

Fire, Fire Surrogates, and Restoration in the Sagebrush Steppe

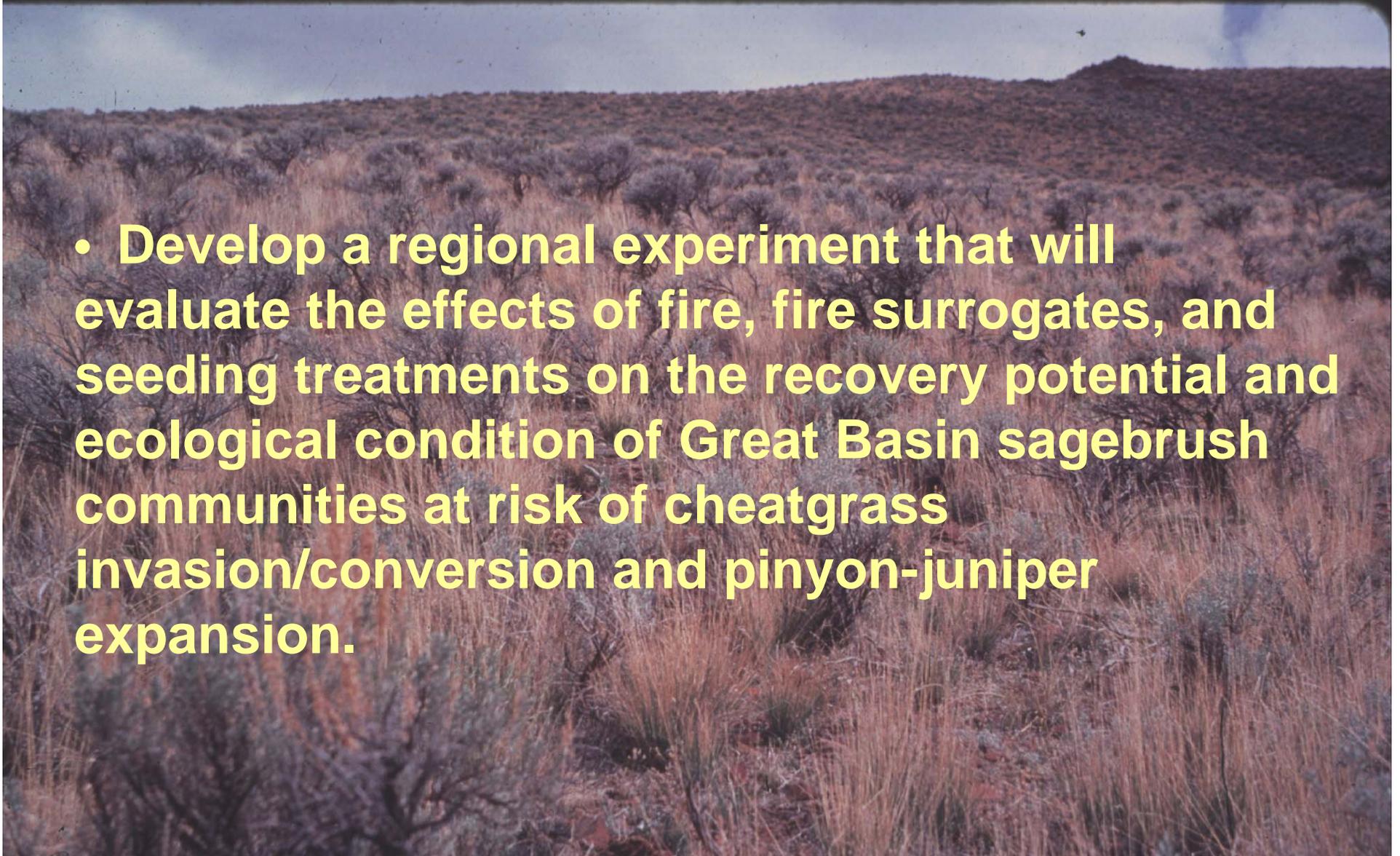
An Experiment to Address Management Needs

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A Joint Fire Sciences Program Funded
Proposal Development Effort

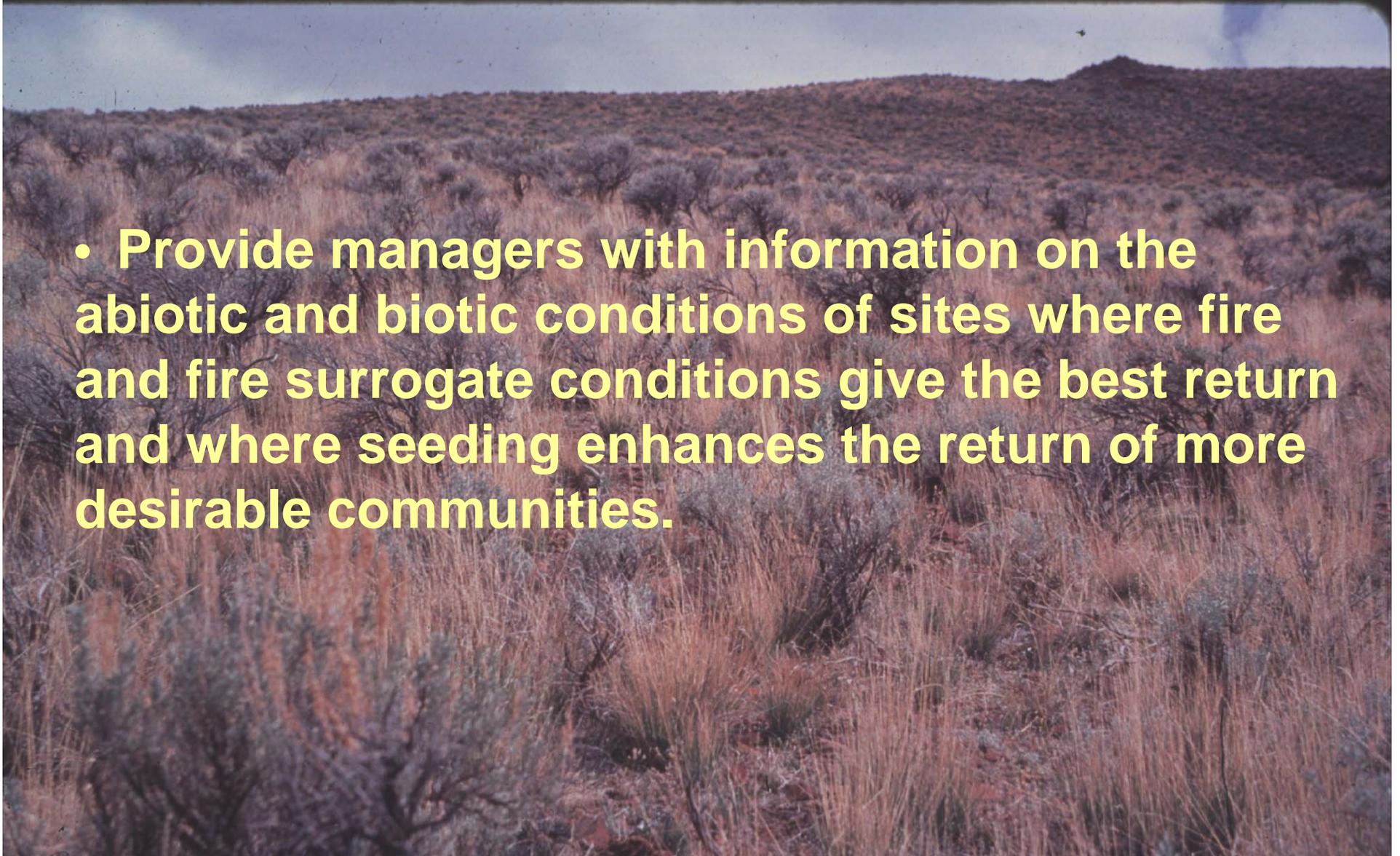
Project Research Goals

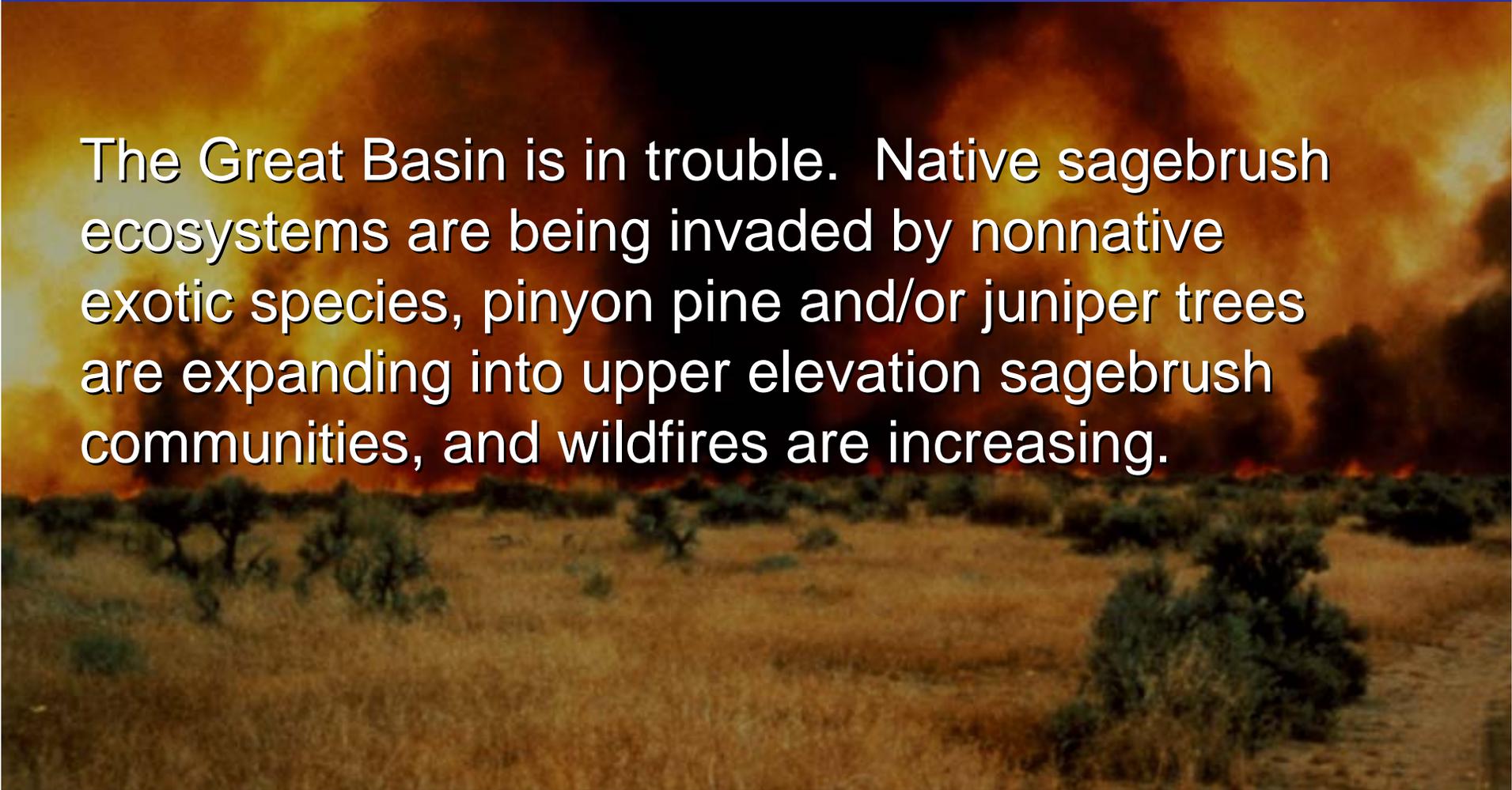
- **Develop a regional experiment that will evaluate the effects of fire, fire surrogates, and seeding treatments on the recovery potential and ecological condition of Great Basin sagebrush communities at risk of cheatgrass invasion/conversion and pinyon-juniper expansion.**



Project Research Goals

- Provide managers with information on the abiotic and biotic conditions of sites where fire and fire surrogate conditions give the best return and where seeding enhances the return of more desirable communities.

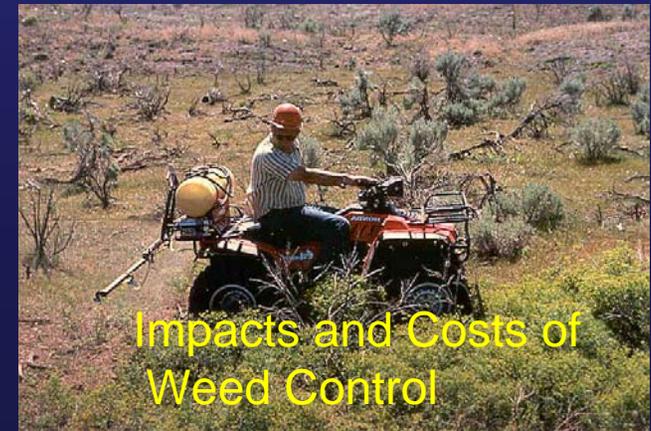
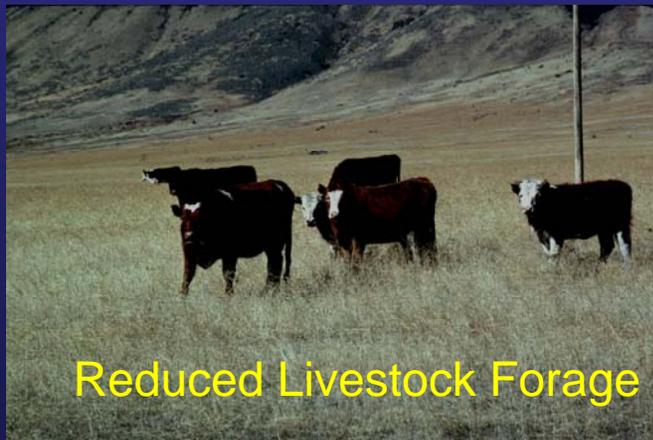


A photograph of a wildfire with thick, dark smoke rising into the sky, obscuring the background. The foreground shows a dry, grassy field with scattered shrubs.

The Great Basin is in trouble. Native sagebrush ecosystems are being invaded by nonnative exotic species, pinyon pine and/or juniper trees are expanding into upper elevation sagebrush communities, and wildfires are increasing.

“Restoration of the Great Basin needs to begin now. Tomorrow may be too late” (Healing the Land, BLM, 2000)

Communities and Economies at Risk



Wildlife at Risk



Sage thrasher



Big game (elk)

Sage sparrow



Sage grouse



Pygmy rabbit



Great Basin Biomes

Forest

Focus

Woodland

Sagebrush

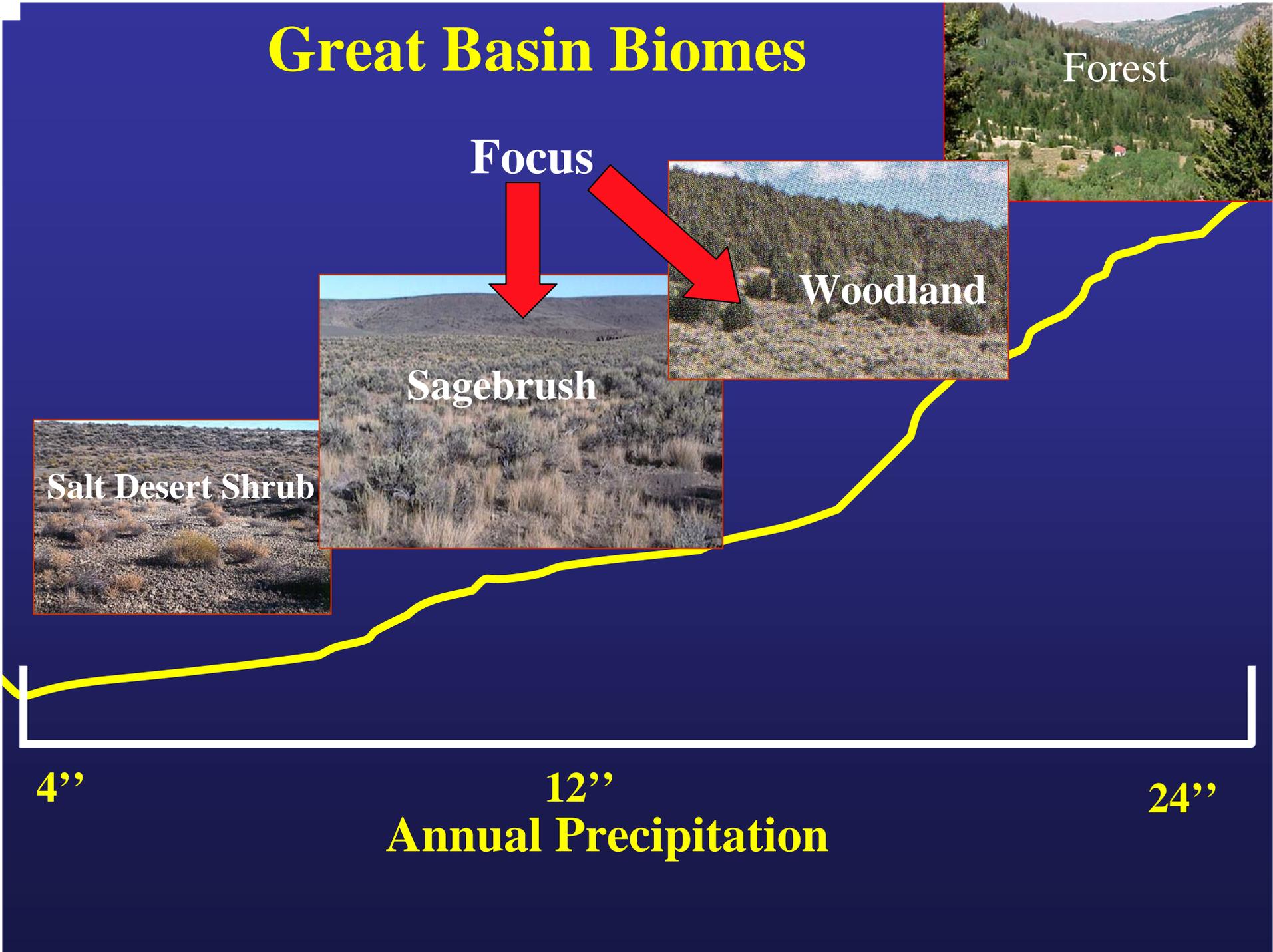
Salt Desert Shrub

4''

12''

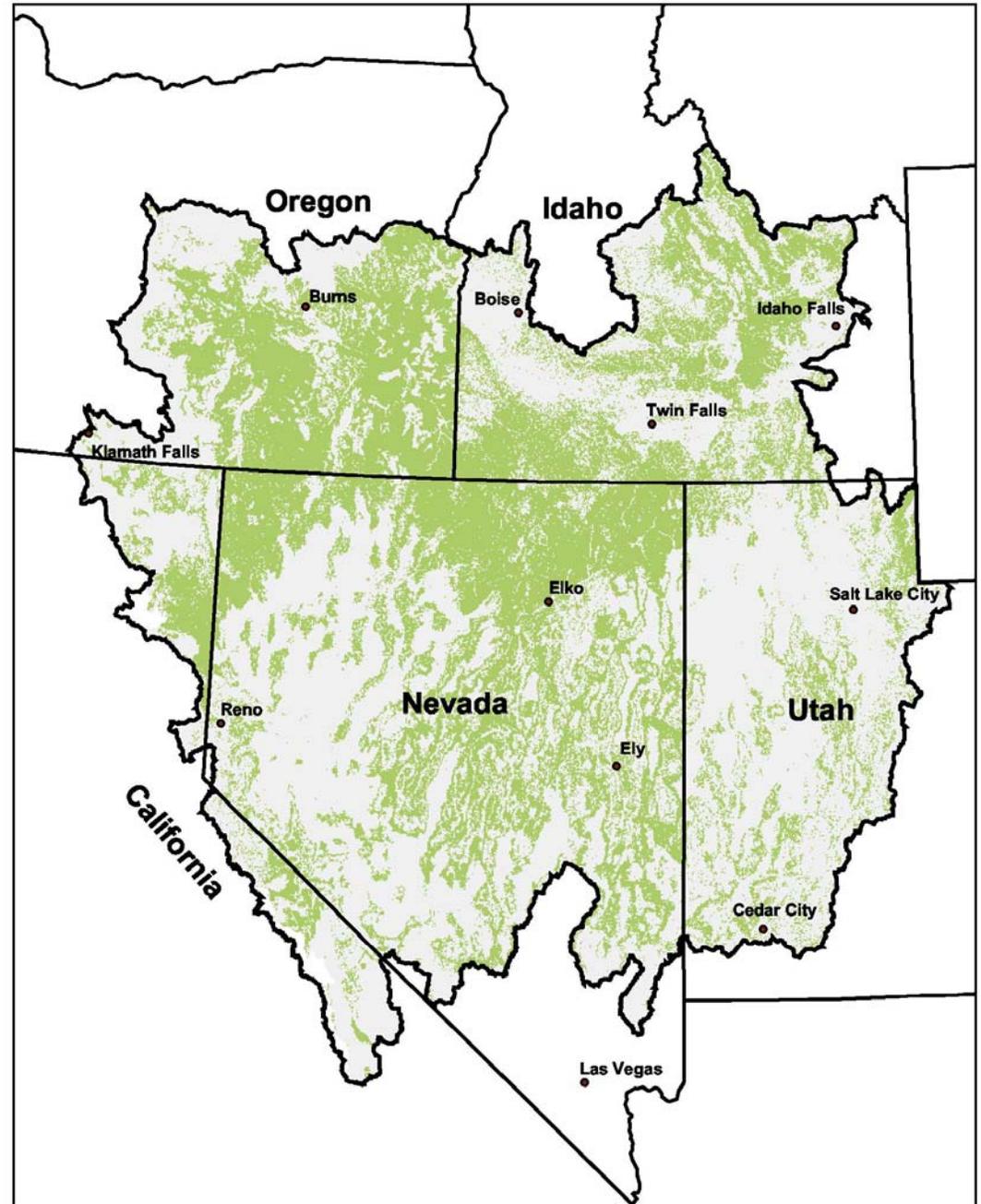
24''

Annual Precipitation

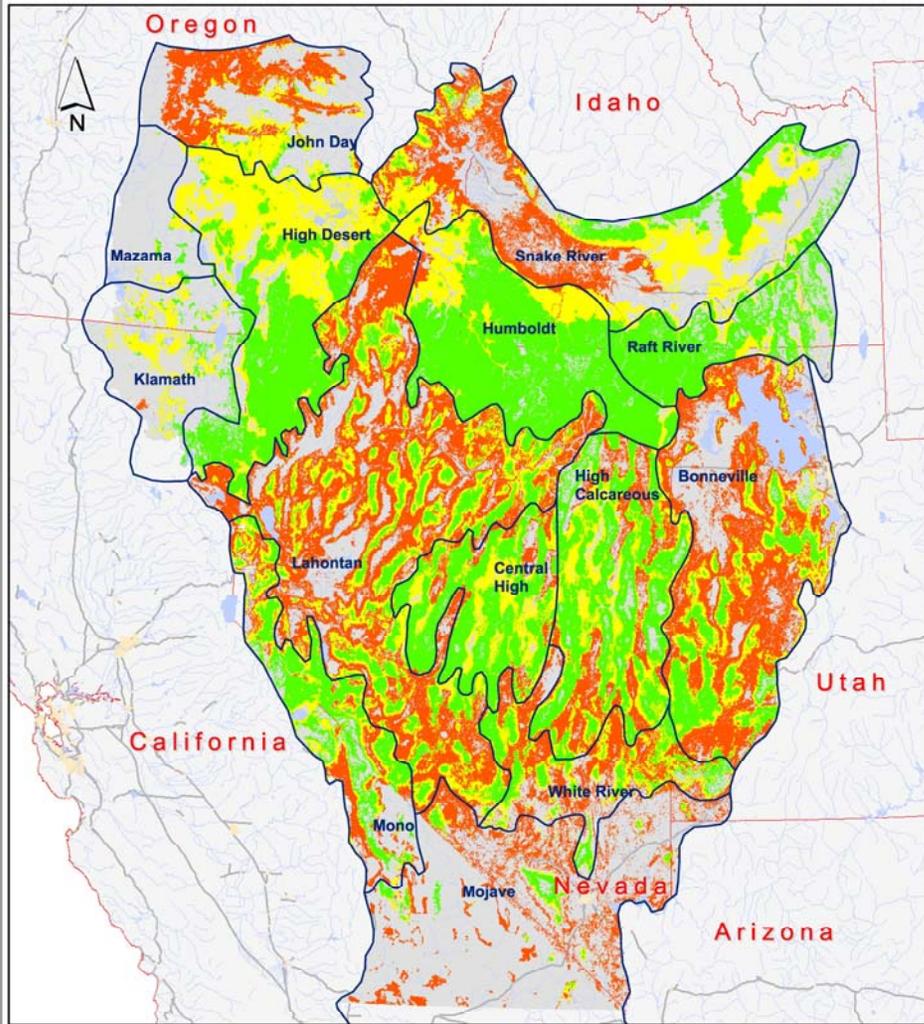


Sagebrush in the Great Basin

- 57 million acres of sagebrush in the Great Basin (54% of total remaining)
- Rapidly disappearing biome due to invasives, wildfires & conifer encroachment



Risk of Cheatgrass Displacement of Susceptible Native Vegetation



0 50 100 200 300 400 500 Kilometers

RISK ■ LOW ■ MODERATE ■ HIGH

NOT MODELLED

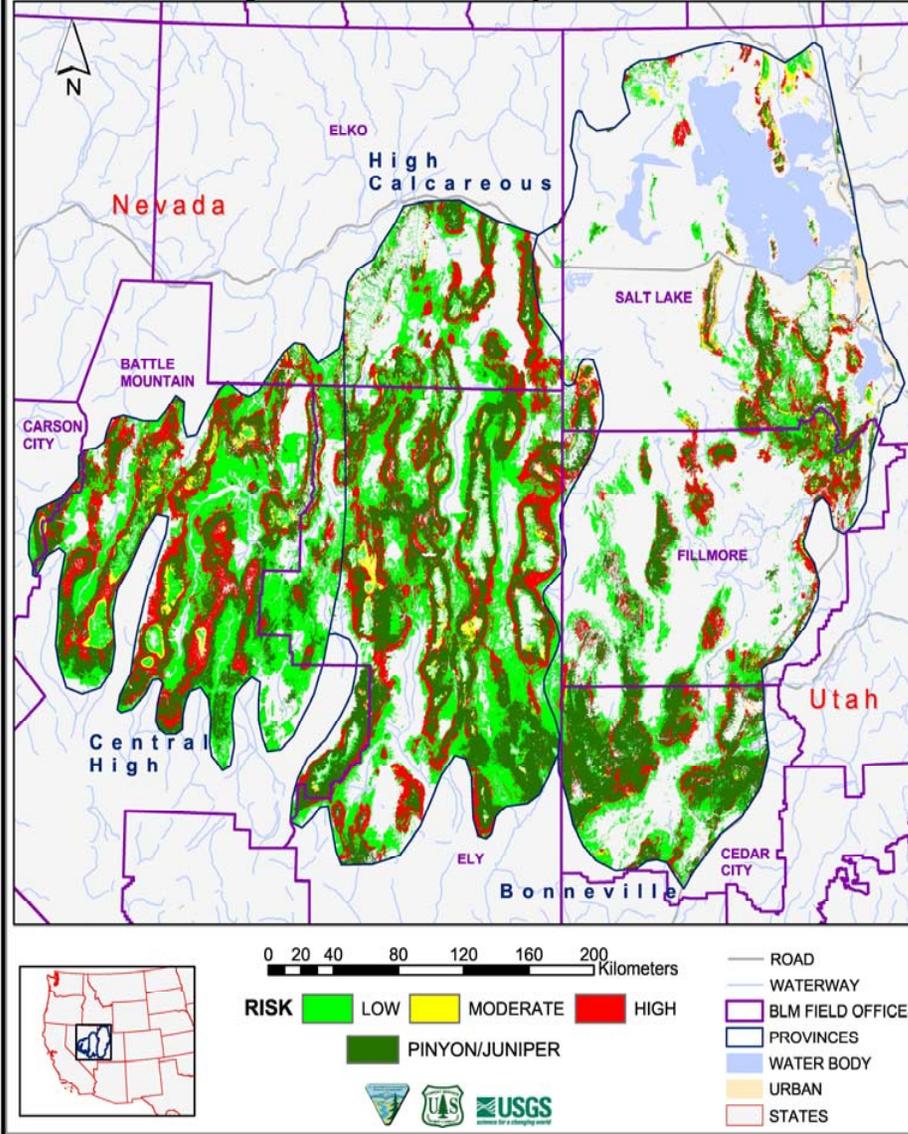
□ PROVINCES
 ■ URBAN
 — ROAD
 — WATERWAY
 ■ WATER BODY
 ■ STATES



6 February 2003



Modelling the Risk of Sagebrush Displacement by Pinyon Pine and Juniper Invasion



10 February 2003





Goal– Healthy sagebrush communities that support sustainable resources and uses.

Steps to Accomplish Goal:

- **Science**
- **Inventory and Assessment**
- **Implementation**
- **Monitoring and Evaluation**



Research Design

- Operational Scale
- Inter-disciplinary
- Multi-site, multi-State
- Test alternative treatments
- Focus on “at risk” sagebrush communities
- Applicable to management needs



Disciplines Represented on Research Team



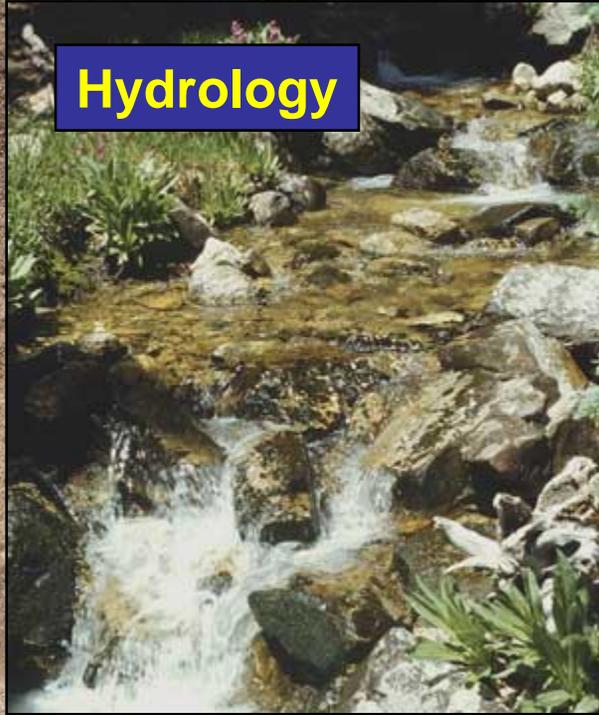
Vegetation/Fuels



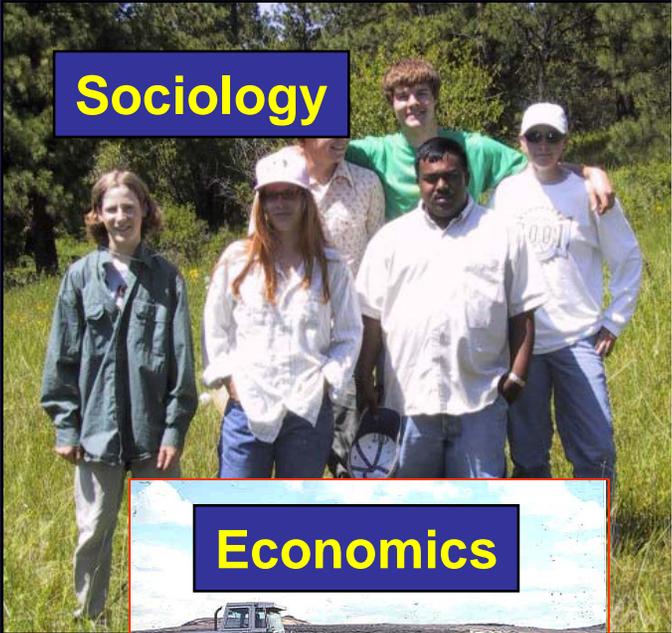
Wildlife



Soils



Hydrology



Sociology



Economics

Triage Concept:

Management Use

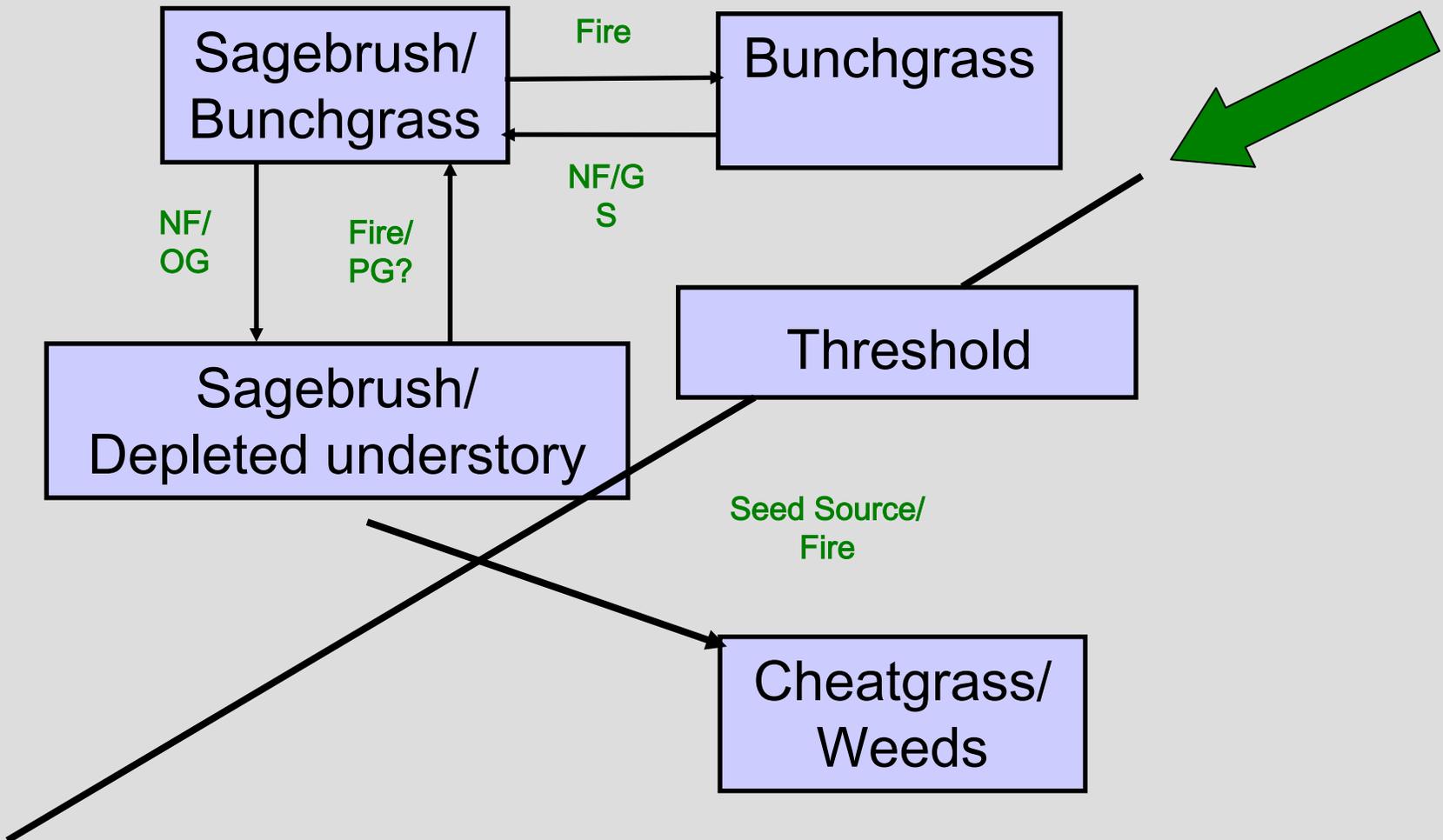
Targeting areas that will give the greatest returns

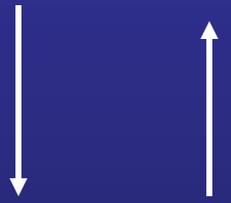
Research Use

Define the recovery thresholds



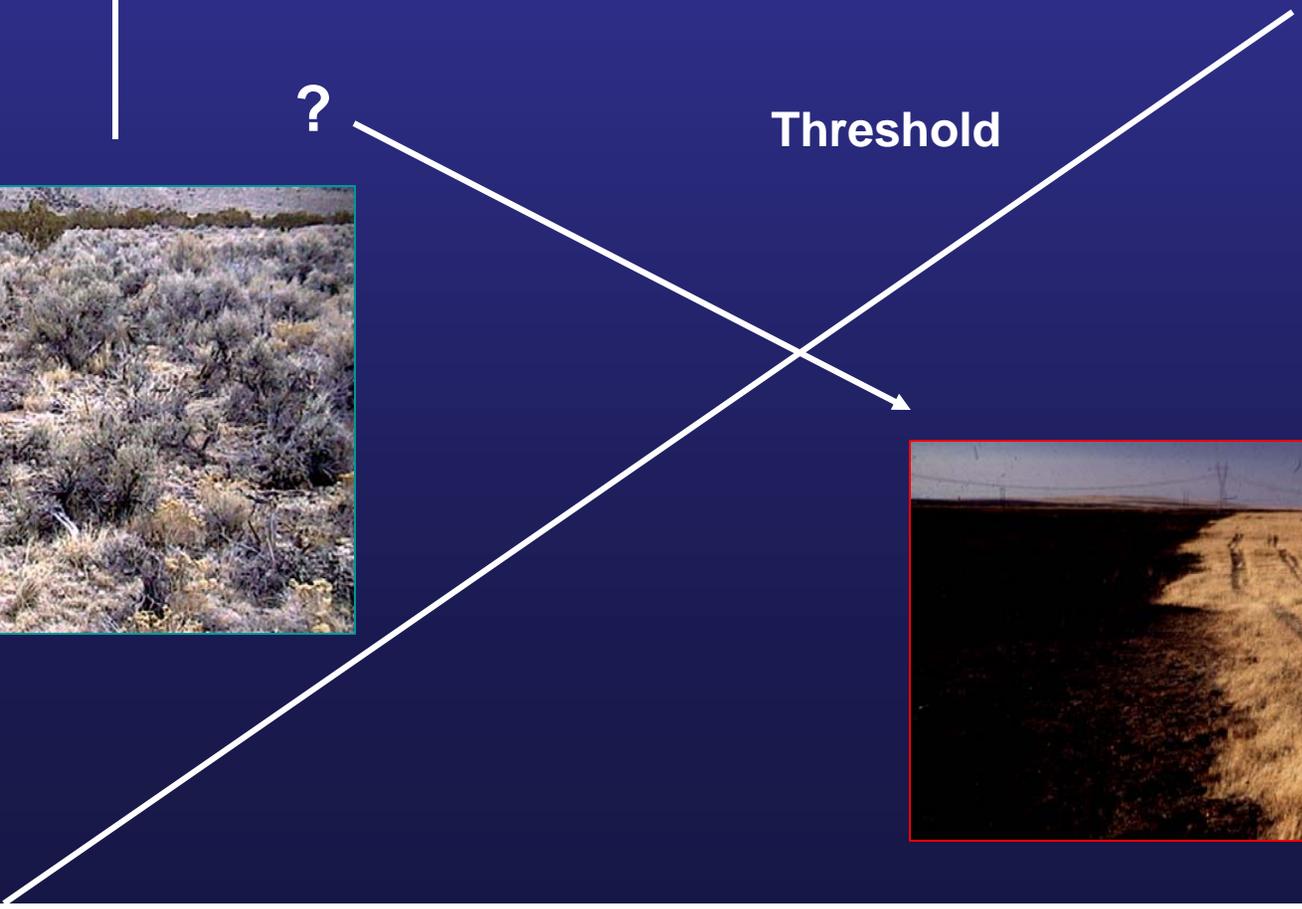
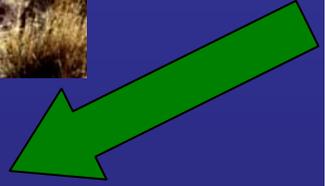
Sagebrush -Focus on Threshold Communities



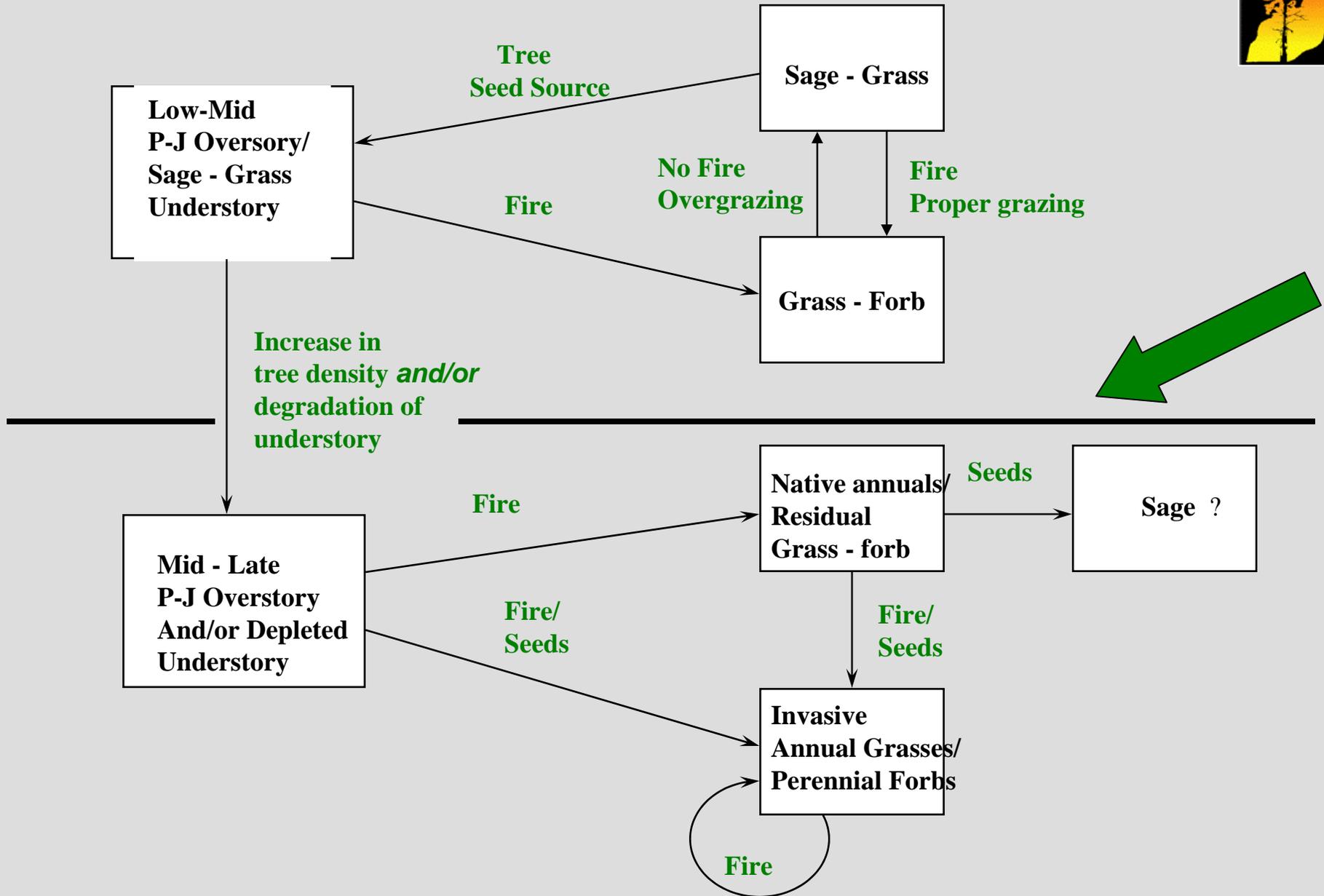
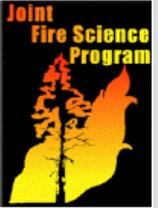


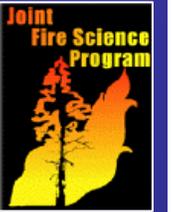
?

Threshold

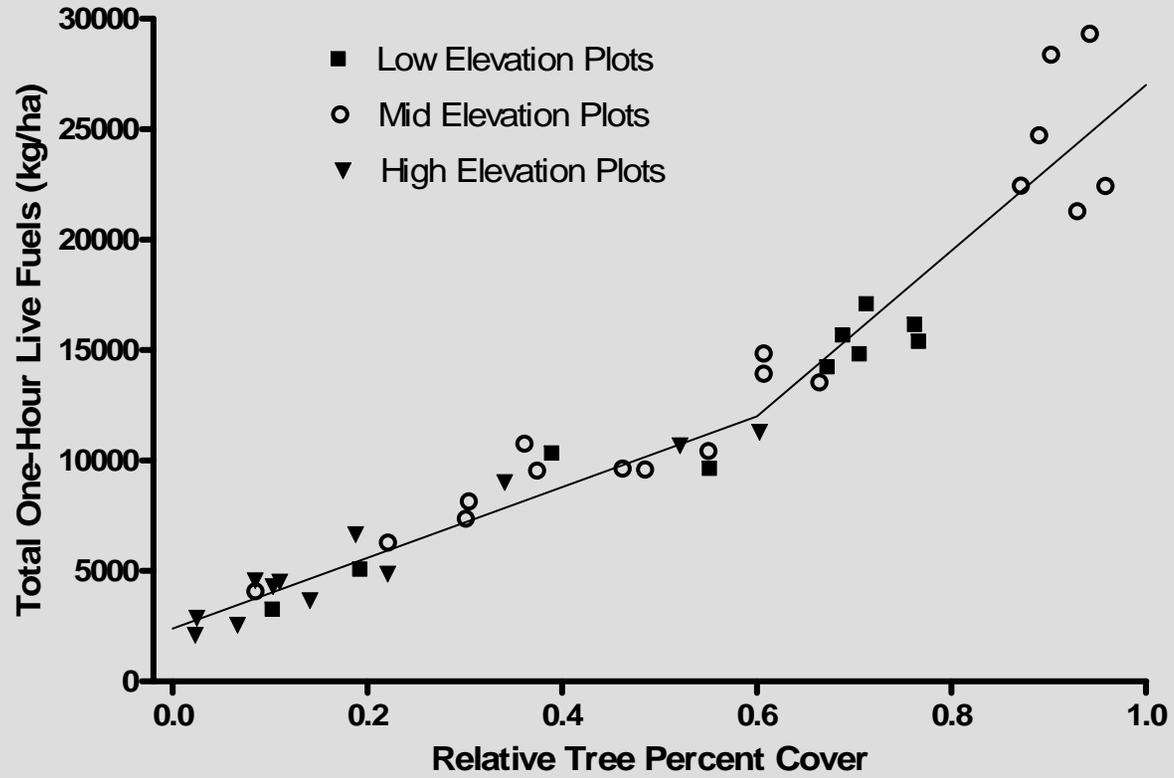


Woodlands – Focus on Thresholds Resulting from Increasing Tree Dominance











Ecological Provinces Selected for Study

= Sagebrush/
Cheatgrass

** = Sagebrush/Juniper
or Pinyon/juniper



Sagebrush / Cheatgrass Conversion

The three Ecological Provinces will have an average of five research locations, for a total of 15 over the Great Basin.

The treatments on each location will each be 200 acres in size.

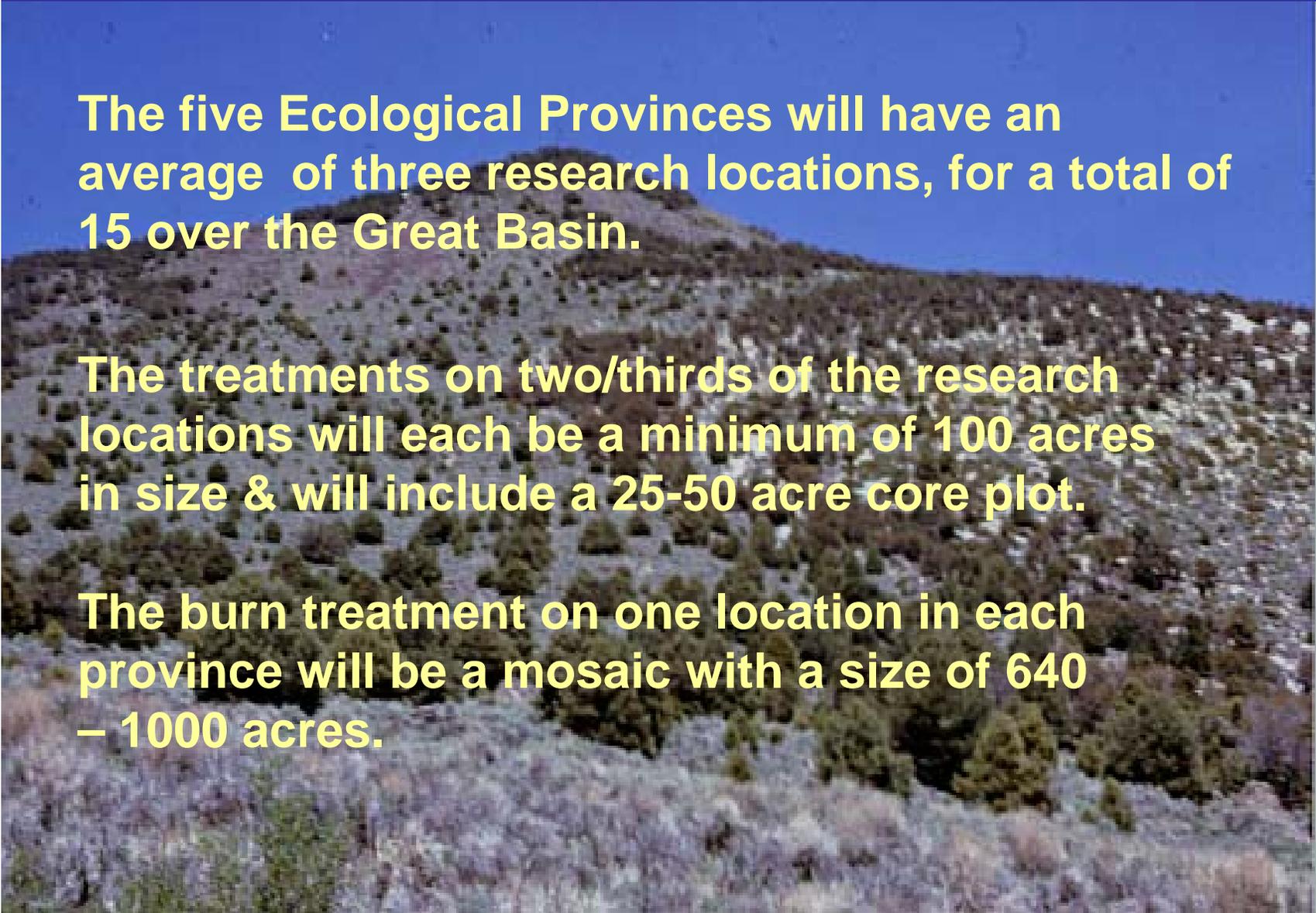


Sagebrush / P-J Encroachment

The five Ecological Provinces will have an average of three research locations, for a total of 15 over the Great Basin.

The treatments on two-thirds of the research locations will each be a minimum of 100 acres in size & will include a 25-50 acre core plot.

The burn treatment on one location in each province will be a mosaic with a size of 640 – 1000 acres.



Proposed Sagebrush / Cheatgrass Treatments



Prescribed Fire



Herbicide



Split plot with and without Herbicide

Brush Control



Control



Elective treatments selected by local manager?

Proposed Sagebrush / P – J Treatments

- 
- Prescribed Fire
 - Hand cut and lay along contour
 - Split plot with and without seeding
 - Control
- Elective treatments selected by local manager?



Researchers will generate results that will be able to answer question such as:

- Under what circumstances do different treatments successfully reduce fuels and restore desirable conditions?
- What are the most important variables to monitor following treatment, and what are their protocols?
- What is the likelihood that a particular treatment will result in the desired improvement in condition?
- What are the relative costs of different treatments, and how do these costs compare with the effectiveness of each?

**Importance of management collaboration
and partnership in the project.**

Refine project goals

Assist project design

Provide input for study site selection

Help select and Implement treatments

Ultimate goal:

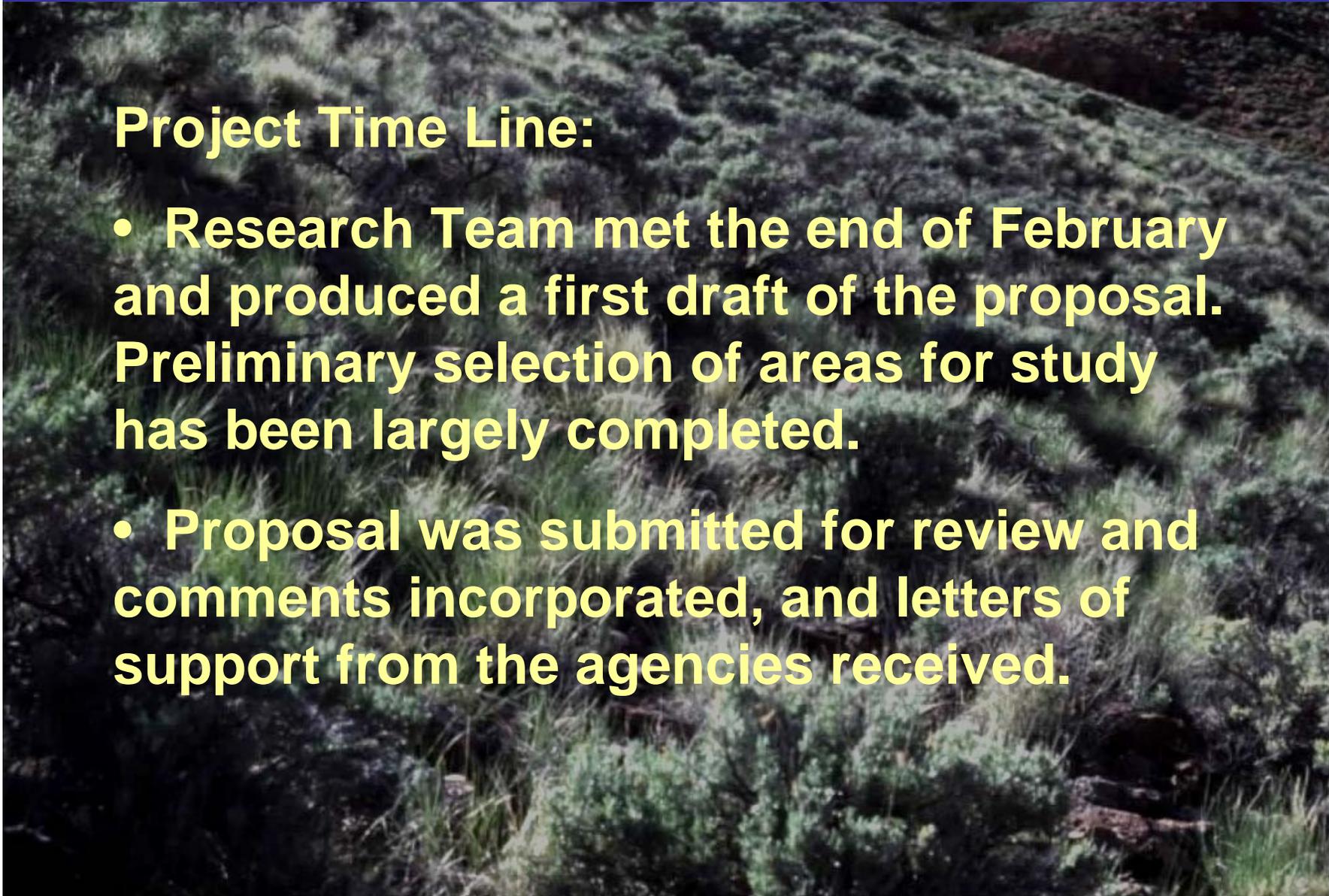
Provide managers with the tools needed to effectively restore “at risk” sagebrush communities in the Great Basin.



Sagebrush / Cheatgrass Conversion

Project Time Line:

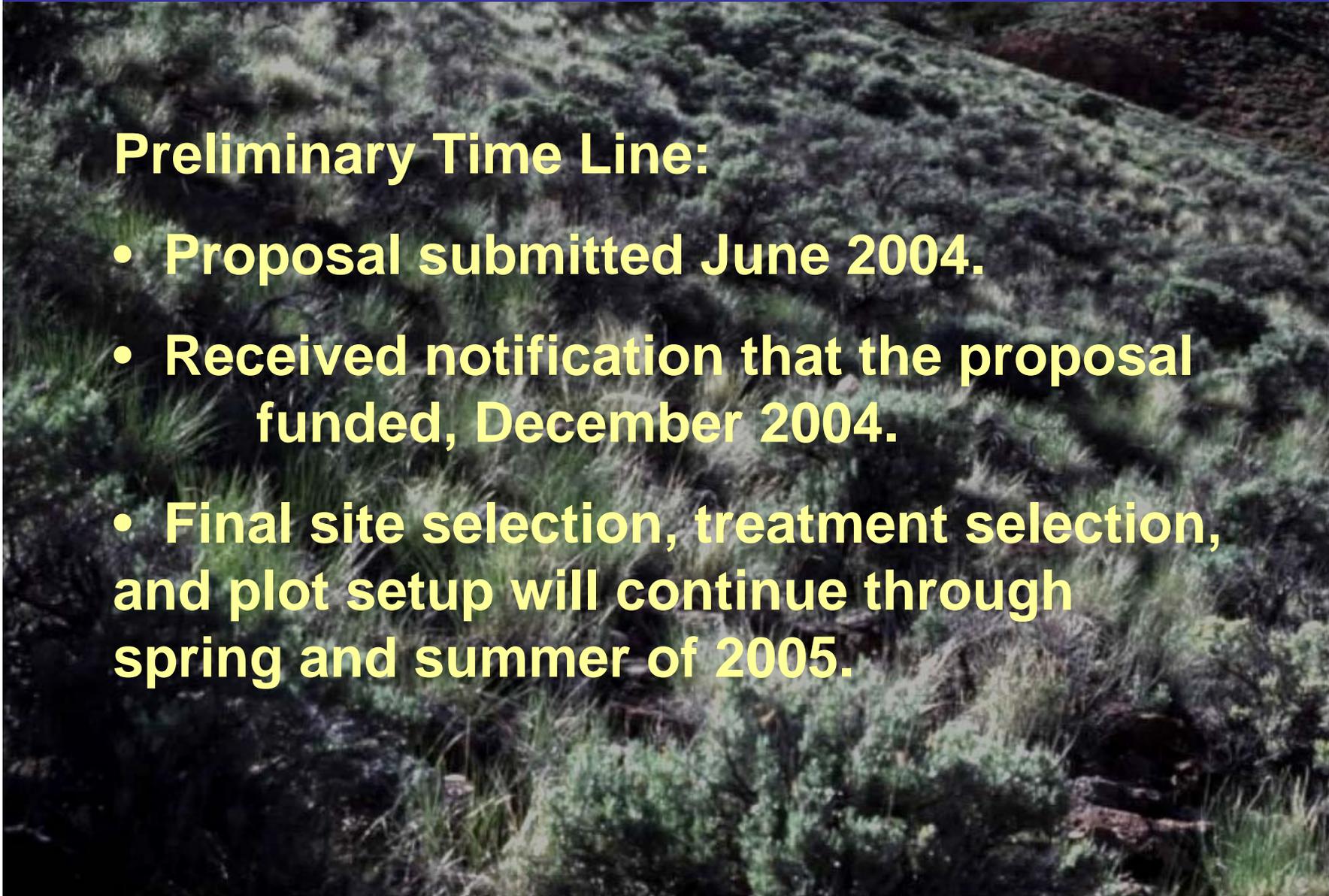
- **Research Team met the end of February and produced a first draft of the proposal. Preliminary selection of areas for study has been largely completed.**
- **Proposal was submitted for review and comments incorporated, and letters of support from the agencies received.**



Sagebrush / Cheatgrass Conversion

Preliminary Time Line:

- **Proposal submitted June 2004.**
- **Received notification that the proposal funded, December 2004.**
- **Final site selection, treatment selection, and plot setup will continue through spring and summer of 2005.**



Sagebrush / Cheatgrass Conversion

Preliminary Time Line:

- **Pre-treatment sampling during the spring and summer of 2006.**
- **Beginning of treatments during the fall of 2006.**
- **Treatments completed the spring of 2007.**
- **All sites monitored for the duration of the project and beyond as additional funding permits.**