

# **“Before the Fire: Rangeland Mitigation Treatments that Work”**

*The Next Steppe Conference*

Thursday, November 6, 8:50 a.m. – 11:35 a.m.

**Moderator:**

**Jim Stovall, BLM**

**Presenters:**

**Dr. Jim McIver, Oregon State University**

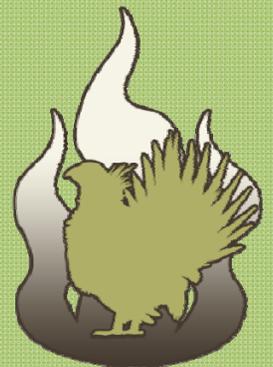
**Lance Okeson, BLM**

**Bob Unnasch, The Nature Conservancy**

**Mike Fetic, BLM**

**Dr. Terry Messmer, Utah State University**

**Todd Black, Deseret Land and Livestock**





## TOUCH ON SEVEN TOPICS

The SageSTEP Study  
Water 'Production'  
Primacy of Native Perennial Grasses  
Sagebrush Concerns  
The Shifting Mosaic  
Livestock Grazing  
Sagebrush Obligate Passerines

# Short-term Effects of Sagebrush Steppe Restoration Treatments on Herbaceous Vegetation: the SageSTEP Project

## FUNDED BY:



2003-2010



2010-present



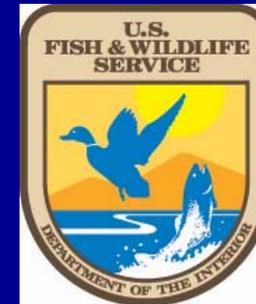
2010-present



GNLCC  
GBLCC

2011  
2014

# COLLABORATORS



University of Nevada, Reno

**BYU**

BRIGHAM YOUNG  
UNIVERSITY

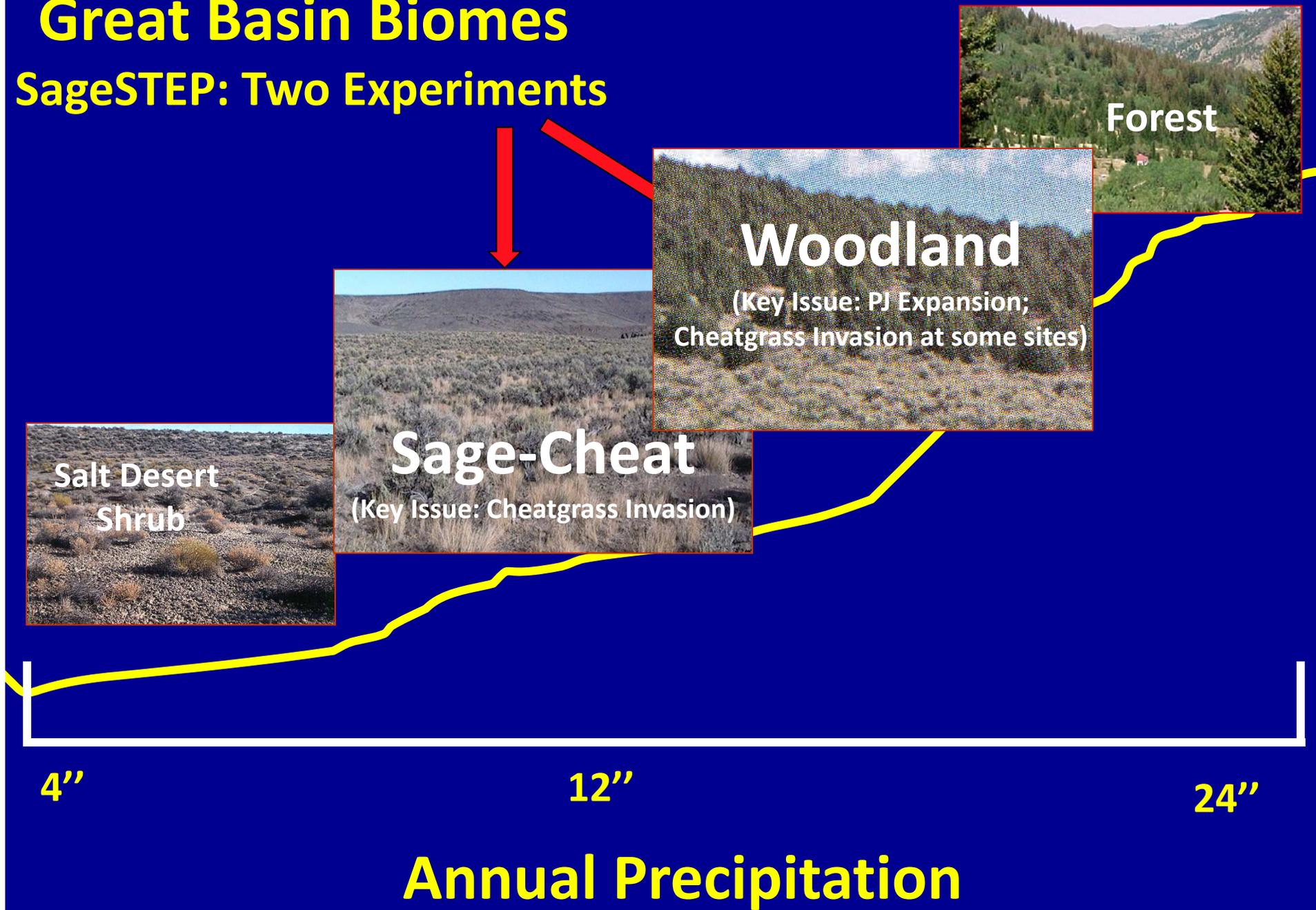


University  
of Idaho



# Great Basin Biomes

## SageSTEP: Two Experiments



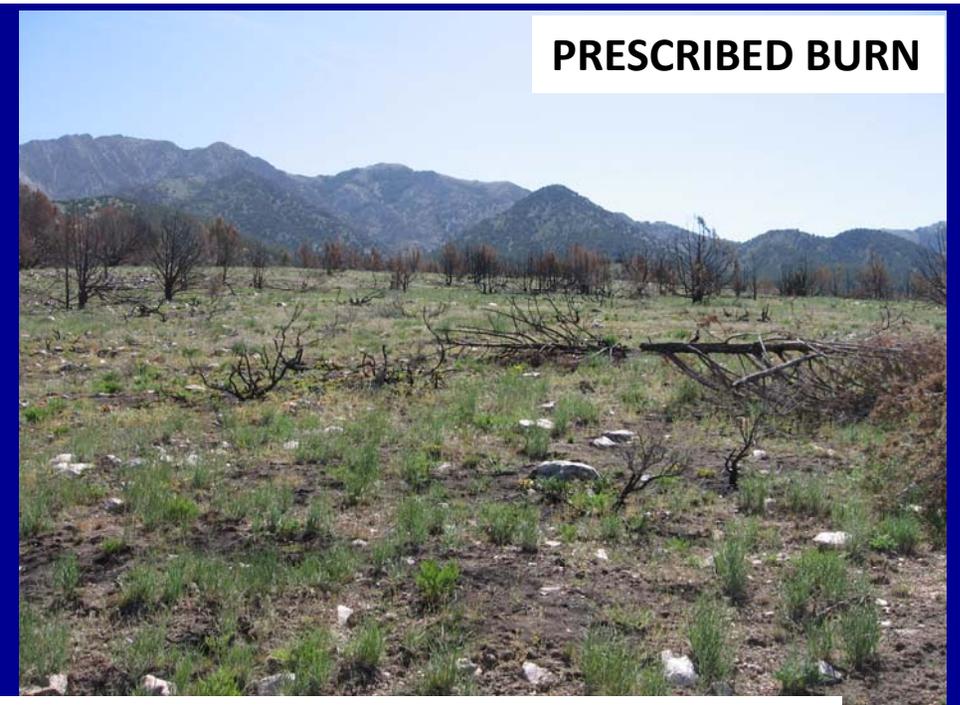
# Pinyon-Juniper Expansion



**Shoshone Mountains, Nevada**  
(Photos by Robin Tausch)



**CONTROL**



**PRESCRIBED BURN**

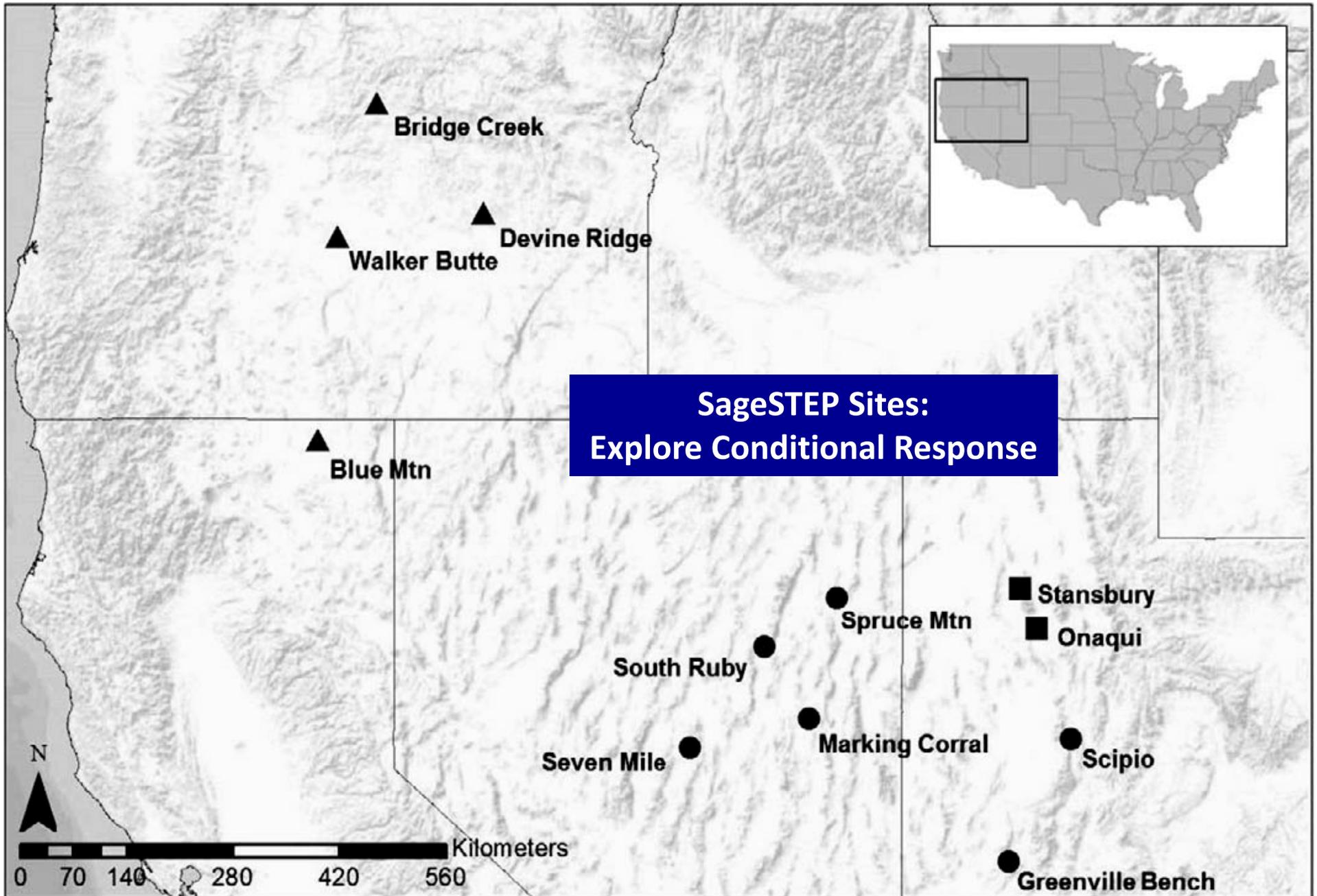
**STANSBURY PLOTS (2008): ONE YEAR AFTER 2007 TREATMENT**



**CLEARCUT**



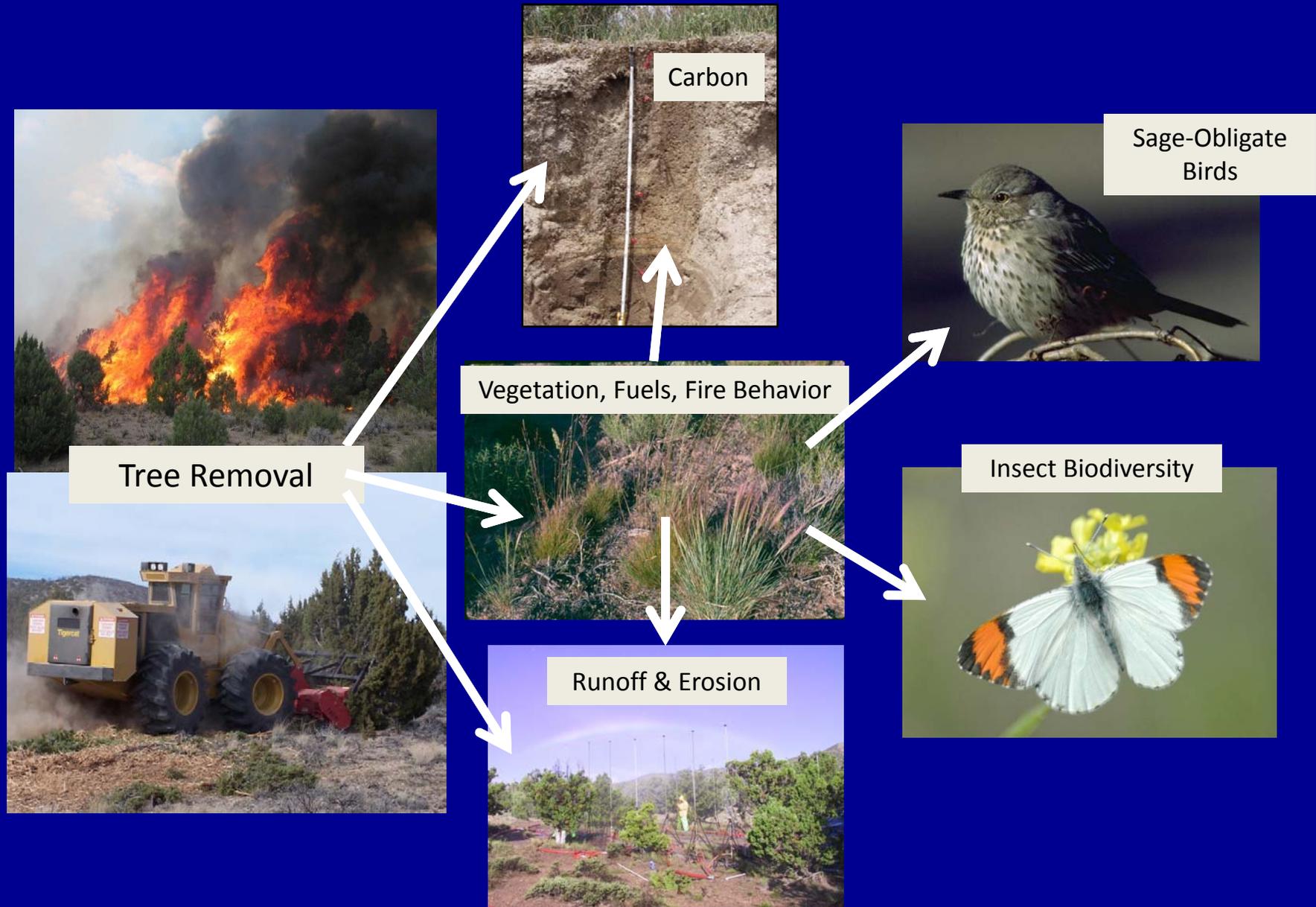
**MASTICATION**



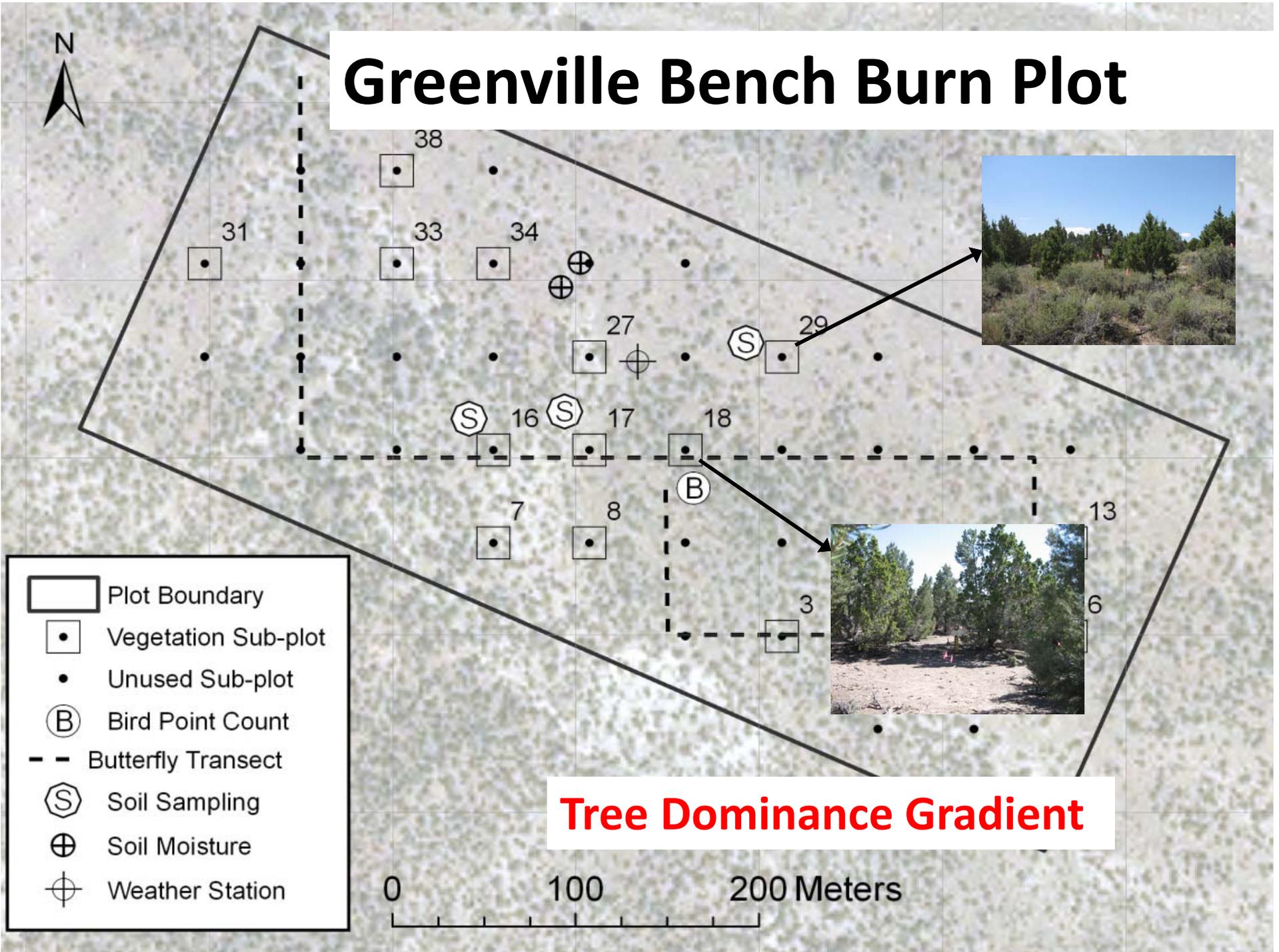
### Regional Categories

- ▲ Western Juniper
- Utah Juniper
- Mixed Community

# Whole System Response



# Greenville Bench Burn Plot





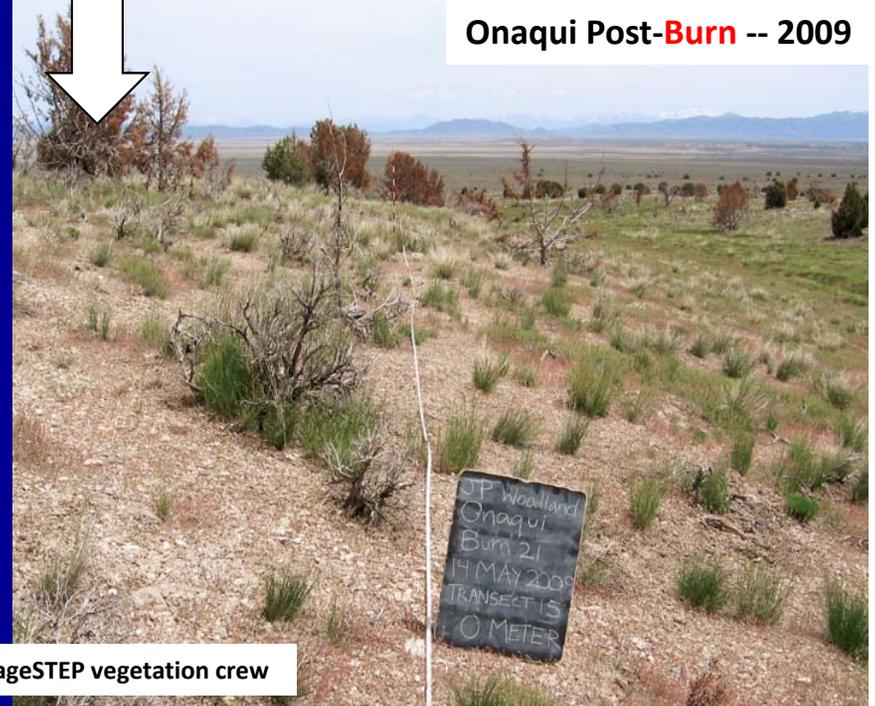
Onaqui **Cut** -- 2006



Onaqui Pre-**Burn** -- 2006



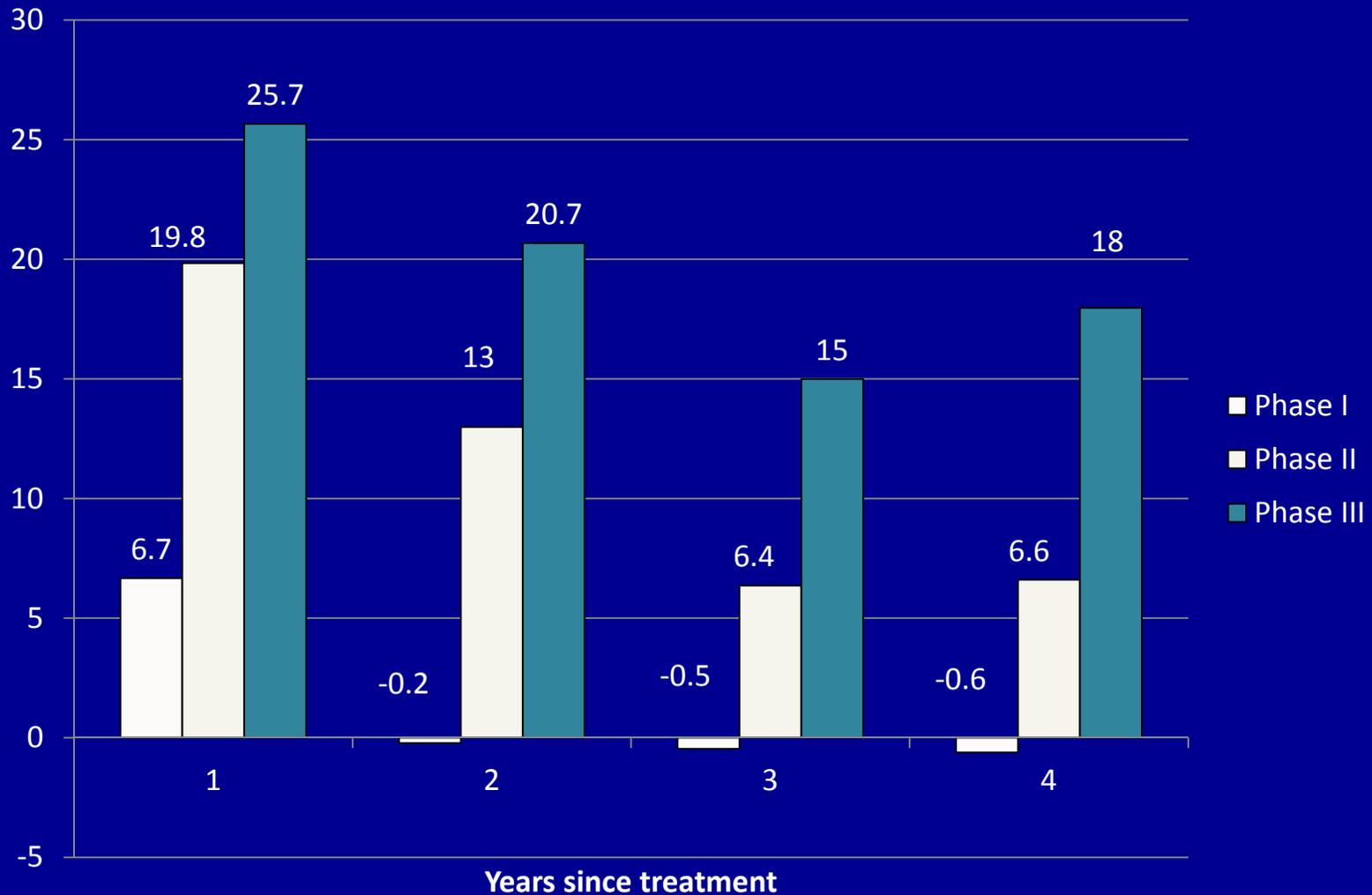
Onaqui **Cut** -- 2009



Onaqui Post-**Burn** -- 2009

# Removing trees increases available soil water

Additional days of soil water March-June



# ECOLOGICAL RESILIENCE

2007: Pre

WJ-BMCP-  
Fi-4-07

2008: Post 1yr

2010: Post 3yr

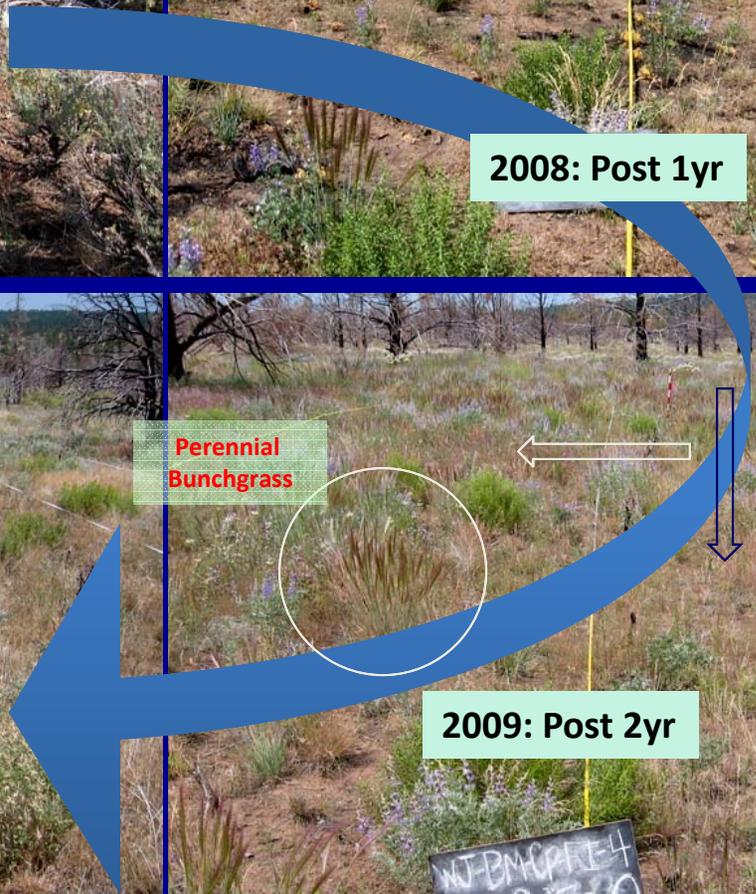
2009: Post 2yr

Perennial  
Bunchgrass

Cheatgrass

Perennial Forb

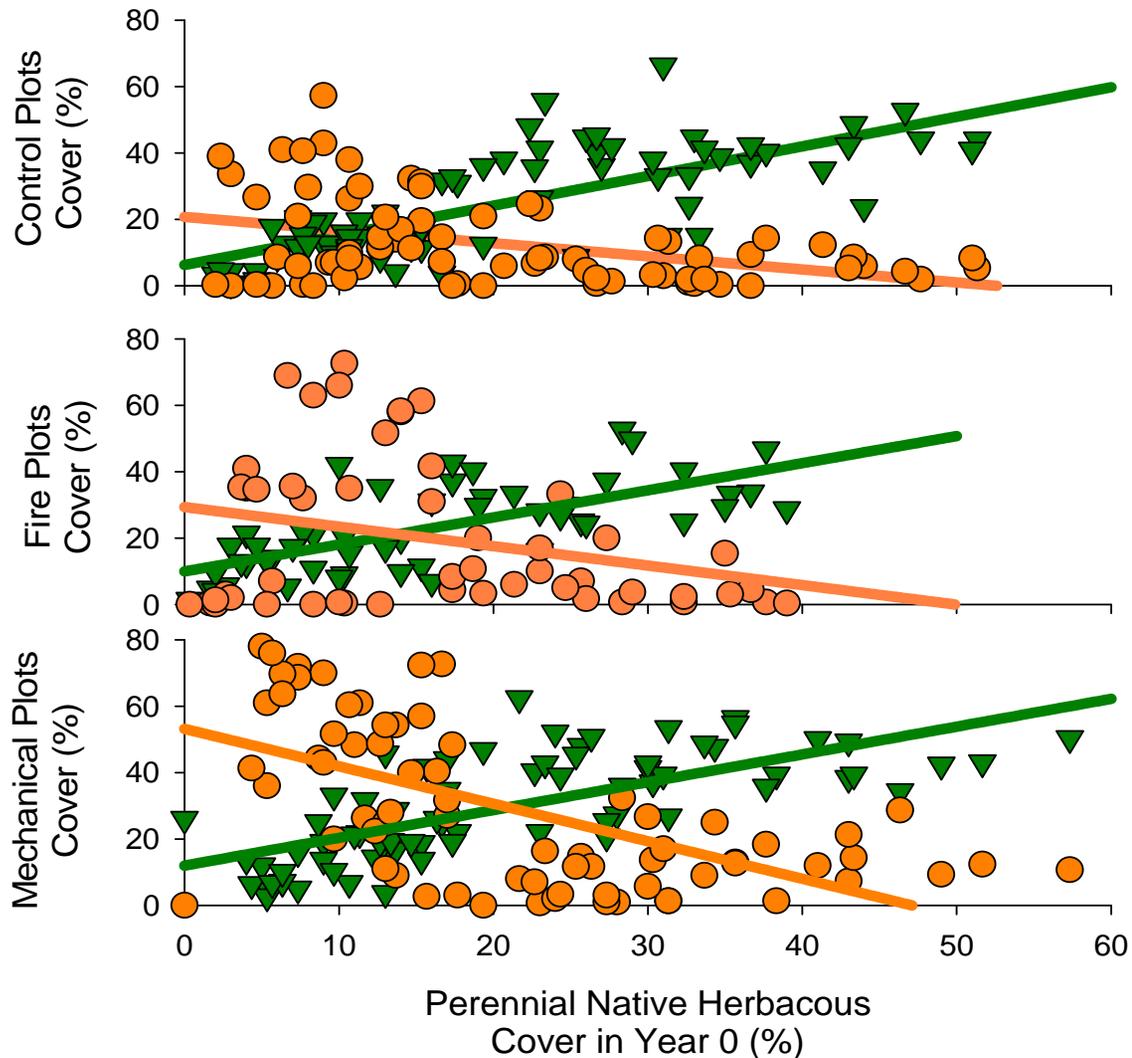
Blue Mt Western Juniper Site, Prescribed Burn Plot, Sub-Plot 4



HIGH R

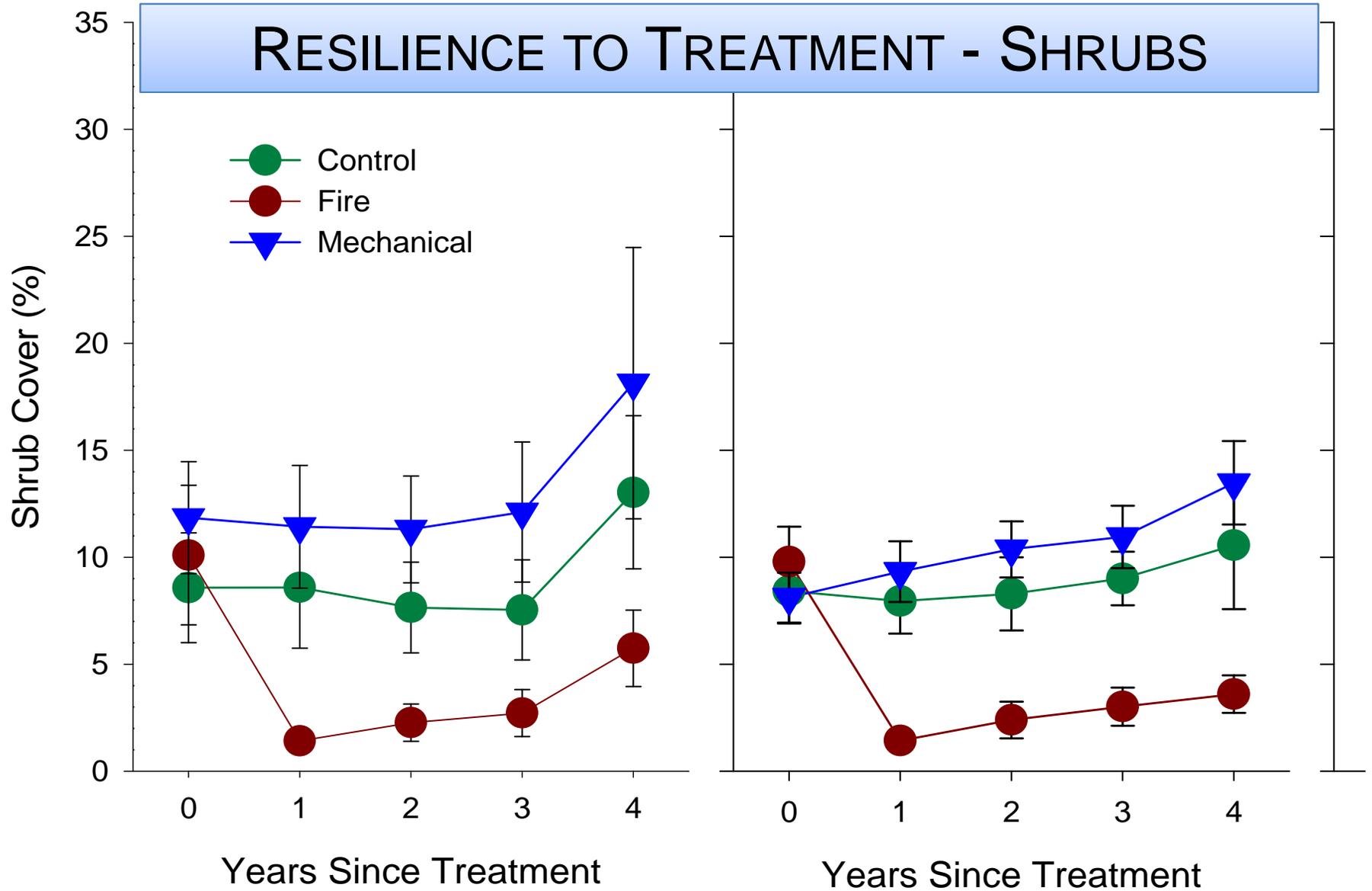
# The Importance of Initial Native Perennial Grass & Forb Cover

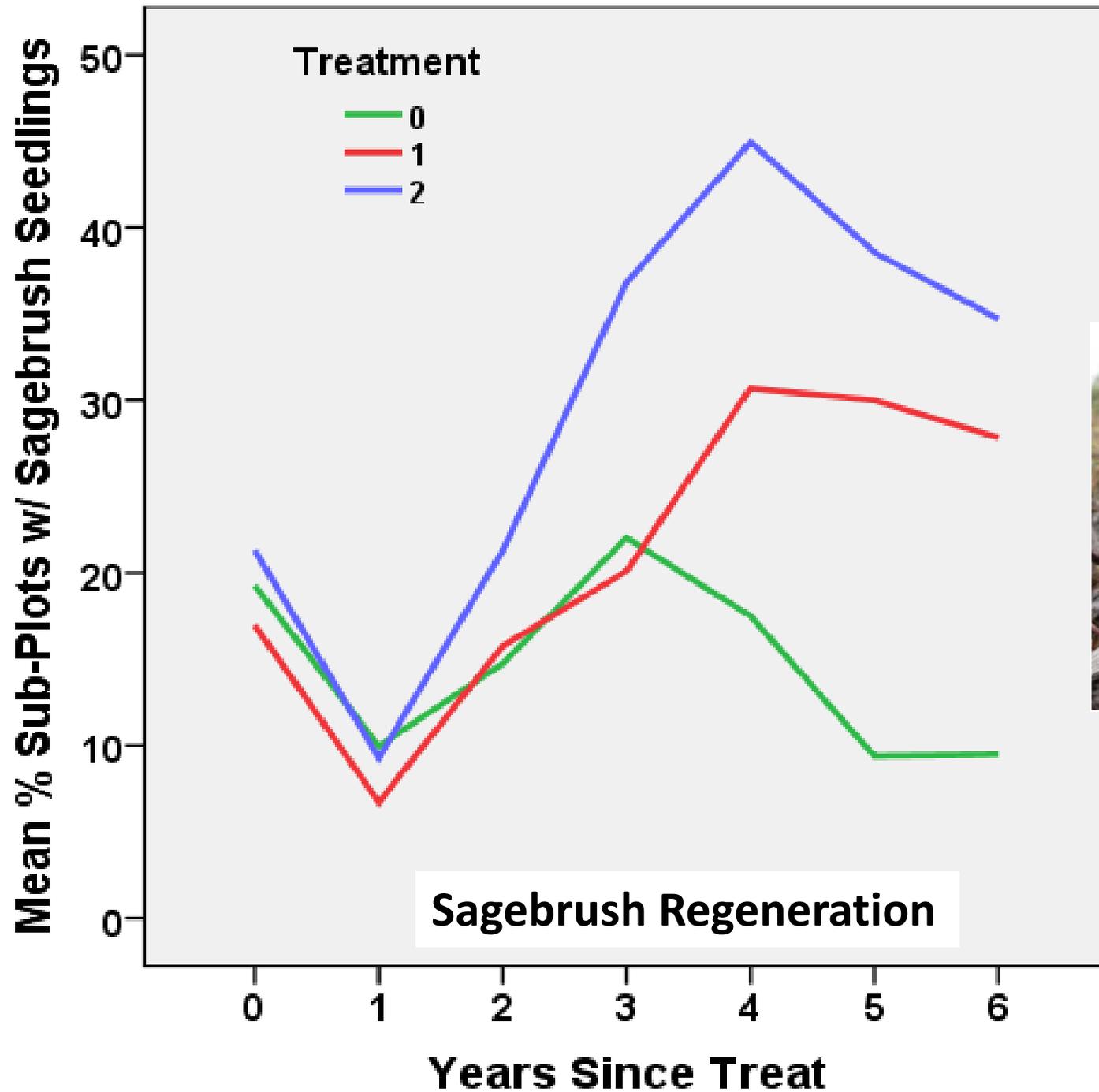
AL HERBS



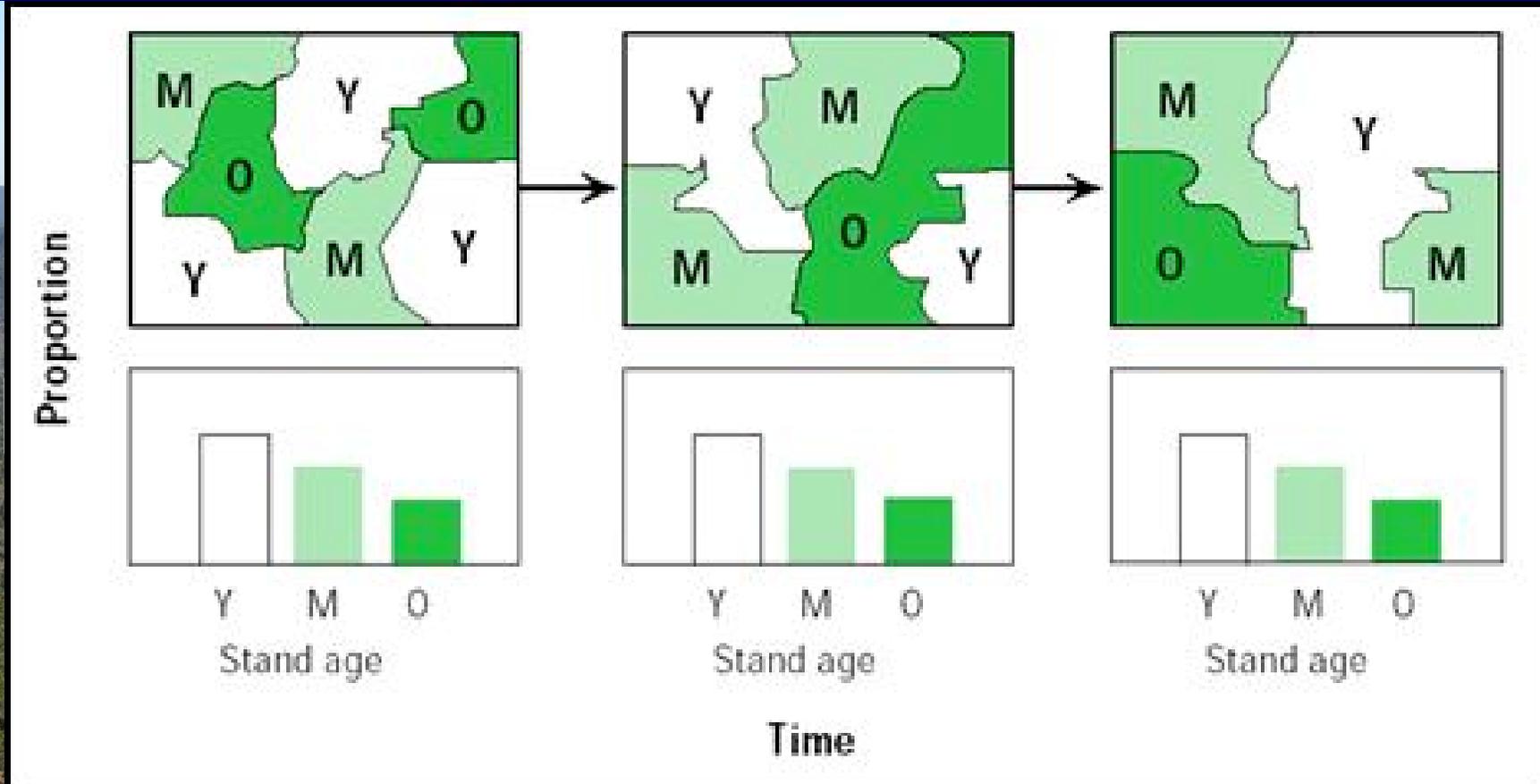
## Mountain Pinyon Juniper

## Wyoming Pinyon Juniper

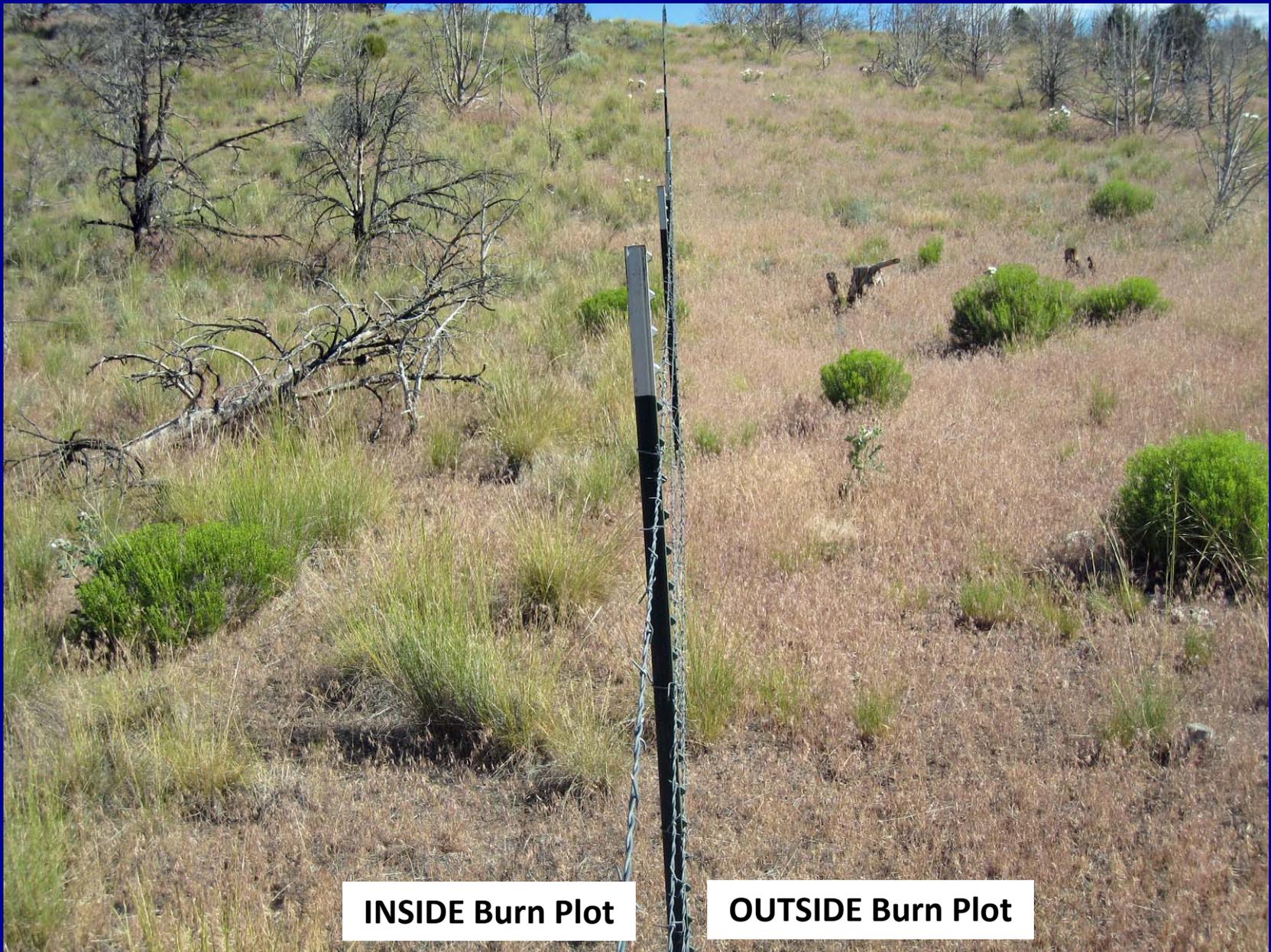




# Shifting Mosaic



Bormann, F.H., Likens, G.E. 1979. Pattern and Process in a Forested Ecosystem. New York: Springer-Verlag. (HUBBARD BROOK)



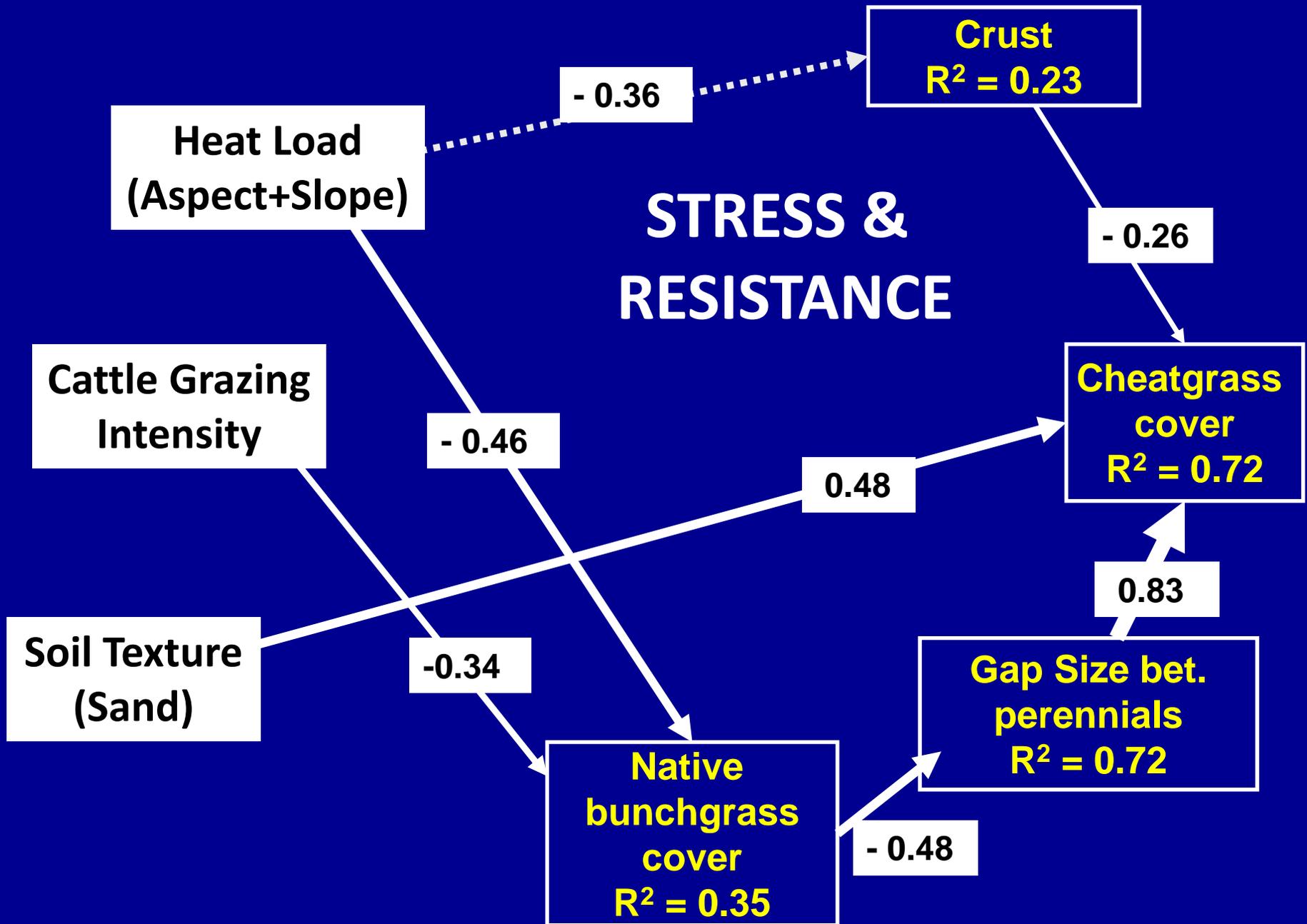
**INSIDE Burn Plot**

**OUTSIDE Burn Plot**

**Warm/moist black sagebrush/Wyoming sagebrush  
and bluebunch wheatgrass site  
5 years post-treatment**

**Photo by Robin Tausch, July 2013**

# STRESS & RESISTANCE



## Tree Removal Treatments Can Work IF:



Two SageSTEP Mechanical Plots  
(Onaqui Site)



**Brewer's Sparrow**  
(Sagebrush Obligate)



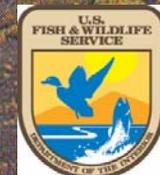
**Brewer's Sparrow**  
(Sagebrush Obligate)

***“When we come upon the Brewer Sparrow, we are ready to wager that here the dame [Nature] has done her utmost to produce a bird of non-committal appearance.***

***Mere brown might have been conspicuous by default, but brownish, broken up by hazy streakings of other brownish or dusky—call it what you will— has given us a bird which, so far as plumage is concerned, may be said to have no mark of distinction whatever—just bird.”***

**William Leon Dawson . 2013. Birds of California**

Ex. Steve Hanser, SER Conference, Redmond, OR, October 2014









2007: Pre

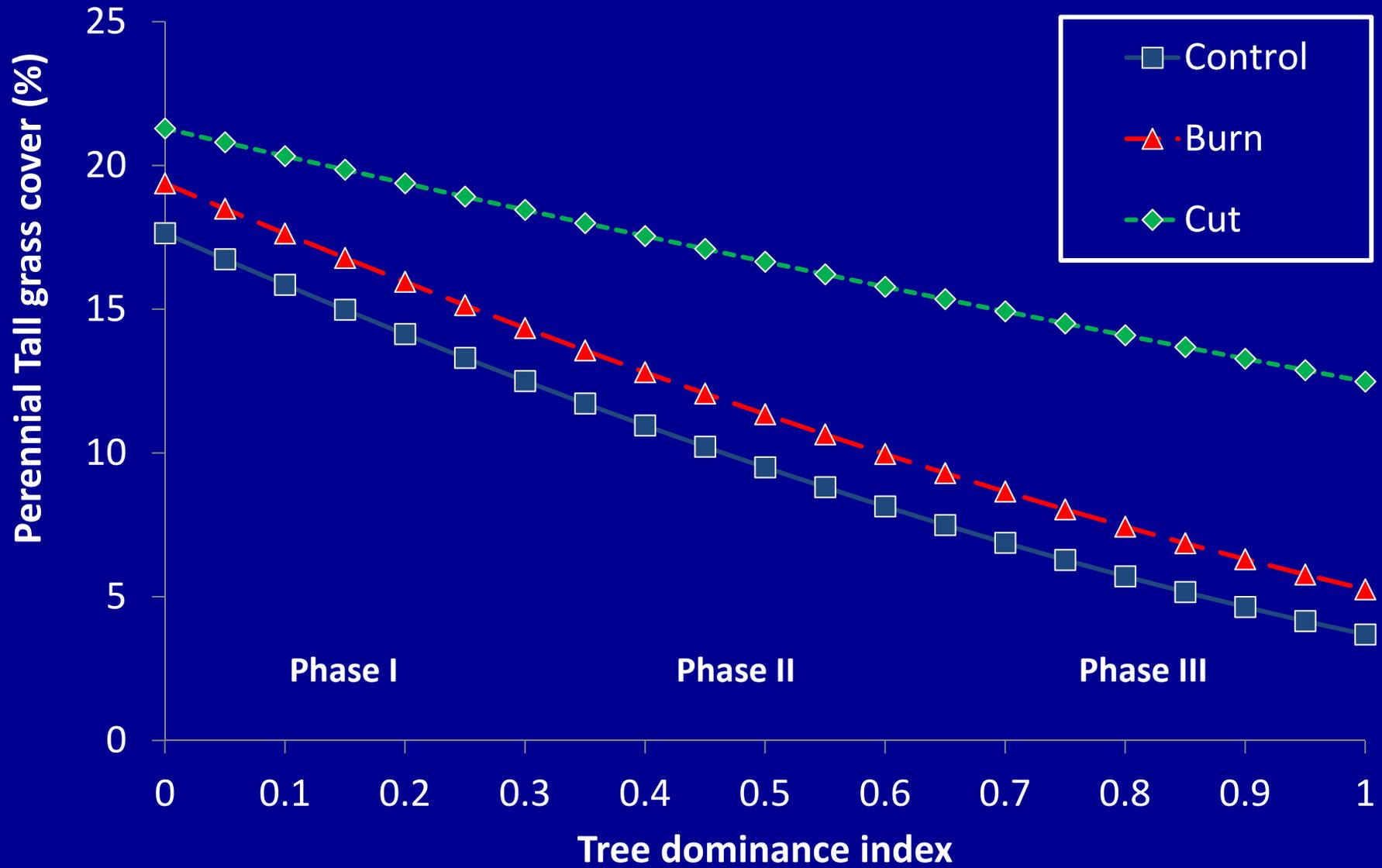
2008: Post 1yr

2010: Post 3yr

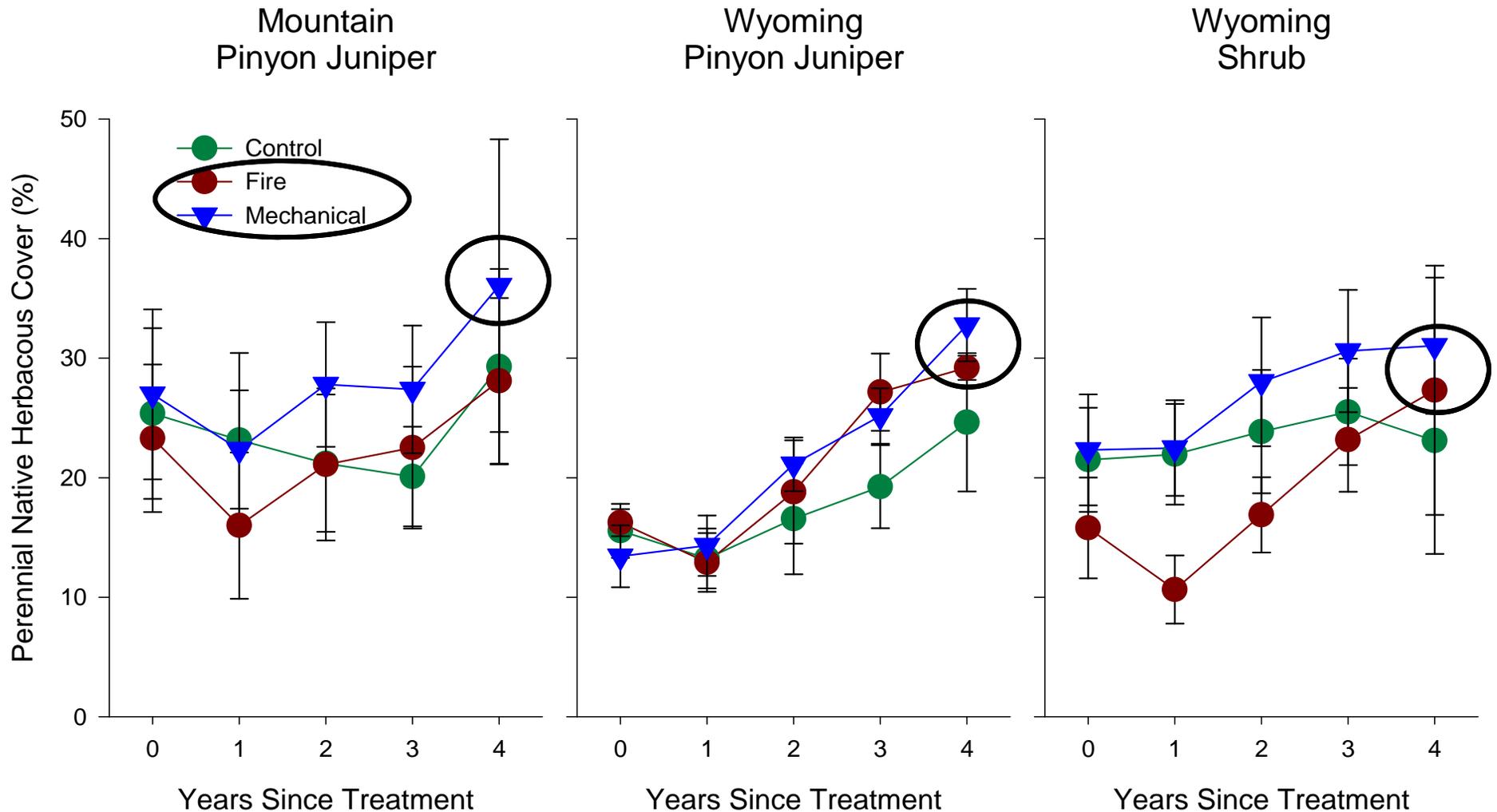
2009: Post 2yr

Blue Mt Western Juniper Site, Burn Plot, Sub-Plot 4

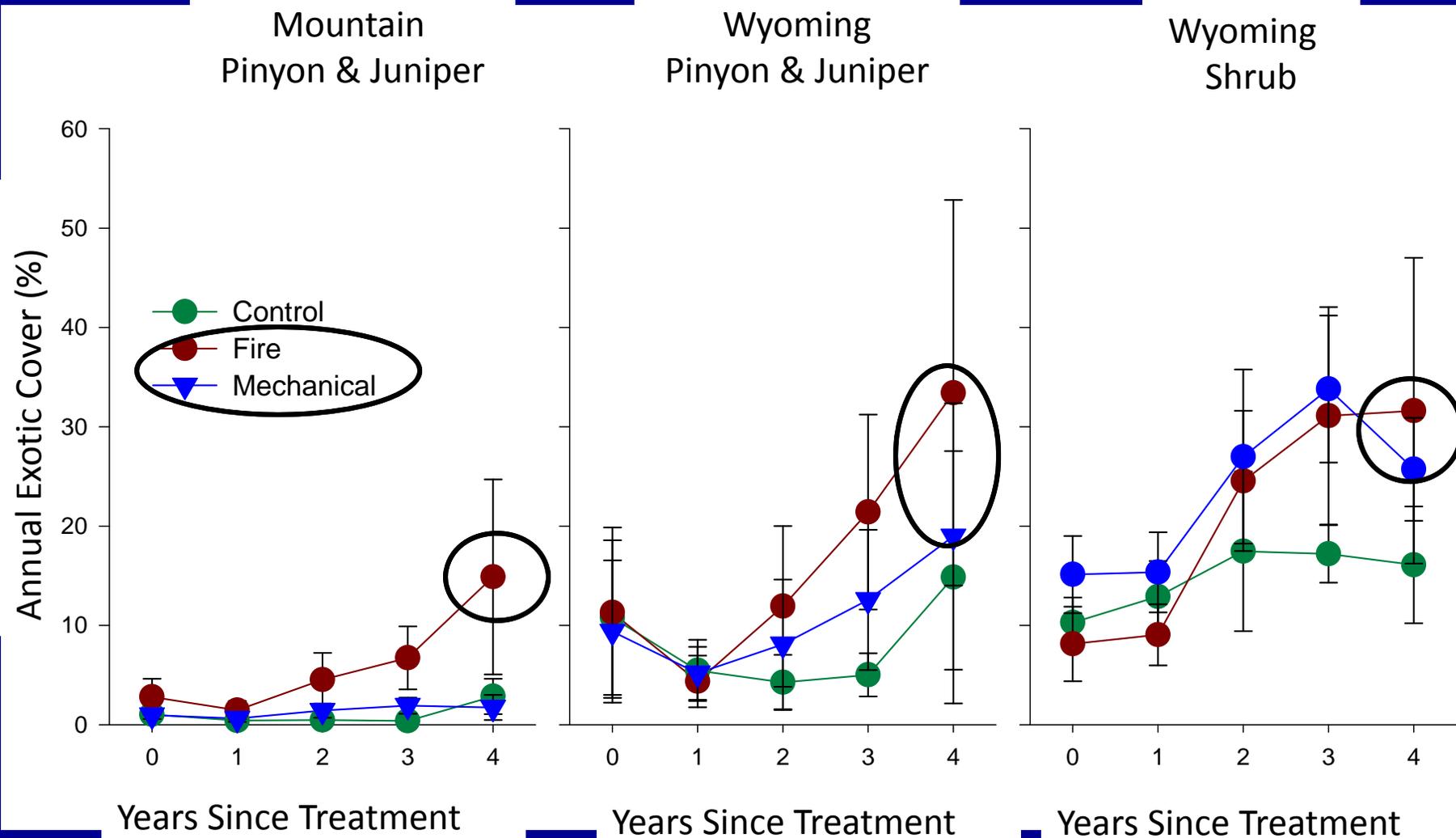
# Phase Effects: Native Perennial Grasses



# HIGH RESILIENCE TO DISTURBANCE = HIGH NATIVE PERENNIAL HERBS



# HIGH ANNUAL EXOTICS = LOW RESISTANCE

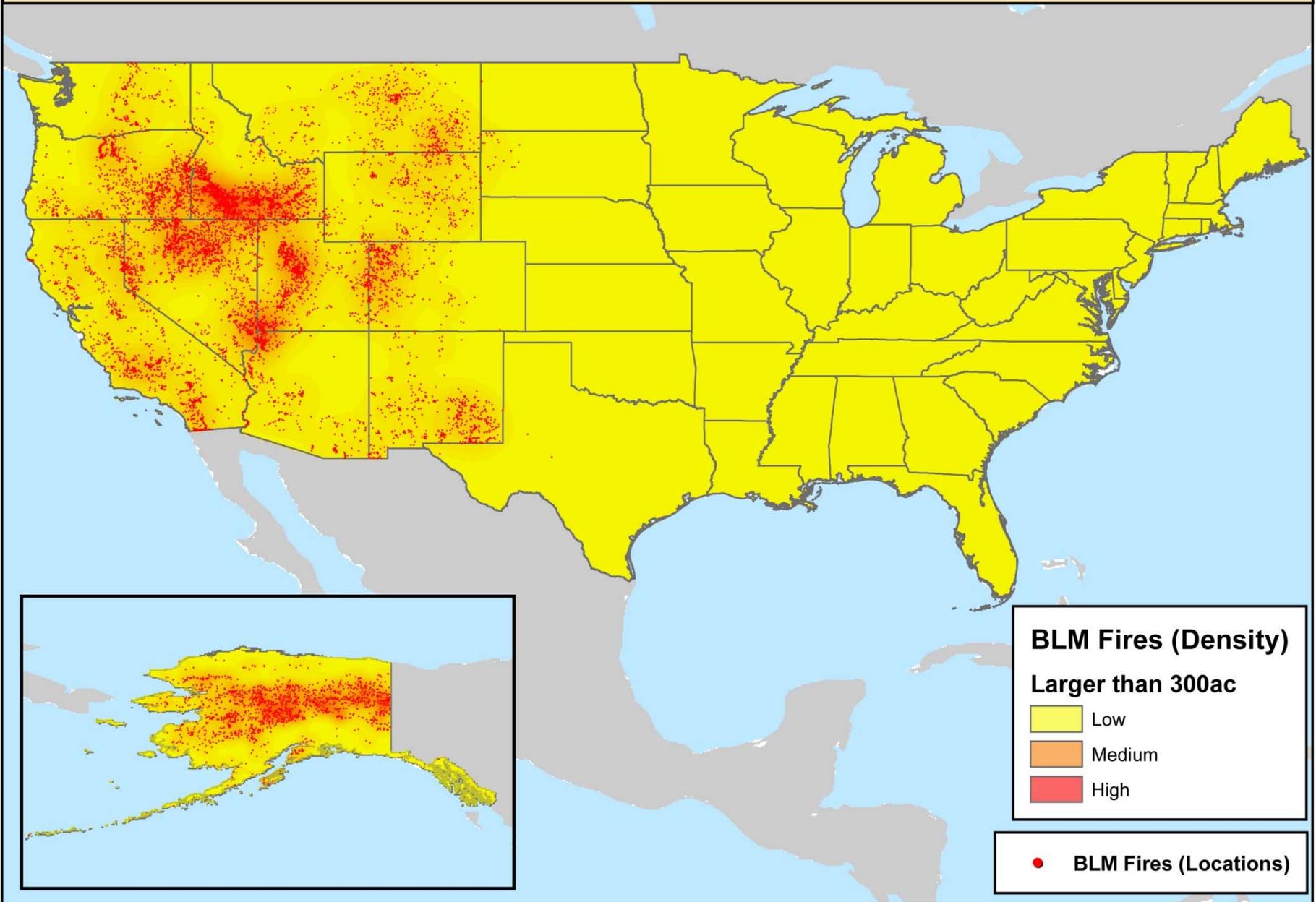


Fire and Fuels Management -  
Strategizing at the landscape level In a  
fire prone world



# BLM Historical Fire Locations - Density Grid/Points

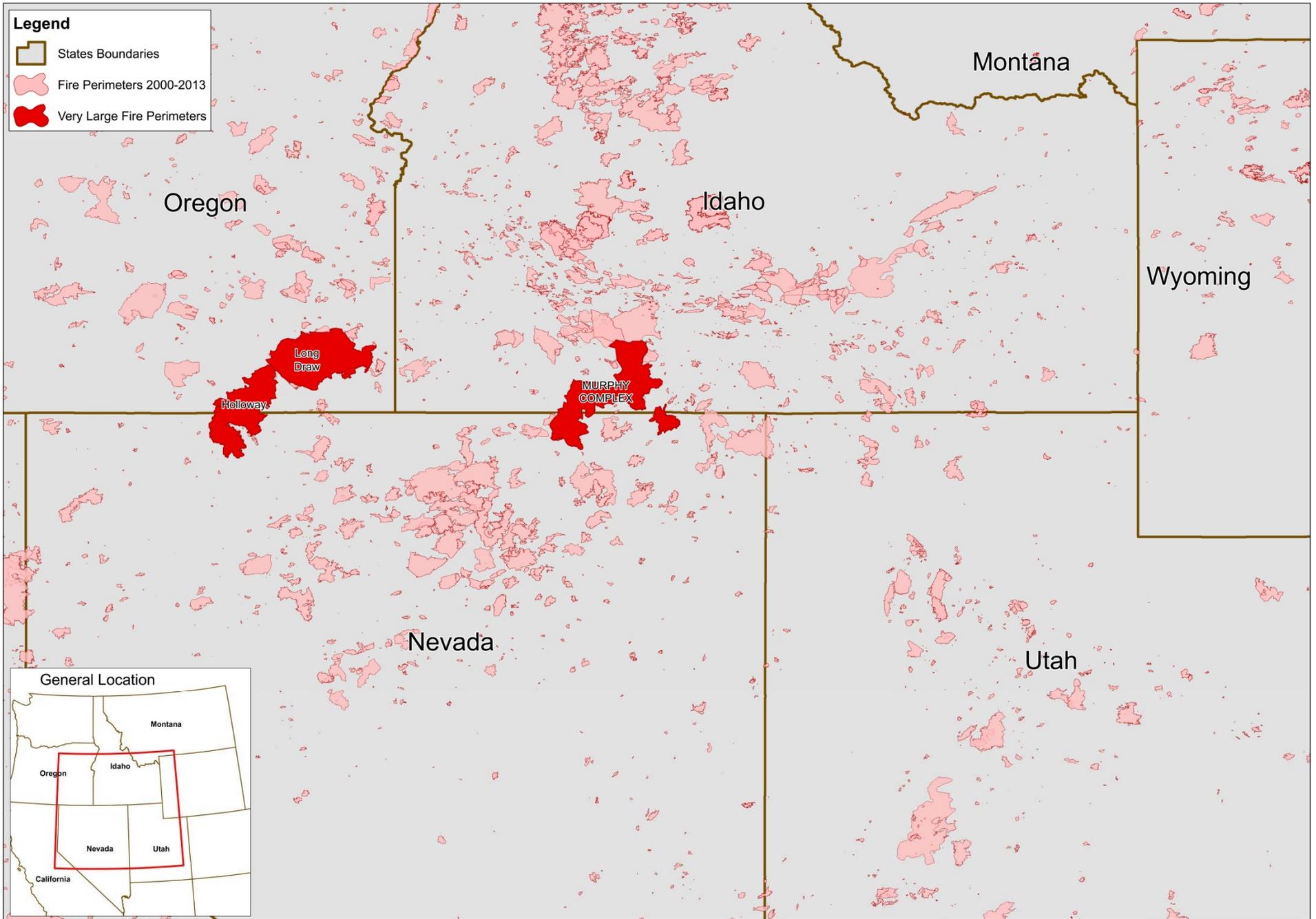
(Bureau of Land Management Fires larger than 300 acres 1980-2012)



# Historical Fire Perimeters (Federal Fires larger than 10 acres 2000-2013)

**Legend**

- States Boundaries
- Fire Perimeters 2000-2013
- Very Large Fire Perimeters



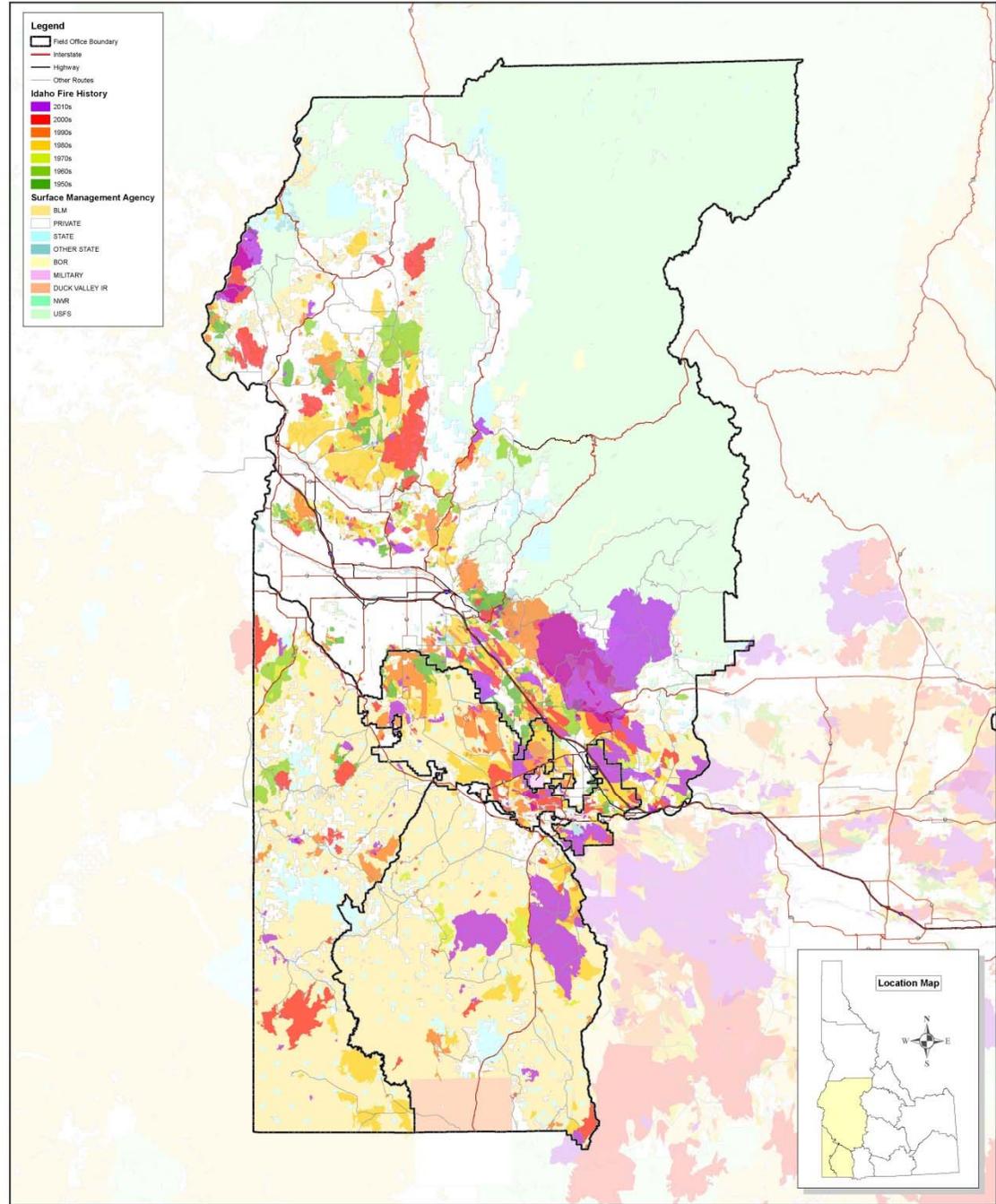
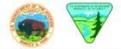
..... N  
A

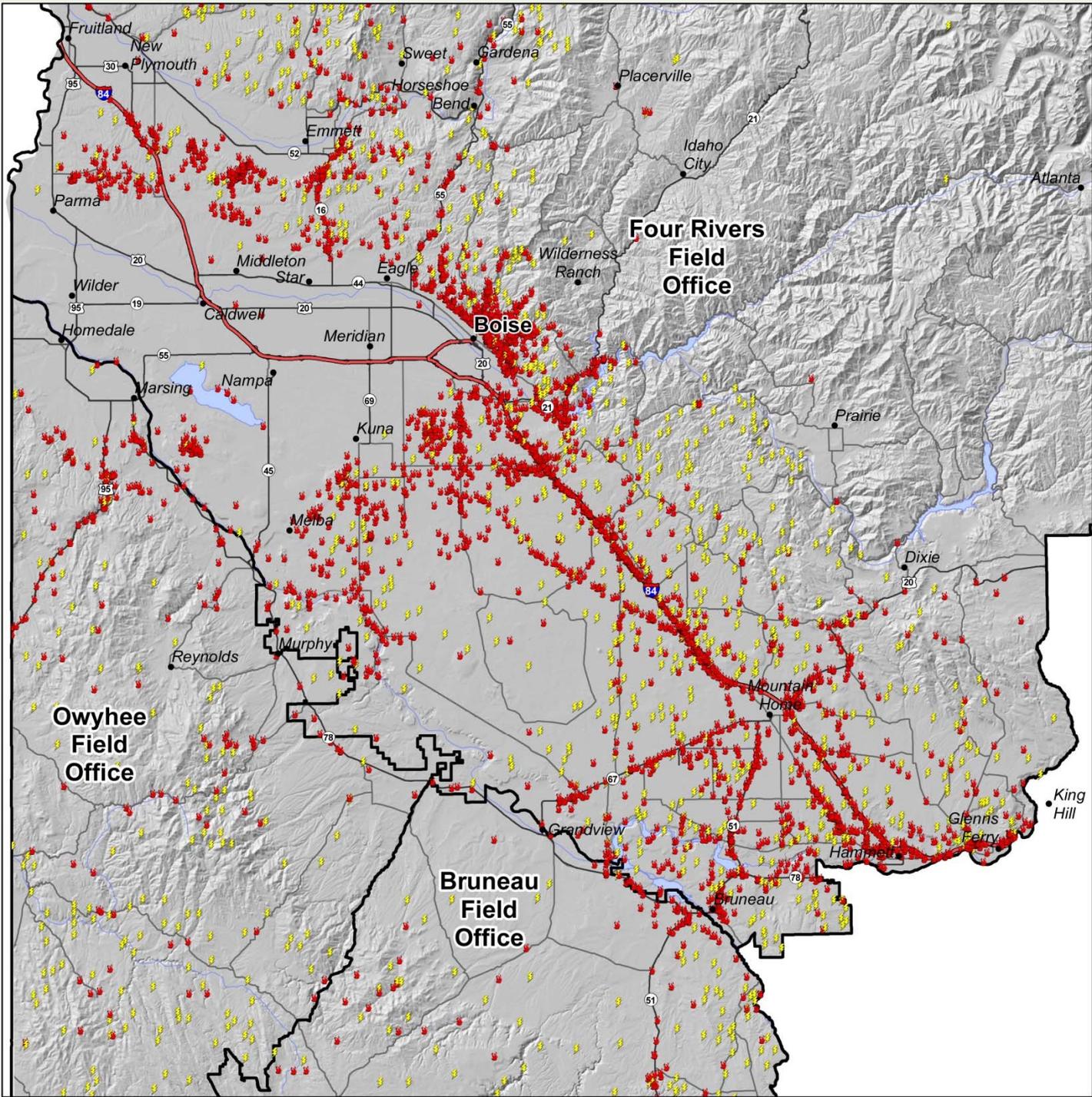
Boise District covers  
3,958,069 acres last  
10 years average is **66,303**  
acres burned

Ave. **99** fires of which **68%**  
human caused **32%** natural  
starts.

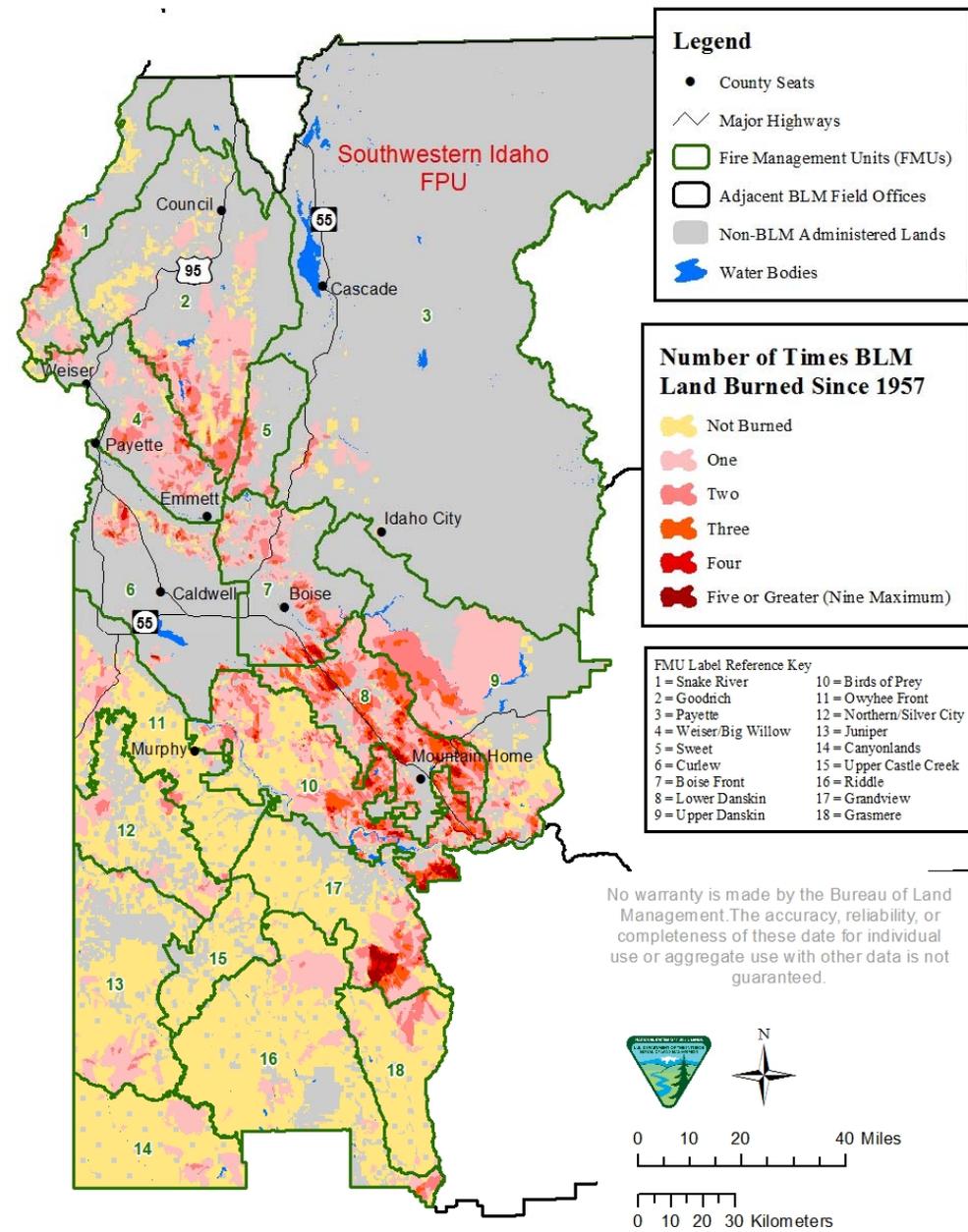
2013 fire season burned  
**168,250** acres  
**117** fires total **52%** human  
caused **48%** natural starts.

## Boise District Fire History by Decade (1957 - 2013)





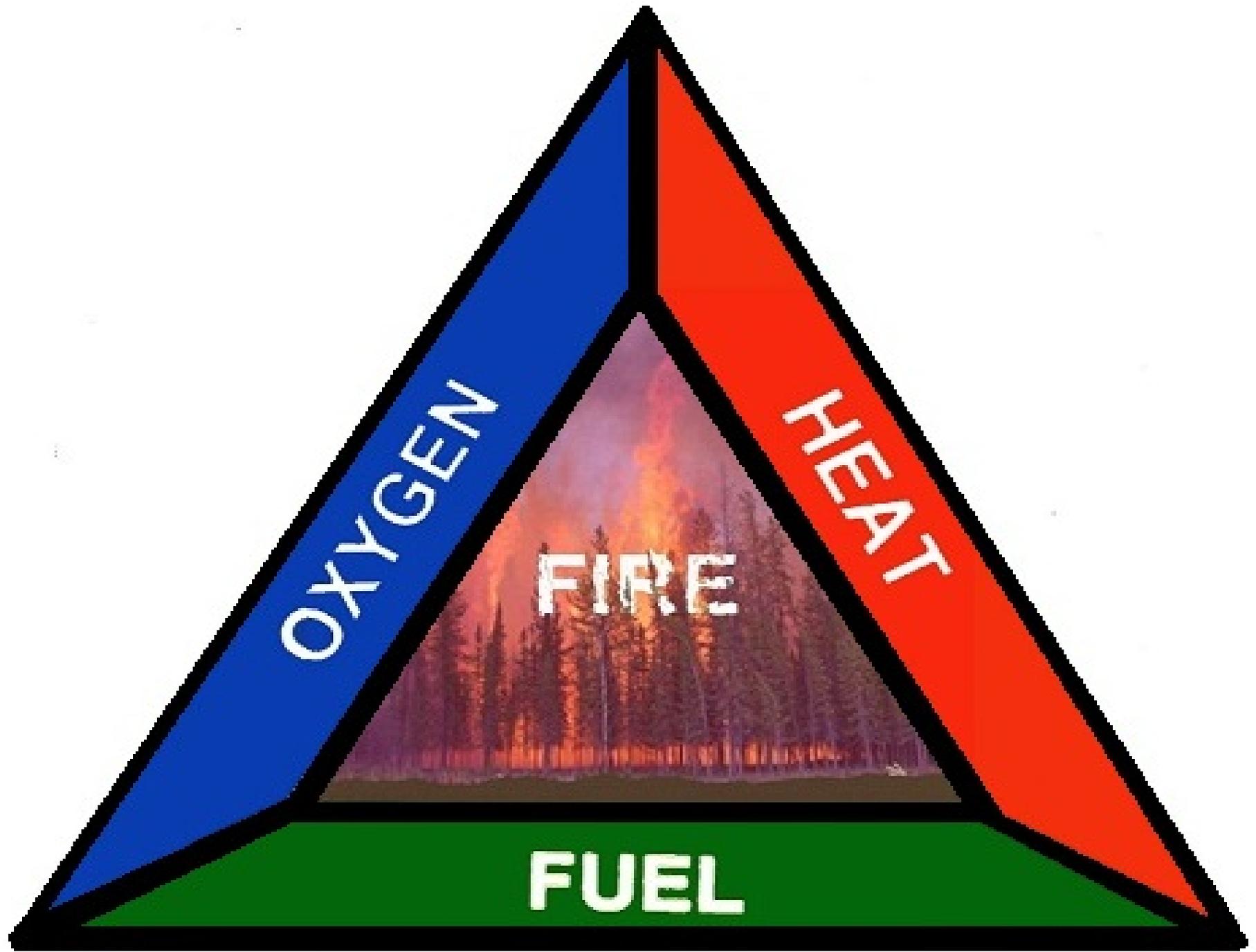
- Map of how many times an area has burned since 1957-2013





**No one silver bullet to breaking the fire cycle – will take a combination of approaches:**

- 1. Fire suppression-** response and capabilities- RFPA's new addition
- 2. Fuel breaks** – setting fire fighters up to succeed before the fire happens.
- 3. Fine fuels management** -at landscape level – both strategically and generally. Question: How do you graze to give some fire benefit and still meet rangeland health standards?

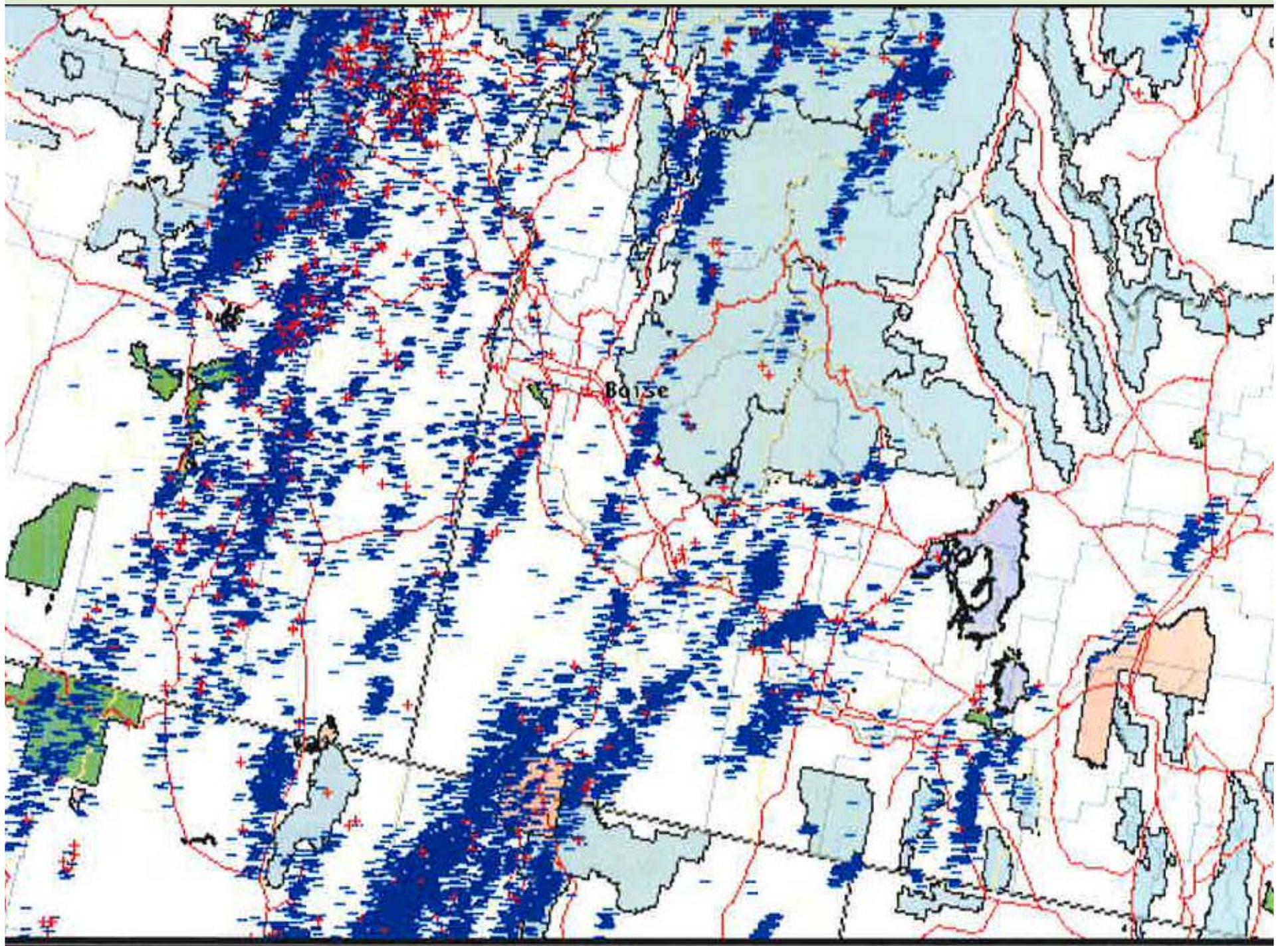


# When Fires Go Big

## When Fires Go Big

Managing for a compressed time frame- when fires “Go Big” it is generally as a result of lightning activity across a large area in a short period of time. Most range fires only last hours or days – yet can cover millions of acres each year.





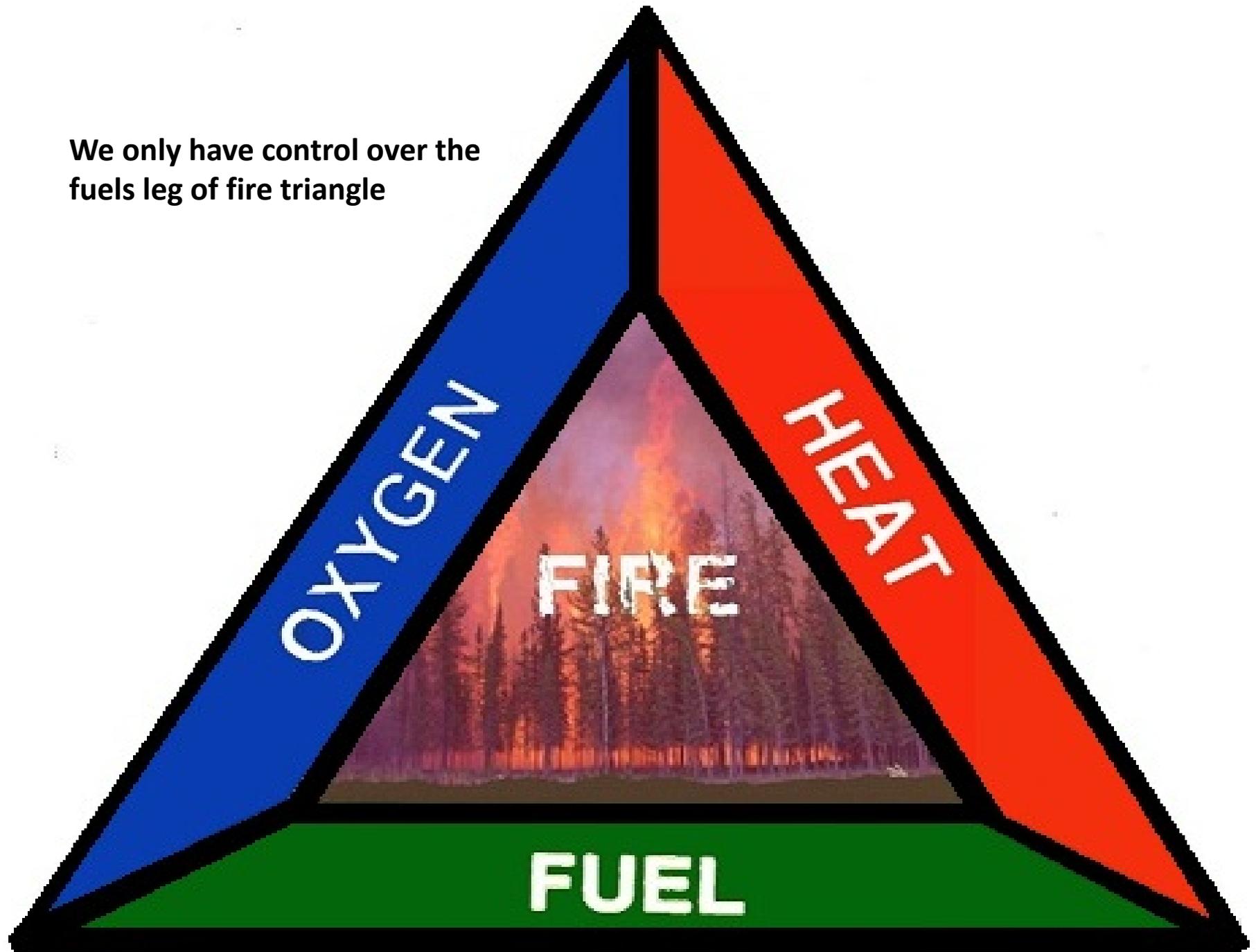
# When Fires Go Big

## Result:

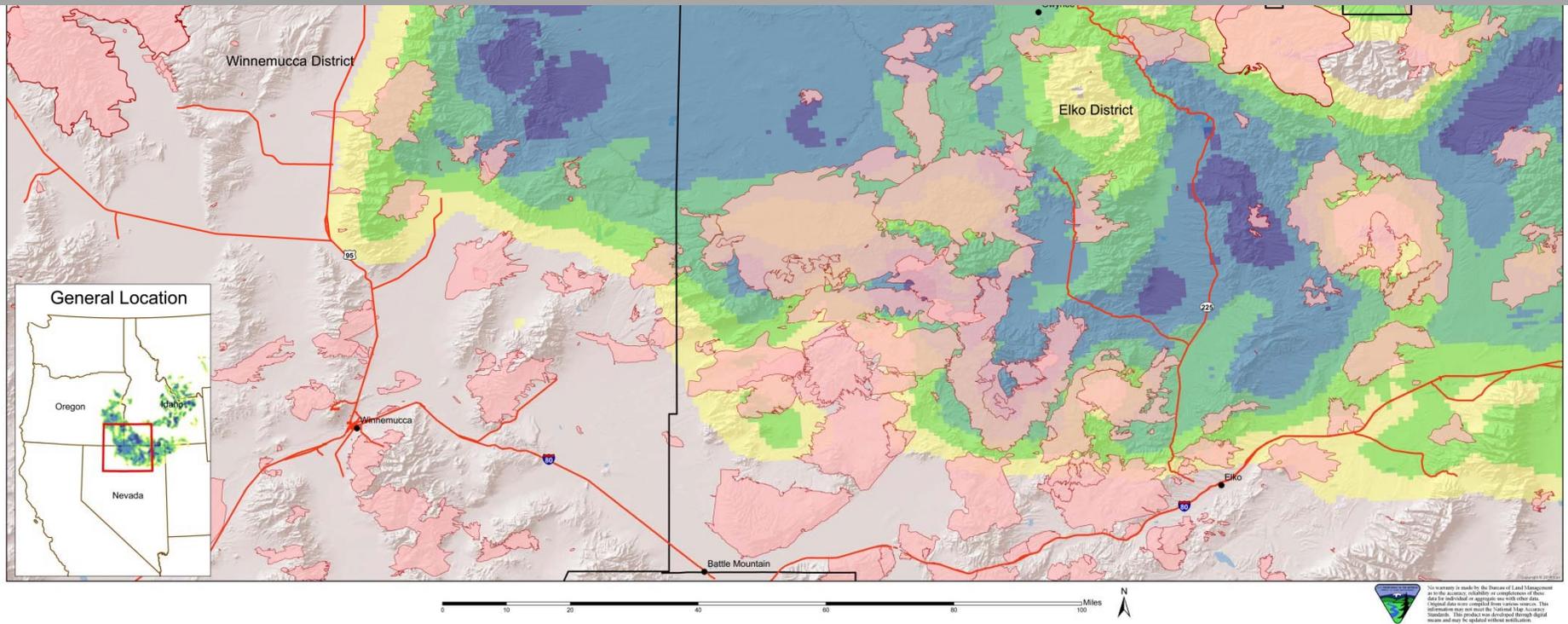
Fire resources are spread thin not only are you busy but everyone around is also and there is not enough resources to address all the fires for a period of time. Knowing this will always be the case- what can we do before the lightning events happen to make fire organizations more successful when everyone has fires? Remember fire triangle-



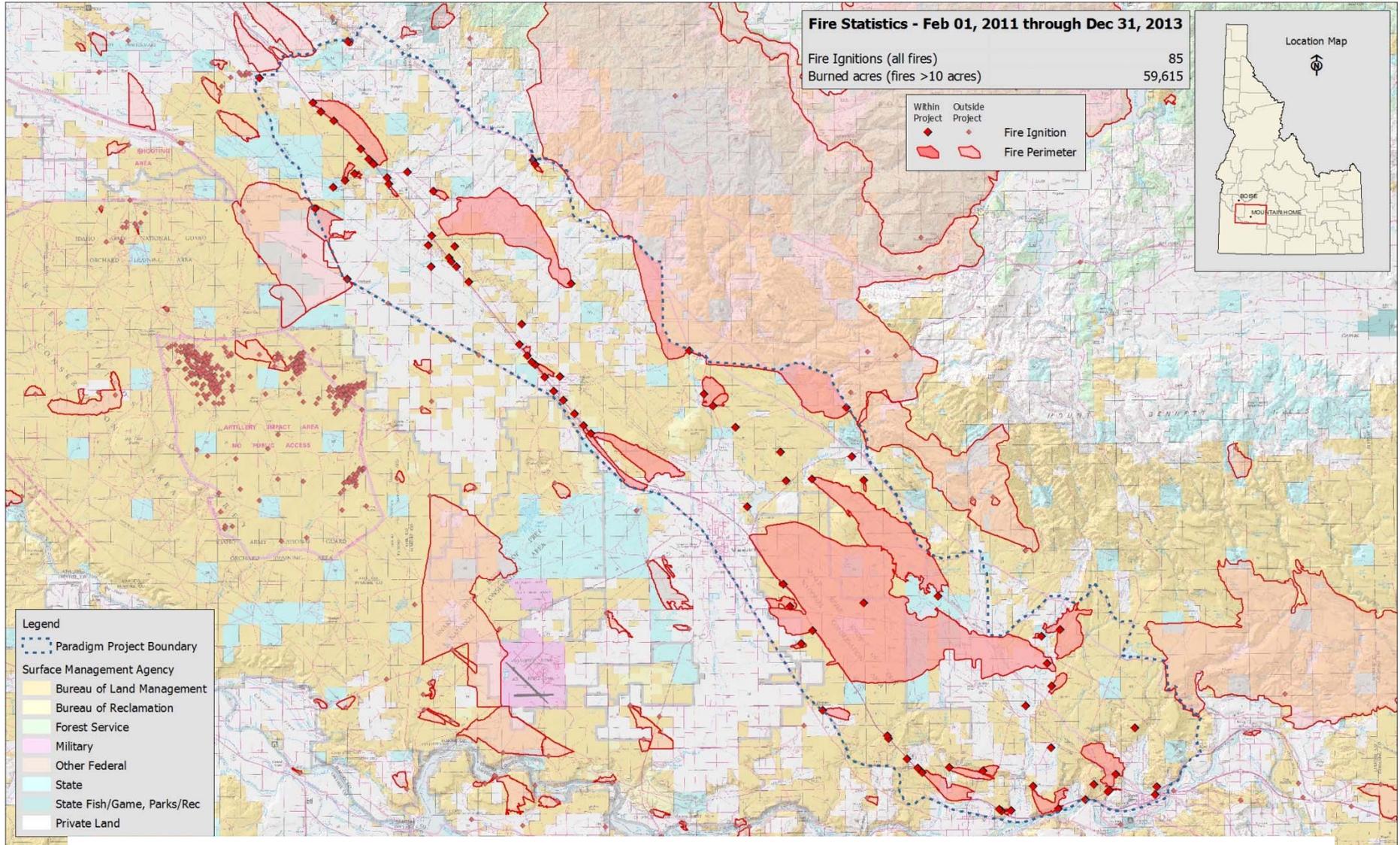
We only have control over the  
fuels leg of fire triangle



**Fuels Management and the Concept of Compartmentalization:** breaking up the landscape with a system of fuel breaks to help minimize large fire growth and provide for firefighter and public safety while providing an area to work from and engage large fires more safely, making scarce resources more effective over a large area.



# Paradigm Project - Fire History (02/01/2011 - 12/31/2013)

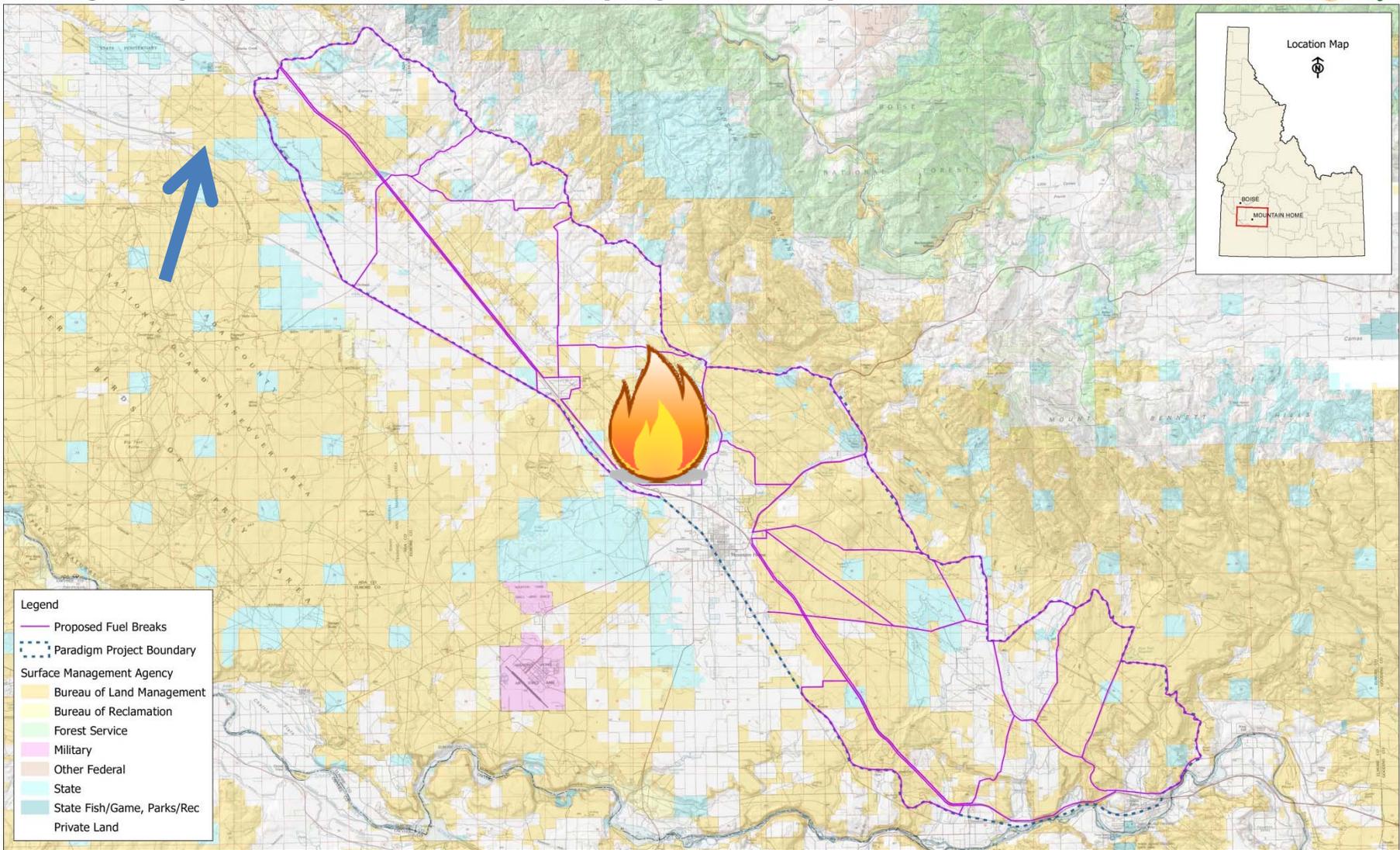


Additional acres from Pony Complex which came from Mud fire estimated an additional 76,272 acres for total of 135,751 acres of fire from the paradigm project (46% of total Paradigm project area)

This is a source of the data 1/24/2014

Bureau of Land Management, Bureau of Reclamation, State of Idaho, and other data is not guaranteed in any way. Please contact the BLM for more information.

# Paradigm Project - Alternative 2 - All Routes (Proposed Action)



- Legend**
- Proposed Fuel Breaks
  - - - Paradigm Project Boundary
- Surface Management Agency**
- Bureau of Land Management
  - Bureau of Reclamation
  - Forest Service
  - Military
  - Other Federal
  - State
  - State Fish/Game, Parks/Rec
  - Private Land

The sources of the data are from Idaho-BLM Corporate Data, and the USGS. 2/5/2015



No warranty is made by the Bureau of Land Management. The accuracy, reliability, or completeness of these data for individual use or aggregate use with other data is not guaranteed. The following disclaimer cannot be made. Neither USGS nor BLM is responsible for any errors or omissions. Please contact the BLM State Office (Mountain Home) at 208-373-6200.

- **If fuel breaks were implemented up to the maximum width of 300 feet, a total of 10,690 acres (3.6% of project area) adjacent to the 187 miles of proposed routes would be treated (disturbed).**



# What a fuel break is and isn't

- Not a show stopper- you still need to show up
- Have been over sold in the past (as show stoppers) leads to unrealistic expectations and false perceptions of failure.
- Fuel breaks provide an area to work from and engage large fires more safely, making scarce resources more effective over a large area.
- **Fuel Breaks are for fire fighters**
- **We make our living on changes in fuel loading and continuity!**

# Changes in fuel loading and continuity











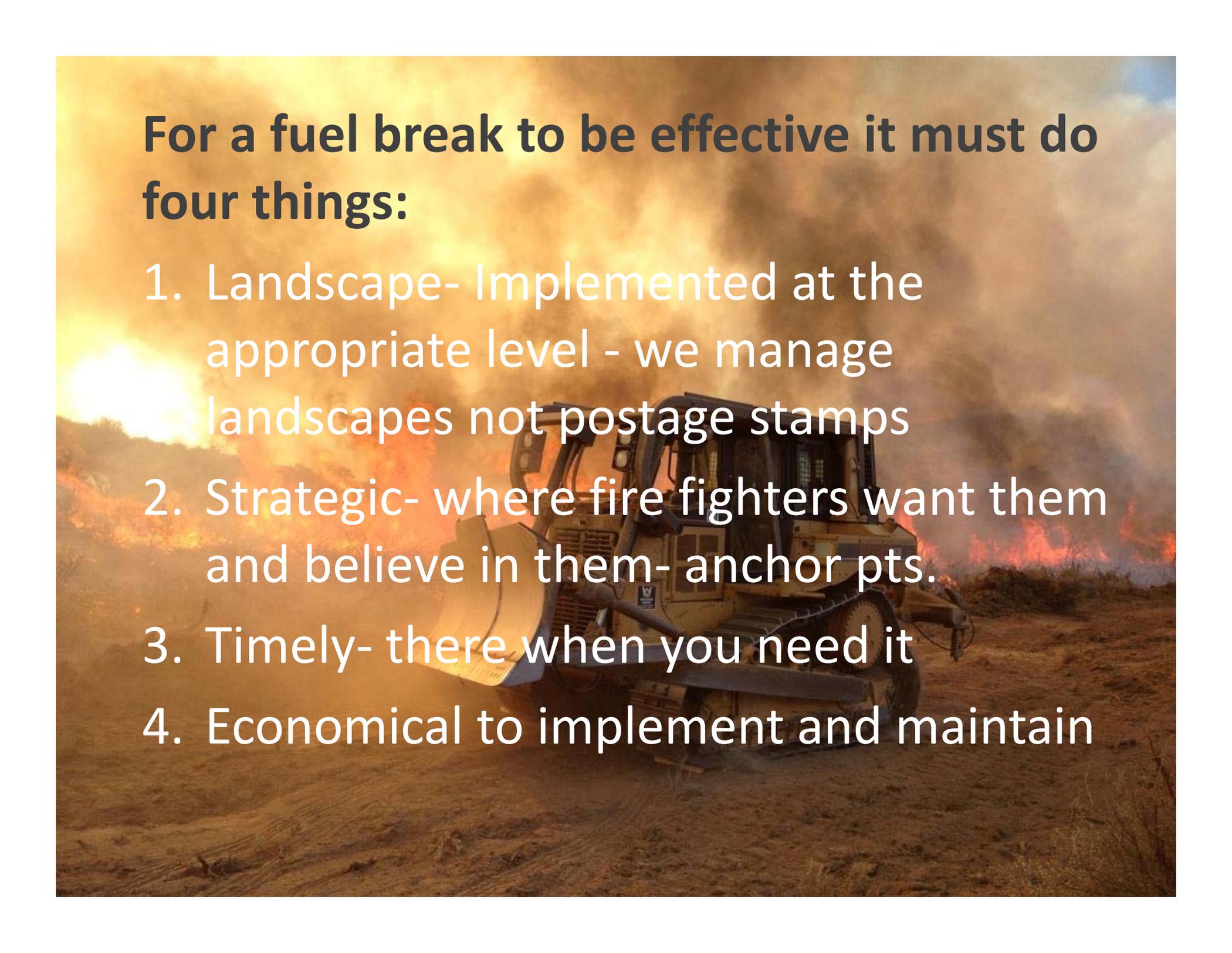




To much time to hold or burn out large expanses of line if no fuel break to work from- which line is safer and more effective as a control line?



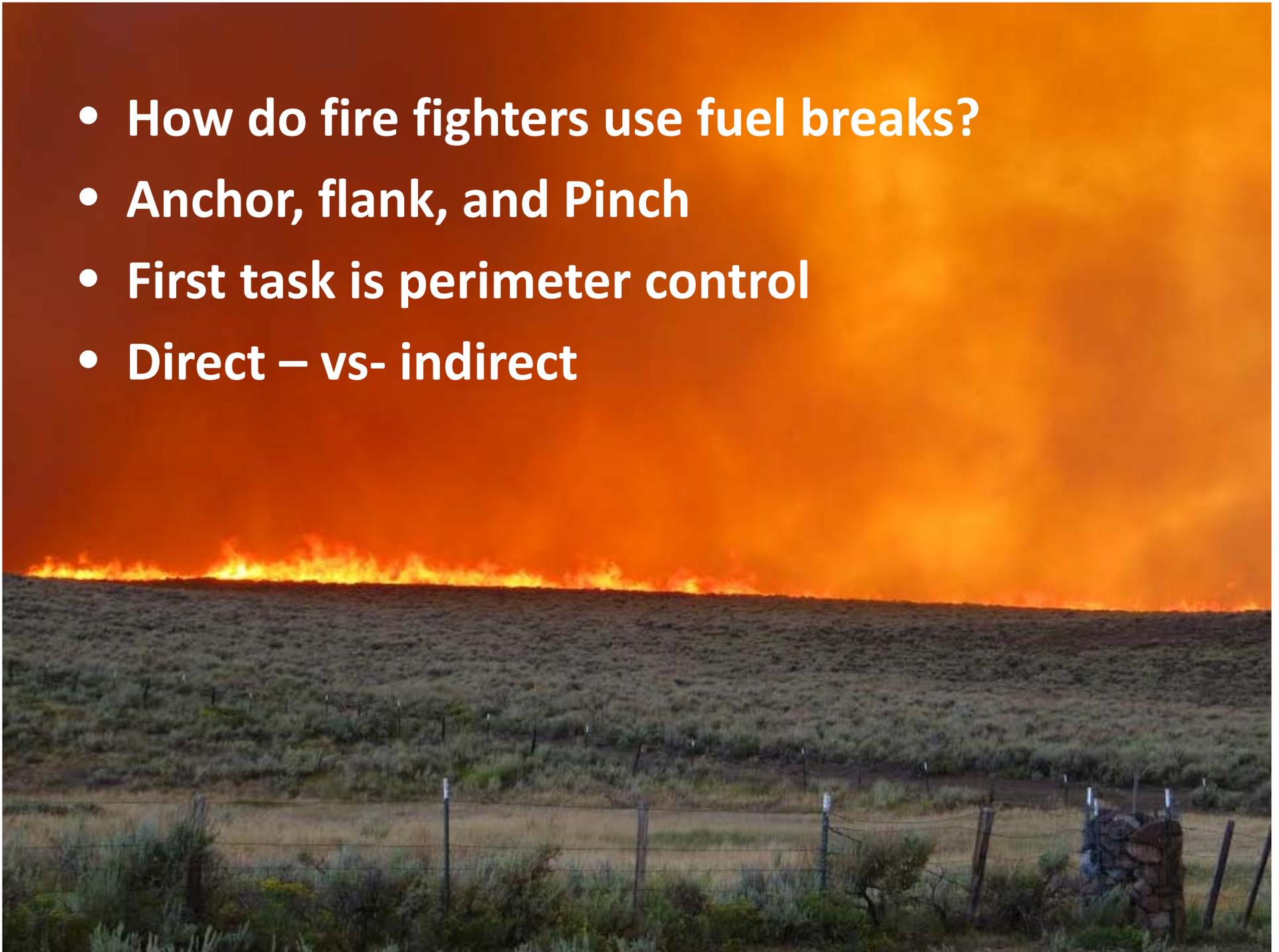


A yellow bulldozer is shown in the foreground, positioned in a field of fire and smoke. The background is filled with thick, billowing white and grey smoke, with bright orange and yellow flames visible in the distance. The scene is set during what appears to be a wildfire or a controlled burn operation. The bulldozer is facing towards the right side of the frame, and its front blade is slightly raised. The overall atmosphere is one of intense heat and activity.

## For a fuel break to be effective it must do four things:

1. Landscape- Implemented at the appropriate level - we manage landscapes not postage stamps
2. Strategic- where fire fighters want them and believe in them- anchor pts.
3. Timely- there when you need it
4. Economical to implement and maintain

- **How do fire fighters use fuel breaks?**
- **Anchor, flank, and Pinch**
- **First task is perimeter control**
- **Direct – vs- indirect**



End





Decision Support for Sagebrush-Steppe Protection:  
Designing a Regional Network of Strategic  
Fuel Breaks to Benefit the Greater Sage-Grouse

The Nature  
Conservancy   
Protecting nature. Preserving life.™

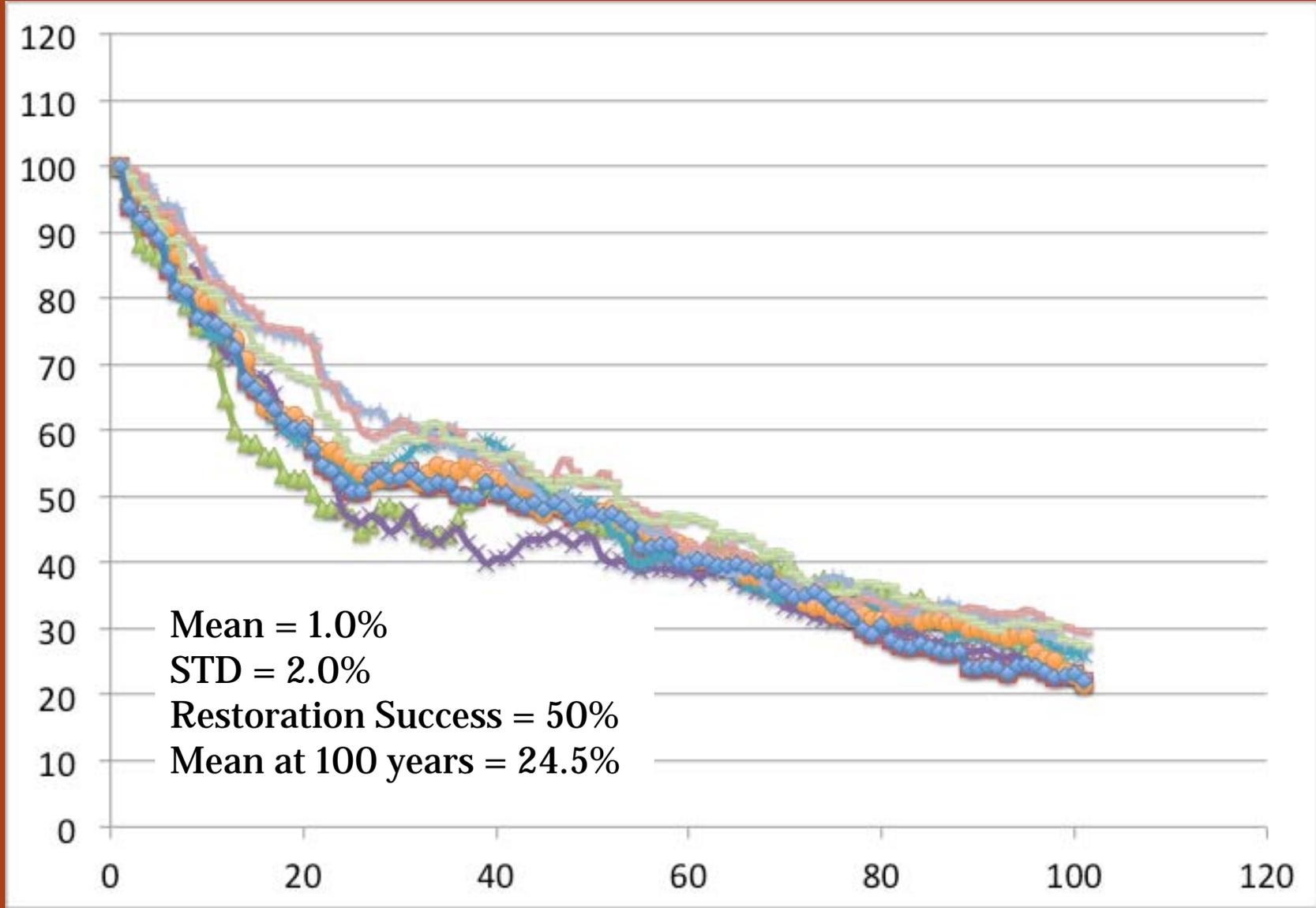
Bob Unnasch, Louis Provencher,  
Nathan Welch & Tanya Anderson

# Challenge



- Greater Sage-grouse need large, interconnected expanses of sagebrush with healthy understories.
- Wildfire is a primary factor linked to the decline of sage-grouse populations in the western portion of the species' range.
- Few options exist to prevent or minimize large wildfires.

Percent of Habitat Remaining



Years from 2014

“Create and maintain effective fuel breaks in **strategic** locations that will modify fire behavior and increase fire suppression effectiveness....”

“Federal firefighters shall ensure close coordination with State firefighters, local fire departments and local expertise (i.e., livestock grazing permittees and road maintenance personnel) to **create the best possible network of strategic fuel breaks** and road access to minimize and reduce the size of a wildfire following ignition...”

Idaho and  
Southwestern Montana  
Greater Sage-Grouse  
Draft  
Land Use Plan Amendment and  
Environmental Impact Statement  
Volume II



US Department of the Interior  
Bureau of Land Management

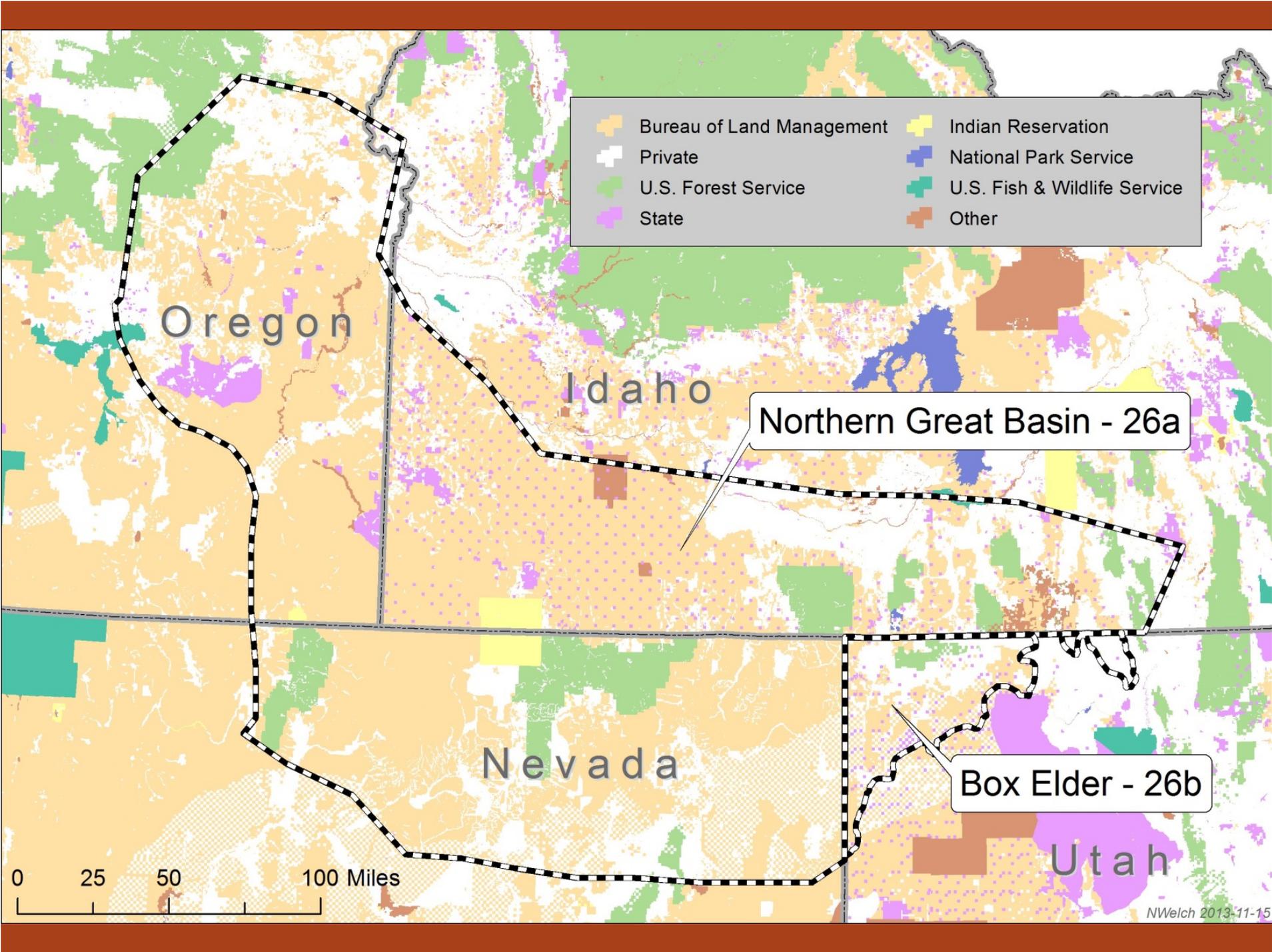
US Department of Agriculture  
Forest Service  
October 2013

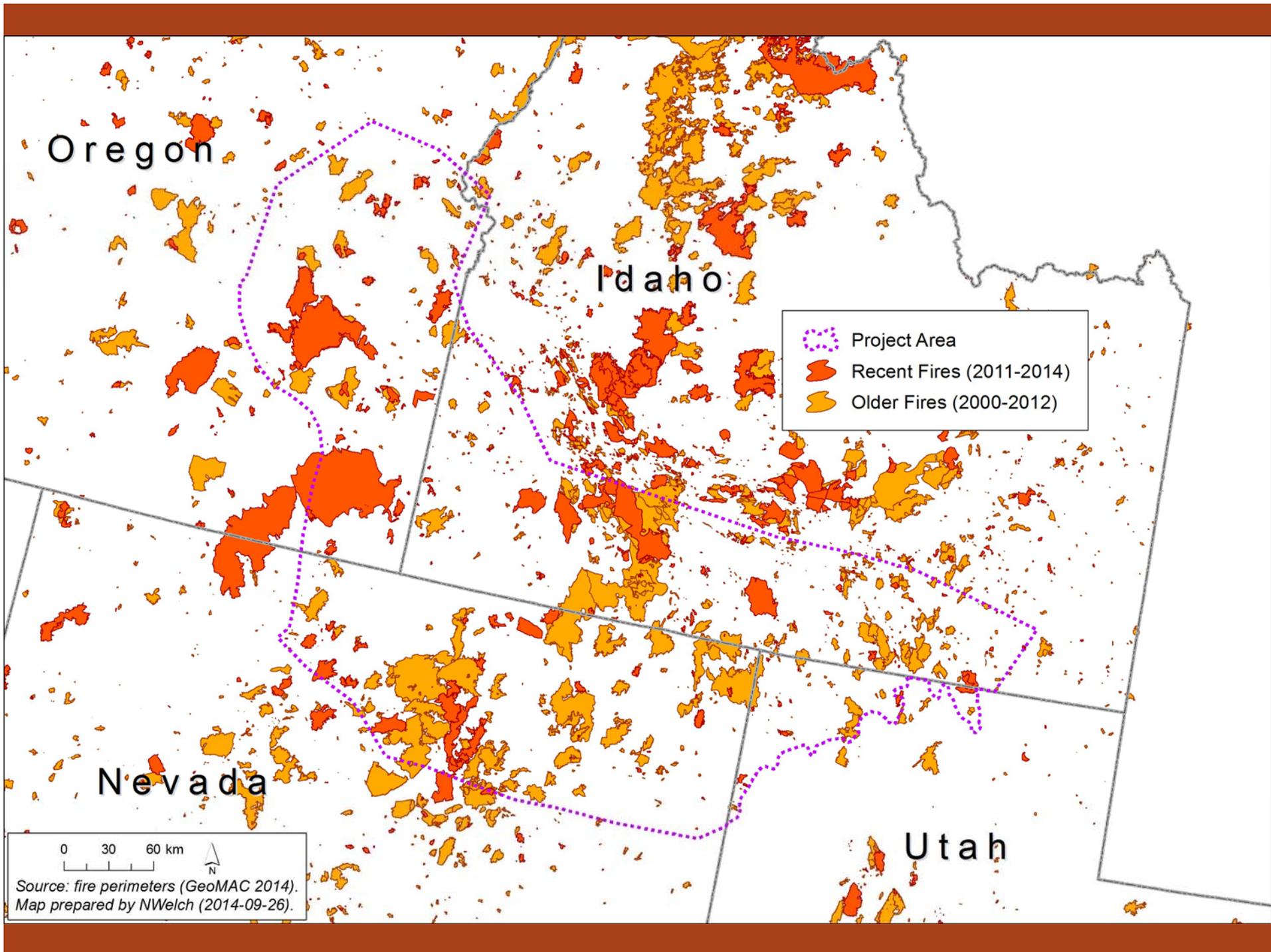


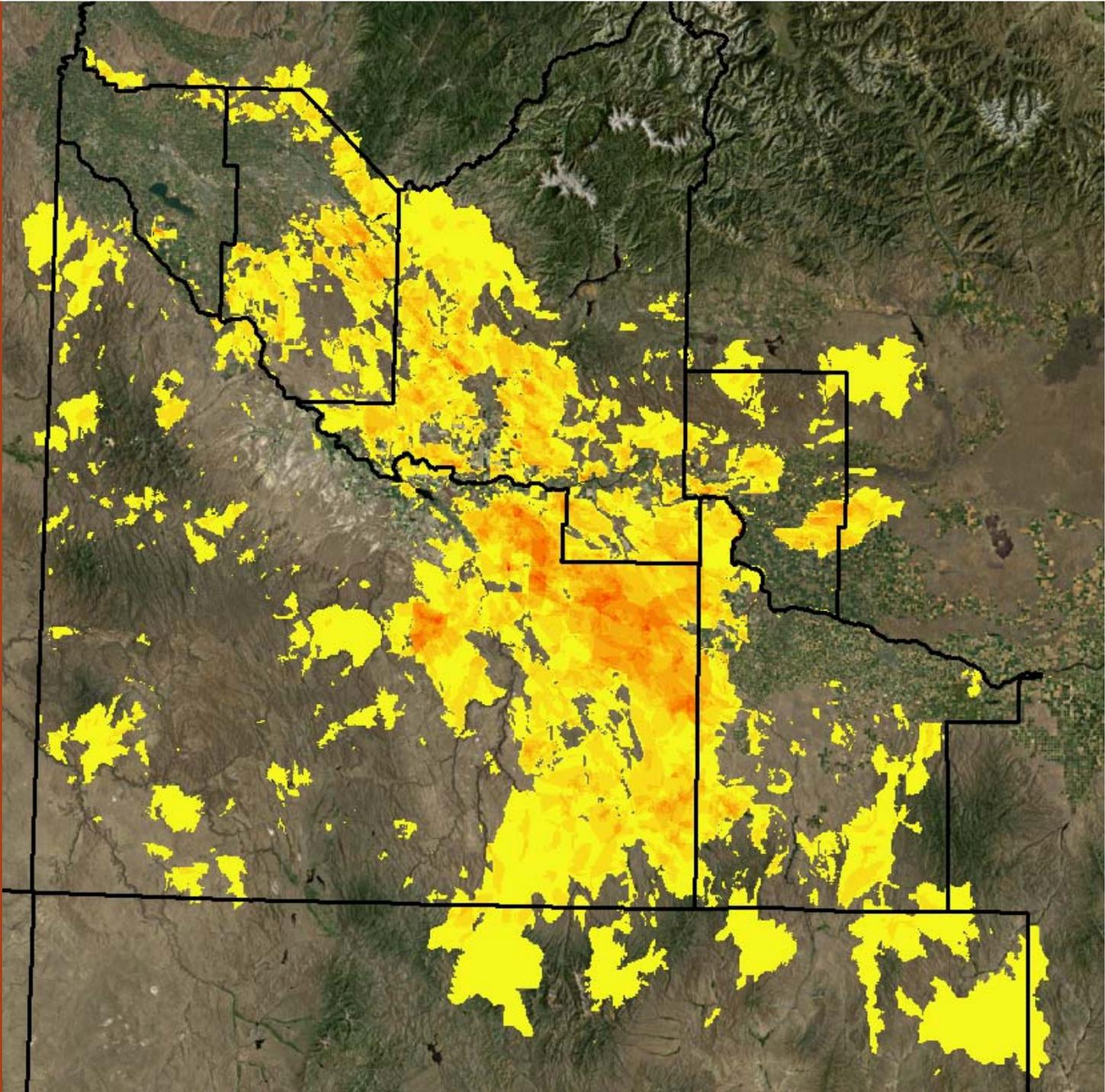
# TNC's Response: Targeting Actions



- We are using existing data and GIS to design a regional network of strategically-located fuel breaks.
- Results can inform the placement of fuel breaks to minimize large fires in important sage-grouse habitat.







# Methods

- Model wildfire likelihood across the study area.
- Identify areas of highest fire-likelihood.
- Investigate fuel-break configurations to protect priority habitat.

# Methods

Parameters include:

- Vegetation Type
- Fuel Loading
- Annual Grass Abundance
- Aspect
- Slope
- Prevailing Wind

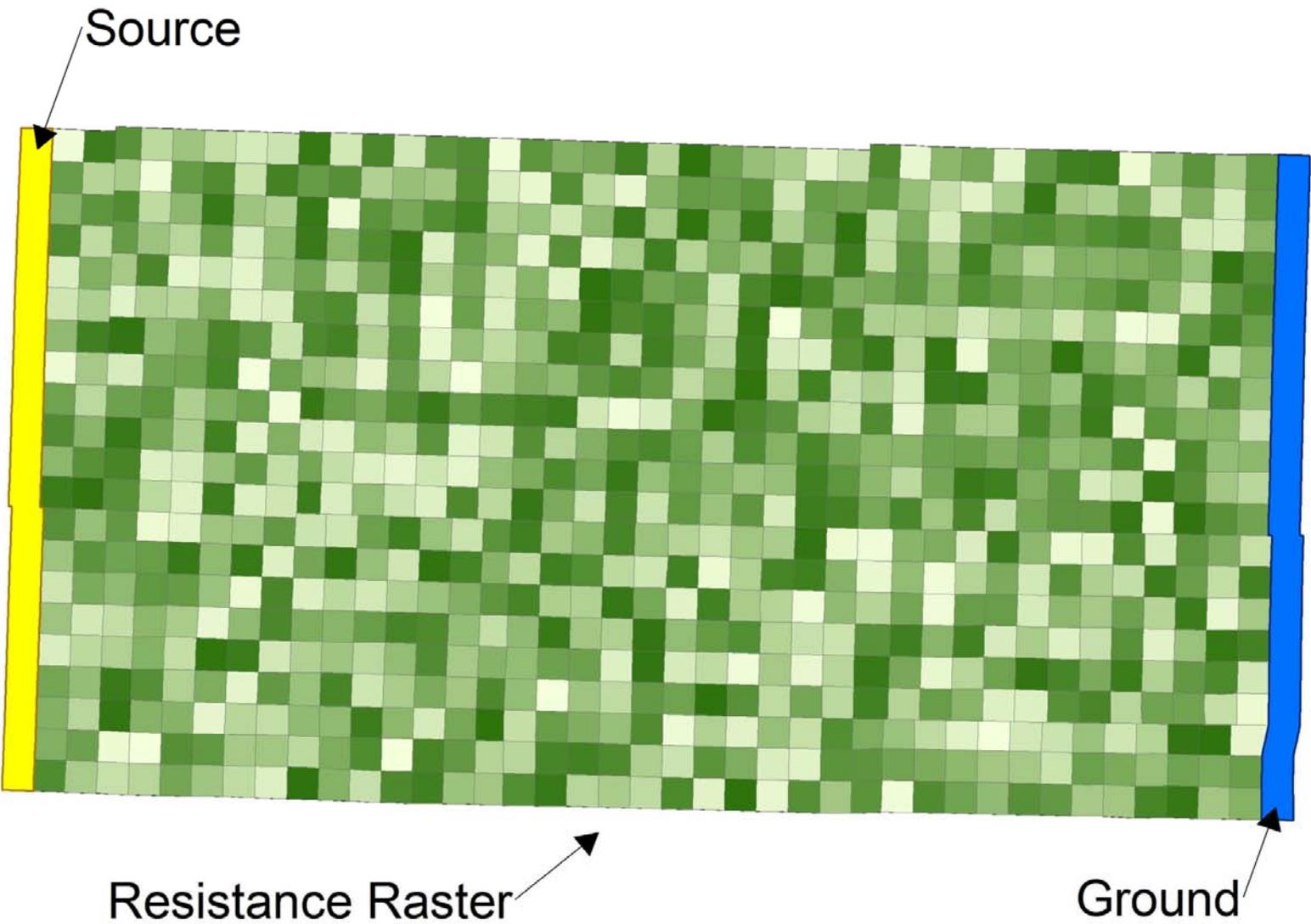
# Methods

## Circuitscape

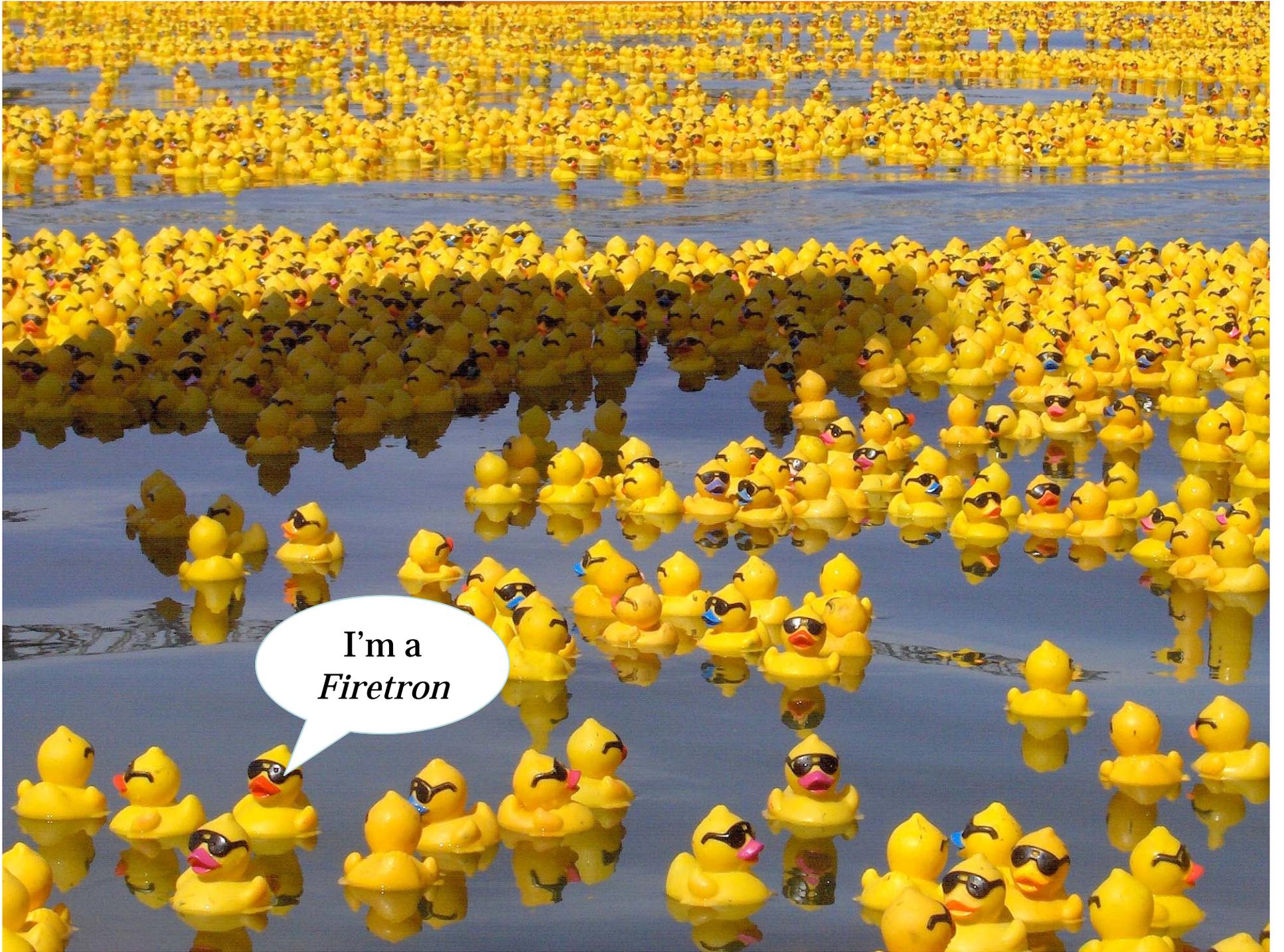


- Open source software that uses electrical circuit theory to model habitat connectivity.
- Quantifies the flow of electrical current across a resistance (1/conductive) surface.
  - » resistance of pixel = flammability
  - » resistance surface = landscape raster
  - » flow of current = fire likelihood

[www.circuitscape.org](http://www.circuitscape.org)



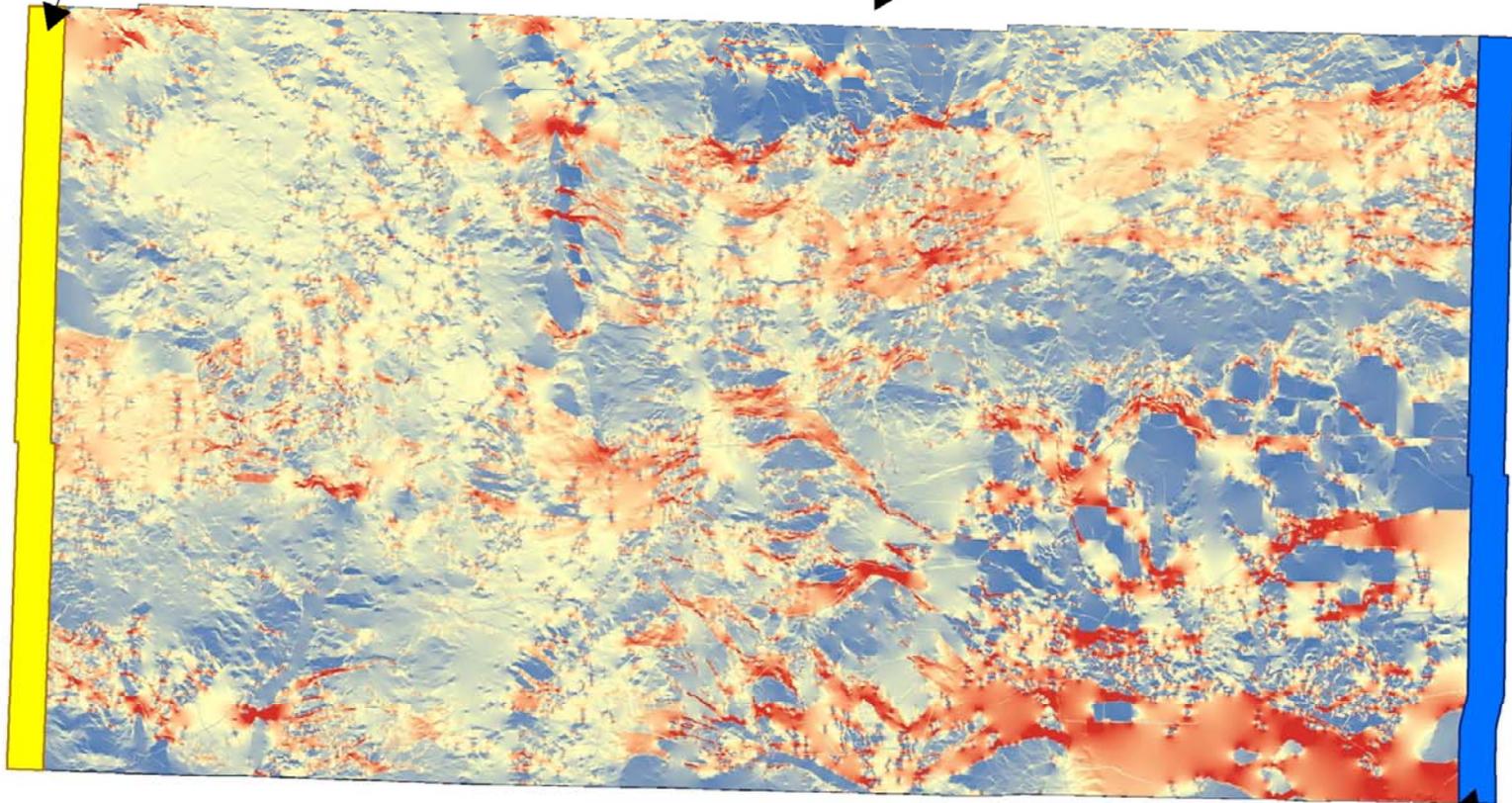
NWelch 2014-09-08



I'm a  
*Firetron*

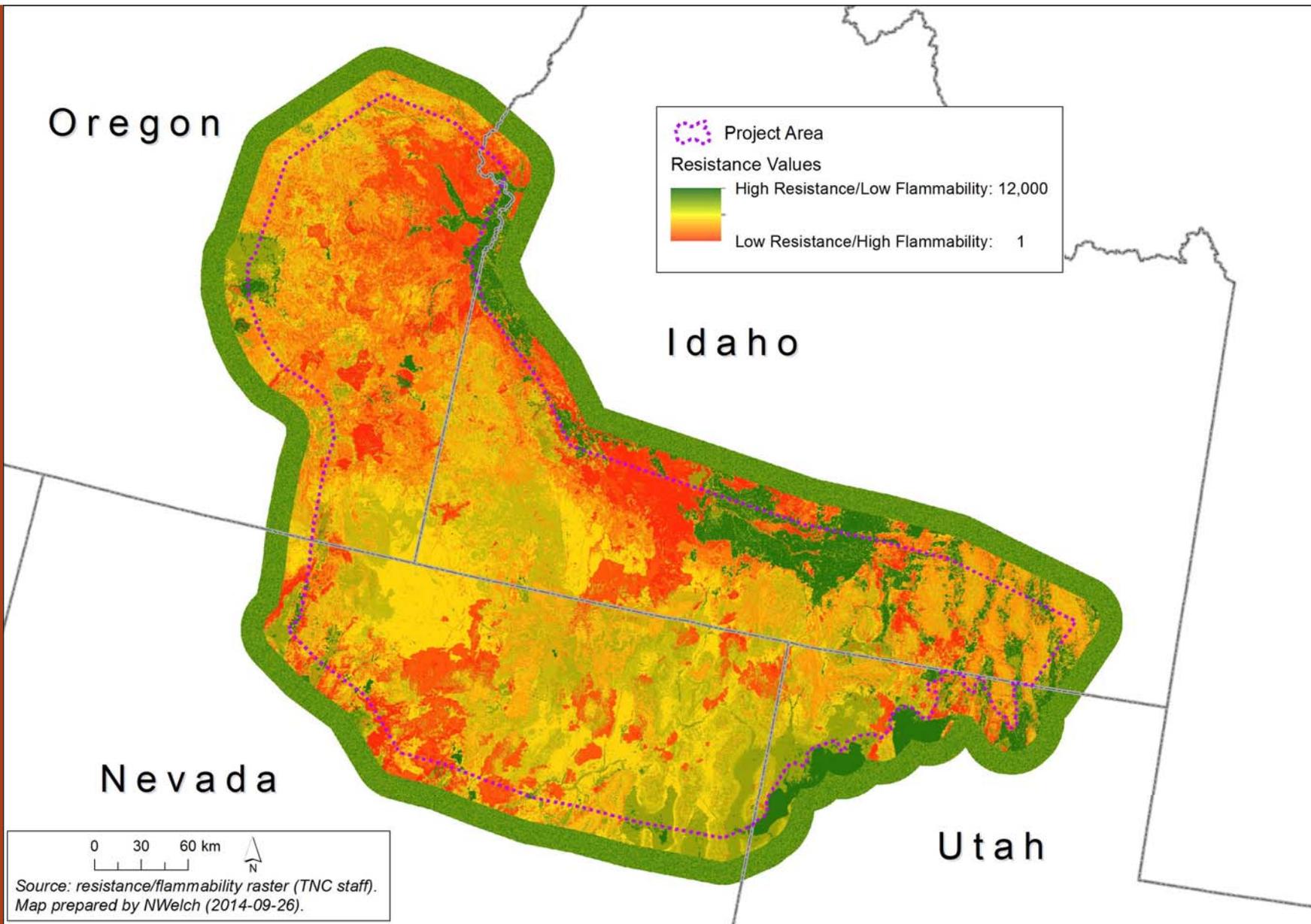
Source

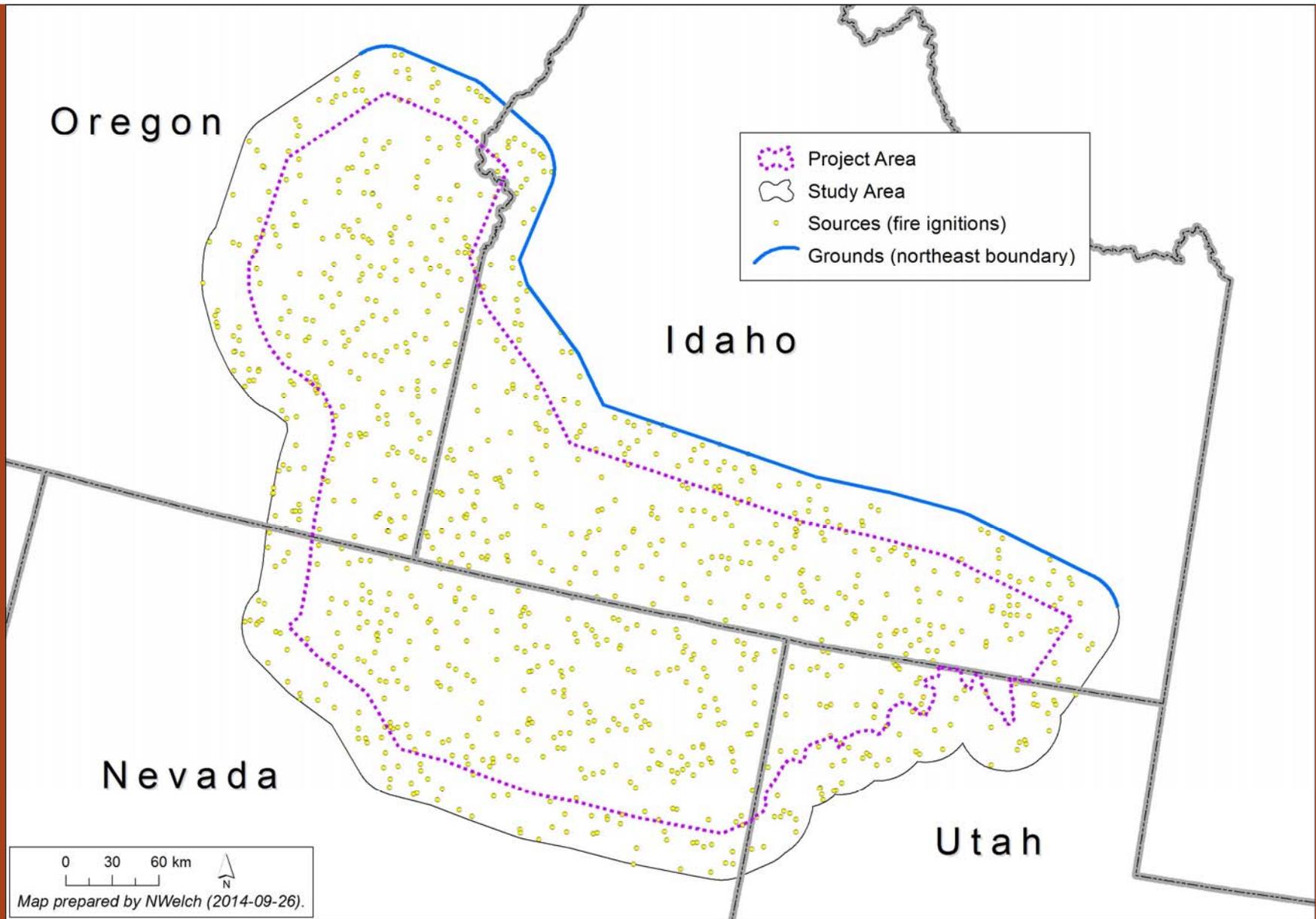
Current Density Raster

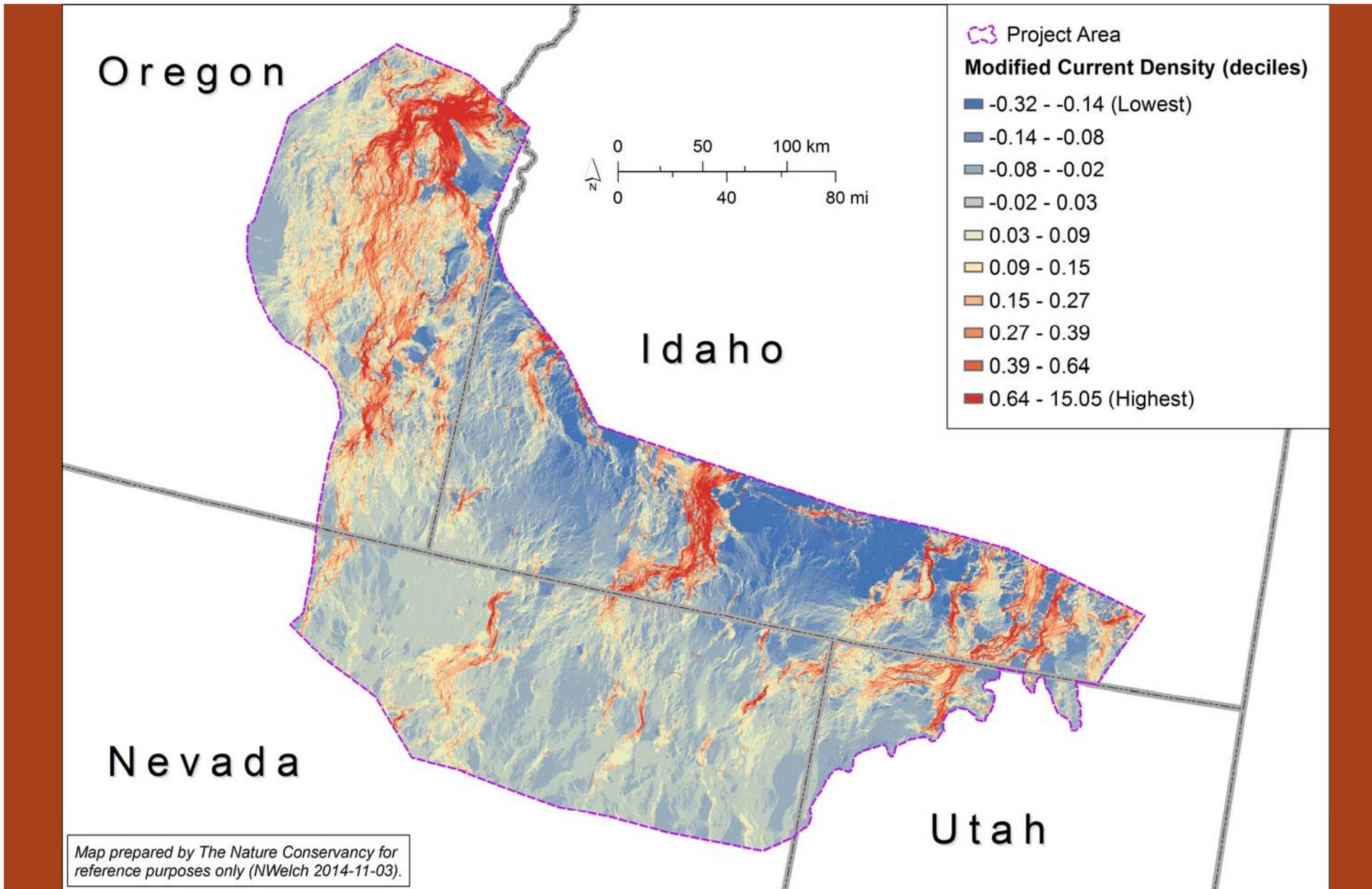


Ground

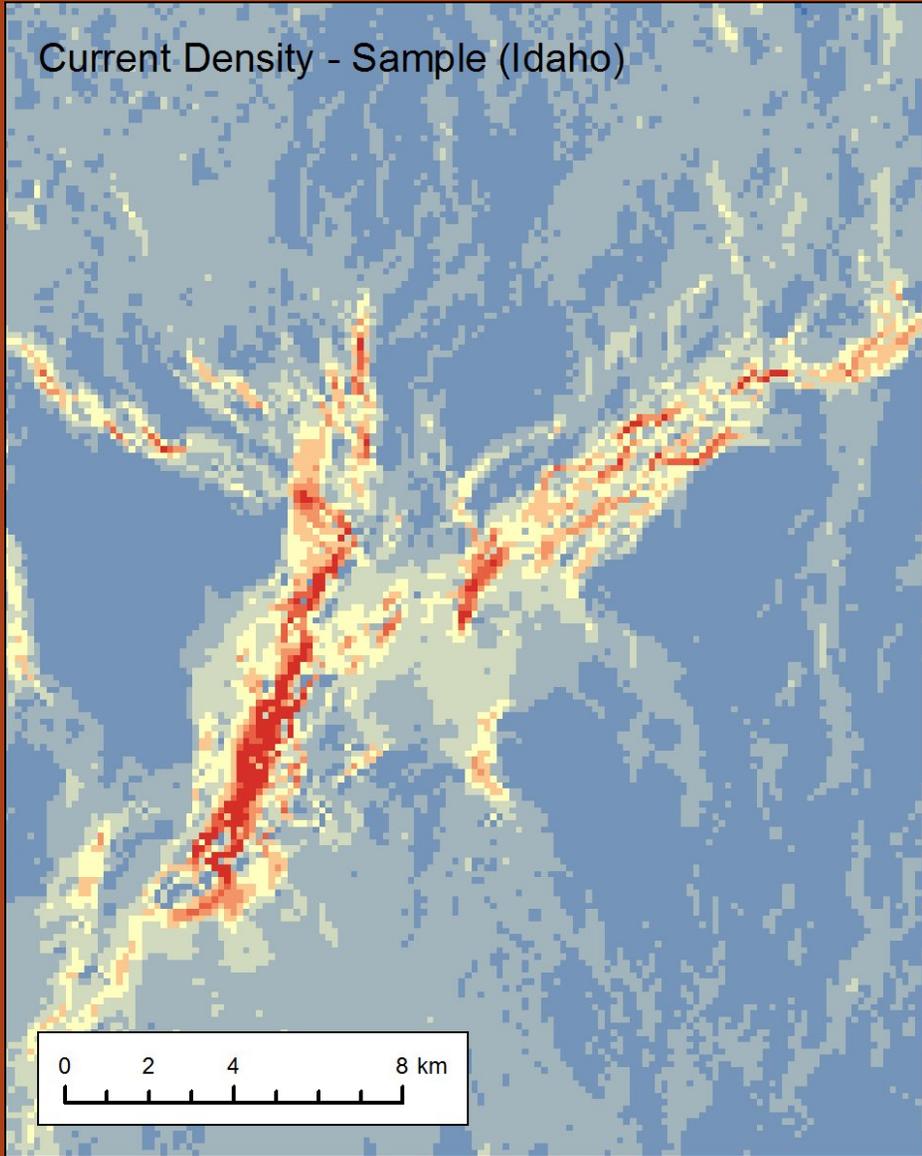
NWelch 2014-09-08



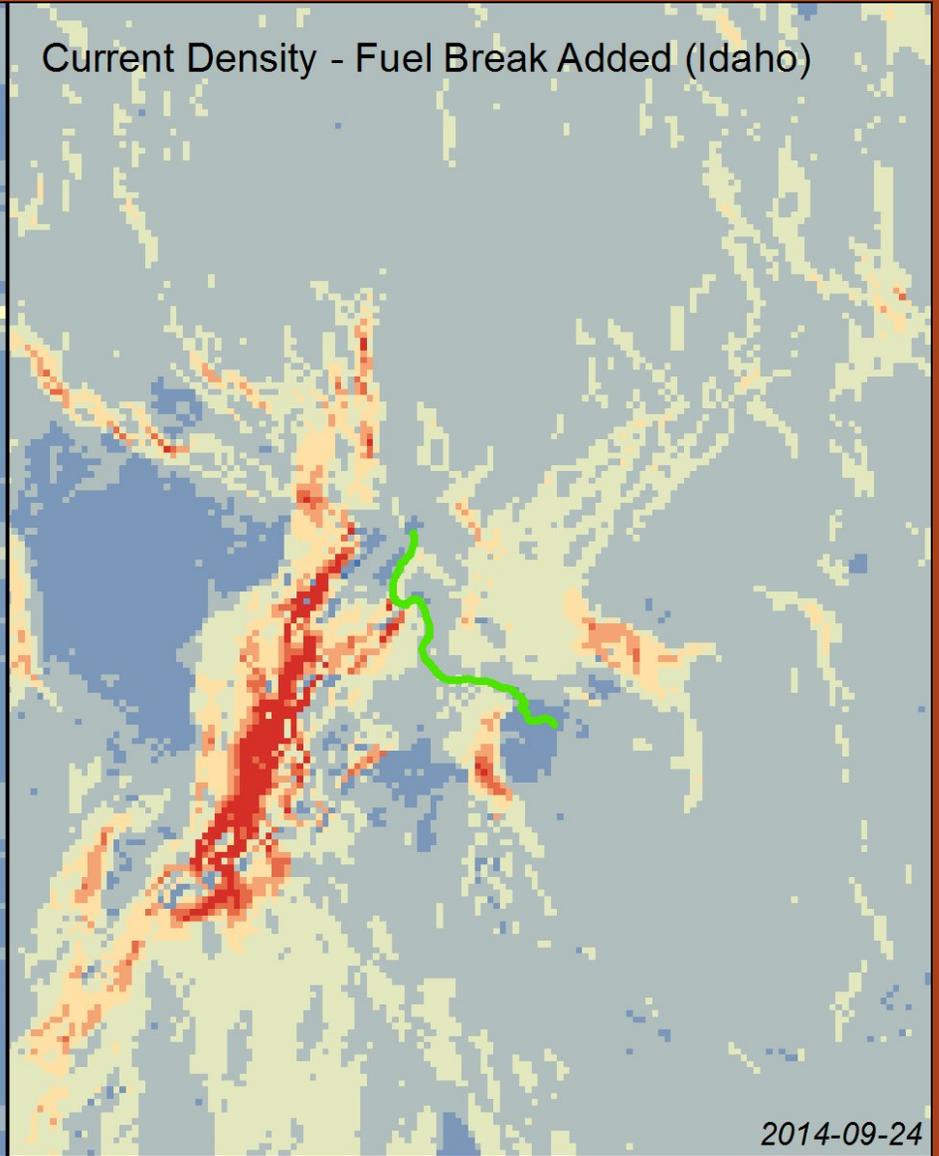




Current Density - Sample (Idaho)



Current Density - Fuel Break Added (Idaho)



2014-09-24

# Strategic Network of Fuel Breaks

- Protect large, intact patches of sagebrush-steppe habitat.
- Protect important areas for Greater Sage-Grouse (e.g., Core Areas).
- Do not encroach on “special” areas (e.g., Wilderness).
- Take advantage of existing roads, firebreaks, and areas of low fire-likelihood

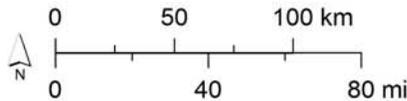
Oregon

Idaho

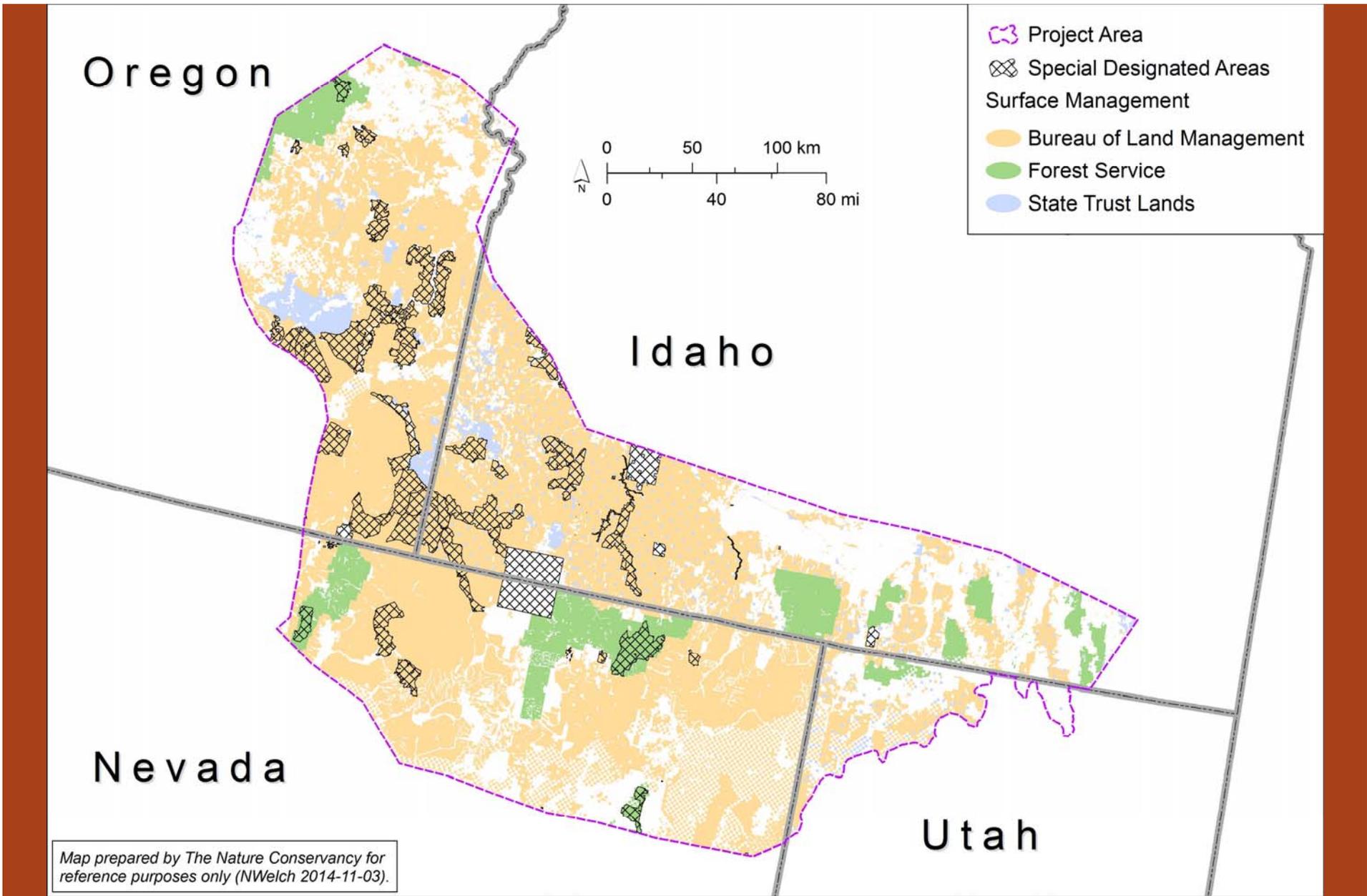
Nevada

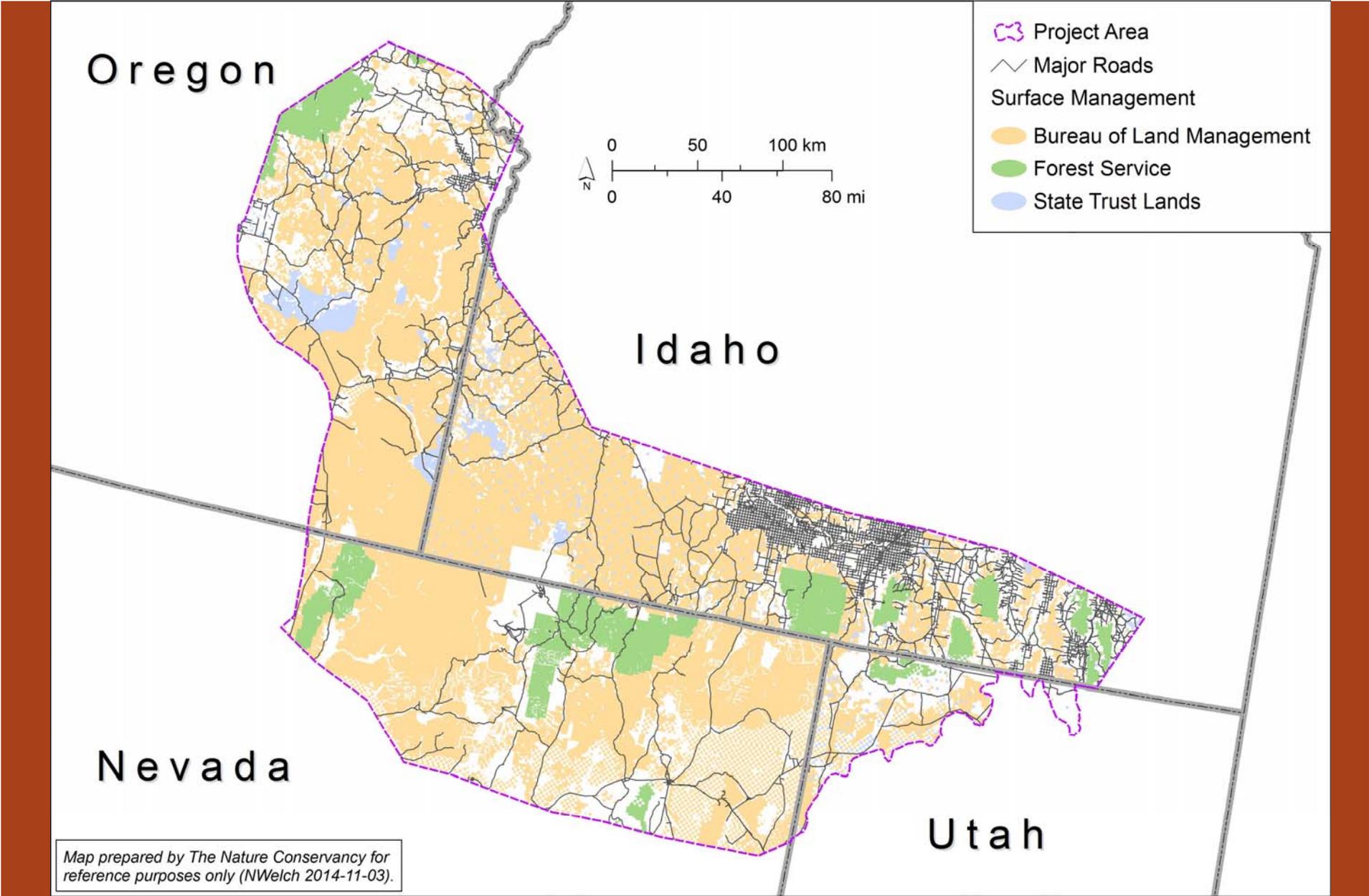
Utah

-  Project Area
-  Generalized Sage-Grouse Habitat
-  Recent Fires (2011-2014)



Map prepared by The Nature Conservancy for reference purposes only (NWelch 2014-11-03).



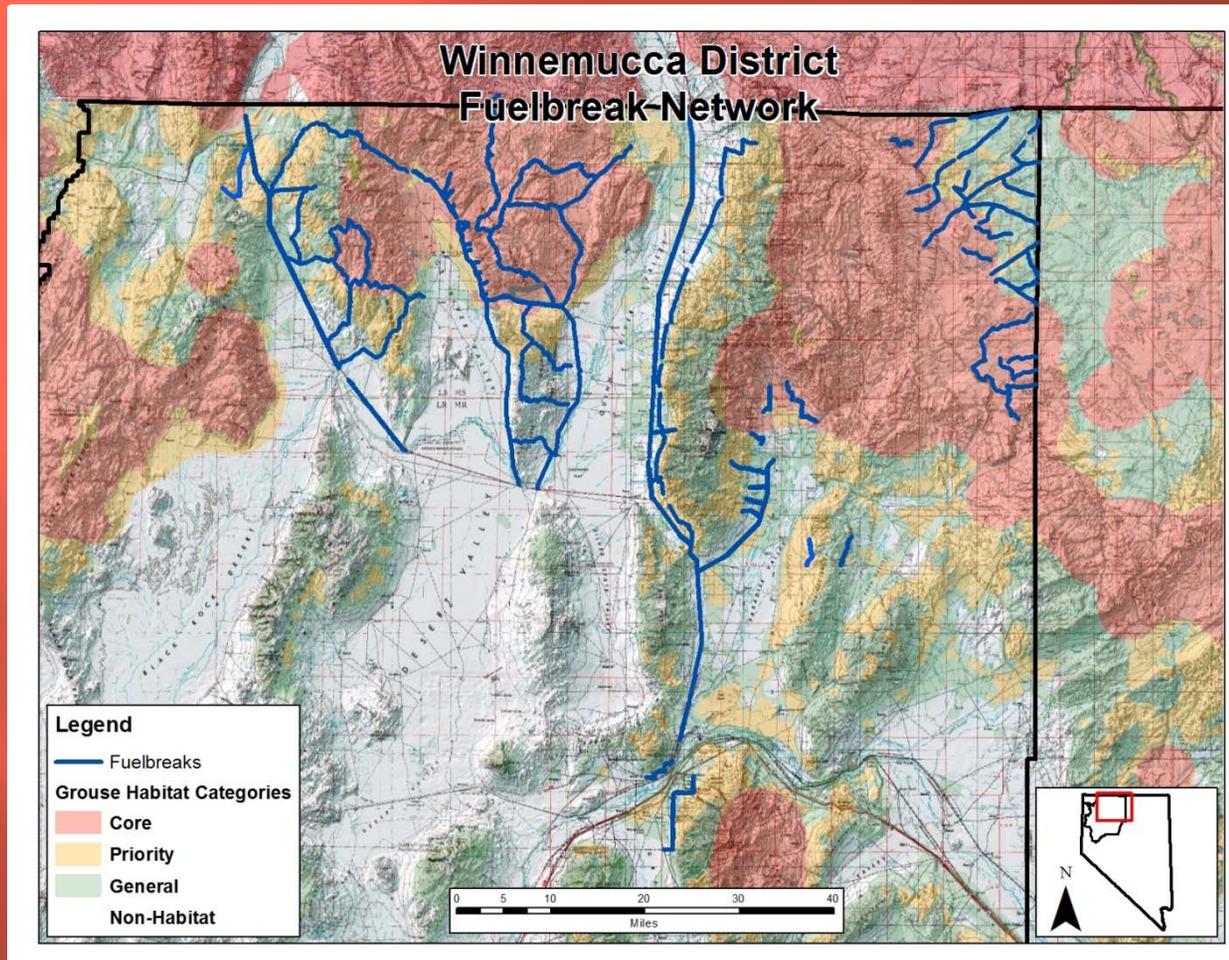




# Questions?



# Beyond WUI – Landscape Fuelbreak Systems



Mike Feticc  
Desert Basin Zone  
Fire Management Officer

# Fuels Management in Rangelands



Fuels Management – modifying fuel properties – vegetation and litter

Attributes modified: vegetation height, vegetative cover or continuity, composition (e.g., annual v. perennial), litter cover (i.e., removal through Rx), and total fuel loading.

Modifying fuel properties reduces fire intensity and/or fire spread.  
Fuelbreak locations can then be utilized by fire operations resources for suppression.

End Result: less area burned in wildfire



Winnemucca WUI Fuelbreak



Hot Springs Fuelbreak

# How do we prioritize placement of fuelbreaks across large landscapes?



Thomas Canyon Fire Winnemucca 2007



Photos taken from Winnemucca Dispatch Office

I. Fuelbreak placement priorities and types

II. Adapted Management

II. Success Stories



Stuart's Gap Fuelbreak

# Fuelbreak Location Selection

WUI - Primary target for treatment remains protection of communities-at risk in the wildland-urban interface



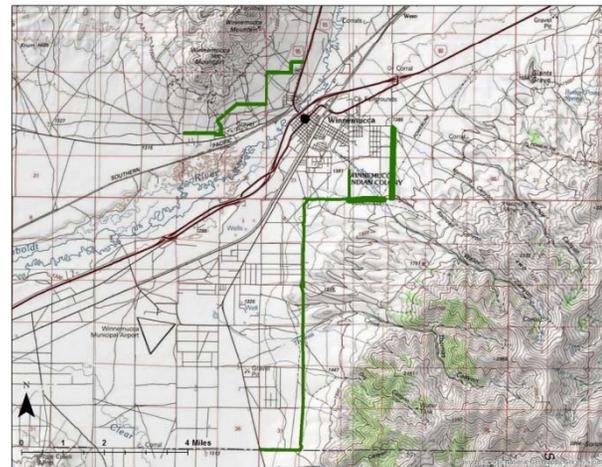
Fort McDermitt Reservation North Road Fire 2005

# Fuelbreak Location Selection

WUI - 13 federally-recognized communities-at-risk within the Winnemucca District



**Pre-treatment Cheatgrass dominated**



**Winnemucca WUI Fuelbreak System**



**Winnemucca 2007**



**Post-herbicide fuelbreak**

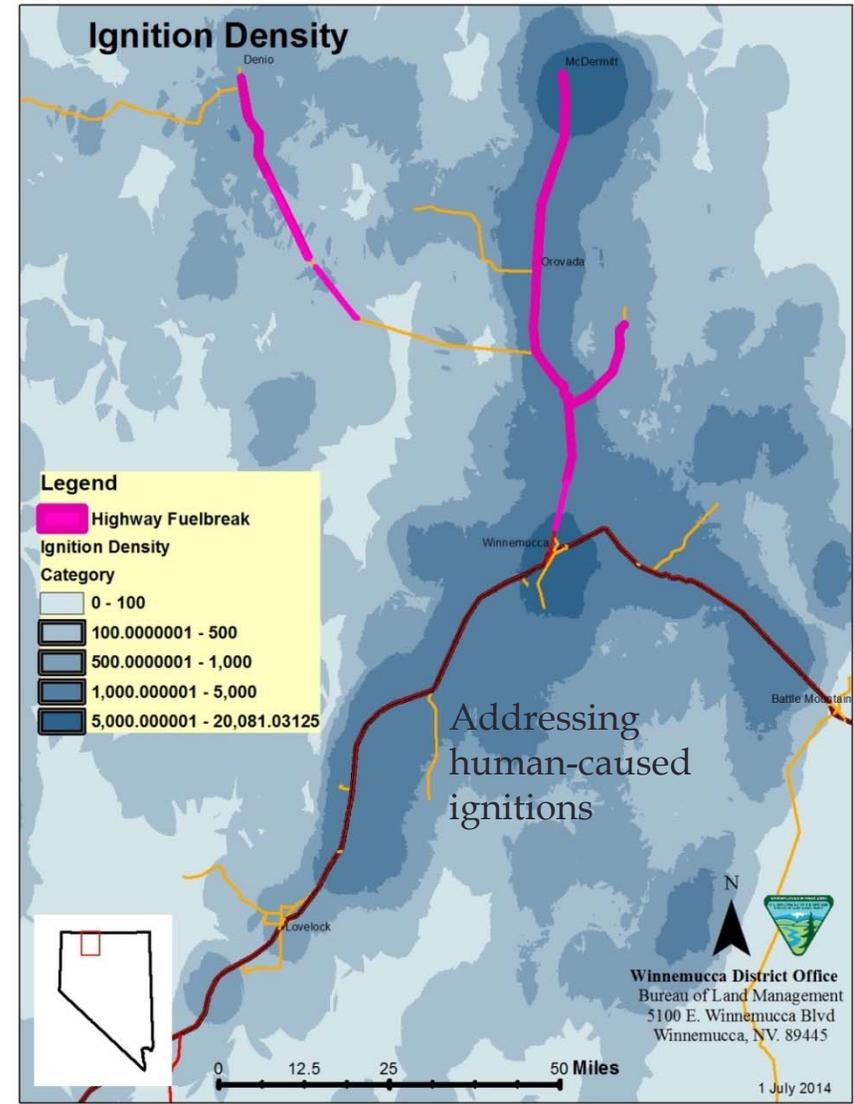
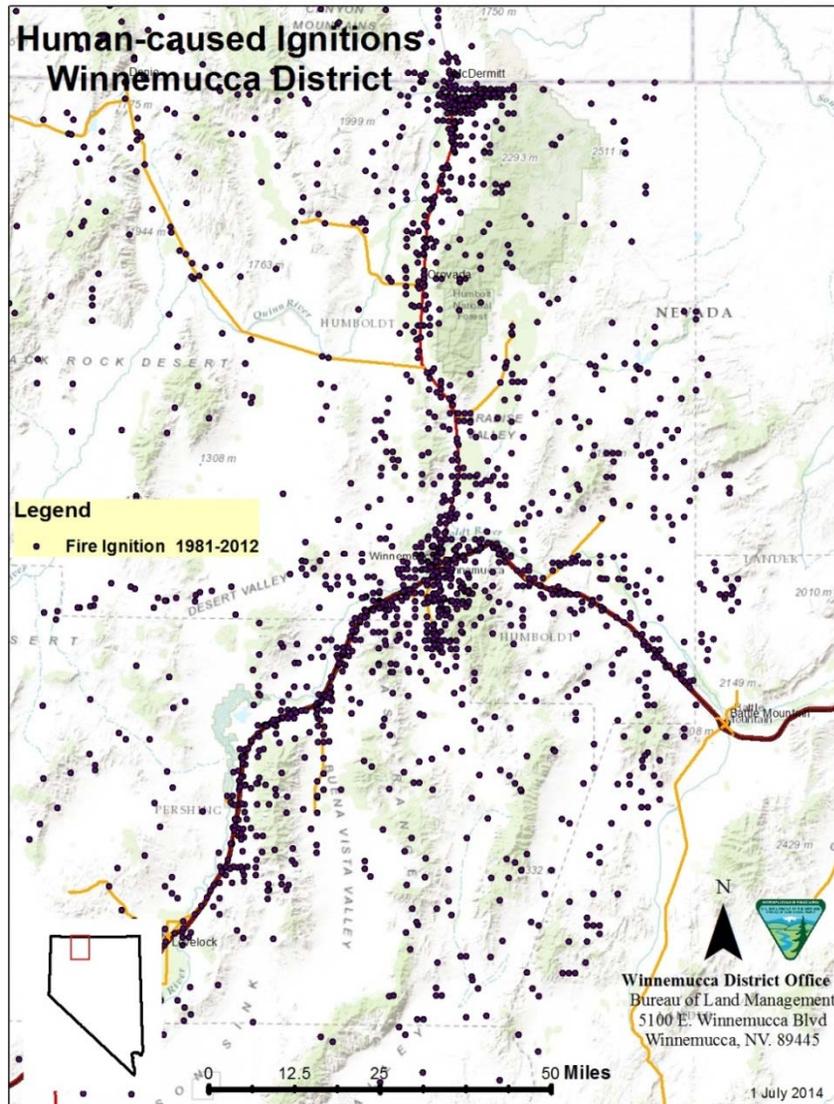


**Drill seedling-fuelbreak**

Protect communities and fires moving out of WUI into adjacent sagebrush habitat

# Fuelbreak Location Selection

Where do we have a high frequency of human-caused ignitions?



# Addressing Human-caused ignitions

## Highway Disking Fuelbreaks

135 miles treated along 4 highways with high fire occurrence

### Specifications

- maintained yearly with disk
- bare dirt 12-16 ft wide, both sides
- after major veg growth but prior to fire-prone conditions



Highly successful fuelbreaks that limit fire spread into adjacent intact habitat

### Why do they work?

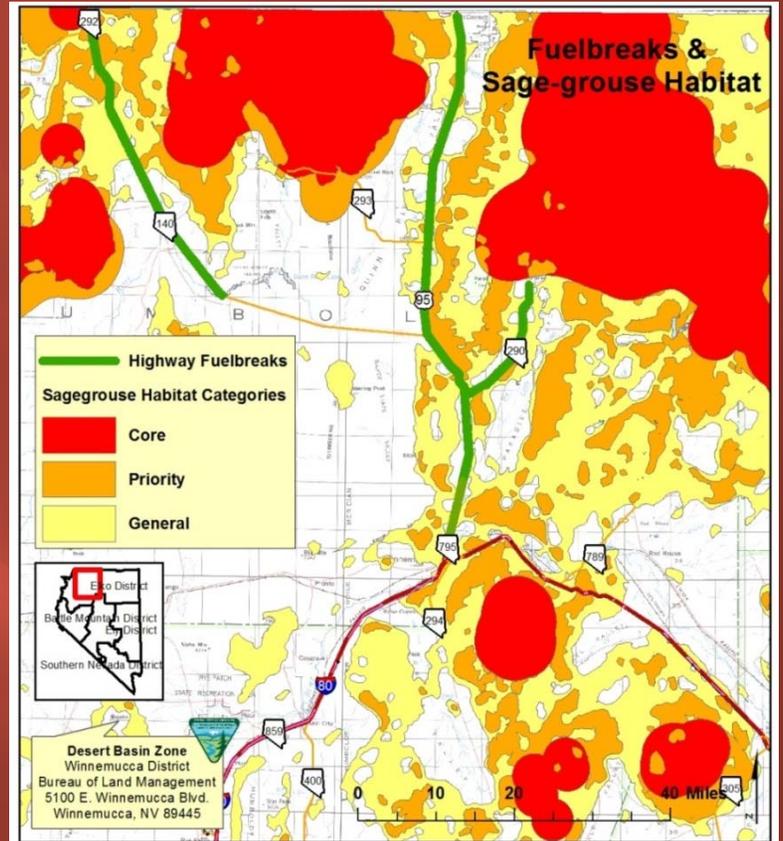
1. Limit fire spread in the direction of large blocks of continuous fuel
2. Limits the distance from ignition origin to fuelbreak – fire cannot build in intensity
3. Fires in alignment with winds can only move in flanking and backing conditions



# What are we saving?



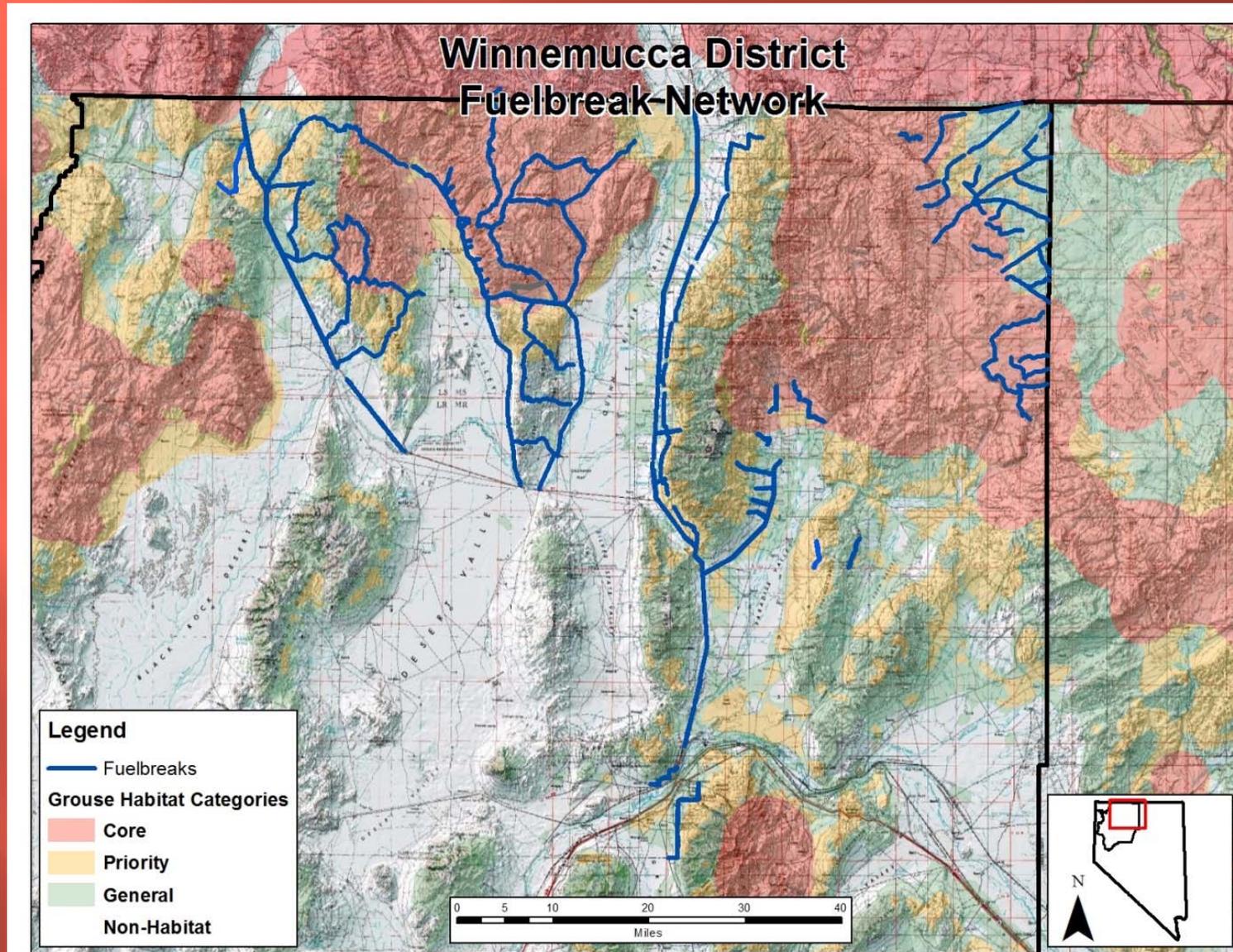
Denio Summit Fire June 2008



Intact Sage-grouse Habitat

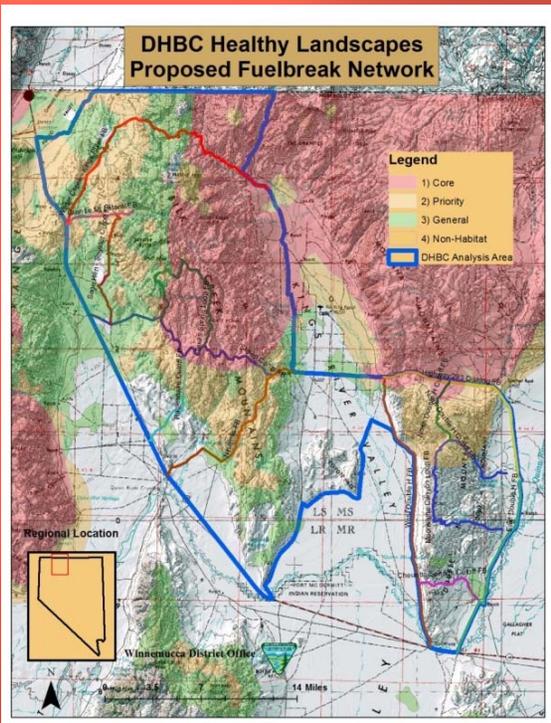
Example: highway diking  
fuelbreaks

# What are we saving?

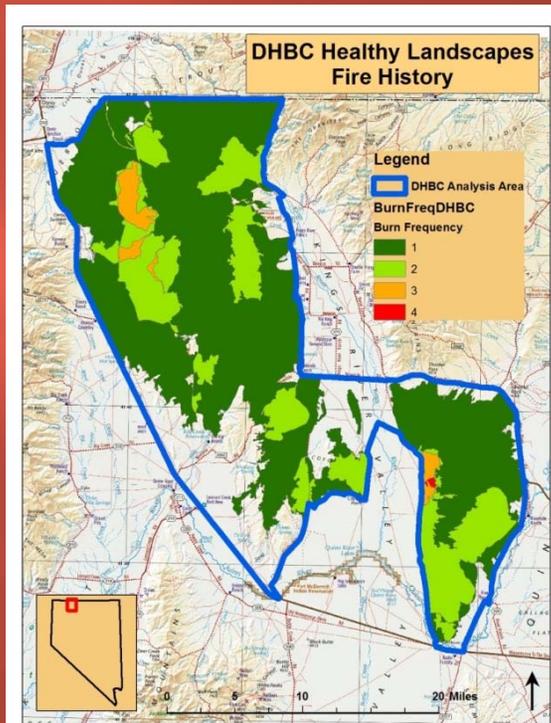


Fuelbreaks include both WUI and other high values including sage-grouse habitat and currently total approximately 840 linear miles with various widths

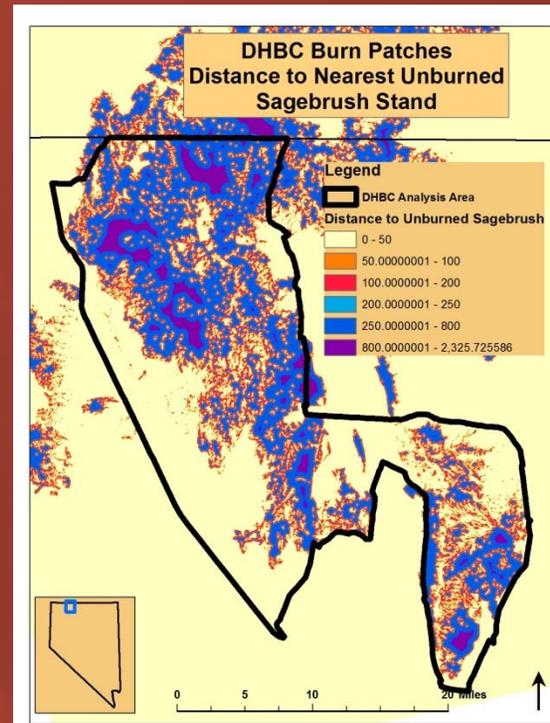
# Why expand fuelbreaks outside of WUI?



Large landscapes of core or priority sage-grouse habitat



Number of times grouse habitat has burned since 1985

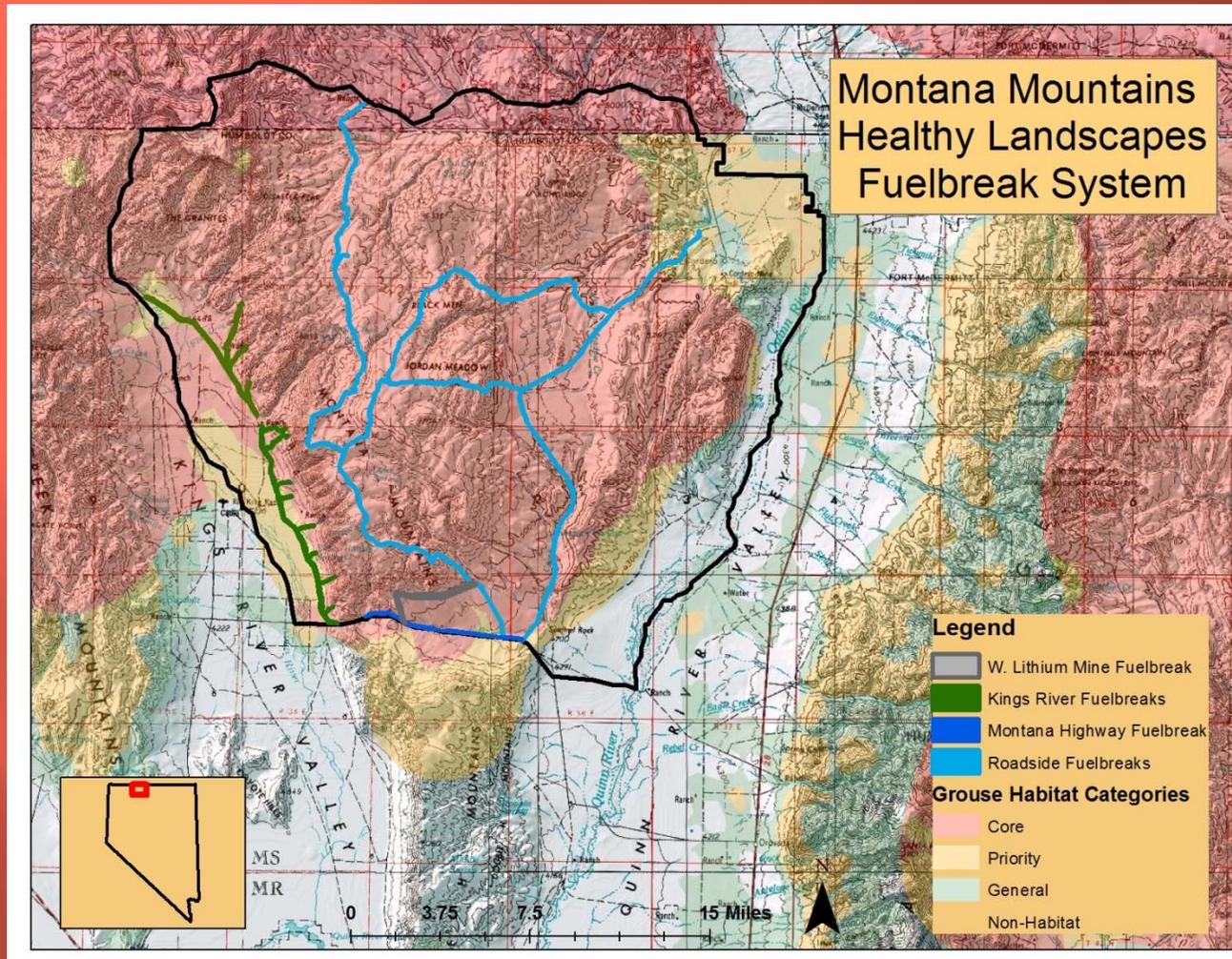


Large blocks of habitat located half mile or more from nearest sagebrush stand – slow recovery

Example: Double H-Bilk Creek Mountains Healthy Landscapes Area - 393,000 acres  
 Total acres burned 401,800 from 1985 to 2012, some areas multiple times  
 - that's a frequency of once every 27.4 years

Some areas have burned 3 or 4 times since 1985

# Montana Mountains Healthy Landscapes Project

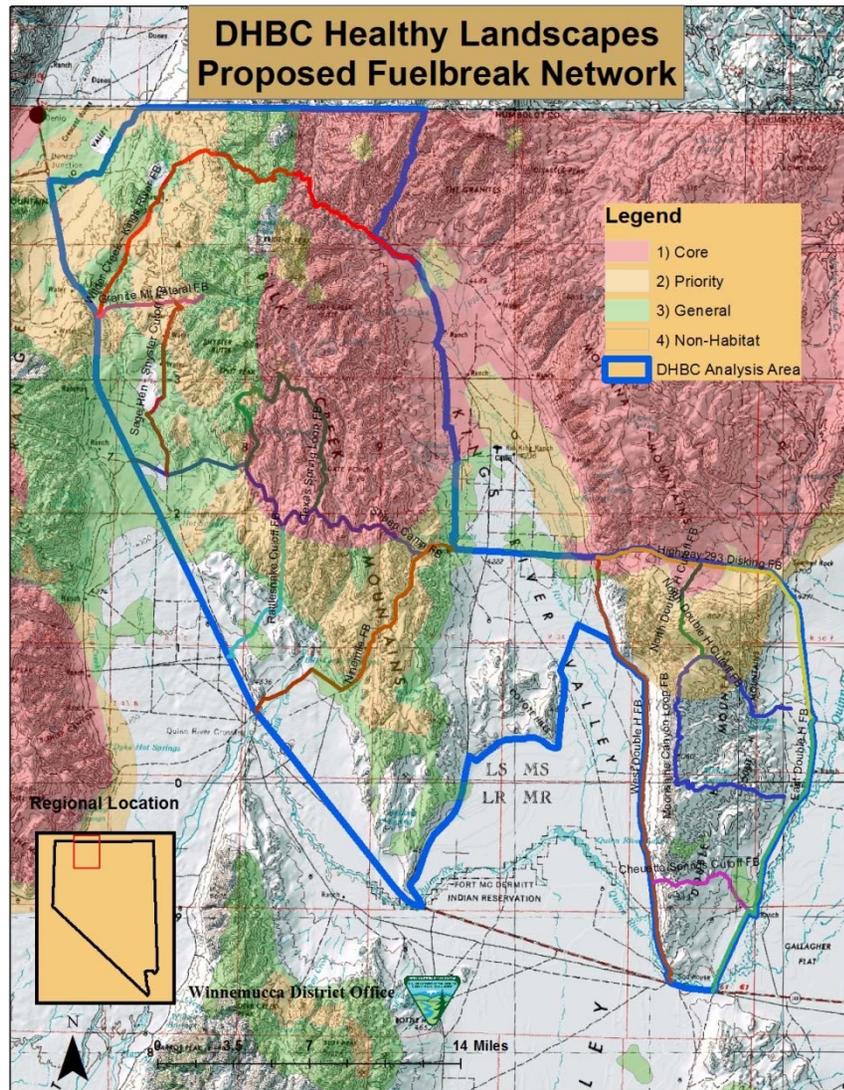


## Variety of fuelbreaks

- 300 ft wide drill-seeded with low-growing grasses 27 miles
- Road fuelbreak: mowing on both sides of road – 79 miles
- Fuelbreak around existing mining operations 5 miles
- Fuelbreak along high-traffic highway 7 miles

Full plan includes both fuels and sagebrush restoration treatments >14,000 acres

# Double H-Bilk Creek Healthy Landscapes Project



Project currently in the planning stage – part of a continuous large block of Sage-grouse habitat.

A variety of fuelbreaks planned from mowing along existing roads in the mountains to drill seeding wide fuelbreaks in the flats.

177 miles proposed

Part of fire defense system to provide firefighters a defensible location for suppression.

With the Montana Mts Project  
313,000 acres PPH  
84,000 acres PGH  
15 LCT streams

# Adaptive Management – Fuels



Pre-treatment - Site conditions determine what treatments are necessary



Post-treatment yr 10 – sagebrush re-establishing  
– identify maintenance treatments

Monitoring of treatments is key to successful fuels management program.

Monitoring assesses the change in fuels structure, success or failure of treatments, and need for maintenance or modification of treatments.



Companion Control Plot – Assess impacts and fuel response to treatments

# Fuelbreaks – Alternative

Change from greenstrips –planting fire resistant vegetation - to planting low growing native perennials

We had mixed success with greenstrips – possibly due to our arid sites mostly 5-8” or 8-10” precipitation

Advantages of low stature native plants

1. Low growing–greatly reduced fine fuel loads
2. Highly competitive with cheatgrass- will completely exclude it at full occupancy
3. Very drought tolerant
4. Resilient to disturbance

## Winnemucca Wildland-Urban Interface Fuelbreak Network

Drilled with blue grass and thickspike, mixture of loamy and sandy soils



Early Establishment

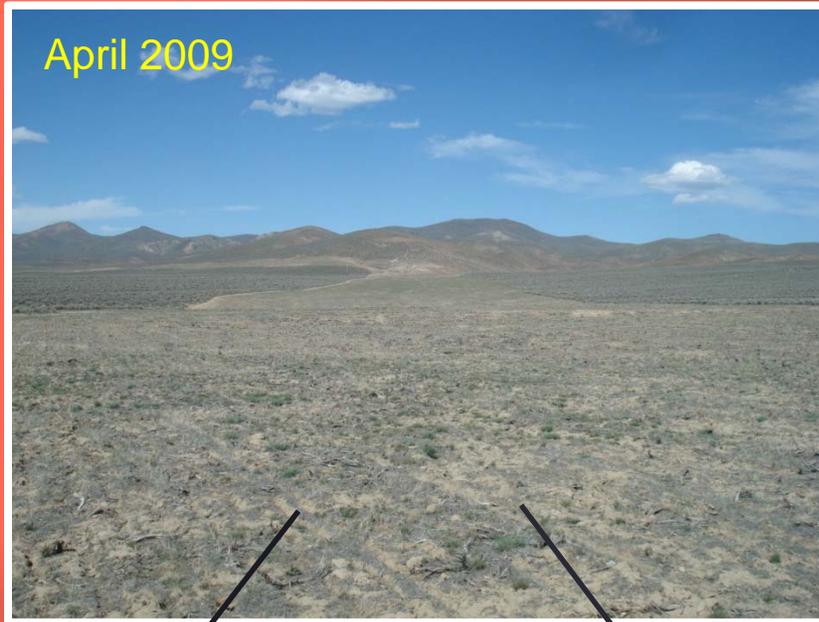


Drill Rows



Full Occupancy May 2014

# Fuelbreaks – Alternative Drill Seeding Strategy

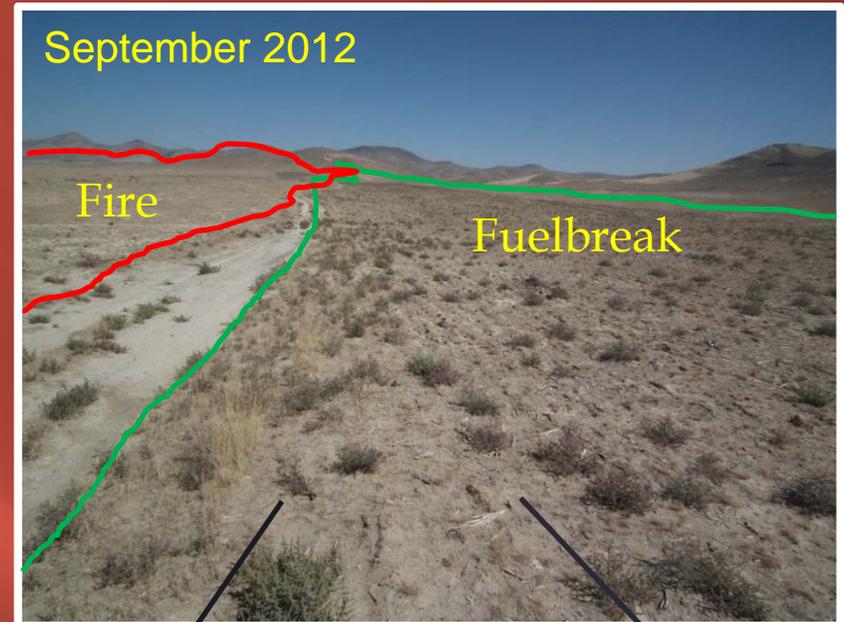


April 2009

Hot Springs Fuelbreak



Full occupancy – Sandberg's blue grass



September 2012

Fire

Fuelbreak

Hot Springs Fire October 2011  
Note unburned fuel



Bluegrass cures early but has low fuel loading and stopped fire

# Changes made due to monitoring – Drilling Method

To reduce impacts of treatments – we now use depth bands on range drills

Less impact to existing perennial plants

Less impact to biological crust

Less surface disturbance and cheatgrass response

Better depth for low-growing native grass



Much less damage to existing perennial plants



Conventional Drilling



Drilling with depth bands

# Fuelbreak Maintenance

Highway Disking Fuelbreaks – require annual maintenance

Drill Seeded Fuelbreaks – maintenance is determined by monitoring

- Ultimate goal would be to have a fuelbreak that is fully occupied by low-growing perennials and maintenance free
- Sometimes we have to retreat a fuelbreak (e.g., failed seeding). The Great Basin has a temperamental precipitation regime.



Mowed Roadside Fuelbreaks – already have good understory of perennials – maintenance is determined by shrub recovery

Low impact WUI Fuelbreak – we have 1 fuelbreak that is treated annually with grass trimmers after major vegetation growth. Unique and only useful on small areas.



Pre-treatment



Post-treatment

# Fuelbreak Success

## Highway Disking Fuelbreaks



Fire stopped in 2003 Moderate burning conditions



Fire stopped in May 2006 Moderate burning conditions



# Fire is stopped under a variety of burning Conditions



2009 Fire, Moderate conditions



Andorno Fire, June 20, 2012 ERC-90, BI-62



Paradise Hill May 2013 Moderate conditions



MM47 Fire, May 11, 2012 ERC-74, BI-54



CODR Fire, July 22, 2012 ERC-102, BI-94



MM66 Fire, Aug 24, 2012



National Fire, August 24, 2012 ERC-99, BI-56



MM65 and MM66 Fires ERC=99, BI=56

# Fuelbreak Success?



You can't win every time

Buckskin Fire August 13, 2012  
ERC-105, BI-64

Storm front with high winds snapped 4  
powerpoles igniting fire and spotting  
over the highway and our fuelbreak,  
total size-10,720 ac



Fuelbreak still held backing and flanking fires



Fire spotted over the fuelbreak

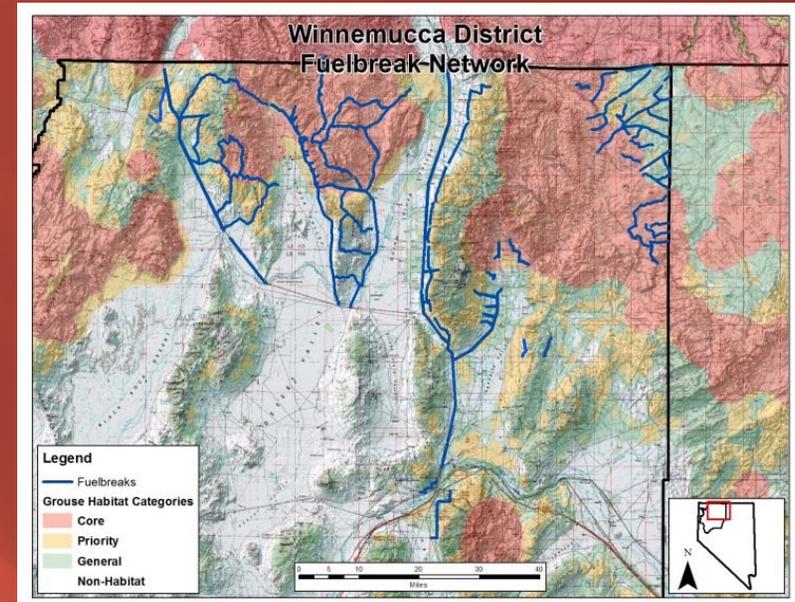
# Conclusion

The large landscapes we manage require a sound comprehensive strategy to prioritize treatments with limited funding.

Although the WUI is still our # 1 priority, the threat of habitat loss due to wildfire makes protecting intact sagebrush habitat the # 1 natural resource priority.

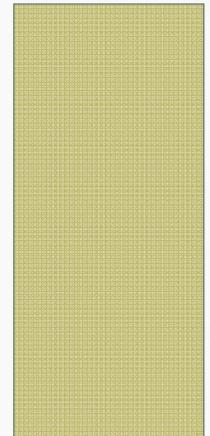
Monitoring information can inform us of success/failure, need for treatment and needed adaptations to our current strategies.

There isn't a single fuels management strategy that will work for everyone – a variety of methods may be required.



# MANAGING LANDSCAPES FOR SAGE GROUSE

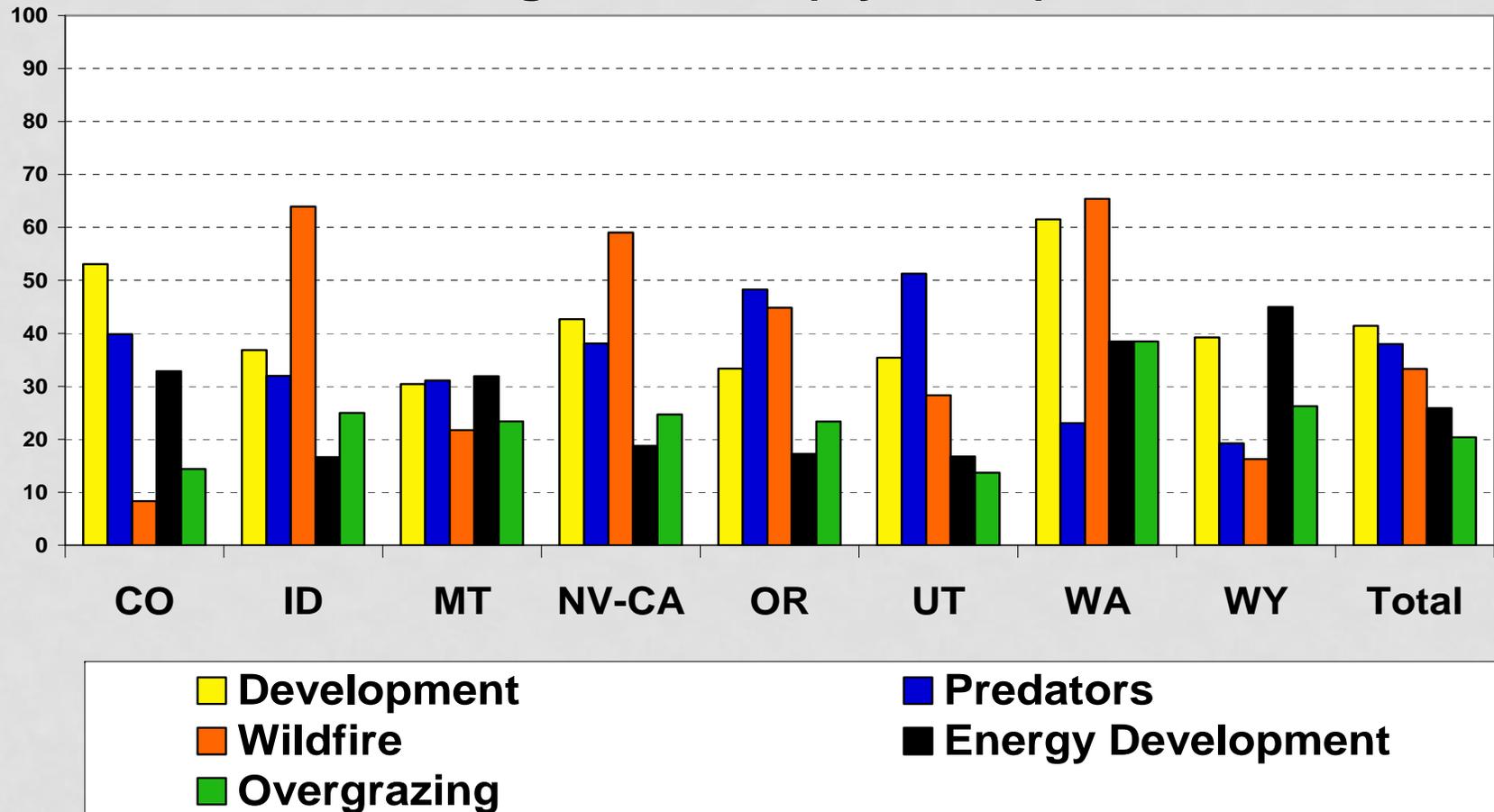
GREEN STRIPPING AND GROUSE



# SAGE-GROUSE REQUIRE SAGEBRUSH



## Percent Citing Factor as "Serious Threat" to Sage-Grouse (By State)



# WILD FIRE

- Change in fire regime
- Increase in conifers, decreases native avian and vegetation species, spread of invasive plant species





Photo: Forestry Images



Photo: Oregon State University



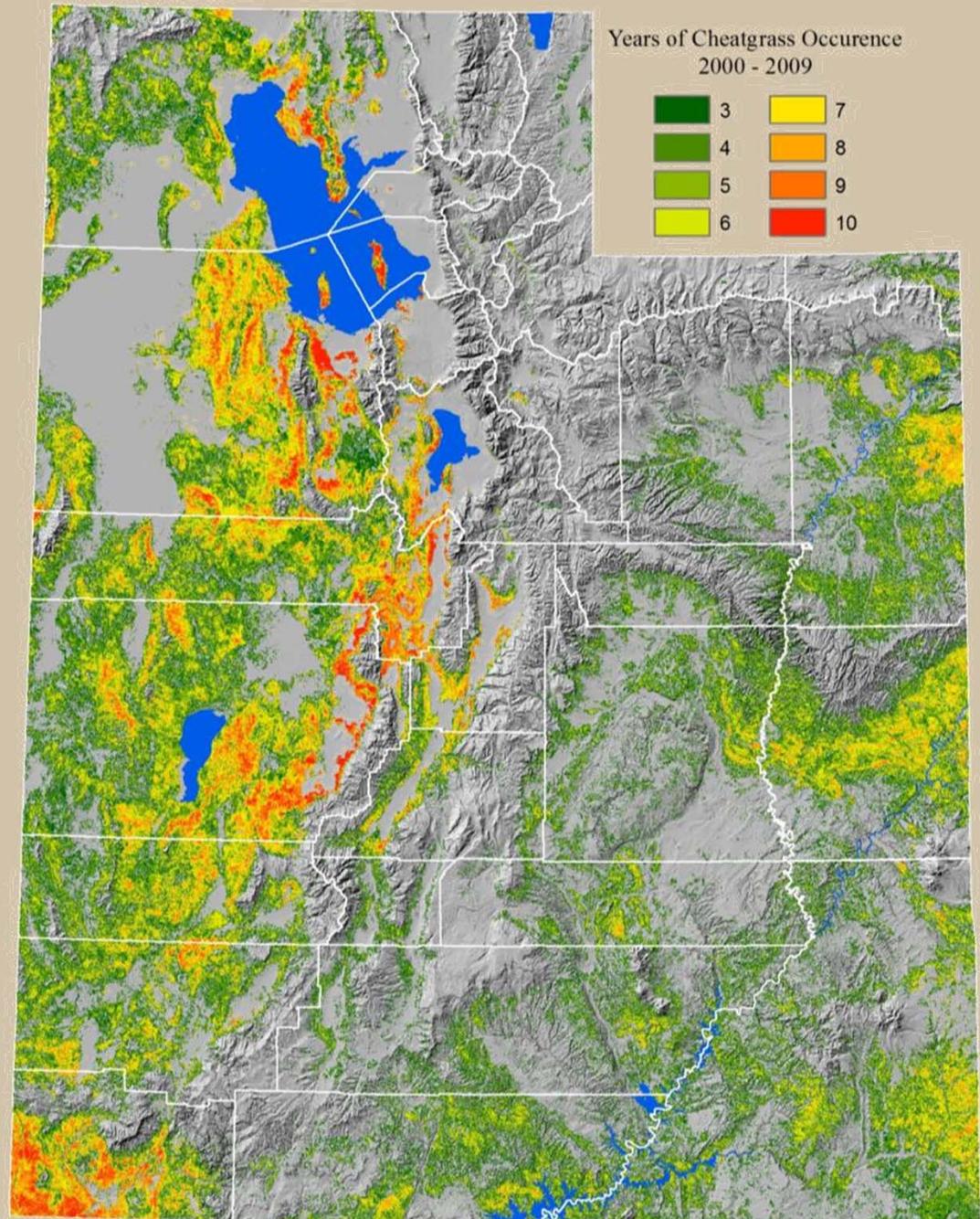
Photo: Intermountain Herbarium



Photo: Stevens County, WA

## Frequency of presumed Cheatgrass occurrence between 2000-2009

Differences between the 1990-99 imagery and the 2000-10 imagery is due in part to variation between sensor platforms (AVHRR vs MODIS) which requires additional calibration.



# Black Mountain Fire

- 3 miles southeast of Minersville
- 2002 Maple Springs fire re-seeded with diverse flame resistant seed mix
- Millions of fire suppression dollars saved
- Thousands of acres saved from burning

## Watershed Restoration Initiative

- Post fire seeding
- Saves dollars and habitat
- Helps fight future fires by
  - reducing their size
  - providing fuel breaks
  - giving firefighters a safe place to work

2002  
Fire  
Seeding

  
Fire  
Direction

# SITE PREPARATION



# MASTICATION



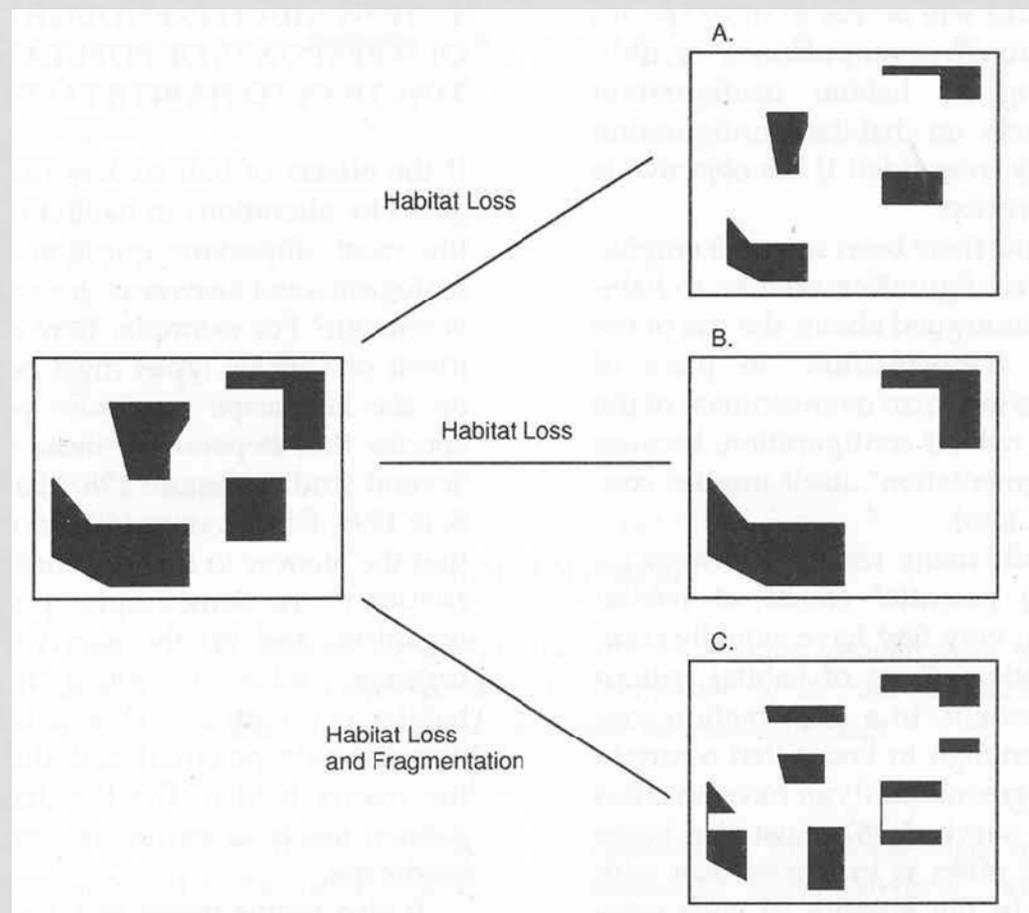
# SEEDING





# HABITAT LOSS AND FRAGMENTATION

- Habitat loss may or may not fragment
- Focus on landscapes not patches
- Few studies compare loss and fragmentation
  - All find loss most important
- Emphasizing fragmentation rather than loss maybe misleading



(Fahrig 1999)

# WHAT WE DON'T KNOW

What effect will the landscape level firebreak treatments and corresponding changes in vegetation have on sage-grouse

- habitat use patterns
- vital rates, and
- foraging.

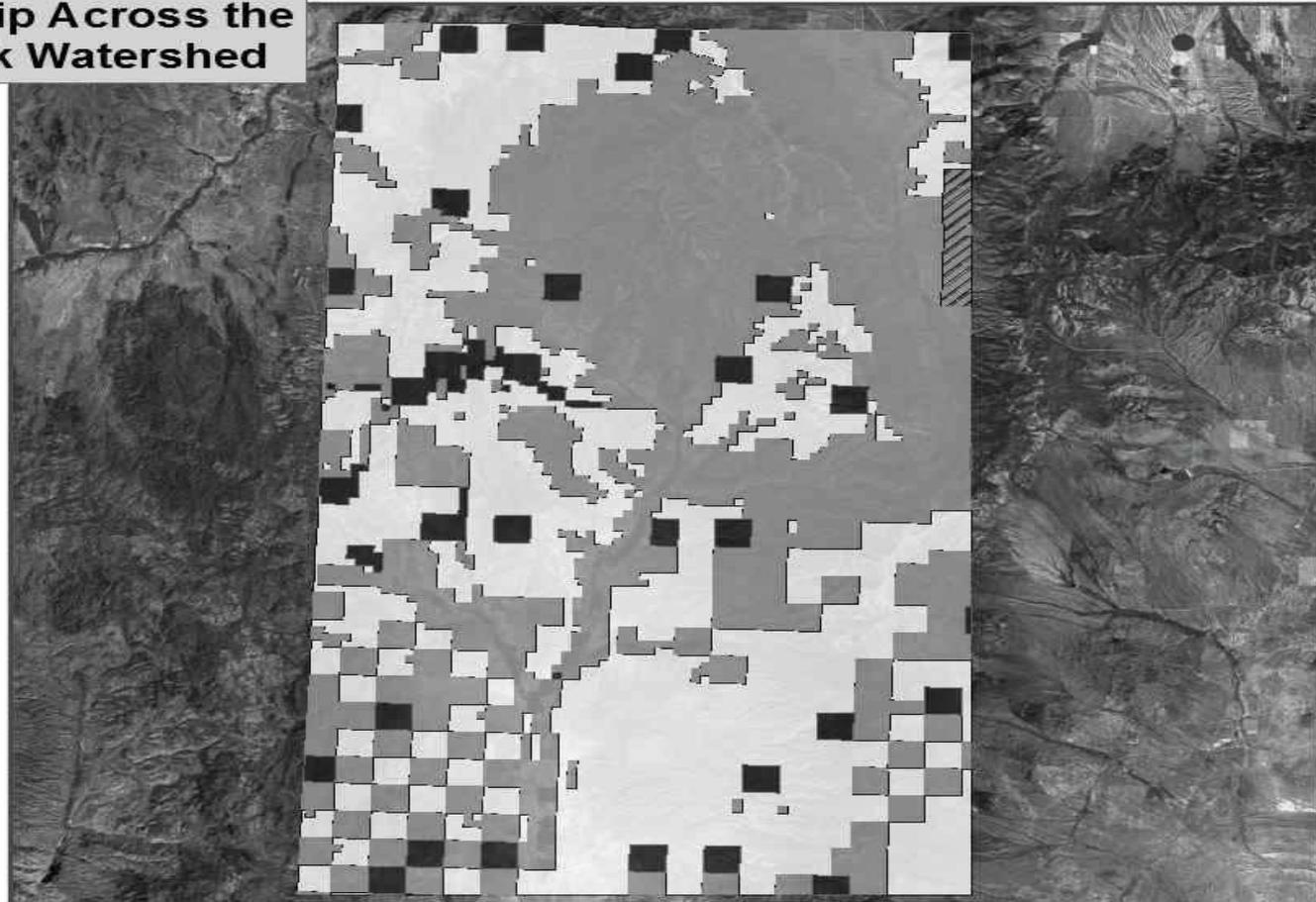
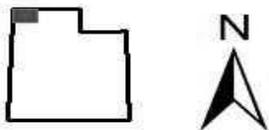
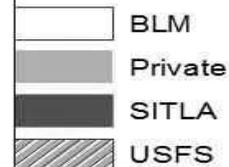
# STUDY AREA – BADGER FLAT

## Land Ownership Across the Grouse Creek Watershed

Author: Stephanie Graham  
Data Source: Utah GIS Portal  
Date: April 5, 2013  
UTM NAD 1983 Zone 12N  
Projection: Transverse Mercator

### Land Ownership

#### AGENCY



0 5 10 20 Kilometers

# TREATMENTS

✧ Aug 16 – September, 2010: chain harrow greenstrip  
(seedbed prep/removal of shrubs)



# TREATMENTS

✧ Aug 1 – 15, 2010: mastication of trees within greenstrip area



# TREATMENTS

- ✧ Sept 2-Sept 12, 2010 - Spray Plateau herbicide
  - ✧ 5 oz Plateau/acre
  - 1 qt MSO/acre
  - Applied in 10 gal water/acre



# TREATMENTS

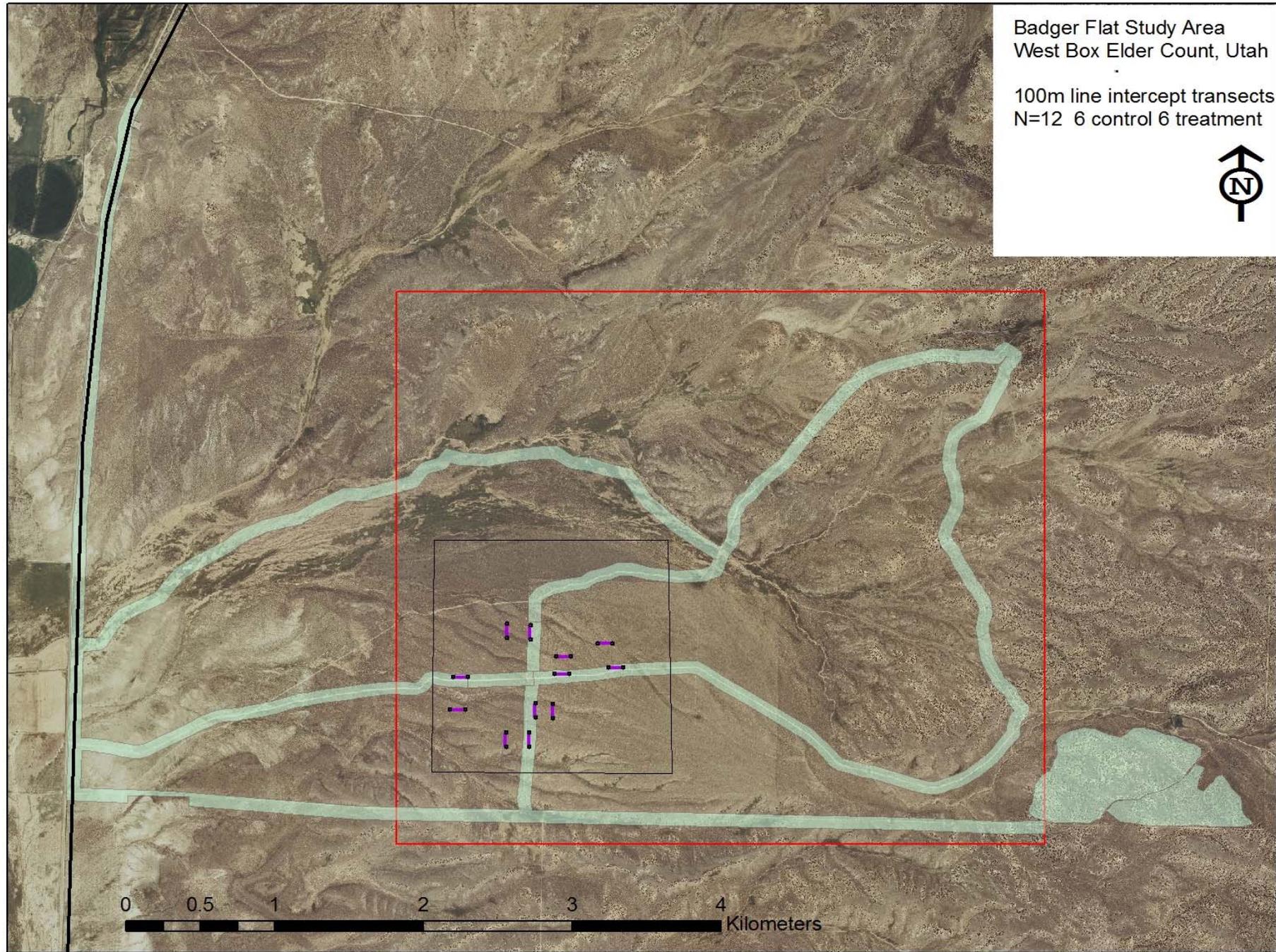
- ❖ December 13, 2010 - Aerially apply forage kochia seed at a rate of 4.5 bulk/lbs/acre.



Photo: Roger Banner

Badger Flat Study Area  
West Box Elder Count, Utah

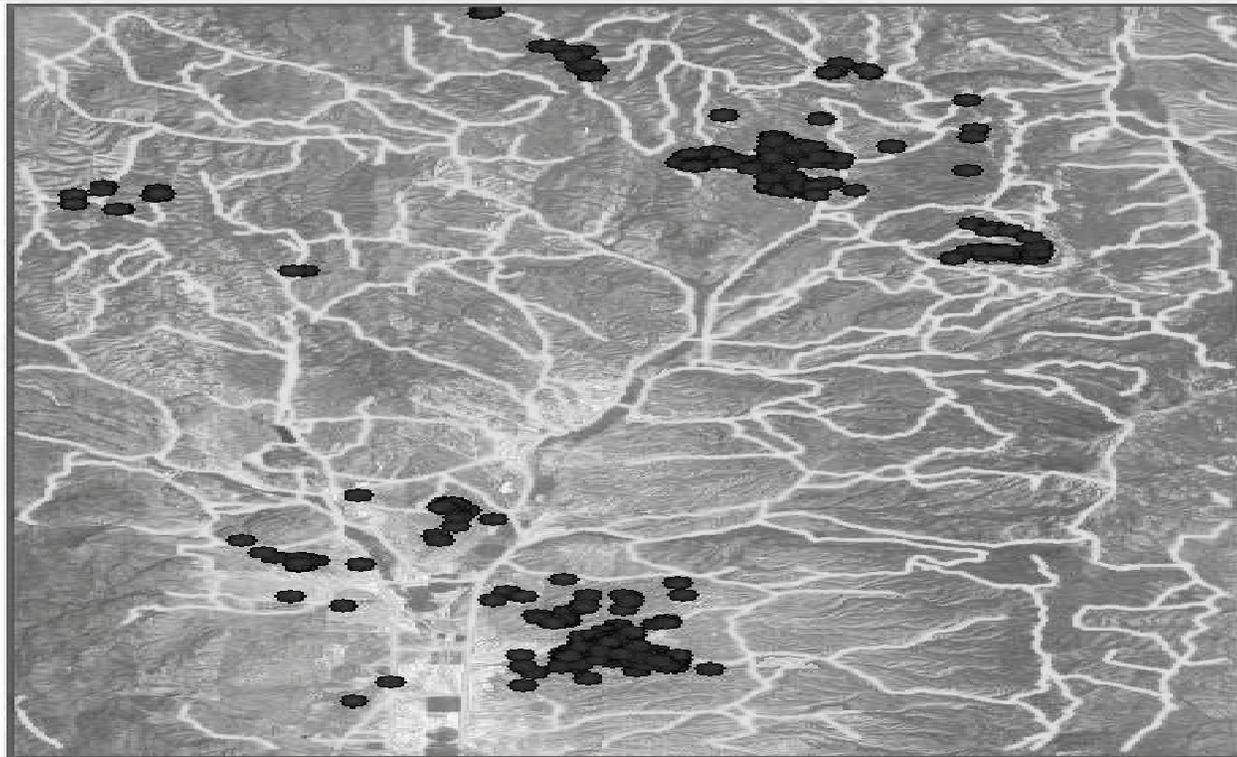
100m line intercept transects  
N=12 6 control 6 treatment



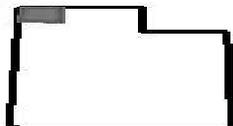
0 0.5 1 2 3 4 Kilometers



# ROADS AND RADIO-MARKED SAGE-GROUSE



0 2.5 5 10 15 20 Kilometers



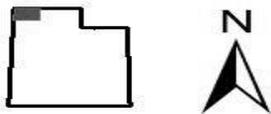
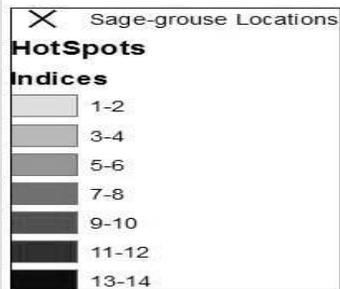
● 2010-2012 Locations  
— Roads

Author: Stephanie Graham  
Date: November 1, 2012  
Data Source: Utah GIS Portal  
UTM NAD 1983 Zone 12 North  
Projection: Transverse Mercator

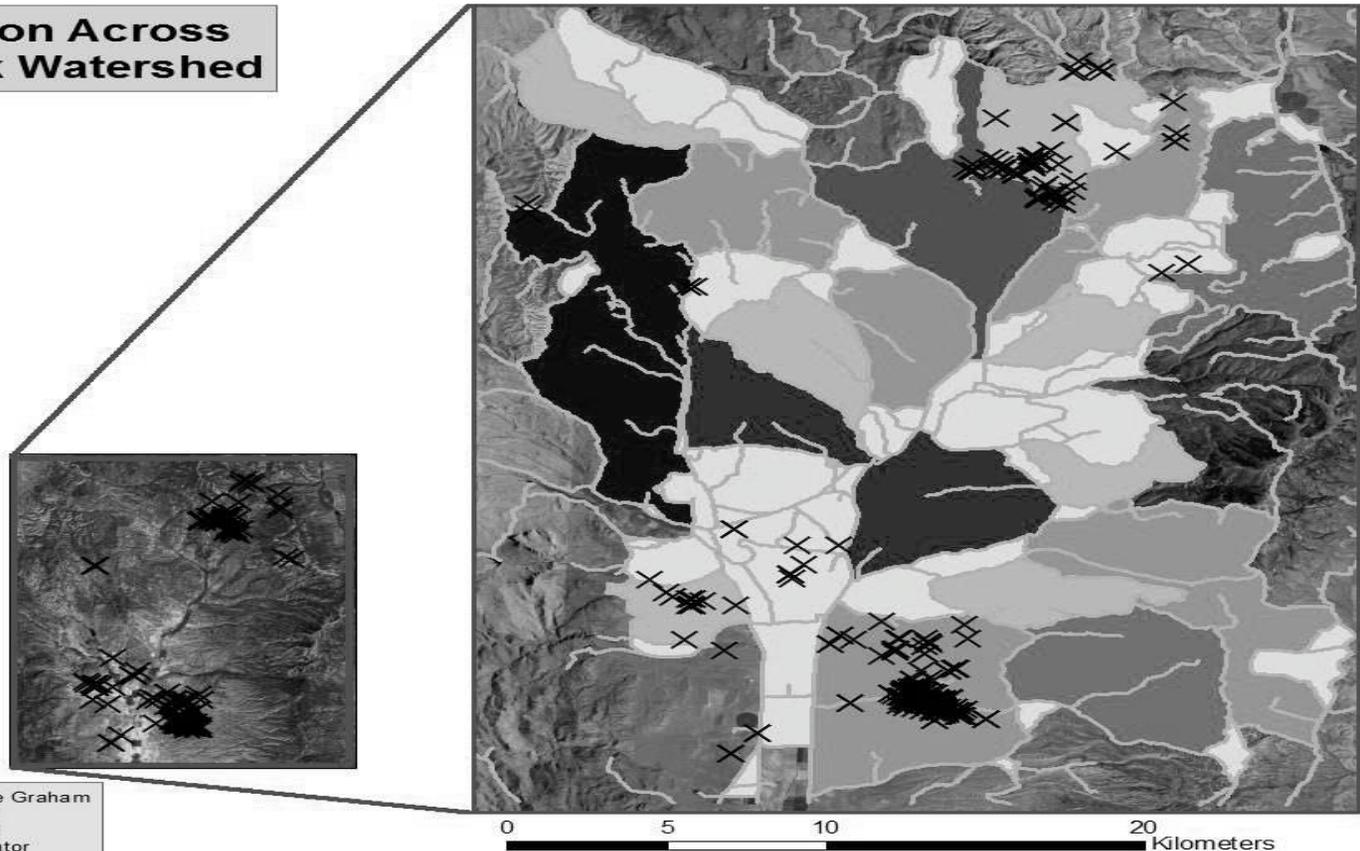


# FRAGMENTATION

## Fragmentation Across Grouse Creek Watershed



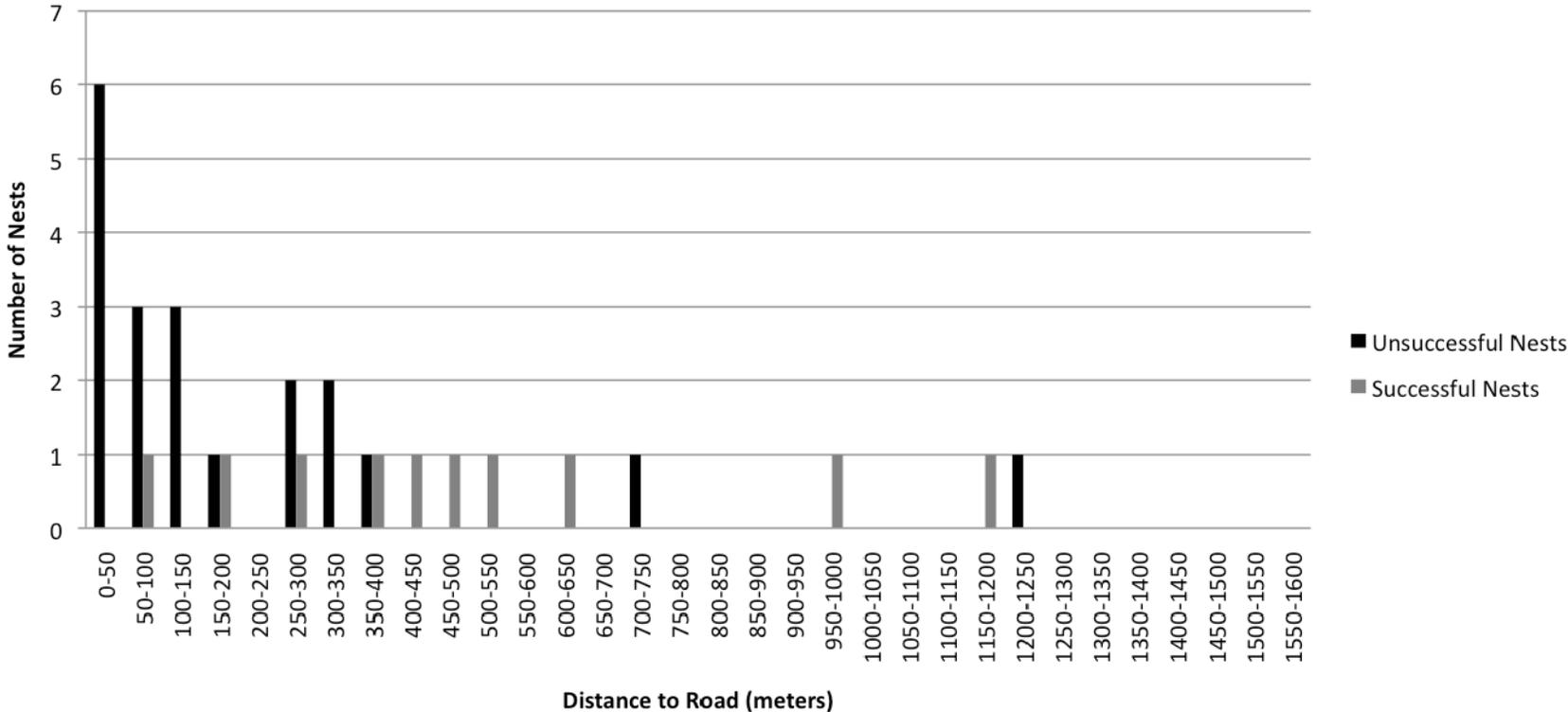
Author and Data Source: Stephanie Graham  
Date: February 13, 2013  
UTM NAD 1983 Zone 12N  
Projection: Transverse Mercator



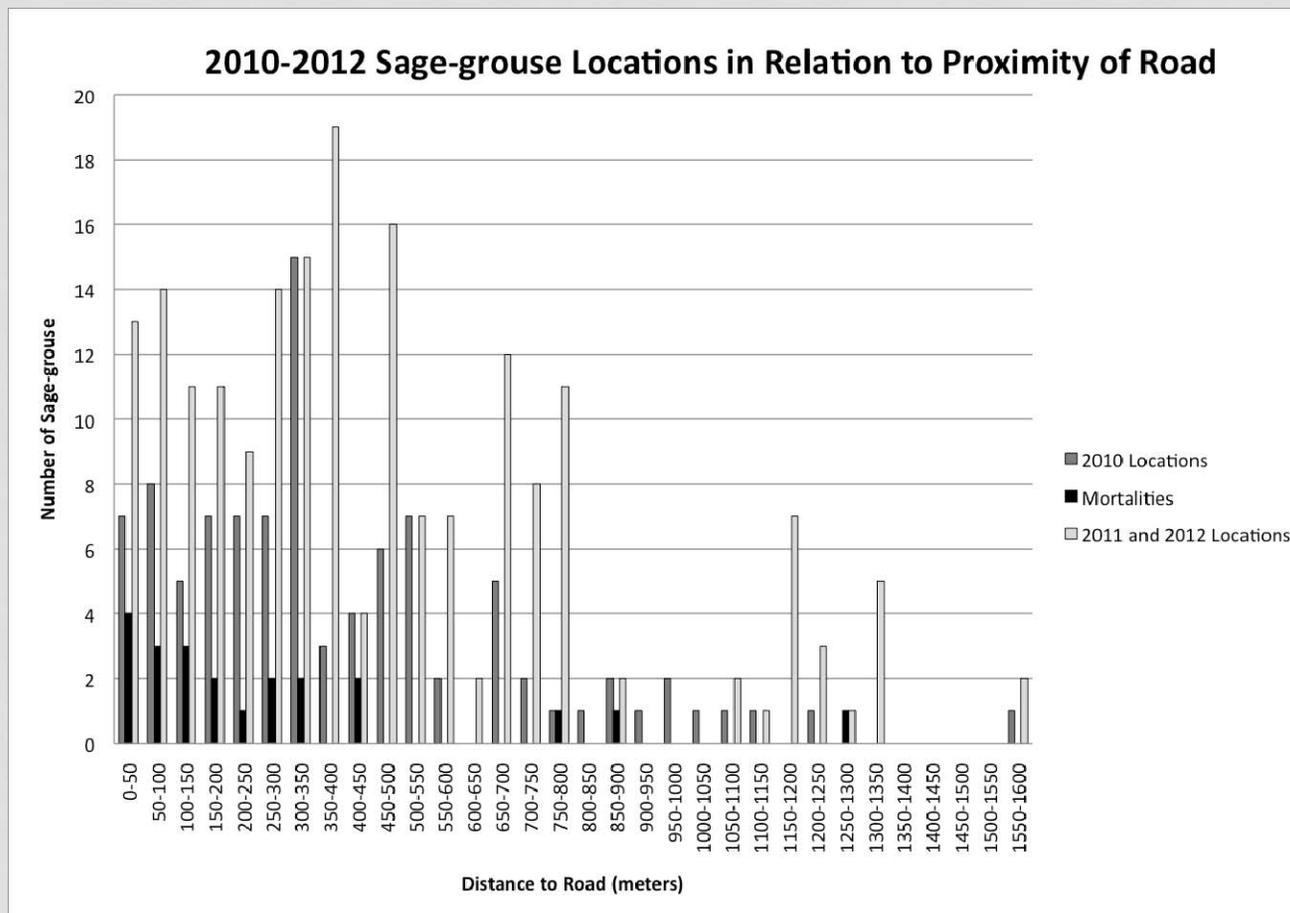
Lower index numbers/lighter color = increased fragmentation.

# VITAL RATES AND FRAGMENTATION

### Nest Success in Relation to Proximity of Road



# EFFECTS OF FRAGMENTATION



# Habitat-use

## Legend

- 2010 Locations
- 2011-2012 Locations
- Treatment
- ▭ Study Site

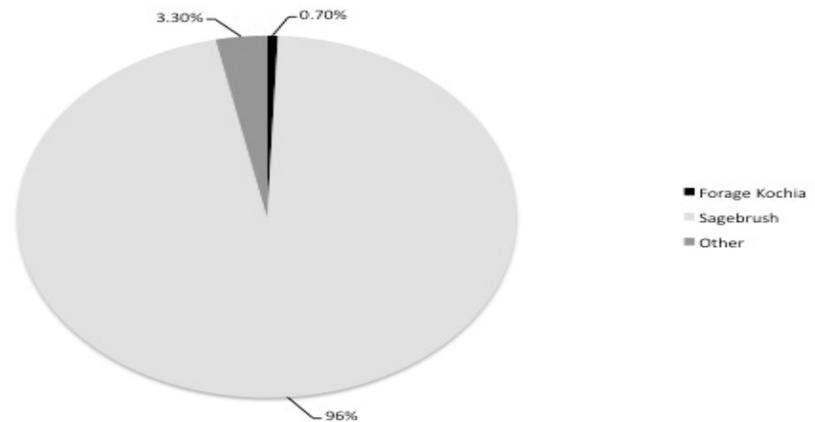
## Pre-treatment and Post-treatment Badger Flat Sage-grouse Locations



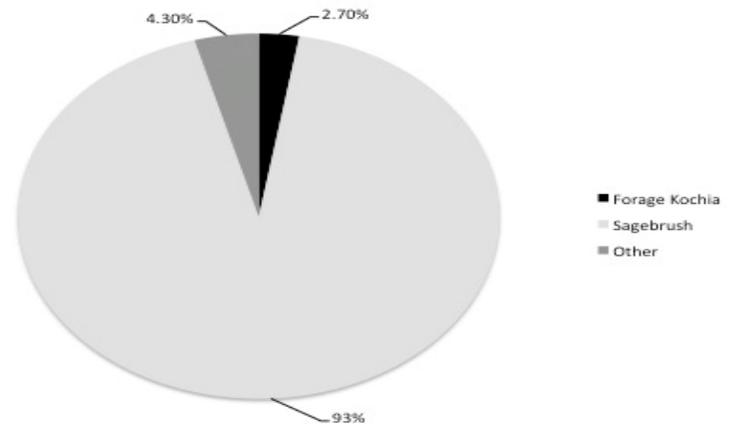
# SAGE-GROUSE USE



**Badger Flat Sage-grouse Diet Composition**



**Tabby WMA Sage-grouse Diet Composition**



# CONSIDERATIONS

- Know the landscape and how sage-grouse use it
- Shrub densities in the treatment area were reduced; sage-grouse preferred untreated areas
- Microhistological techniques were successful in identifying small quantities of forage kochia in sage-grouse pellets.
- Forage kochia greenstrips may be a beneficial technique for protecting rangelands from wildfire and provide a dietary source for wildlife, but treatments should be minimal in scope.
- Long-term monitoring should be completed to determine extended effects of greenstripping treatments on sagebrush habitat and sage-grouse behavior patterns.



# Working Fuelbreaks on a Working Cattle Ranch Deseret Land and Livestock Woodruff, Utah

---

Todd A. Black  
AgReserves, Inc. Western Ranches  
Natural Resource Manager

6 November 2014

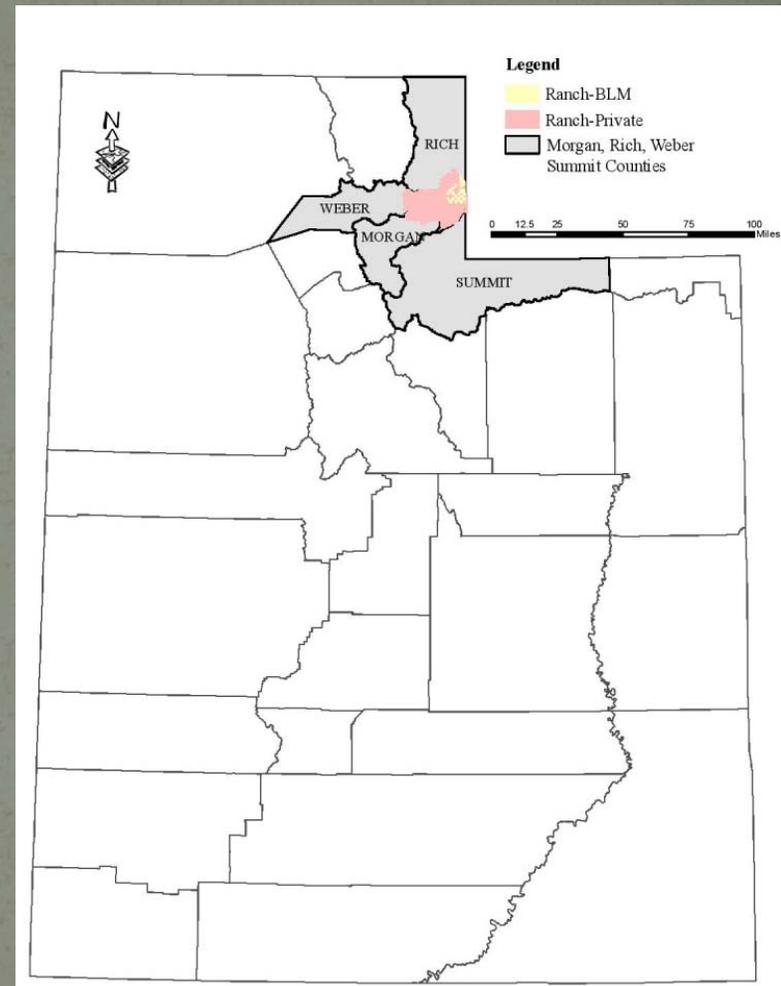
# DLL History

- Deseret Livestock Company Formed in 1891 (sheep...)
- Sold in 1953 to 1974 Garff, Freed, Robinson
- Became Deseret Livestock Ltd. in 1974 to 1983 and sold to Joseph Hotung
- Became Deseret Land and Livestock in 1983 bought by the LDS Church.



# Deseret Land and Livestock

- 220,000 acres
  - 203,000 private
  - 16,000 BLM
- Primarily cattle operation
  - High intensity short duration deferred/rest rotation grazing system
  - ~5,800 pairs
  - ~1,400 replacement heffiers
  - ~500 bulls
- Wildlife/Hunting Program
  - ~1800 elk
  - ~2800 deer
  - ~1000 pronghorn
  - ~150 moose



# AgReserves, Inc.

## Our Mission

---

We have felt that good farms, over a long period, represent a safe investment where the assets of the Church may be preserved and enhanced, while at the same time they are available as an agricultural resource to feed people should there come a time of need.



*President Gordon B. Hinckley  
General Conference, April 1991*

# General statements about Rich County and Deseret Land and Livestock

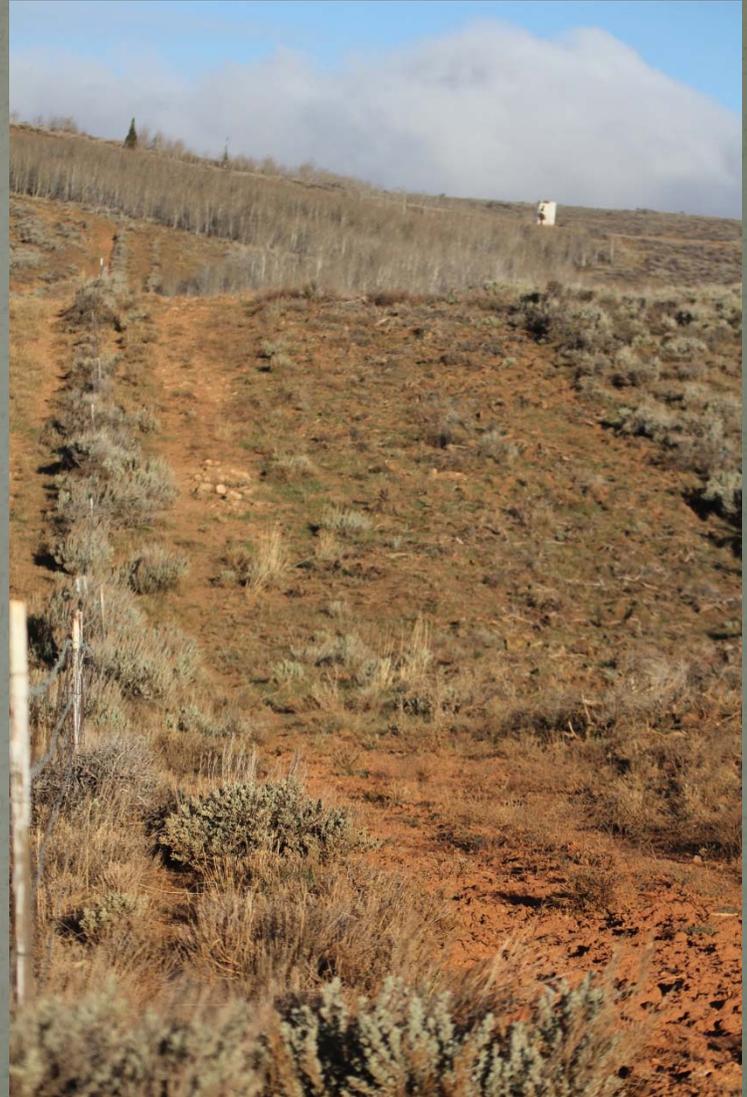
- Utah's sagebrush steppe
  - It wants to grow sagebrush
  - Similar to western WY
  - 10-50 year treatment interval
- 20 year period 'treated'  
~1.4% annually



*The biggest threat to Rich County when it comes to sage-grouse management is doing nothing. This country wants to grow sagebrush and if we are not actively managing our sagebrush habitats the densities and carrying capacity of sage-grouse populations will continue to decline. Todd Black Rich QRM meeting 2005.*

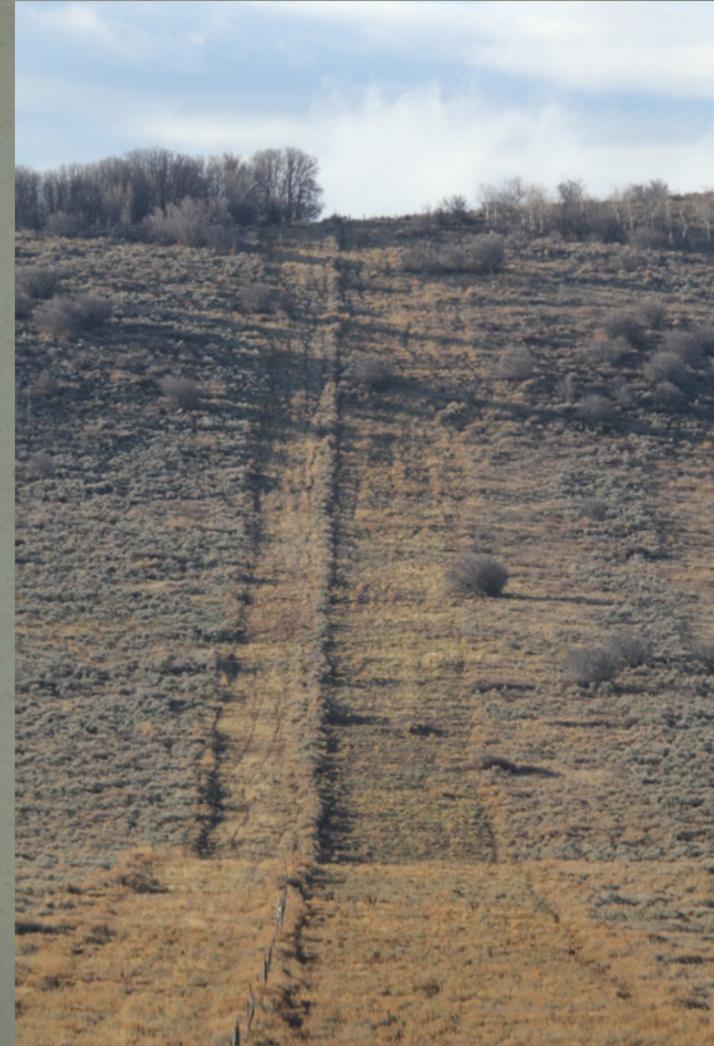
# Working Fuelbreaks

- What:
  - Simply a treatment of sagebrush in an area(s) that provide benefits to the Ranch
- Why:
  - To protect of our investments ie., structures, rangelands, utilities/ROW
    - Edge habitat for wildlife
    - More forage/grocery store (mule deer/grouse)
    - Protection of catastrophic fires
    - Allows for control burns



# Working Fuelbreaks

- Where:
  - Along existing linear features (roads, fences, ROWs)
  - In areas that have <25% canopy of sagebrush
  - In areas that exceed 15" annual precip.
  - Along fence lines
  - Along existing roads
  - Other areas to allow for smaller scale treatments (burns)
- When:
  - Fall disturbance, winter/spring plantings

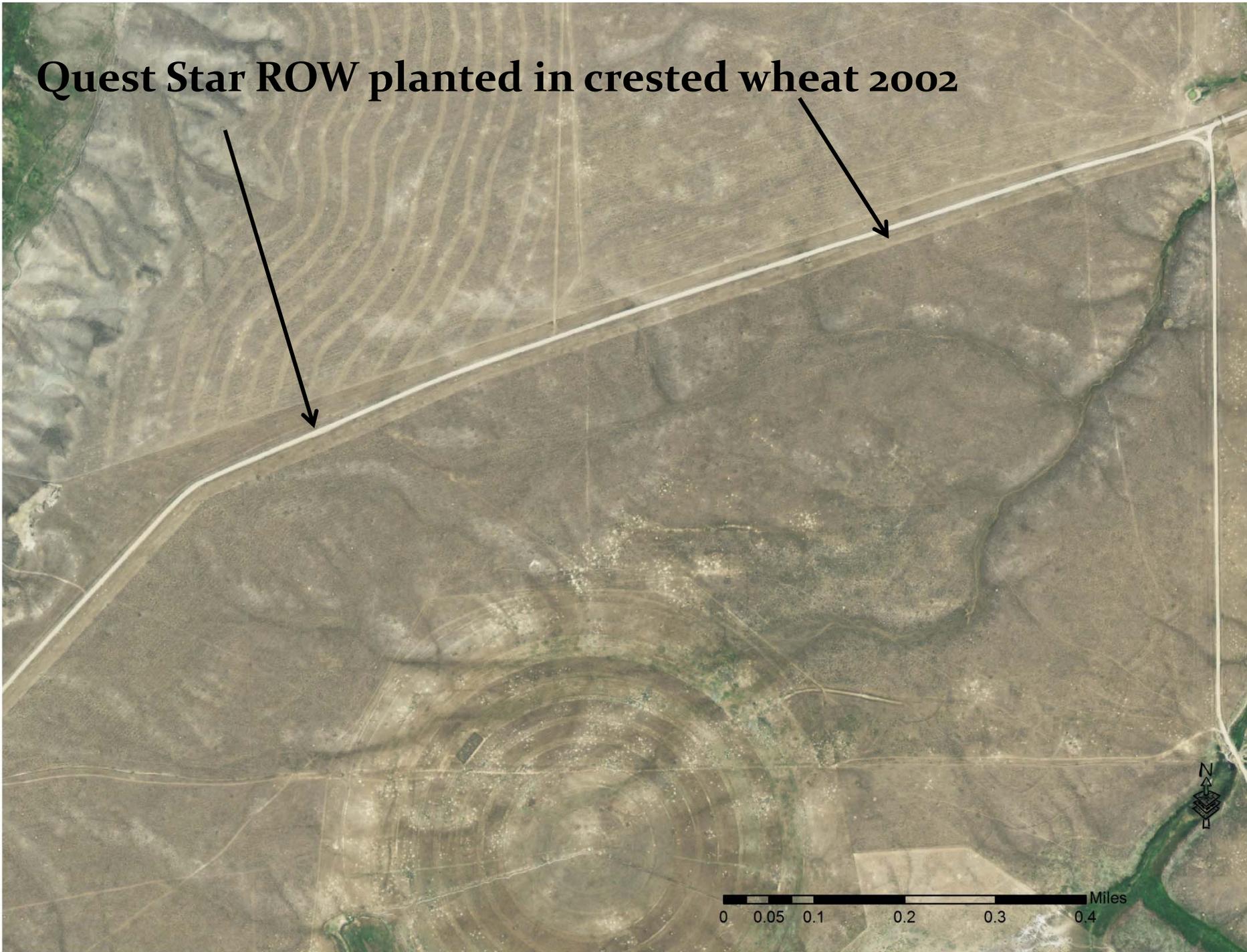


# Working fuelbreaks

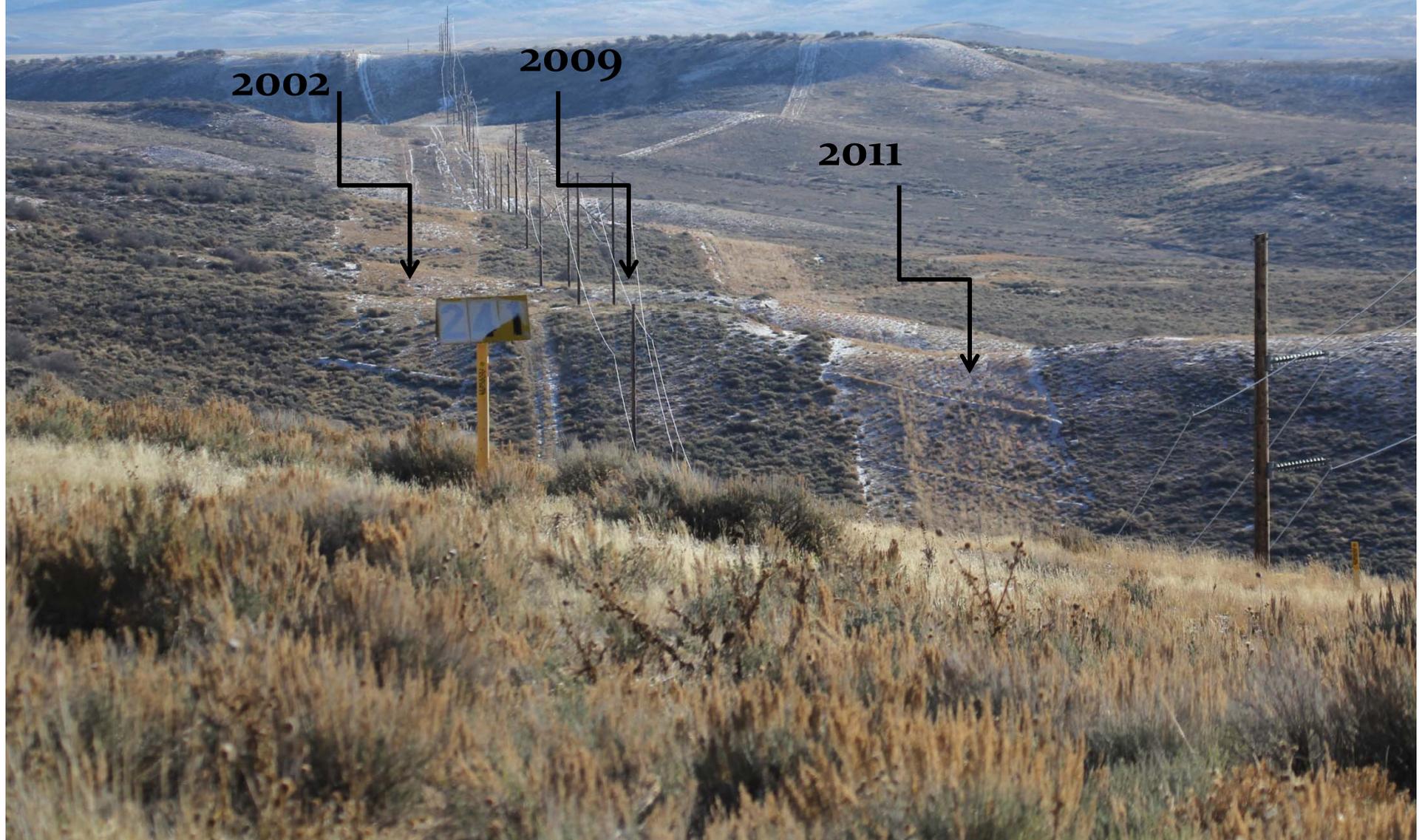
- Disturbance Methods
  - 15' disk
  - Intense angles 12'
  - 45-50' disturbed area plus fence/road
  - Doze/blade fence lines
- Planting Methods
  - 2013 and beyond either forage kochia or ranger alfalfa. Broadcast vs. drill
  - No planting in areas where good understory



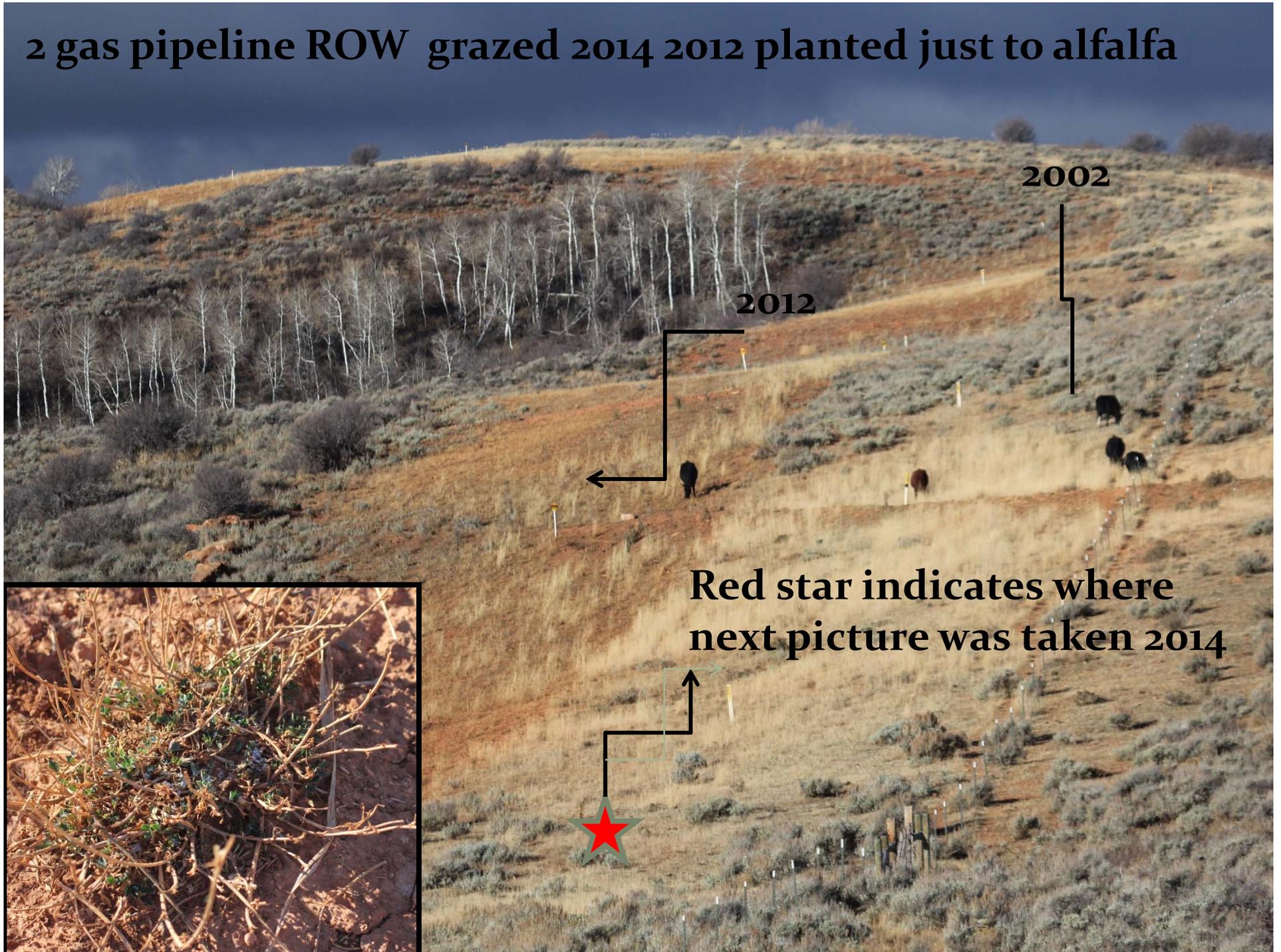
**Quest Star ROW planted in crested wheat 2002**



**2 gas pipeline ROW and a  
transmission ROW pasture  
rested 2014**



**2 gas pipeline ROW grazed 2014 2012 planted just to alfalfa**



**Red star indicates where next picture was taken 2014**





**Fall 2012 disturbance Spring  
2013 planting to protect**



Fall 2013 treatment, spring 2014  
planting. Kochia already being  
browsed by mule deer



**Significant deer use particularly in the spring and fall. 2012 treatment.**

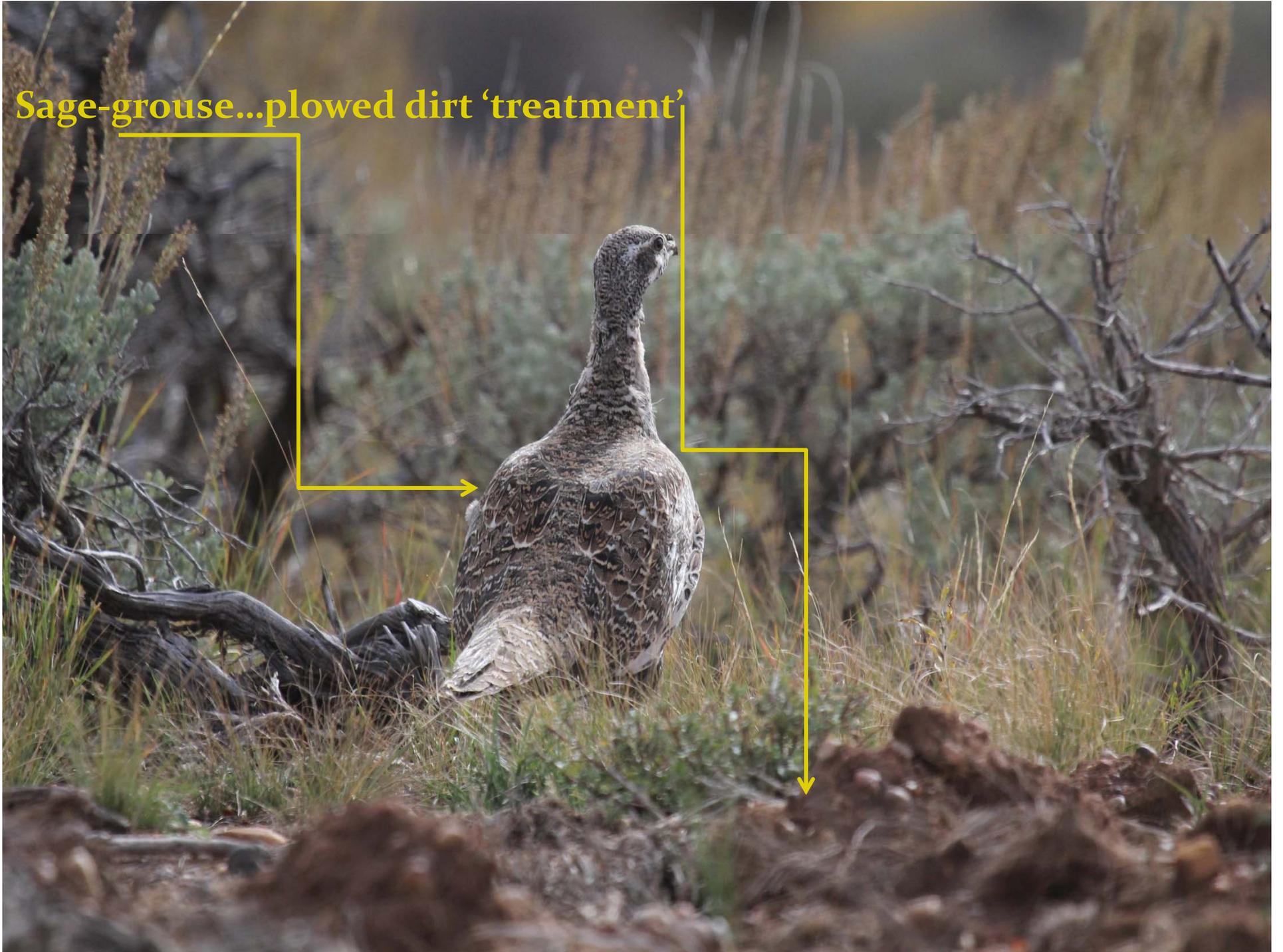


**Fall 2011 disturbance nothing planted in 2012 due to drought**



**More sage-grouse use of these 'treatments' than I can document.....**

Sage-grouse...plowed dirt 'treatment'







**Fall 2012 disturbance nothing planted this hen nested in treatment**

**2004 treatment , mostly wheatgrass but still use by grouse,  
picture take fall 2014.**



**Even well know sage-grouse researches like fuelbreaks. 2011 treatment, not seeded. Picture take fall 2014**



**Replacement fence, dozed/bladed, fenced, seeded (kochai/alfalfa). Photo take fall 2014**



**Fall 2013 treatment, spring 2014 planting of Kochia, produced seed, November 3, 2014.**



**Fall 2013 treatment, spring 2014 planting June 2014 burn.**



**Fall 2013 treatment, spring 2014 planting June 2014 burn mule deer use within 14 days of burn.**







