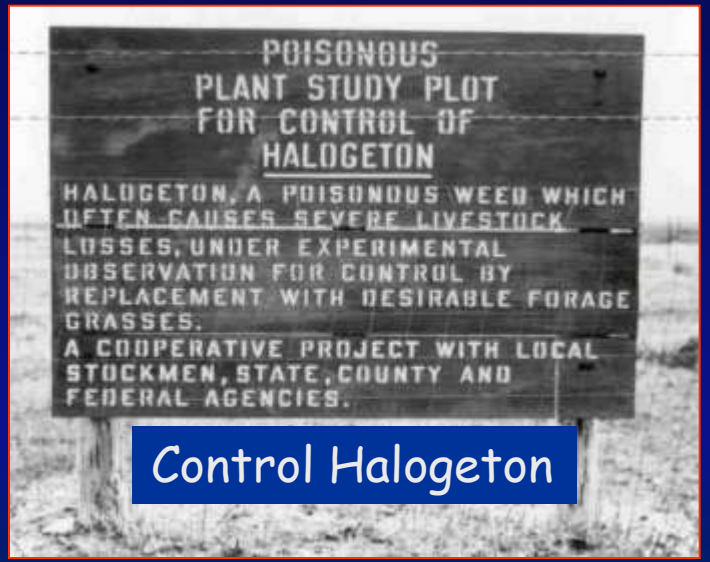


Solution for Degraded Rangelands!


Crested wheatgrass seeding

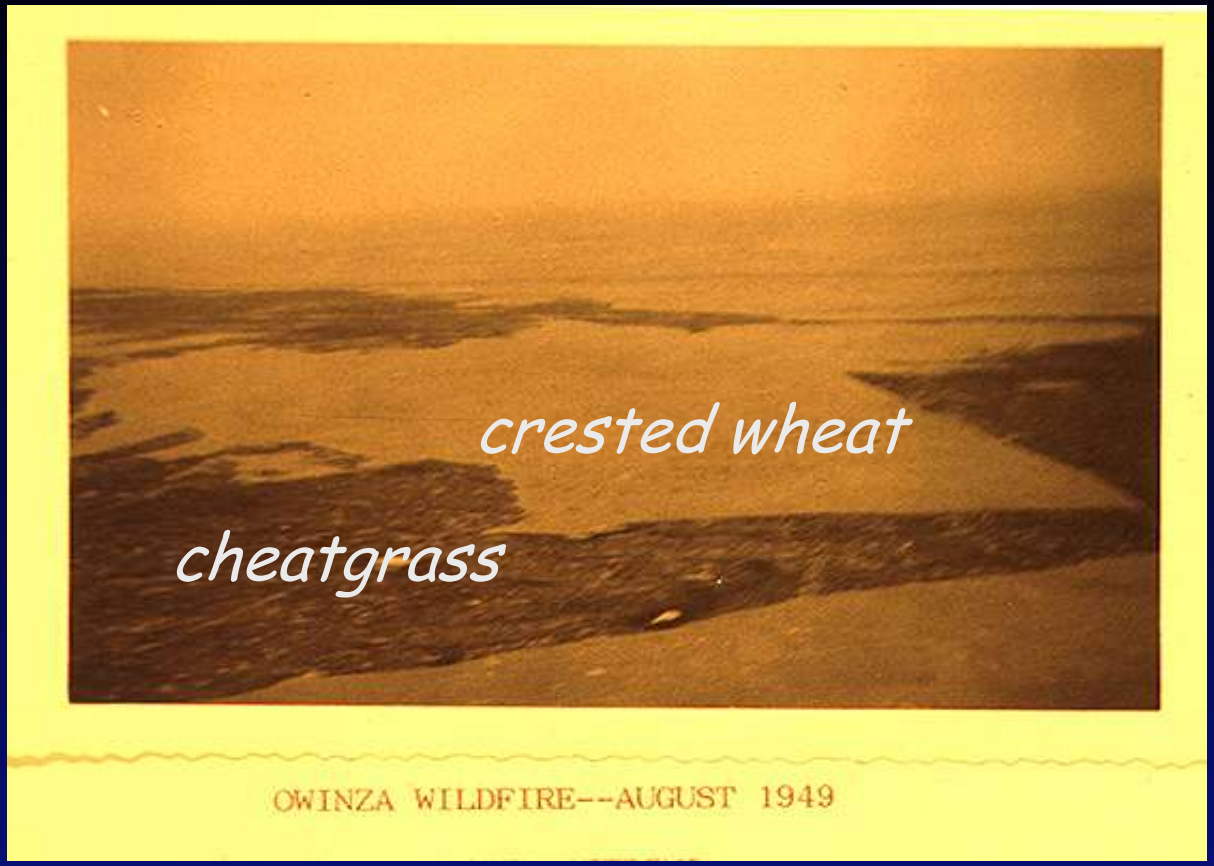
"Sagebrush to Grass"


Rangeland drill



Control Halogeton

Crested Wheatgrass and Wildfires



BLM Owinza Fire File- August 1949: "*The reseeded area on Owinza Butte, which has a good stand of crested wheat, shows without doubt the value of this type of planting in fire control work.*"

1951 BLM Publication

REBUILDING THE FEDERAL RANGE

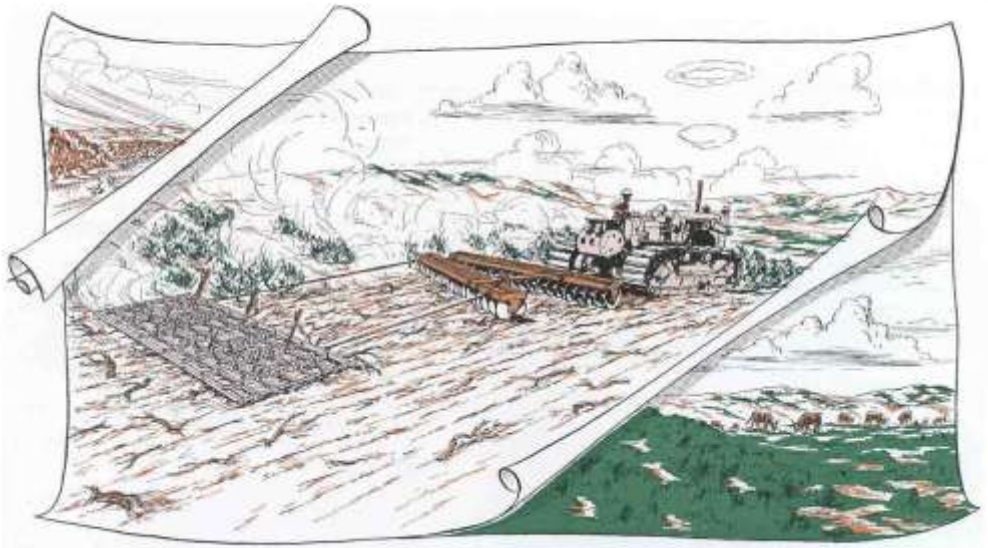
UNITED STATES DEPARTMENT OF THE INTERIOR · BUREAU OF LAND

RANGE REVEGETATION

Crested Wheatgrass

RANGE REVEGETATION.

RANGE RESEEDING



RANGE RESEEDING. Reseeding depleted rangelands with hardy, adapted varieties of grasses increases from 3 to 10 times the volume of forage produced, and restores the much-needed protective covering for the soil.

1970's-- Wildfires & Environmental Laws

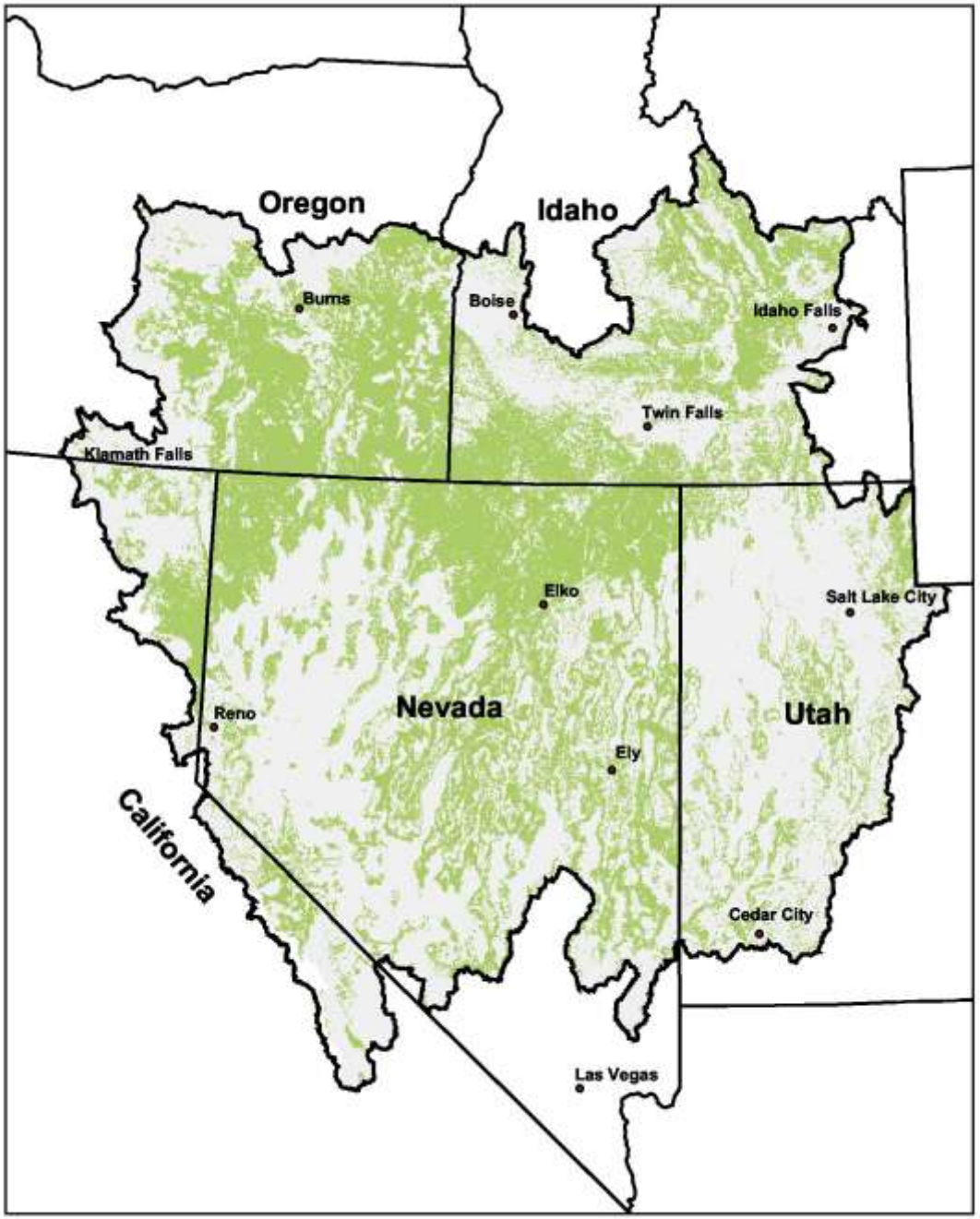
- National Environmental Policy Act (1970)
- Threatened & Endangered Species Act (1973)
- Federal Land & Policy Management Act (1976)
- Wildlife habitat losses

1981- Sagebrush still "common" with an accelerating cheatgrass/wildfire cycle

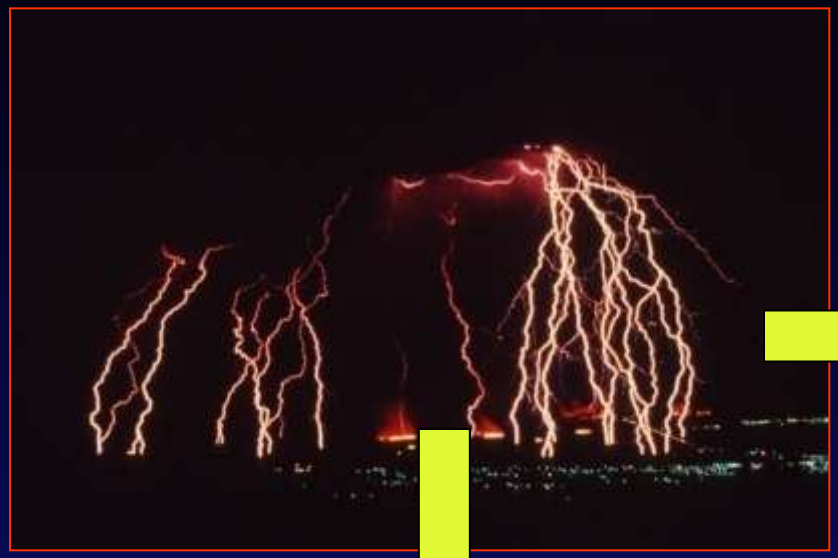
Big fires were 100,000+ acres

Sagebrush in the Great Basin

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



Cheatgrass-Wildfire Cycle

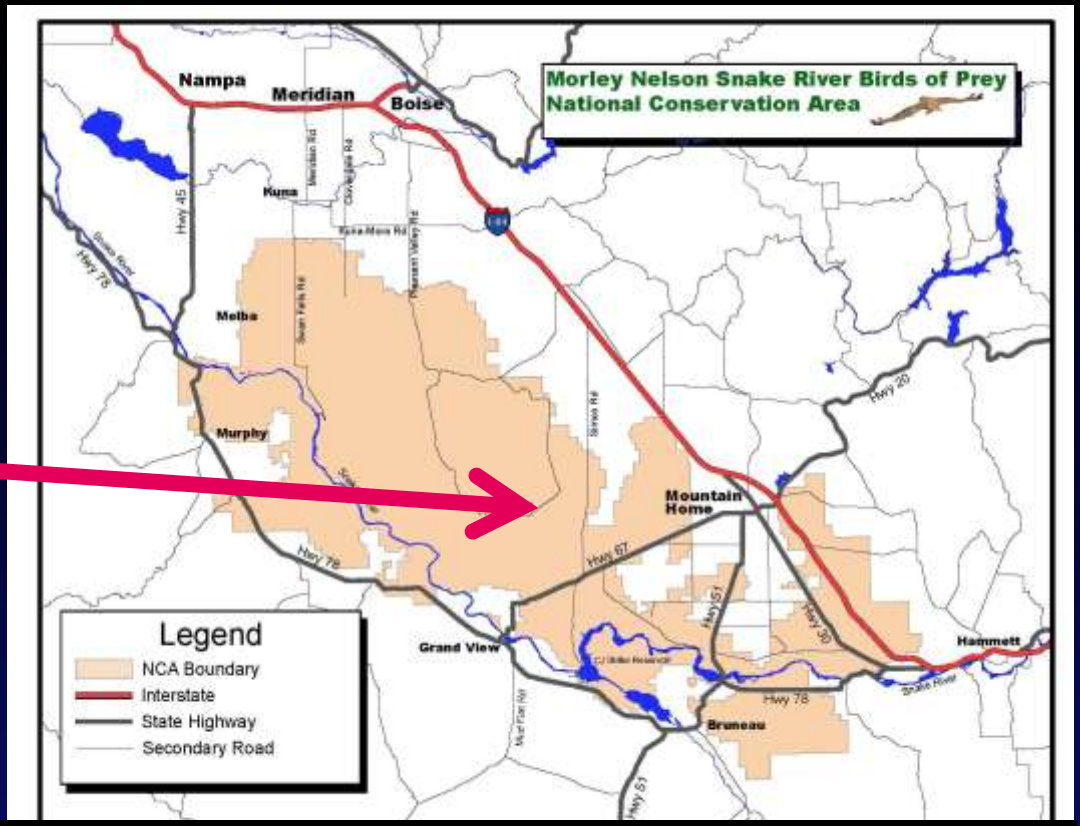


1986 Wickahoney Fire

Wickahoney Stage Stop

1986 Dorsey Butte Fire

Salt Desert Shrub



- 25 raptor species
- 43 special status wildlife species
  - 12% birds
  - 11% mammals
  - 22% reptiles
  - 57% amphibians
  - 7% fish
- 18 special status plant species

1992 Foothills Fire-
Largest fire in ID in 80 years (257,000 acres)

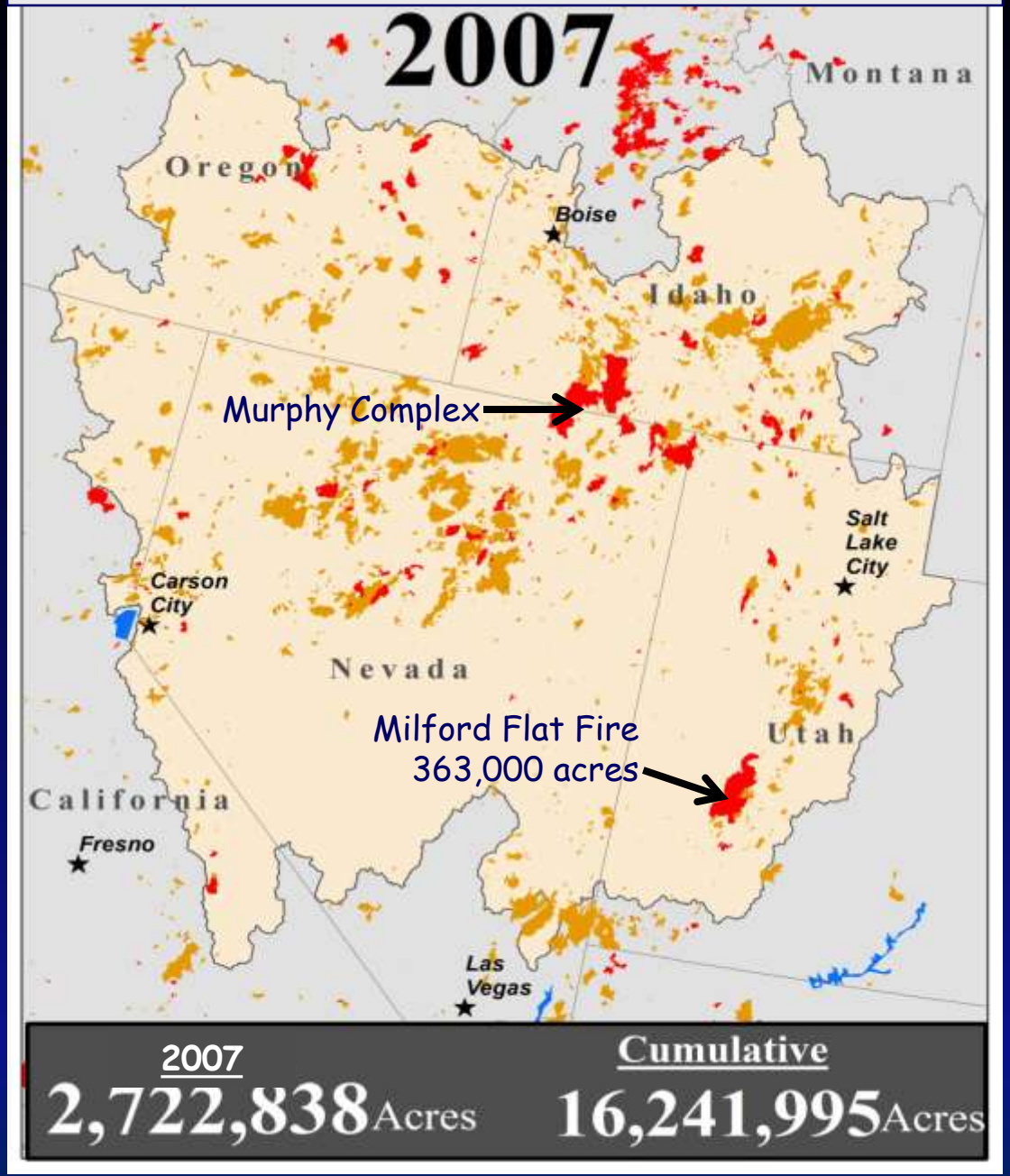
The wildfires of 1999 (1.7 million acres burned) served as a wake-up call to the plight of the Great Basin.

GREAT BASIN
Restoration Initiative

"Maintain the best before you restore the rest"

2007- Beginning of the rangeland mega-fire era?

Great Basin Wildfires 1990-2007 (2007 in red)

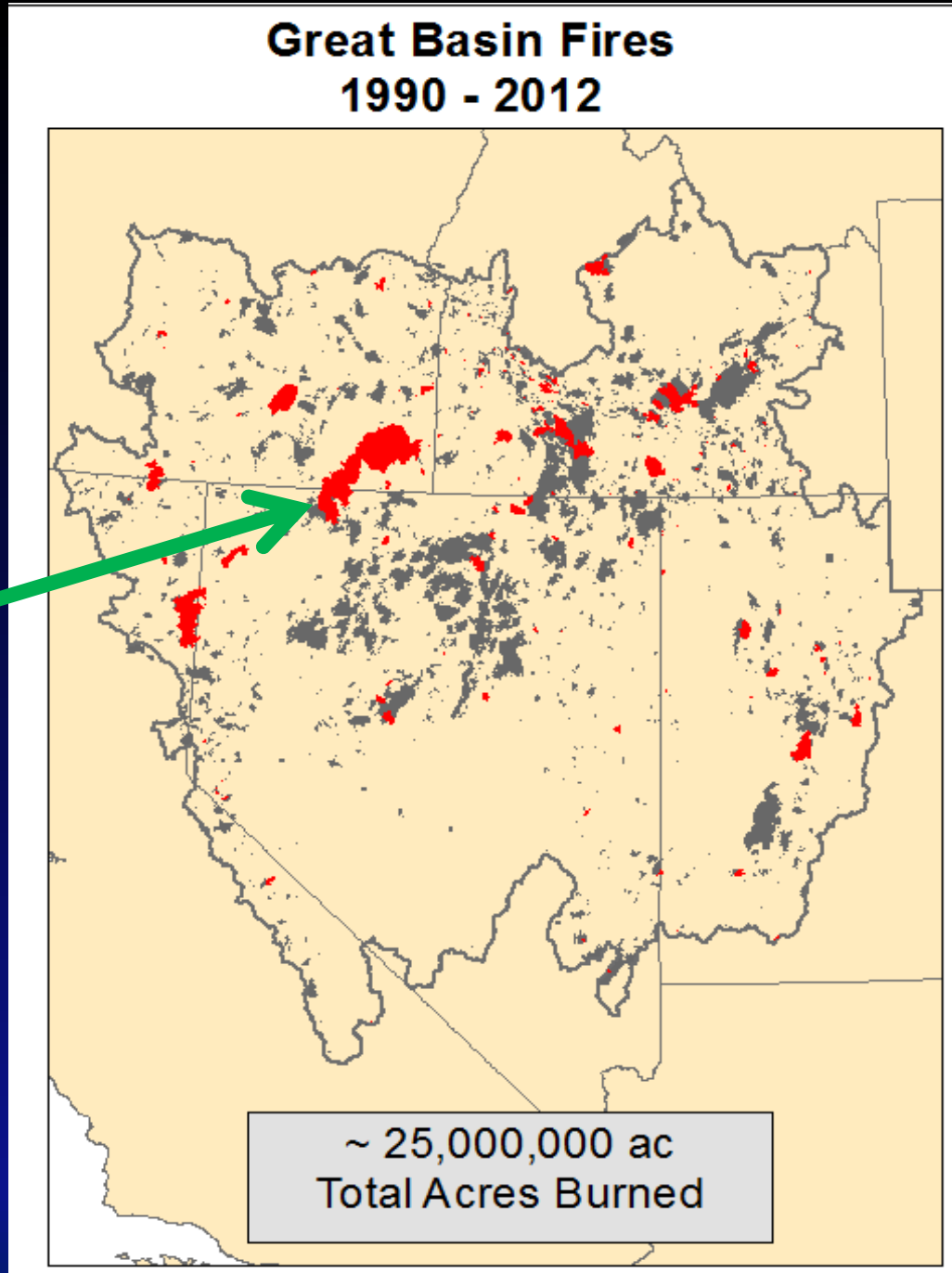


2007 Murphy Complex Fire

653,000 acres

2012 Fire Season

- 3.3 million acres burned
- Holloway/Long Draw Fires- 1 million acres
- Rehab-2.7 million lbs seed @ $25 million



Future-- Wildfires and Cheatgrass

- Warmer temperatures
- Wetter winters in N. Great Basin (20-50% increase in rain versus snow)
- **Fire season 1-3 weeks earlier & increased large fire potential**
- Cold spells could occur once per decade by mid-21st century (every other year now)

Abatzoglou and Kolden (2011)

Warmer Winters With (More Rain & Less Snow) = More Cheatgrass

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?**

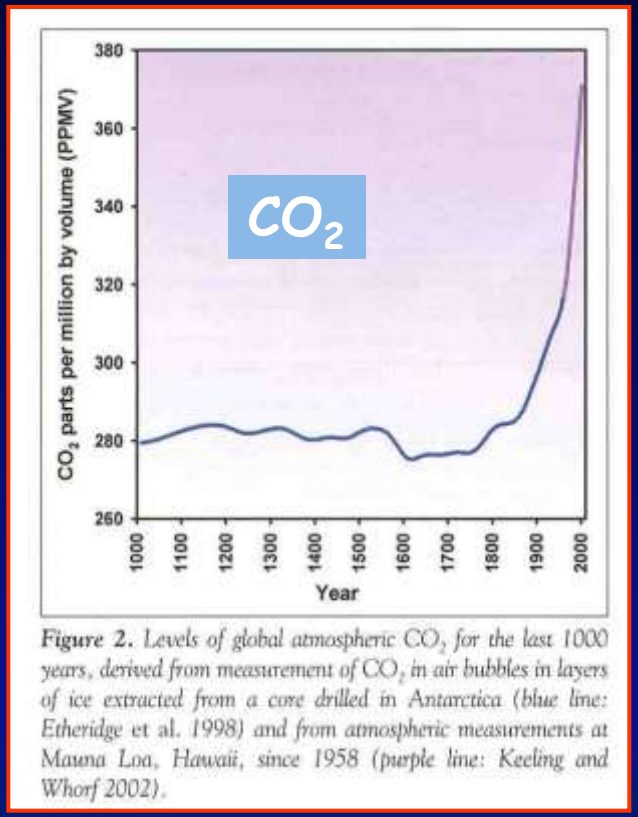
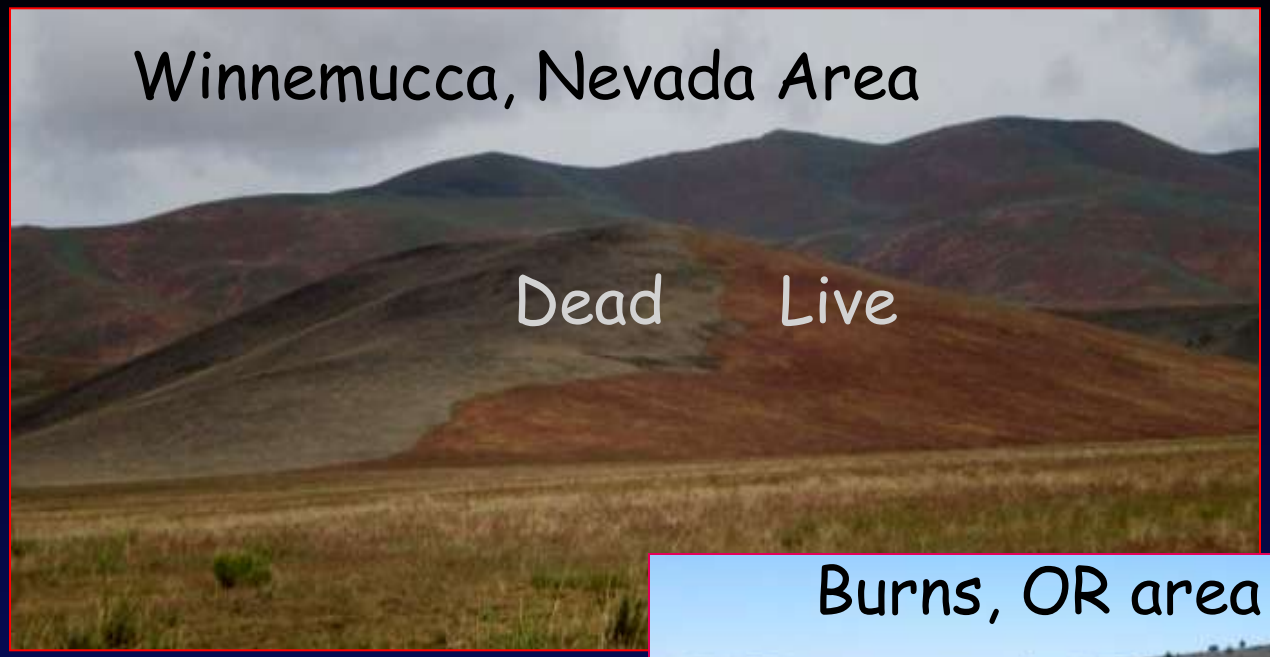


Figure 2. Levels of global atmospheric CO_2 for the last 1000 years, derived from measurement of CO_2 in air bubbles in layers of ice extracted from a core drilled in Antarctica (blue line: Etheridge et al. 1998) and from atmospheric measurements at Mauna Loa, Hawaii, since 1958 (purple line: Keeling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

Science Daily (Feb. 10, 2010)— A new University of California, Davis study, says it is harder than experts thought to predict when sudden shifts in Earth's natural systems will occur.

"Climate scientists worry about 'tipping points' ... thresholds beyond which a small additional increase in average temperature or some associated climate variable results in major changes to the affected system" (U.S. presidential science adviser John Holdren).



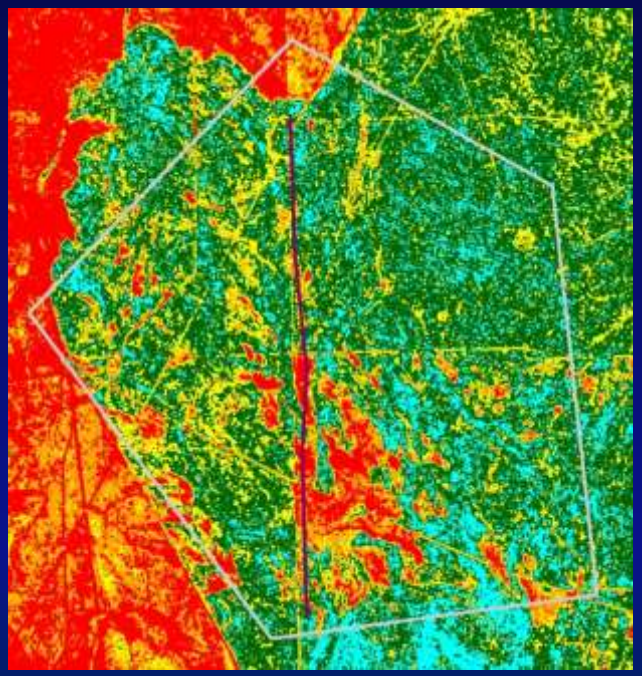
Cheatgrass Die-off in the Great Basin

Aroga Moth & Sagebrush Mortality

Important Question: Can the current management strategies and practices meet the future wildfire and invasive plant challenges?

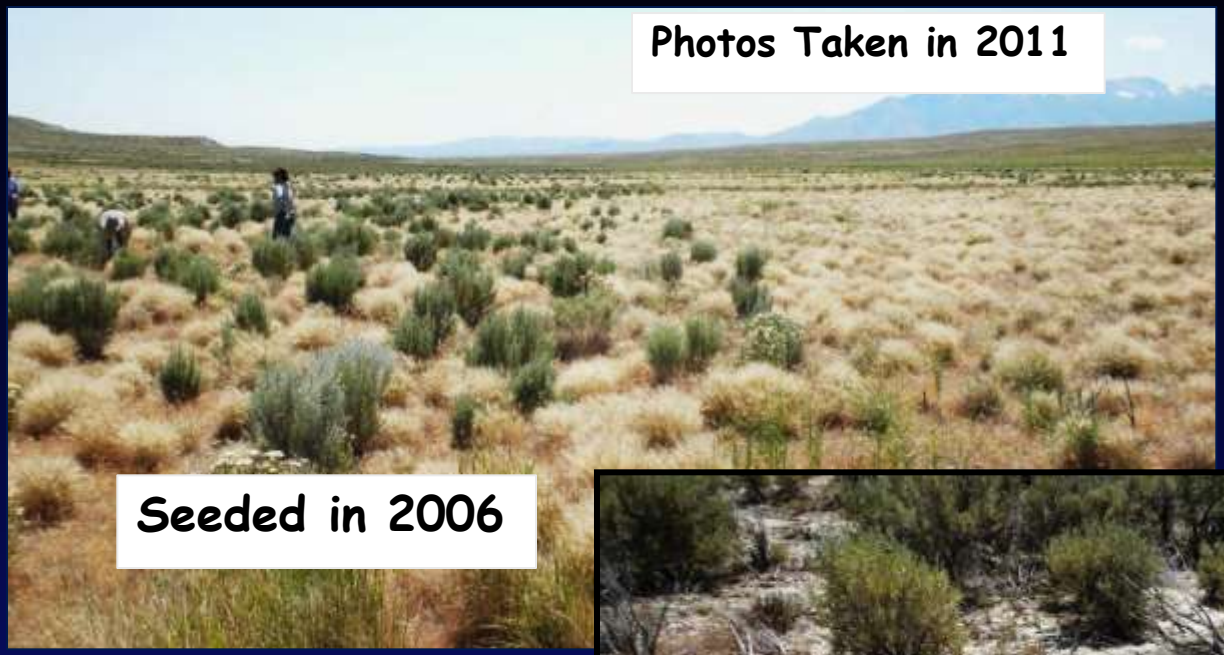
Meeting the Wildfire & Cheatgrass Challenge

Pre-fire Plant Community Resiliency & Post-fire Plant & Soil Response



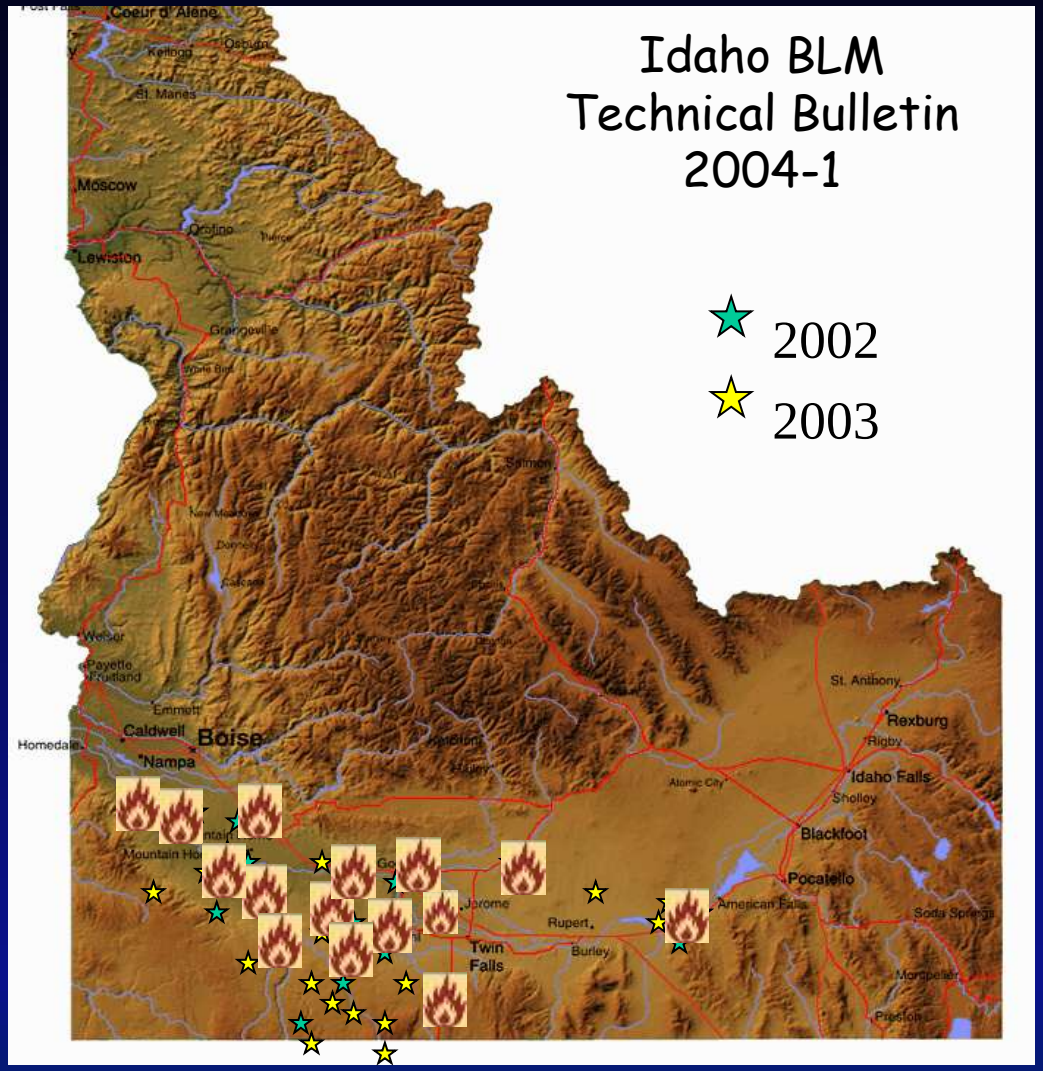
Landscape level pre-fire community resiliency & better burn severity mapping for rangelands

Improving Post-fire Rehabilitation Decisions



GREAT BASIN
Native Plant
Selection & Increase
PROJECT

Persistence of 35 WY Big Sagebrush Aerial Seeding Projects in Snake River Plain



- 15 projects (43%) burned since 2002-2003.
- Five of the 15 projects burned twice.
- Success is measured by both sagebrush establishment and **long-term persistence.**
- **Implement measures to reduce wildfire threat to rehabilitation treatments.**

Fuels Management

Maintain

1987-Greenstripping Program

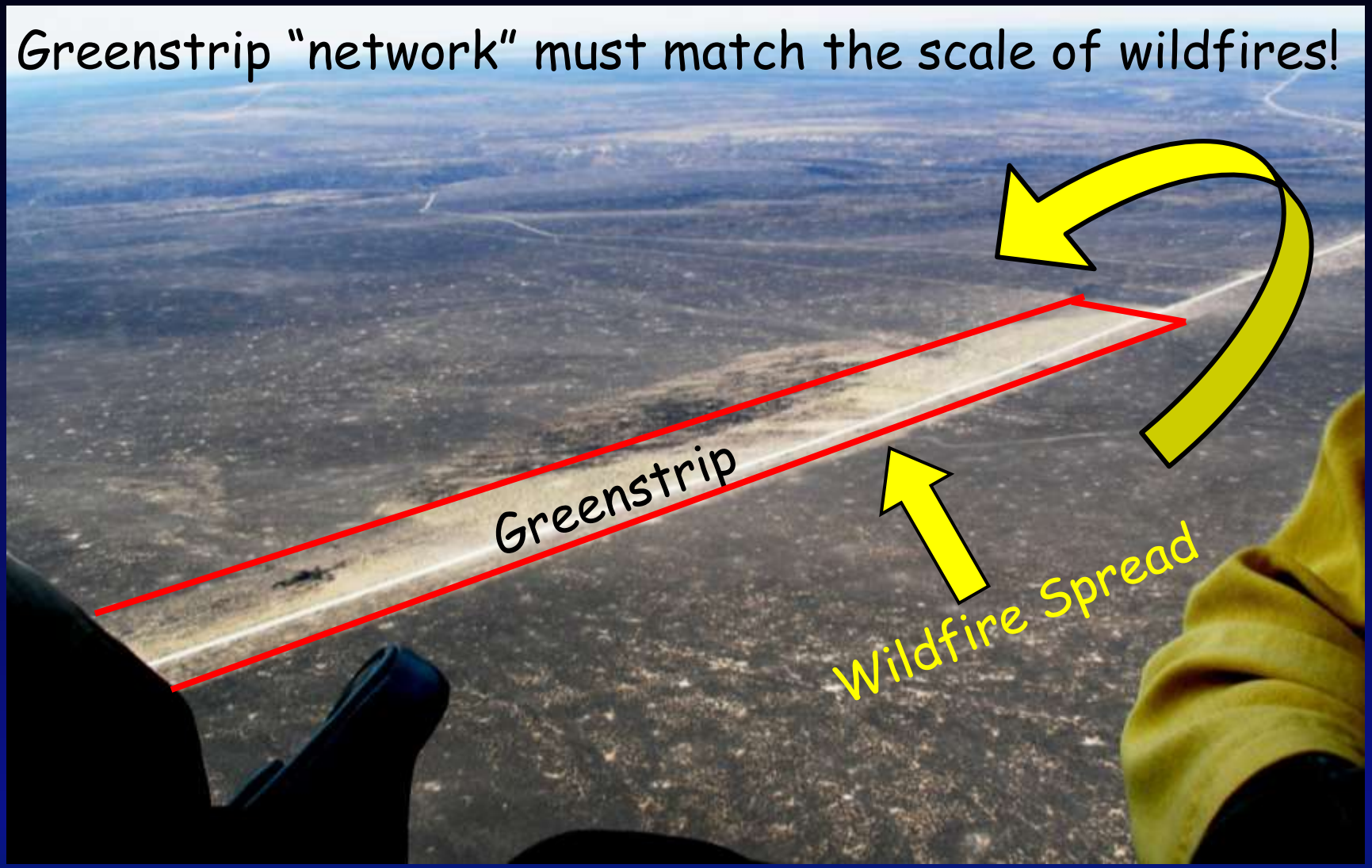
(1985-86: 1.5 million acres burned in Great Basin)

Bands of fire resistant vegetation placed at strategic locations to slow or sometimes stop wildfires

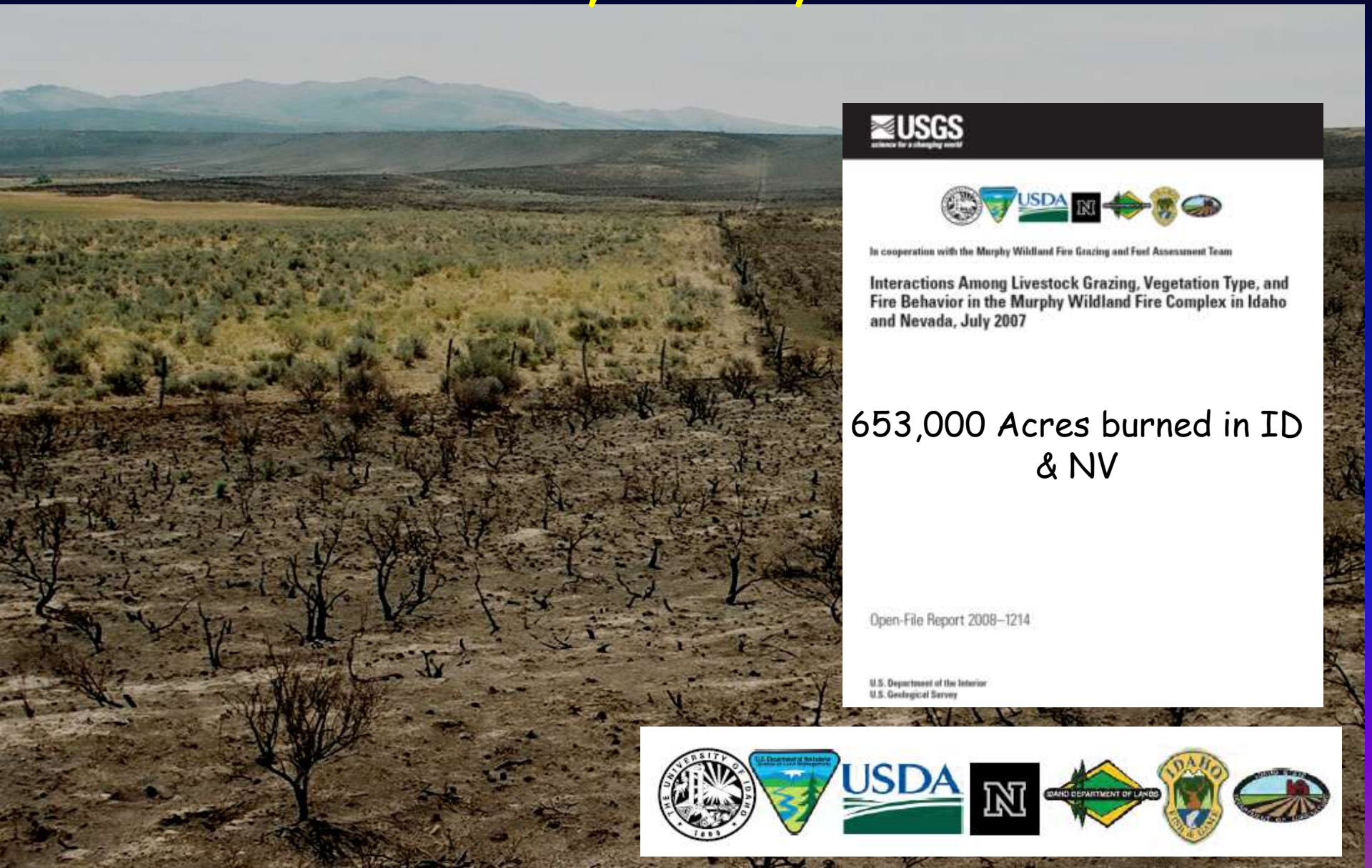
Greenstrip Effectiveness- Reduce Fuel Continuity

Lockman Butte Greenstrip: I-84 Just West of Mountain Home

2007 Murphy Complex Wildfire -Idaho



2007 Murphy Complex Wildfire- Livestock, Fuels, and Fire



USGS
science for a changing world

In cooperation with the Murphy Wildland Fire Grazing and Fuel Assessment Team

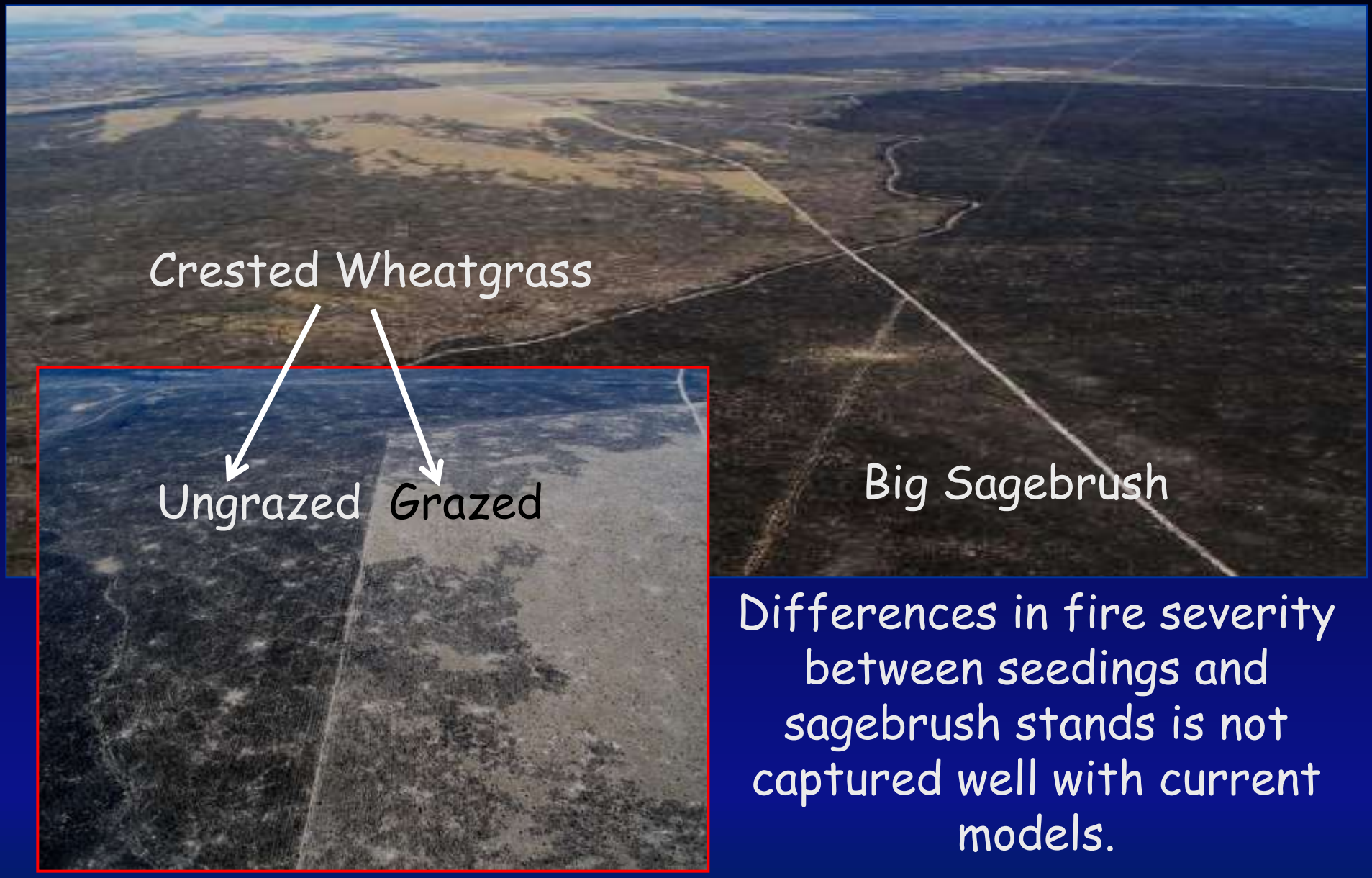
Interactions Among Livestock Grazing, Vegetation Type, and Fire Behavior in the Murphy Wildland Fire Complex in Idaho and Nevada, July 2007

653,000 Acres burned in ID & NV

Open-File Report 2008–1214

U.S. Department of the Interior
U.S. Geological Survey

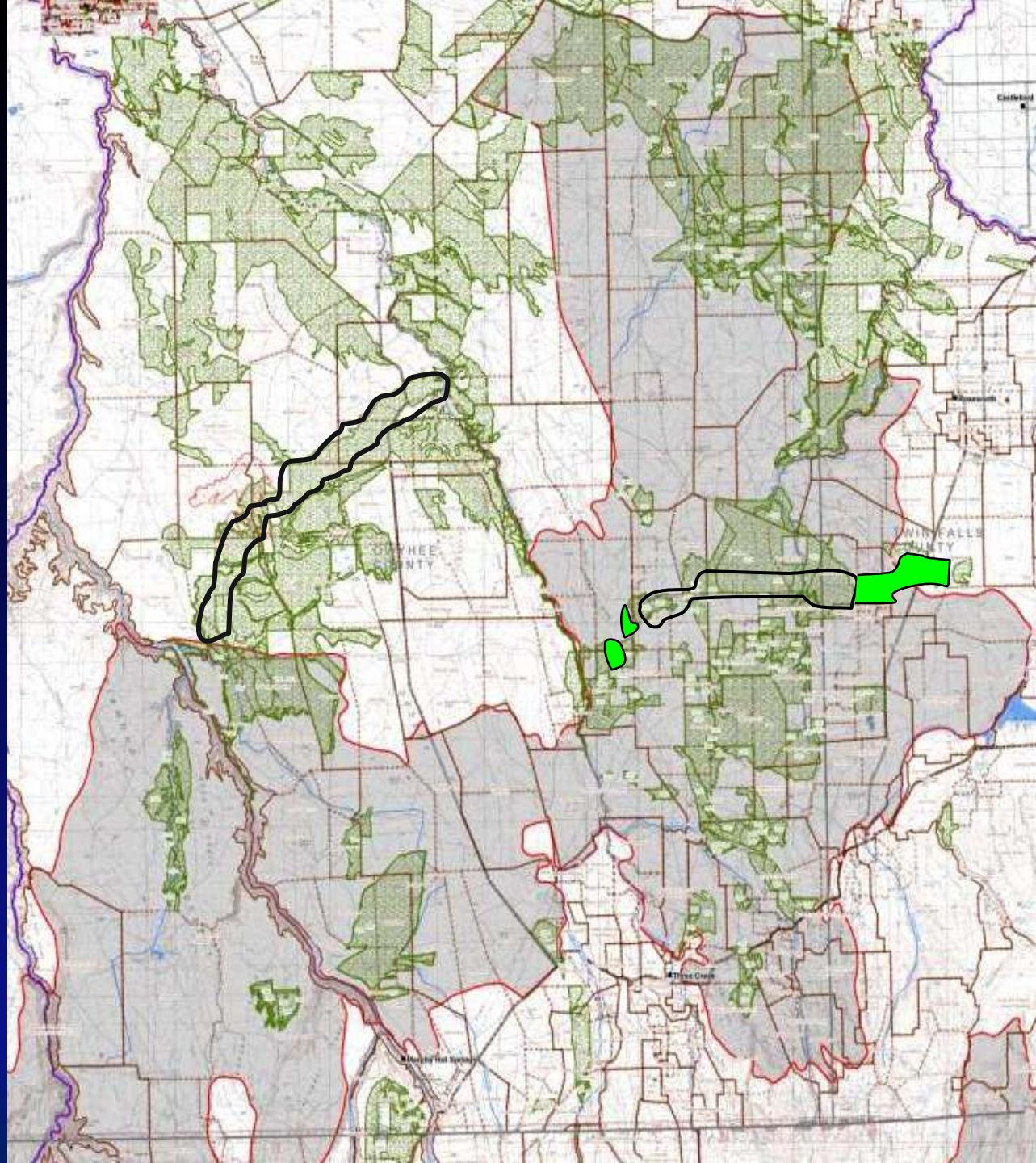
Murphy Complex Fire-August 2007



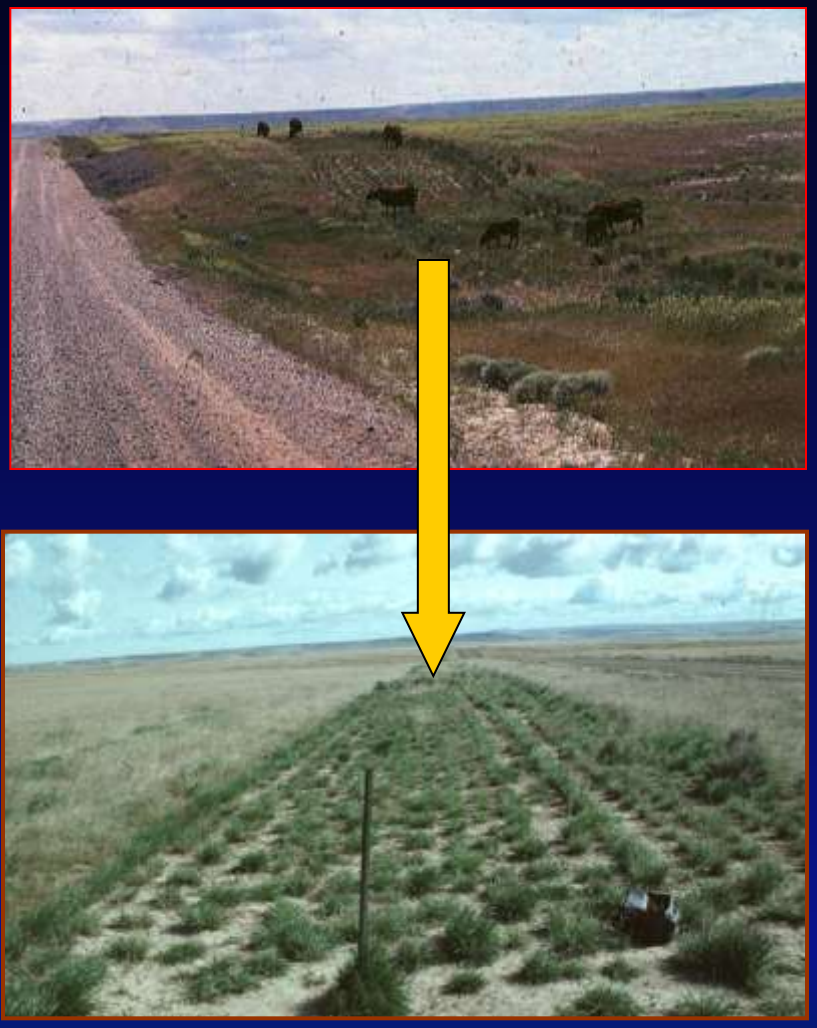
Differences in fire severity between seedings and sagebrush stands is not captured well with current models.

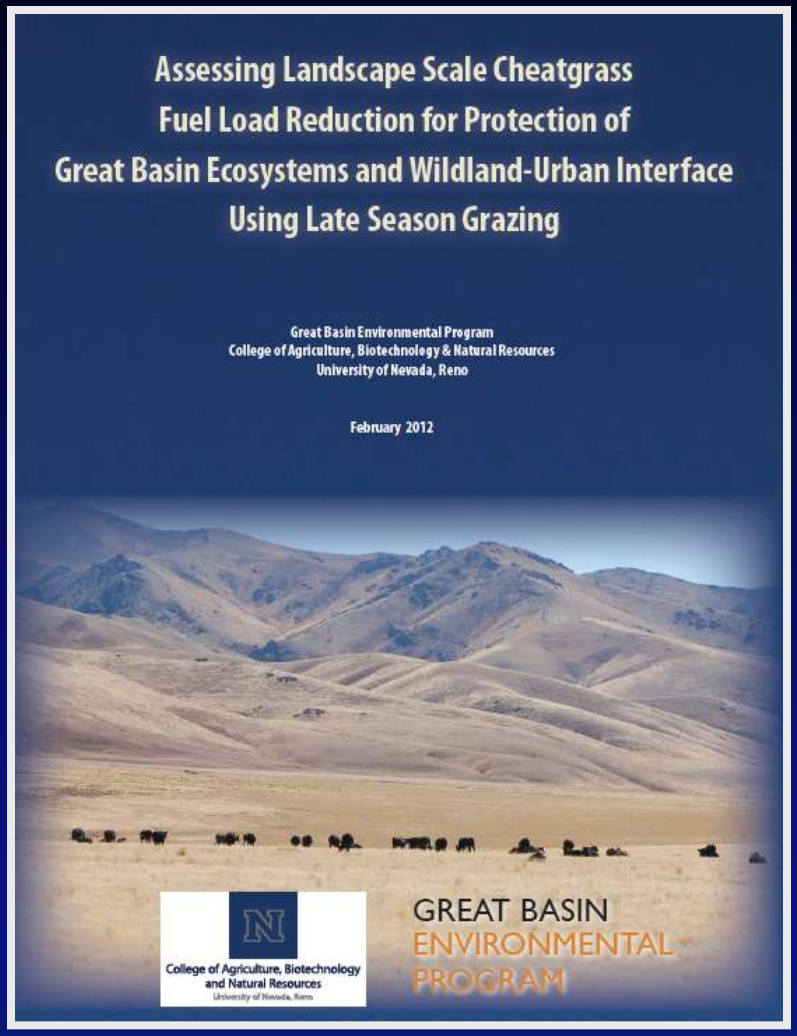
What is needed is a landscape not a project approach… **strategic** with a good **targeted grazing plan.**

Strategically link a system of grazed strips or bands across multiple grazing allotments.



Targeted Grazing on Greenstrips—1+1=3





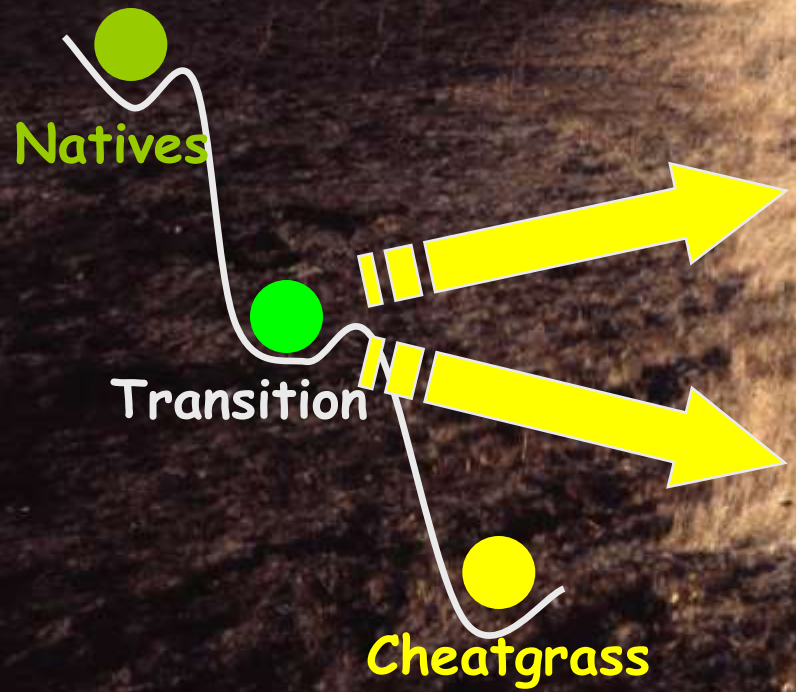
Great Basin Restoration Initiative

Restoration is, "a set of actions that promotes plant community diversity and structure that allows plant communities to be more resilient to disturbance and invasive species over the long-term."

The use of native species is, "recommended dependent on seed availability, cost, and chance for success."

Strategy to Convert Cheatgrass Rangelands to a Desired, Diverse Plant Community

Assisted Succession Model



The Great Basin Native Plant Selection & Increase Project

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

1. Seed collection

2. Evaluation and selection

3. Seed increase

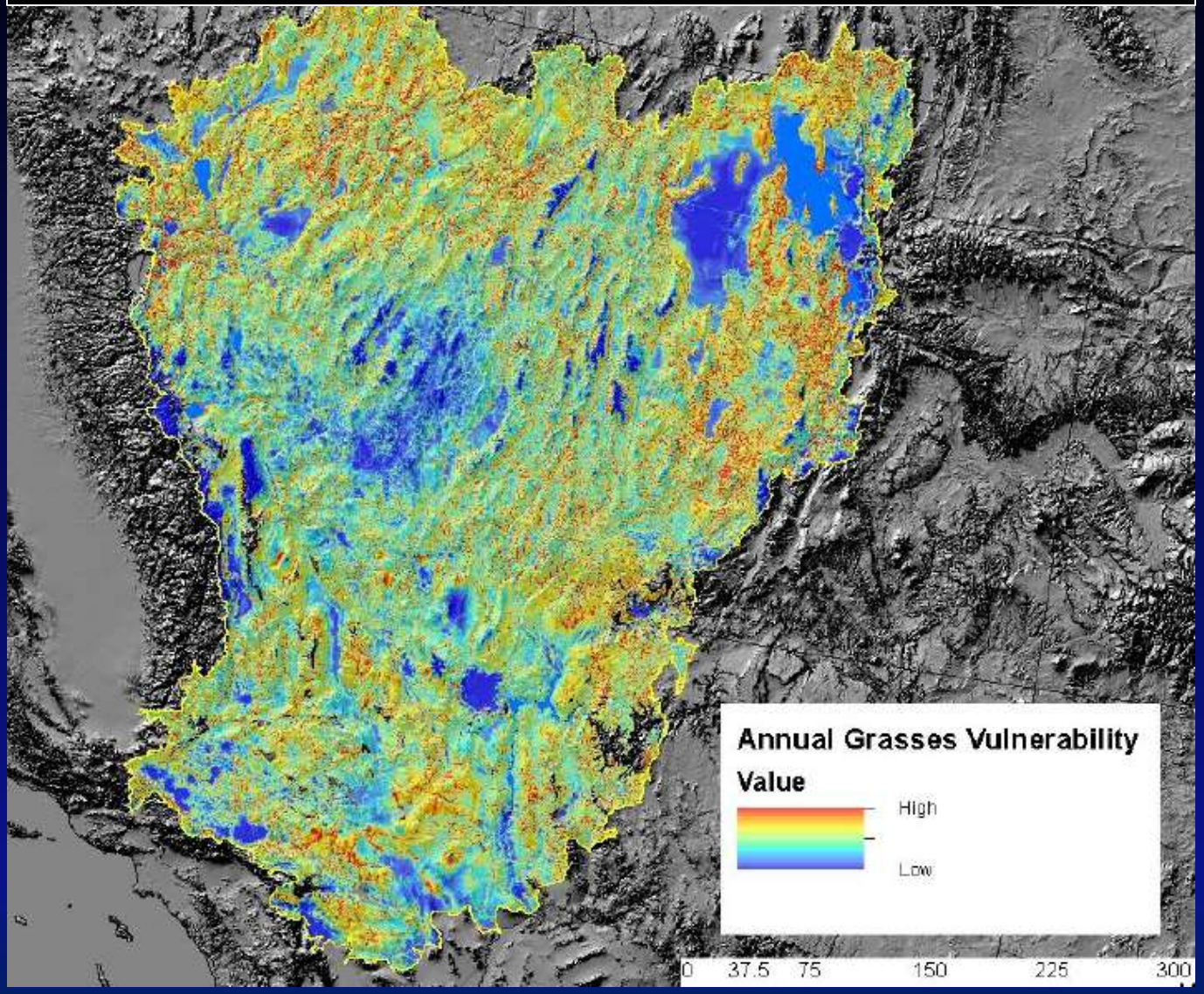
4. Seed production by private growers

5. Improved seeding technology

6. Healthy native plant communities

Restoration Prioritization

Central Basin & Range Rapid Ecoregional Assessment



Putting it all together- conserving and restoring the Great Basin :

1. Think big, landscape level actions.
2. Be strategic.
3. Promote resilient, sustainable landscapes.
4. Be together

Great Basin Consortium

RESEARCH. EDUCATION. OUTREACH. CONSERVATION.

"In this desert lies an ocean of shrubs… More than anything else, however, in this Great Basin lies a message about time."

Stephen Trimble

The Sagebrush Ocean: A Natural History of the Great Basin