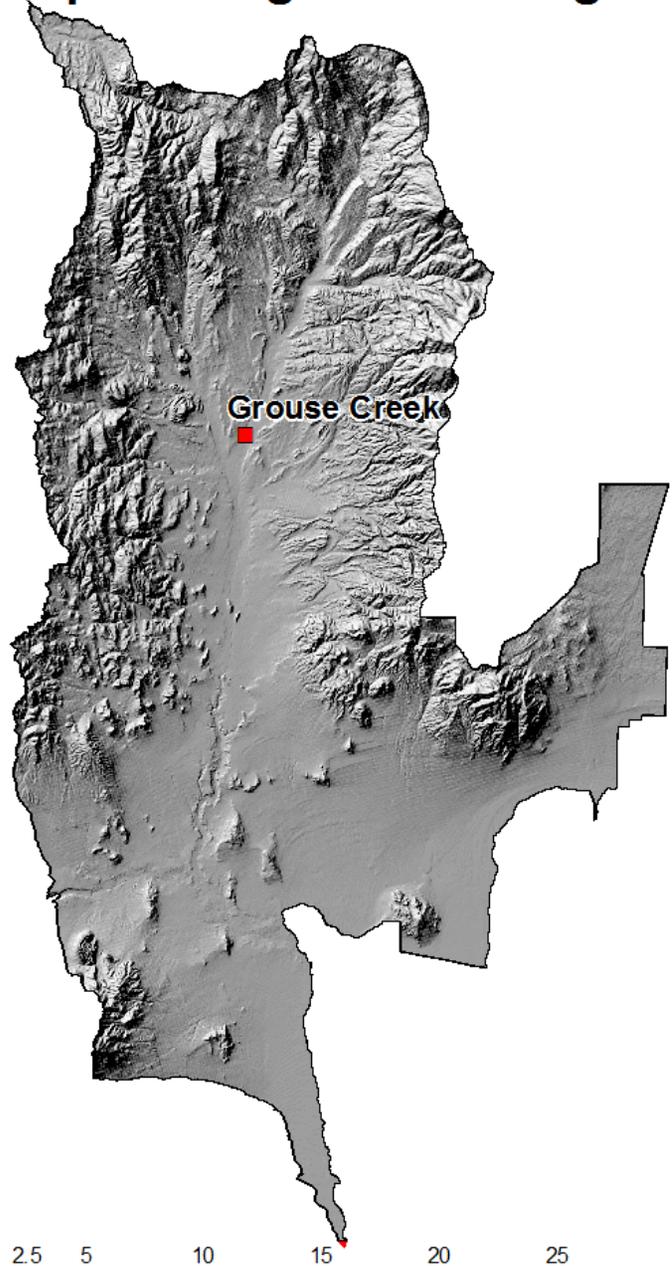


# Grouse Creek Watershed Assessment

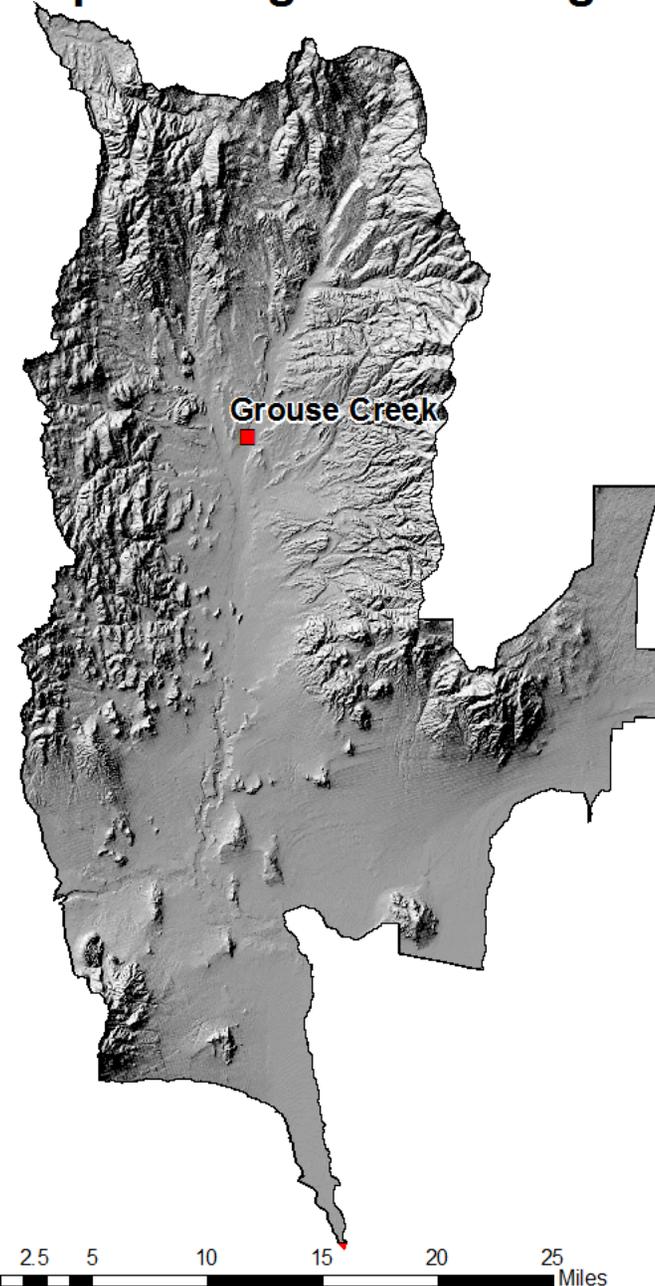
## Open Range Consulting



## Deliverables

- Landcover Map
- Continuous Cover Map
- Rangeland Usability
- Riparian Change
- Juniper Change

### Grouse Creek Watershed Assessment Open Range Consulting

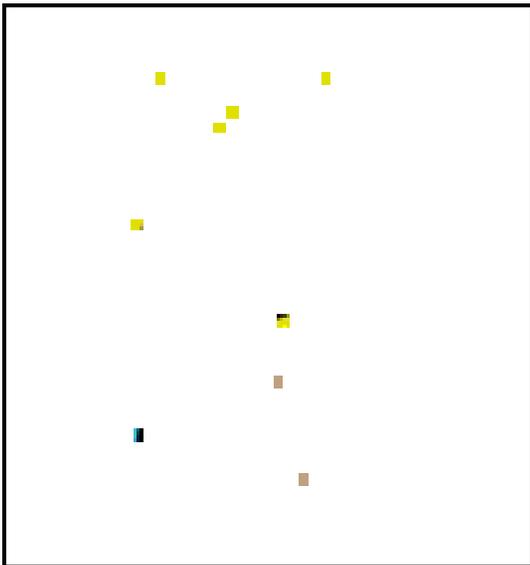


# ORC Land Assessment Technique

- Based on historical range assessment techniques but.....
  - Has a lot more ground samples
  - Tied to remote imagery (photos and satellites)
  - Focuses on assessing functional ground cover
  - Can go back in time
  - Reduces bias

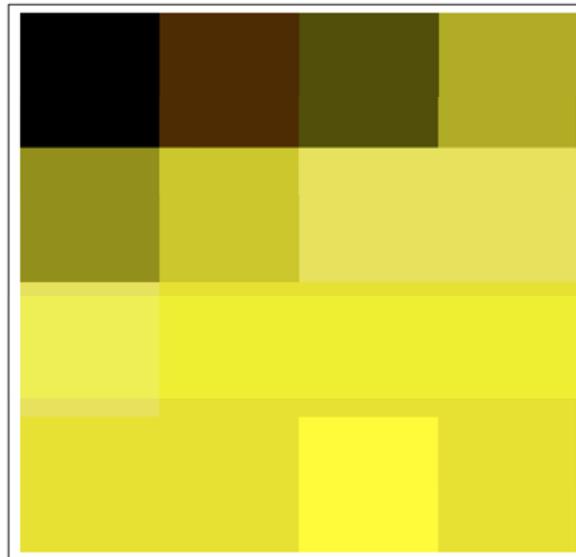
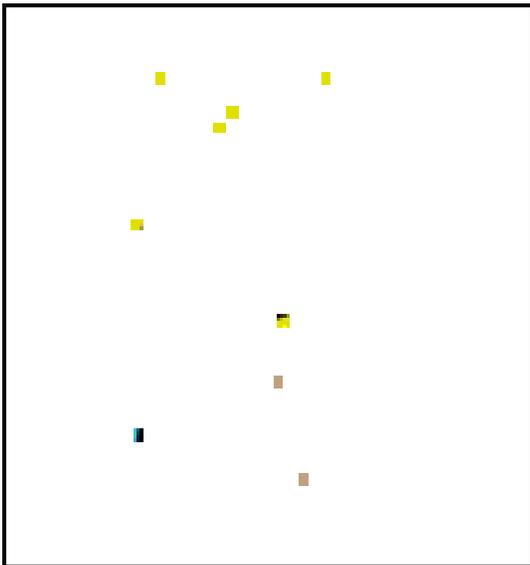
# ORC's Landscape Assessment

## Historical Landscape Assessment



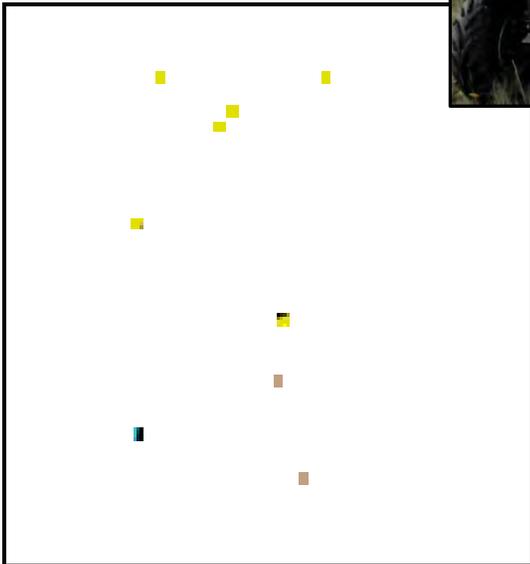
# ORC's Landscape Assessment

Historical Landscape Assessment

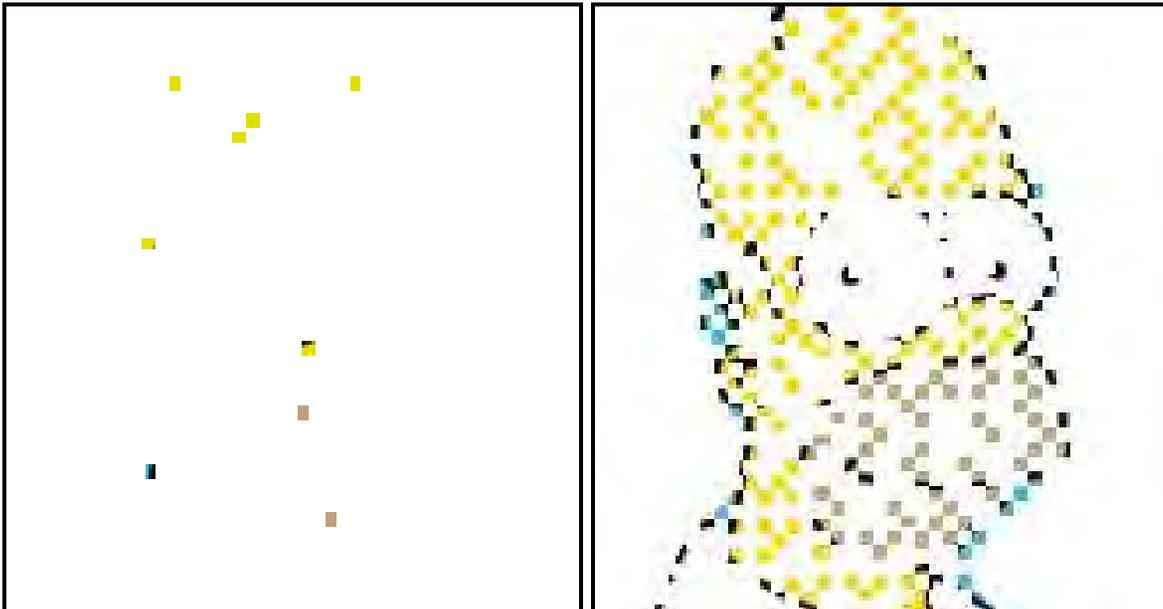


# ORC's Landscape Assessment

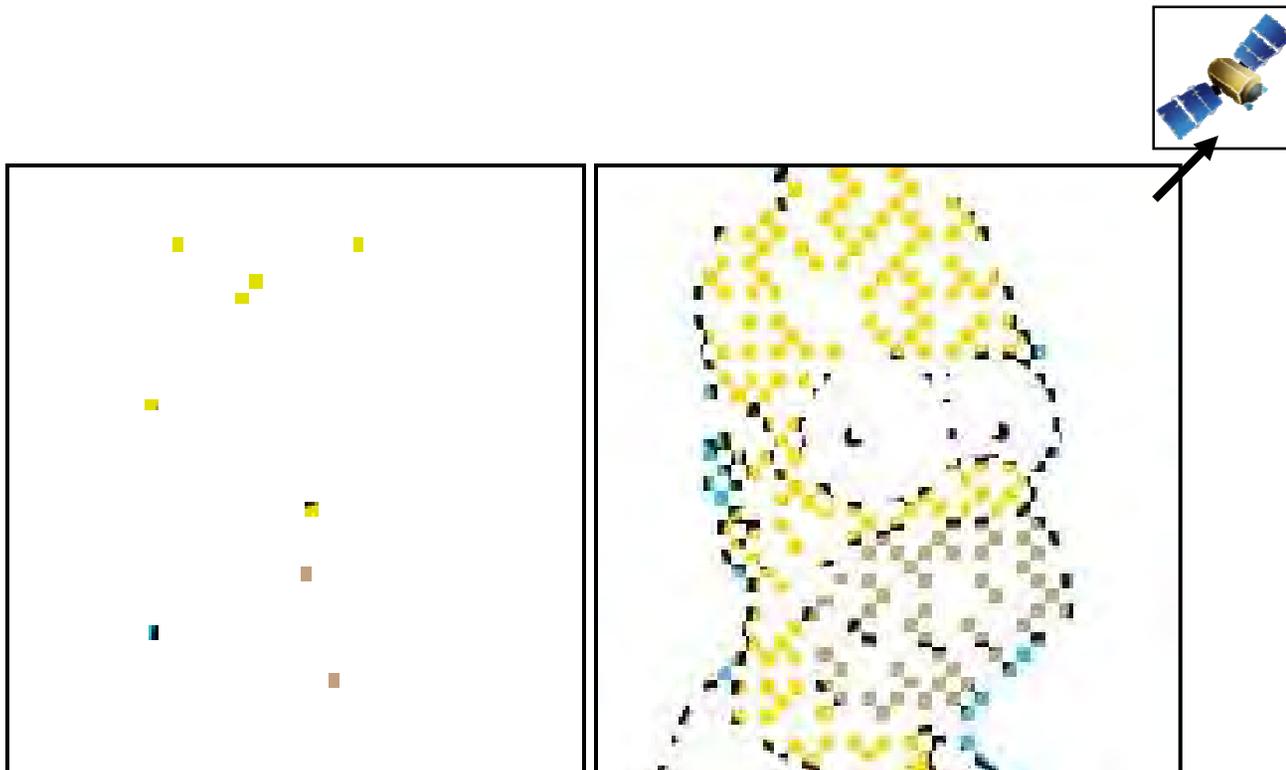
Historical Landscape Assessment



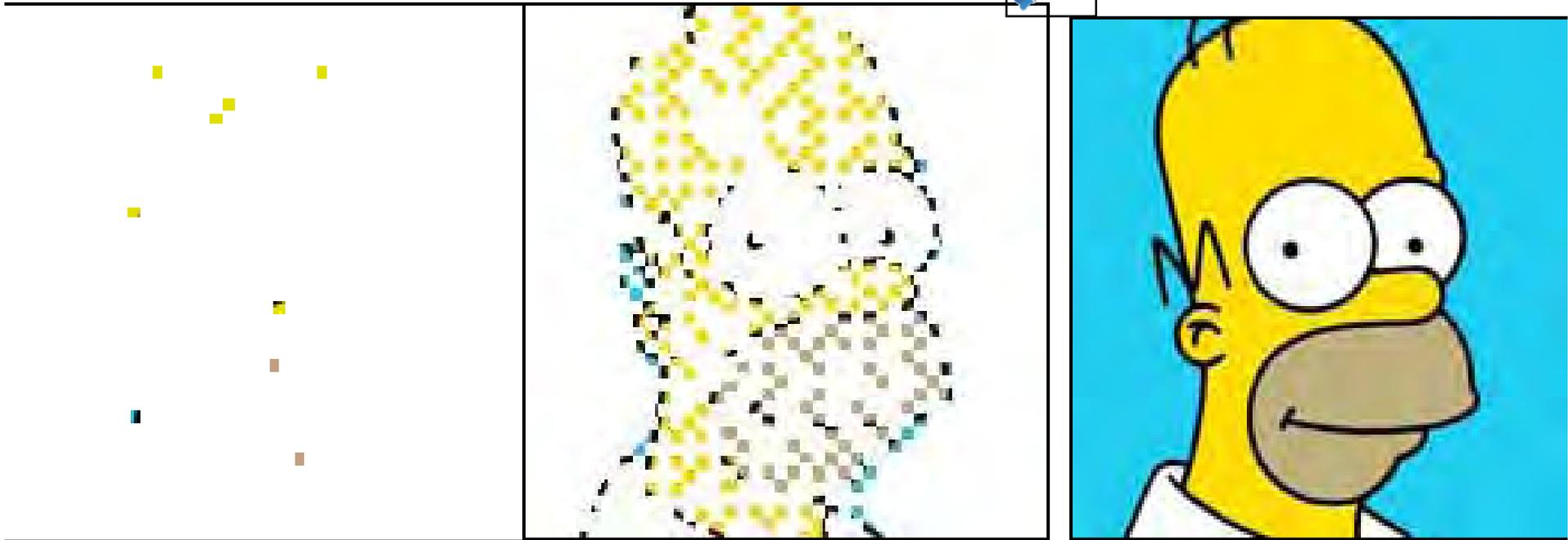
# ORC's Landscape Assessment



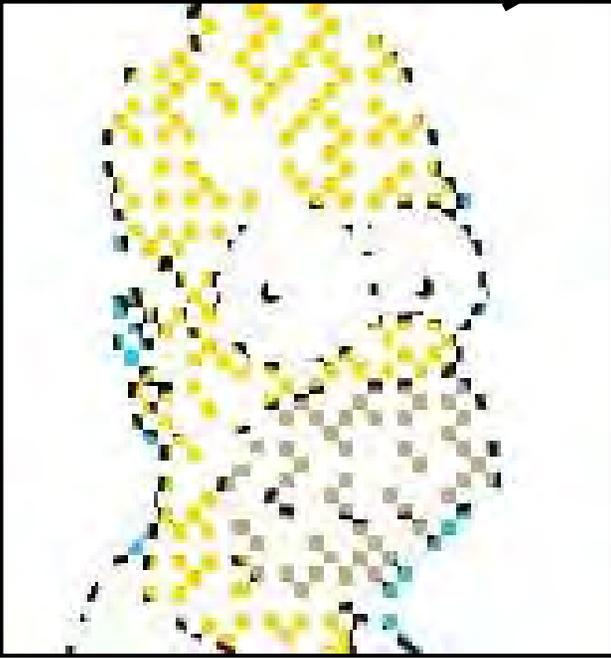
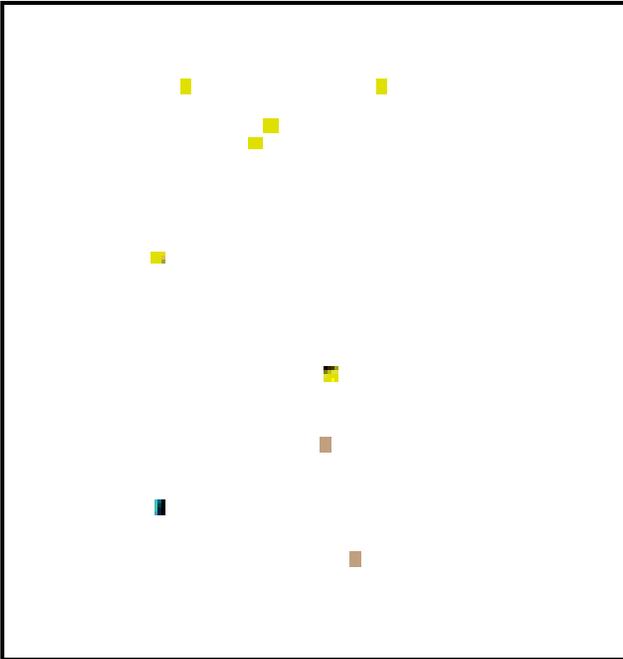
# ORC's Landscape Assessment



# ORC's Landscape Assessment



# ORC's Landscape Assessment



# Upland Methodology

Measures Important Function Cover Types

Bare Ground

Herbaceous

Litter

Shrubs

# Upland Assessment

Bare Ground

Herbaceous

Litter

Shrubs

HR Photos



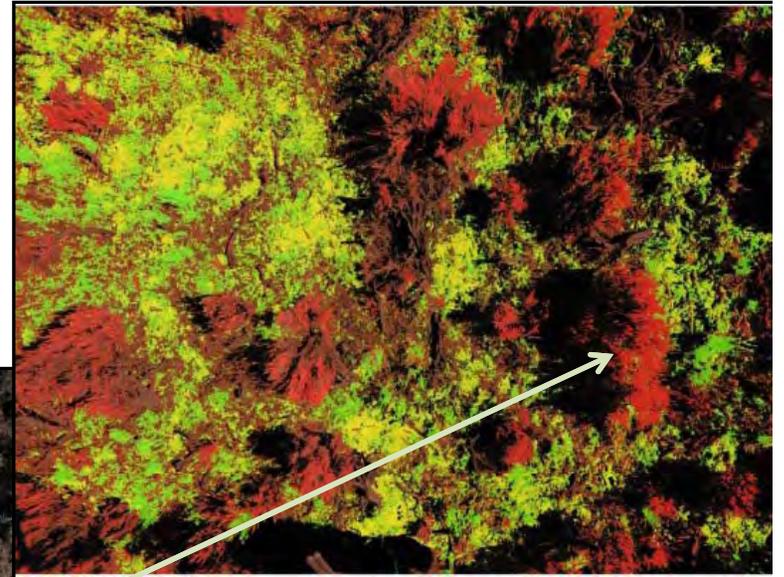
Field Work



6x7 m 2mm

# Upland Assessment

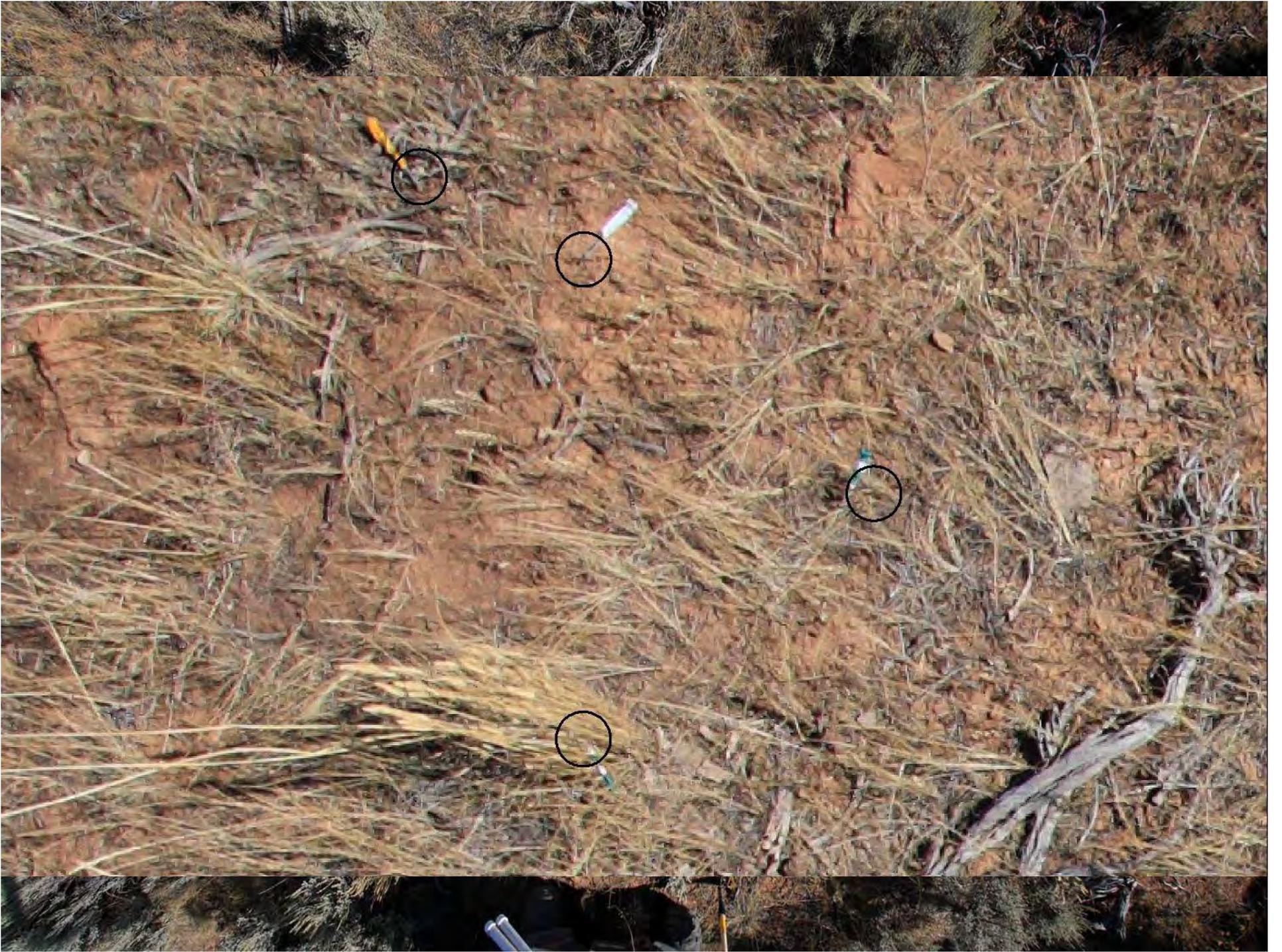
Bare Ground  
Herbaceous  
Litter  
Shrubs

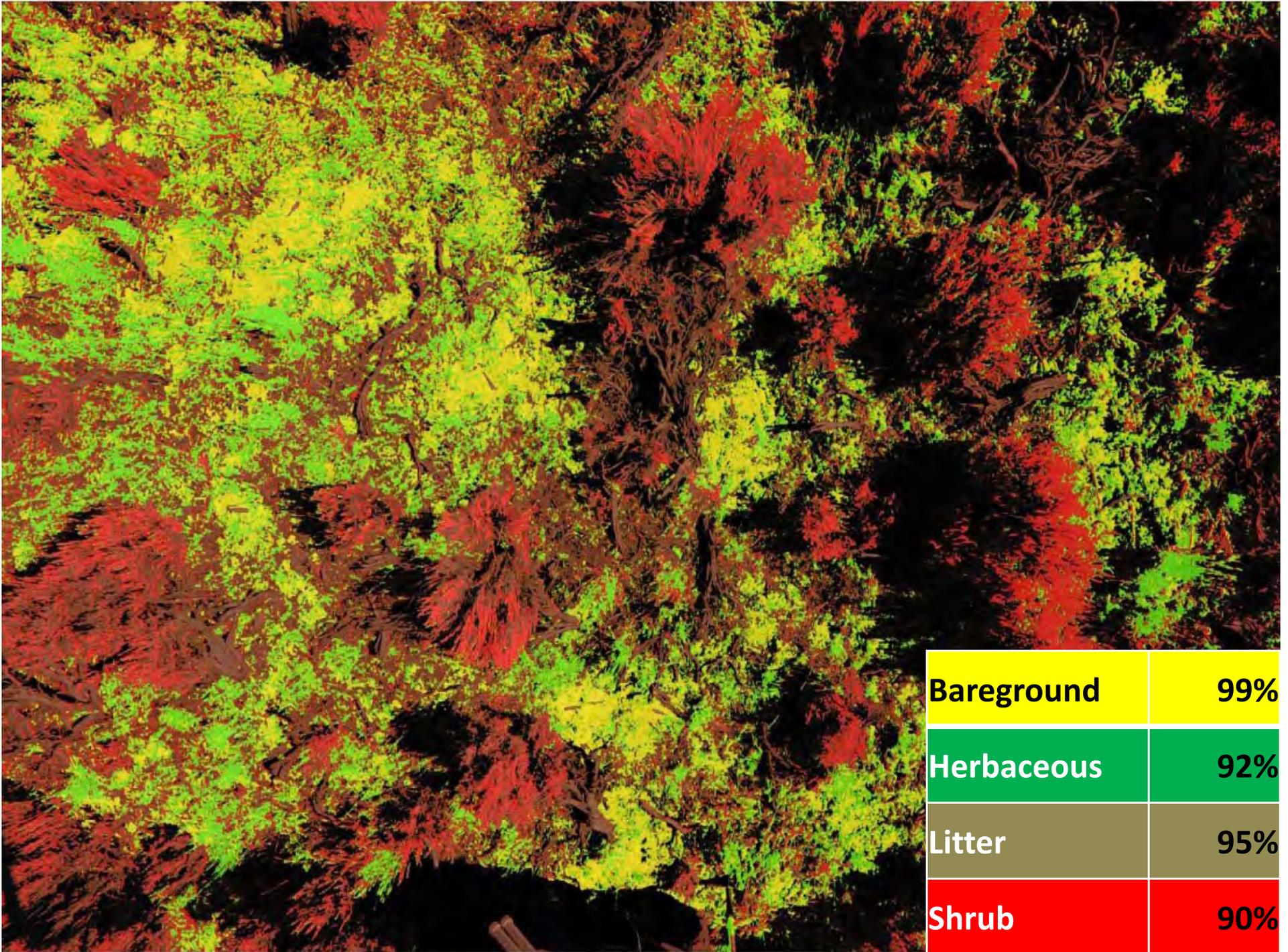


Analysis

Field Work







<b>Bareground</b>	<b>99%</b>
<b>Herbaceous</b>	<b>92%</b>
<b>Litter</b>	<b>95%</b>
<b>Shrub</b>	<b>90%</b>

# Shrub Cover



Shrub Cover	
Yellow	0 - 5%
Light Green	5 - 10%
Green	10 - 15%
Teal	15 - 20%
Dark Teal	20 - 25%
Dark Blue	25 - 30%

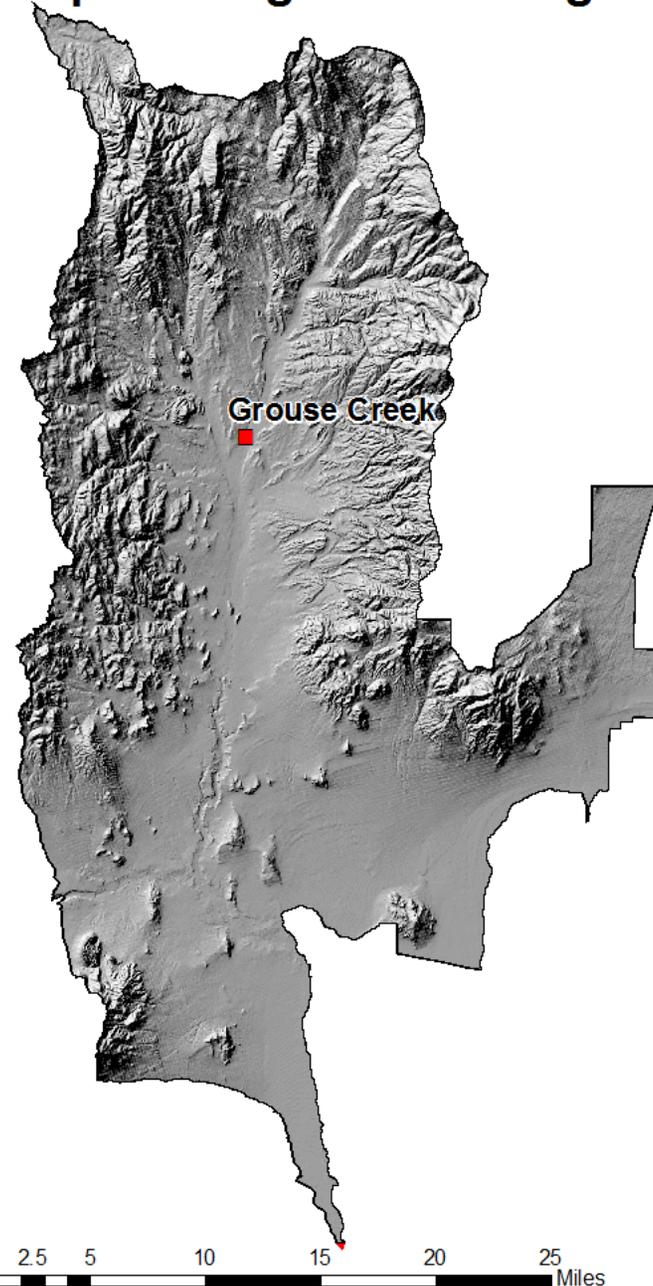
1m Accuracy	R <sup>2</sup>
Bareground	0.92
Herbaceous	0.89
Litter	0.85
Shrub	0.91

Historical Accuracy	R <sup>2</sup>
Bareground	0.74
Herbaceous	0.72
Litter	0.2
Shrub	.75

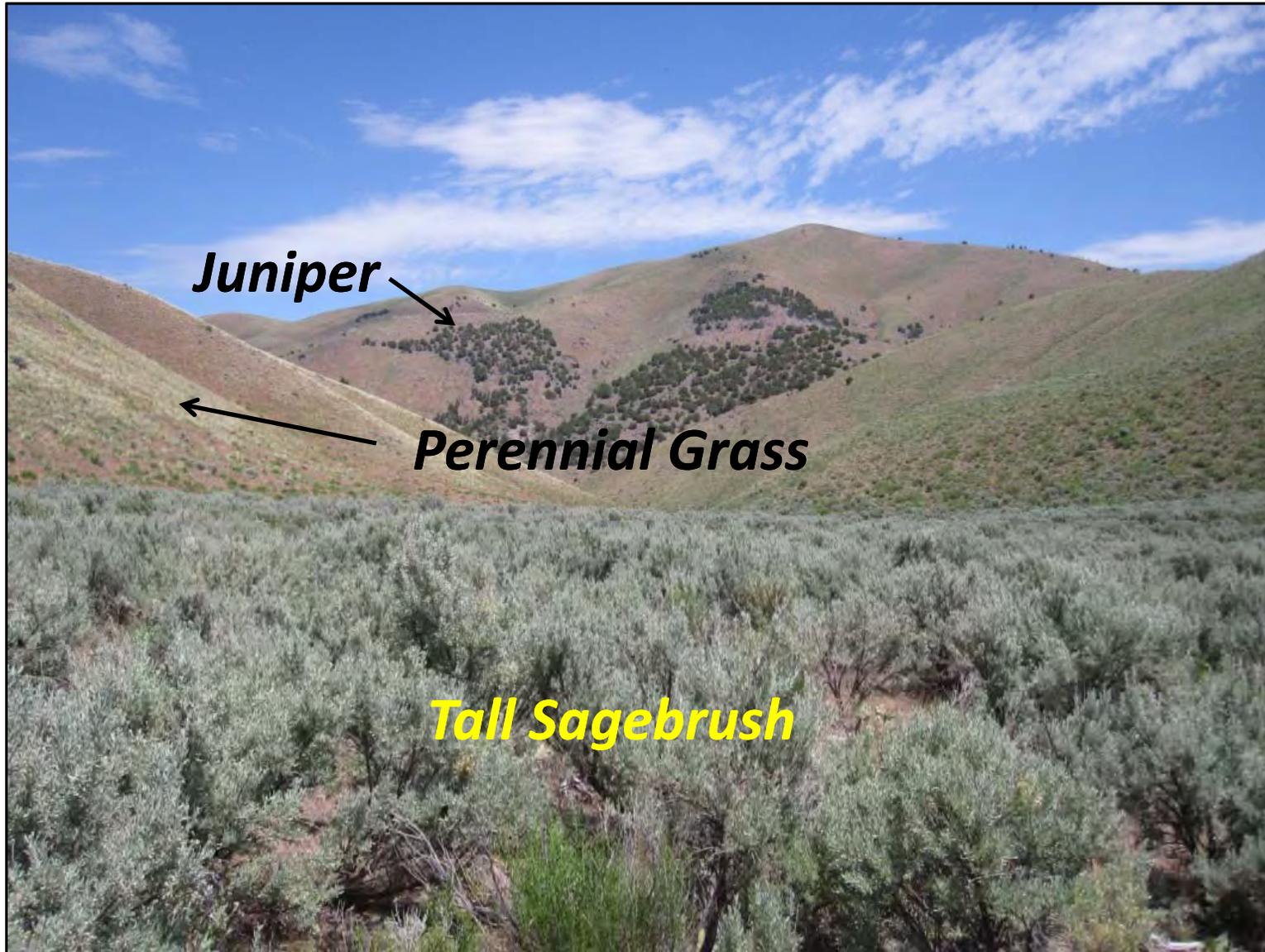
## Deliverables

- Landcover Map
- Continuous Cover Map
- Rangeland Usability
- Riparian Change
- Juniper Change

### Grouse Creek Watershed Assessment Open Range Consulting

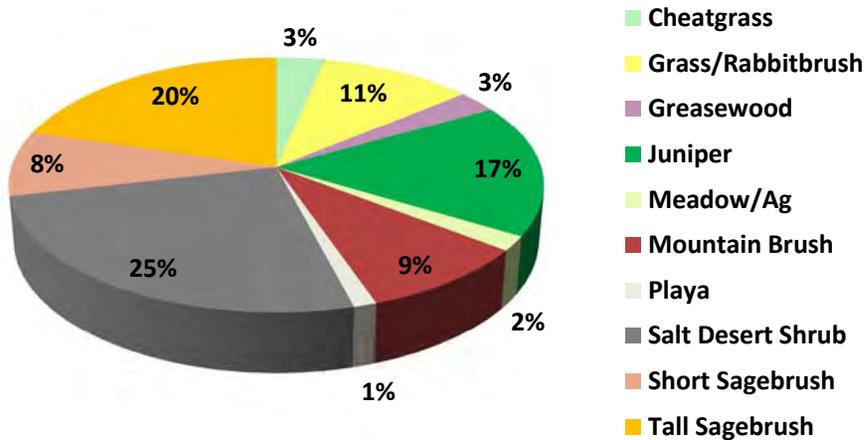


# Landcover

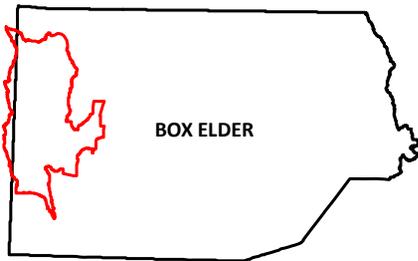


## Grouse Creek Landcover

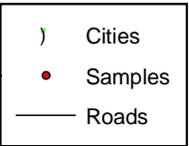
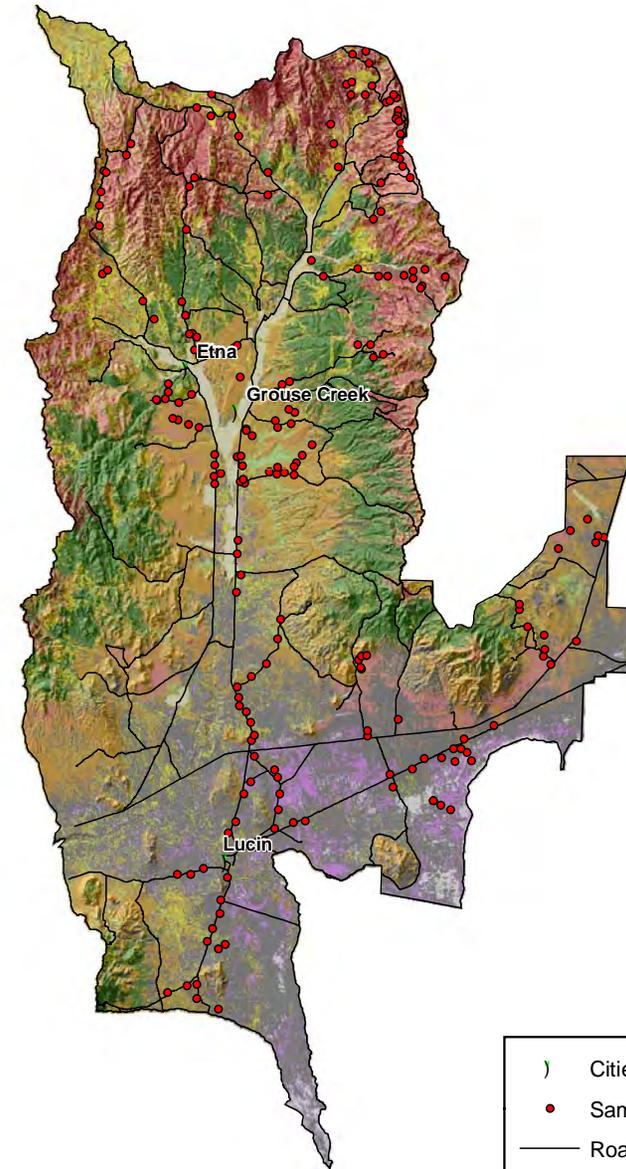
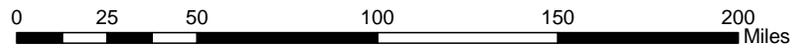
Landcover Percents



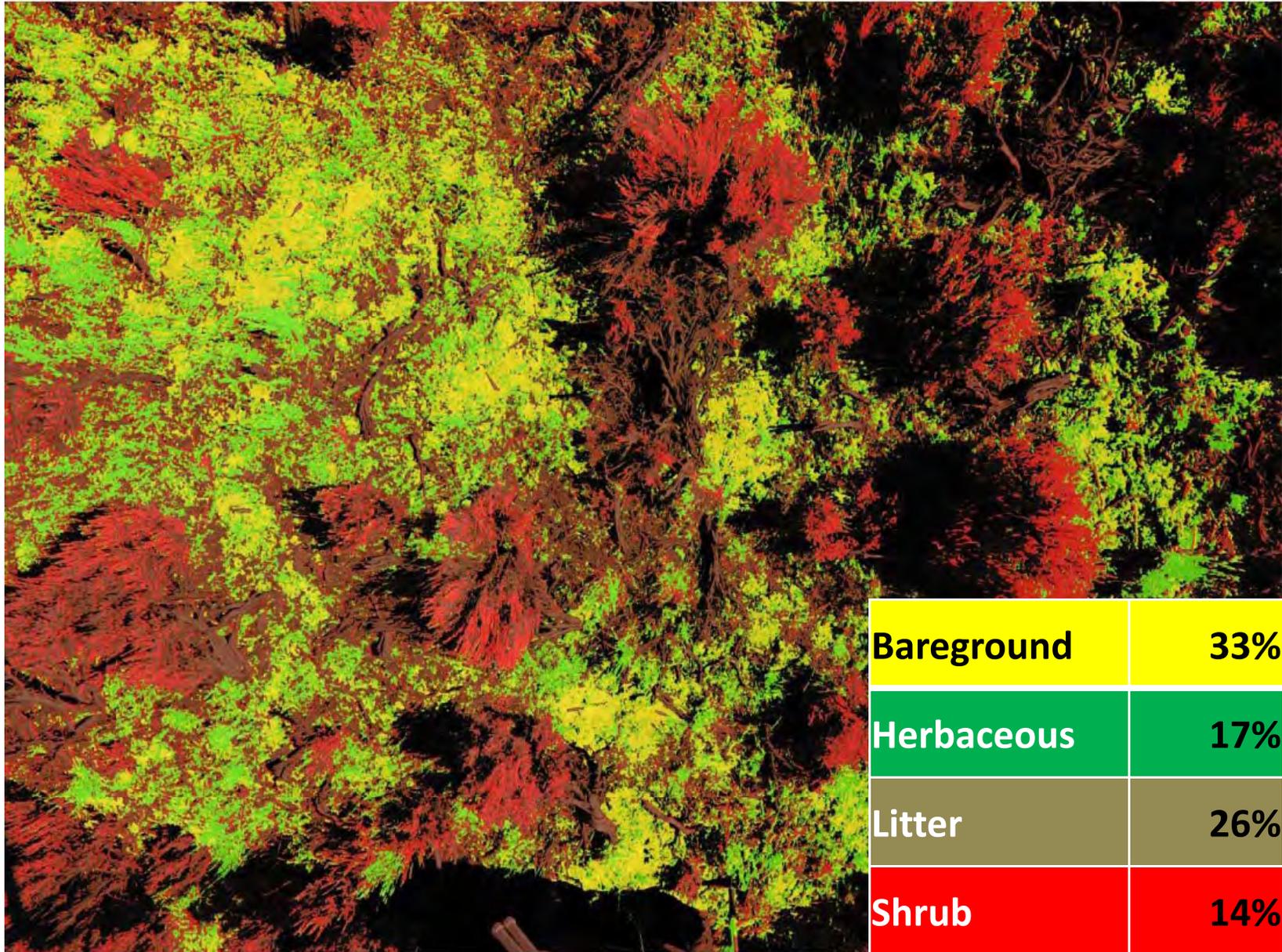
Mapped Area



Landcover	Acres
Cheatgrass	16,837
Grass/Rabbitbrush	53,282
Greasewood	14,000
Juniper	85,094
Meadow/Ag	9,250
Mountain Brush	46,484
Playa	6,136
Salt Desert Shrub	128,053
Short Sagebrush	41,724
Tall Sagebrush	102,397
<b>Total</b>	<b>503,259</b>



# Continuous Cover



# Why Bareground?

## Standards and Guidelines (Utah BLM)



1. Sufficient cover and litter to protect the soil surface from excessive water and wind erosion, promote infiltration, detain surface flow, and retard soil moisture loss by evaporation

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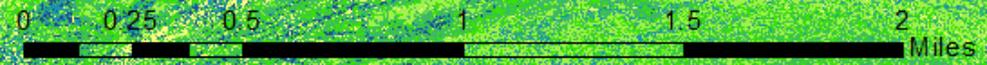
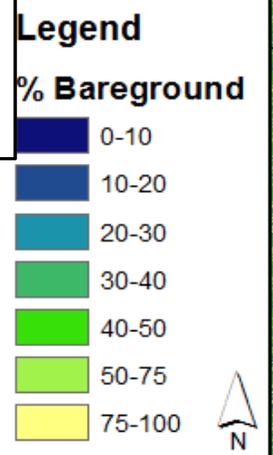
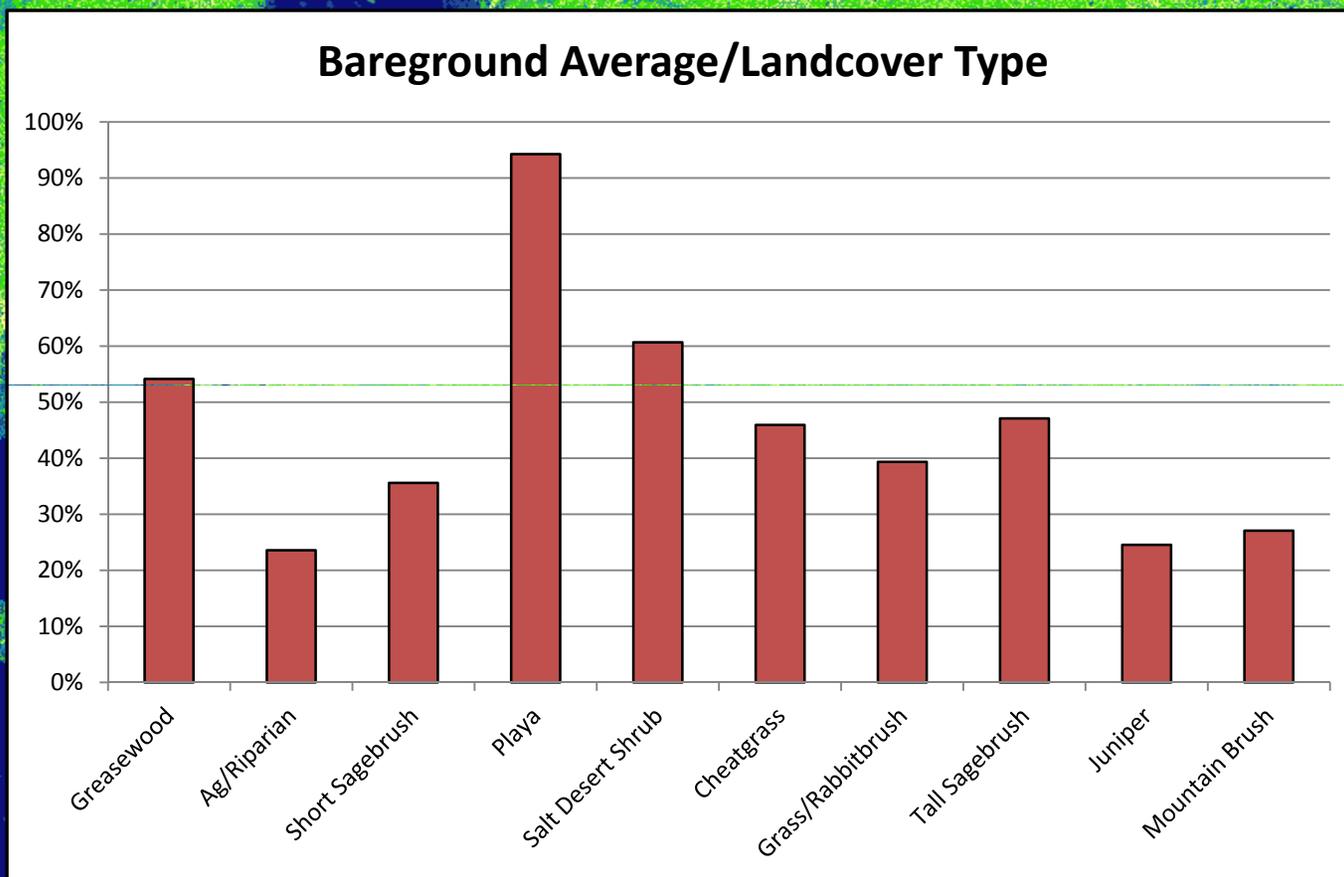
## USFS Objectives for Range Management



1. Manage range vegetation to protect basic soil and water resources

# Bareground

## Bareground Average/Landcover Type



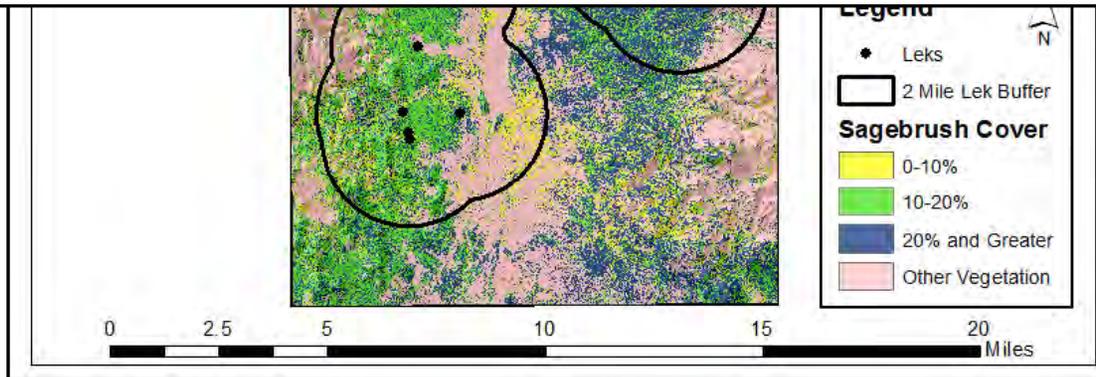
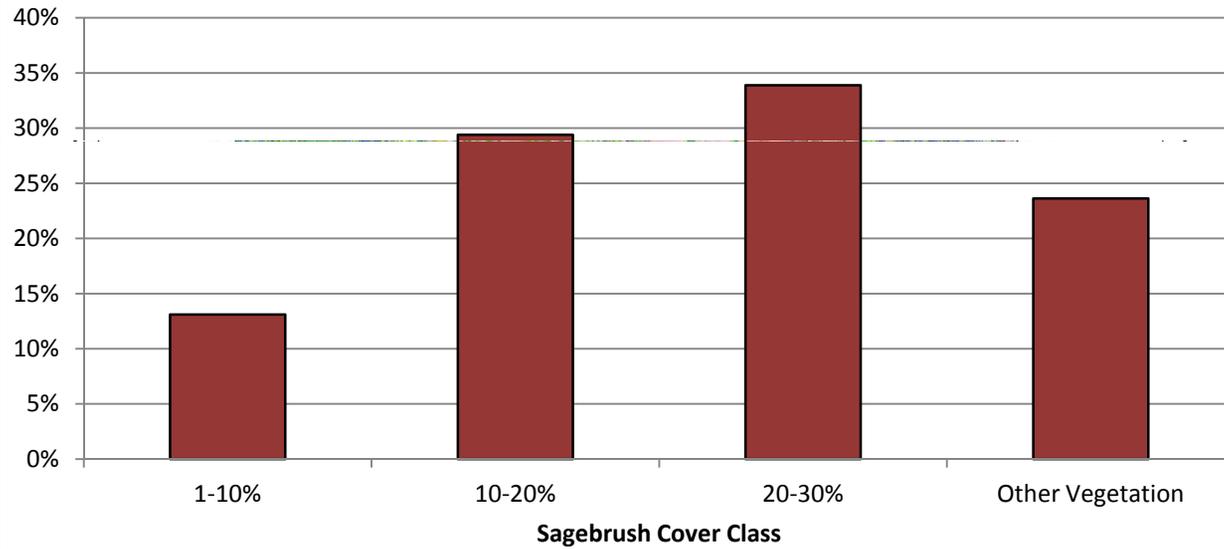
# Why Sagebrush?



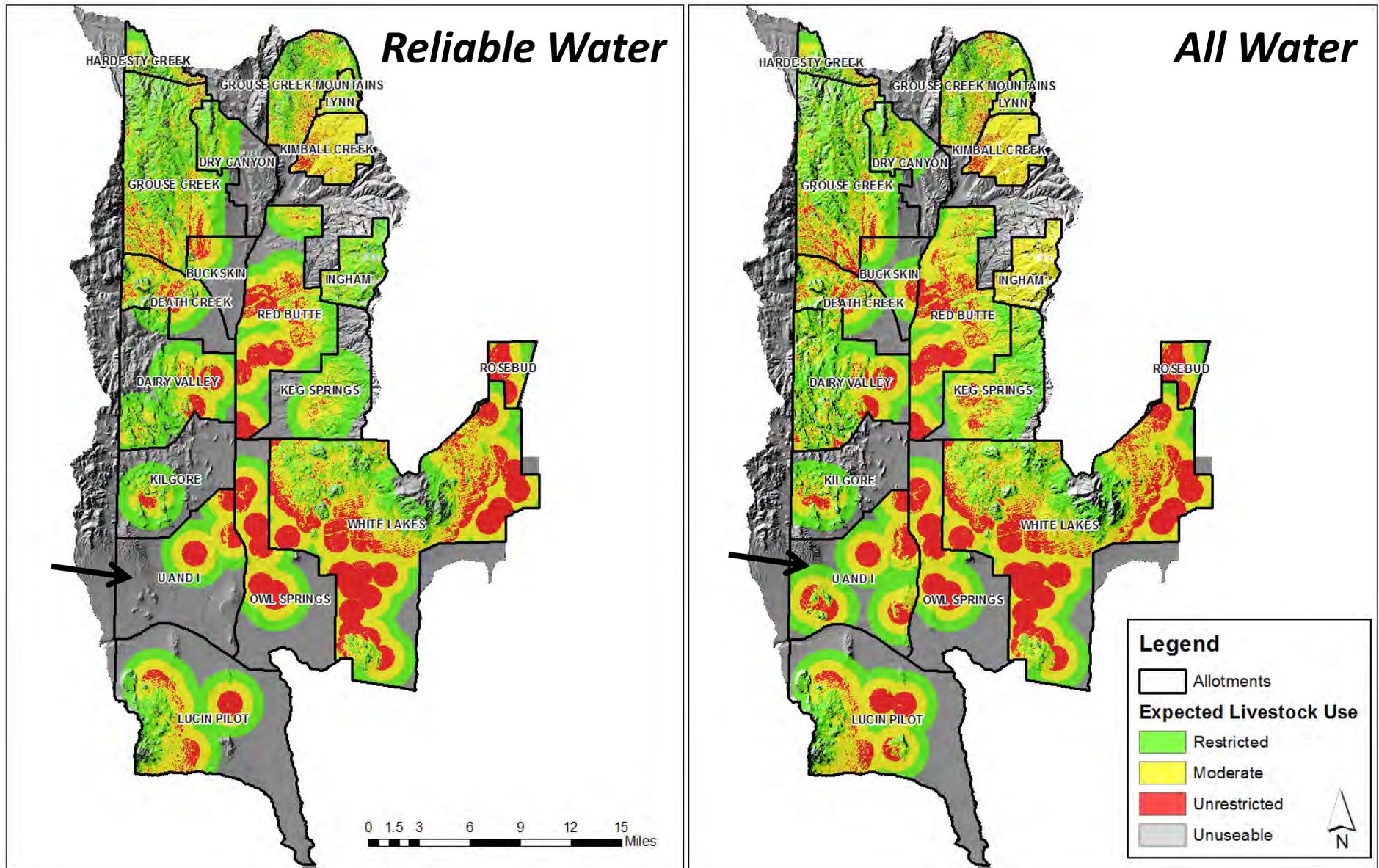
# Sagebrush Cover and Sage Grouse Habitat



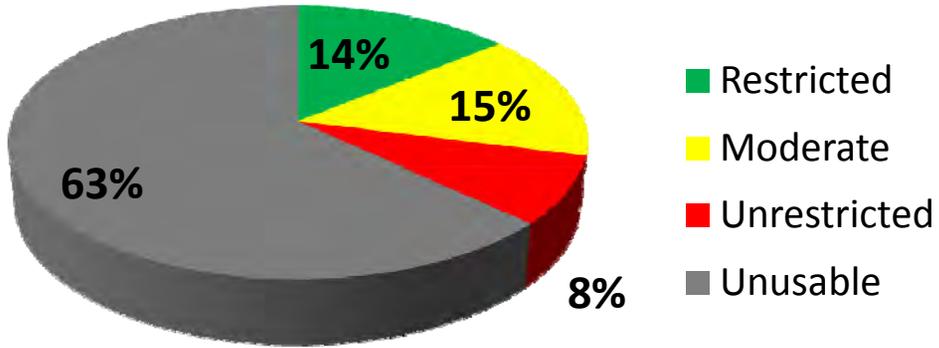
## Sagebrush Cover Within 2 Miles of Leks



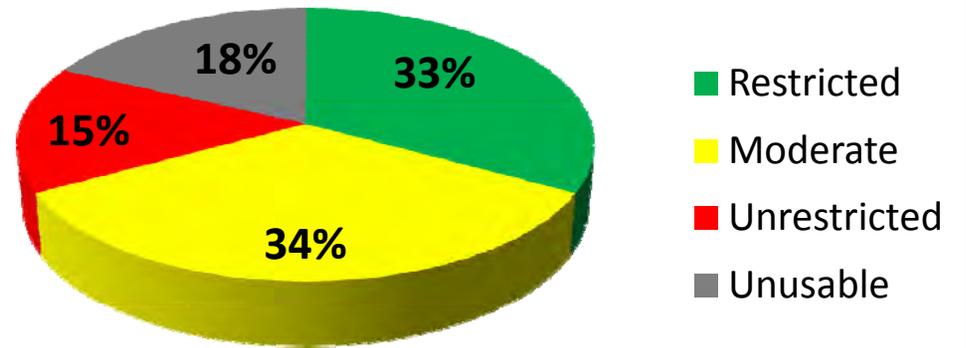
# Landscape Usability by Livestock



### Reliable Water U&I Allotment

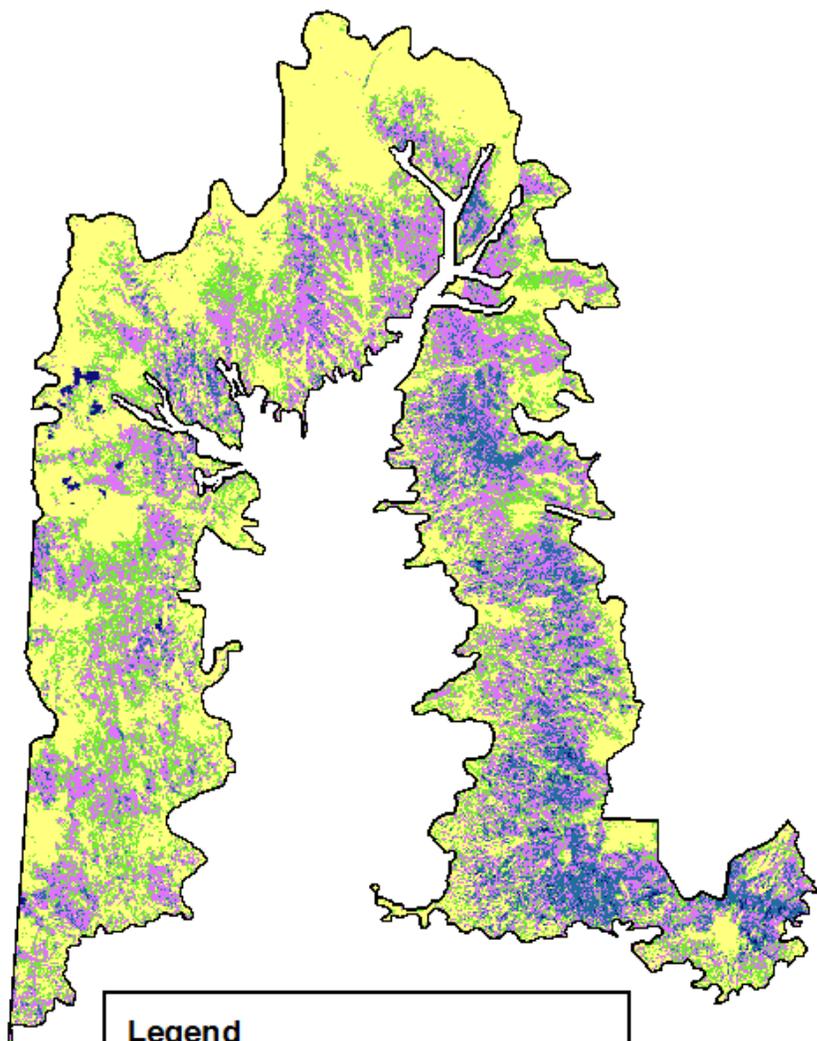


### All Water U&I Allotment

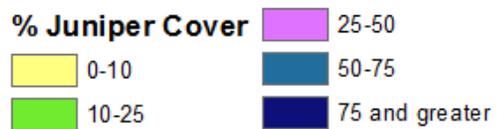


# Juniper Change

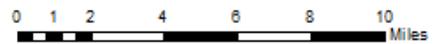
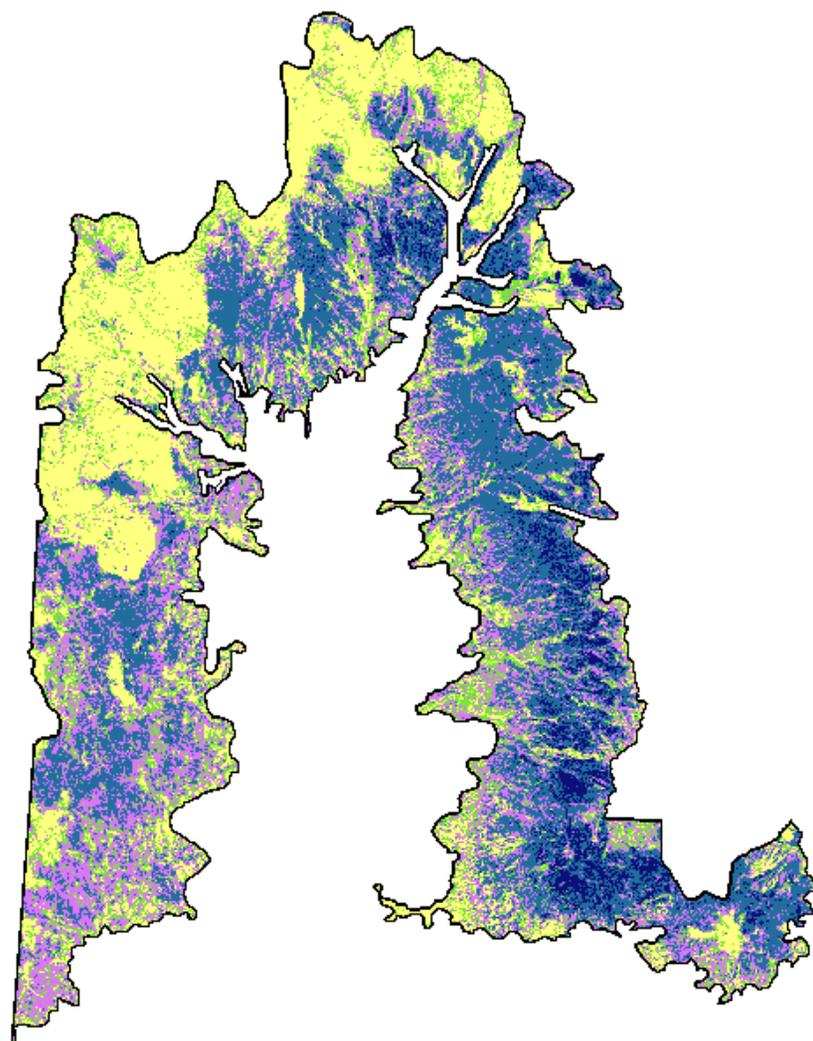
1977

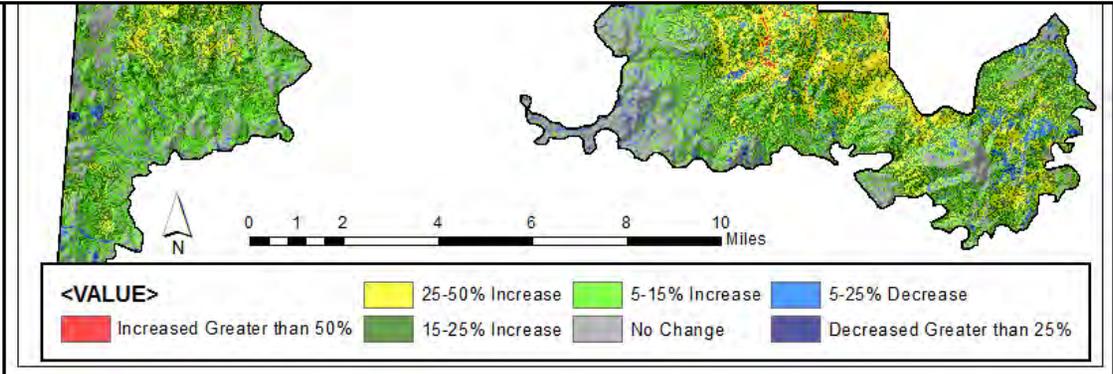
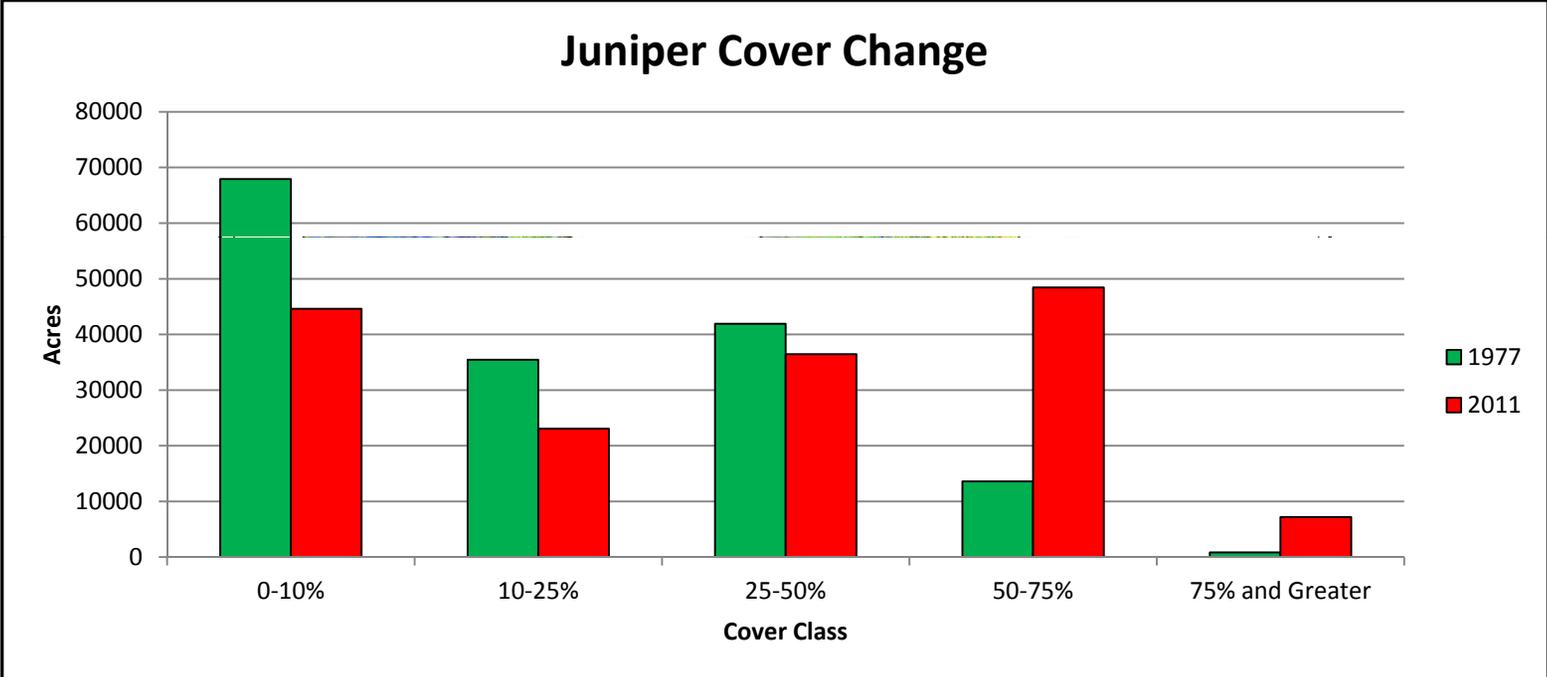
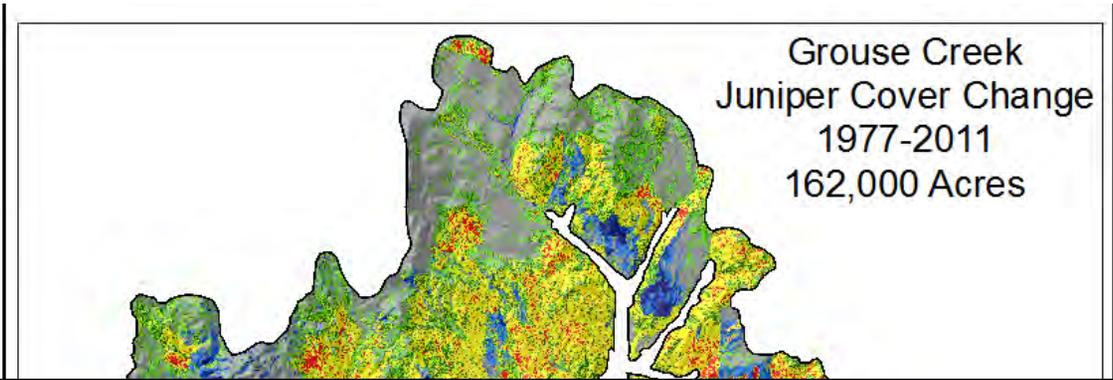


**Legend**



2011





# Juniper Management

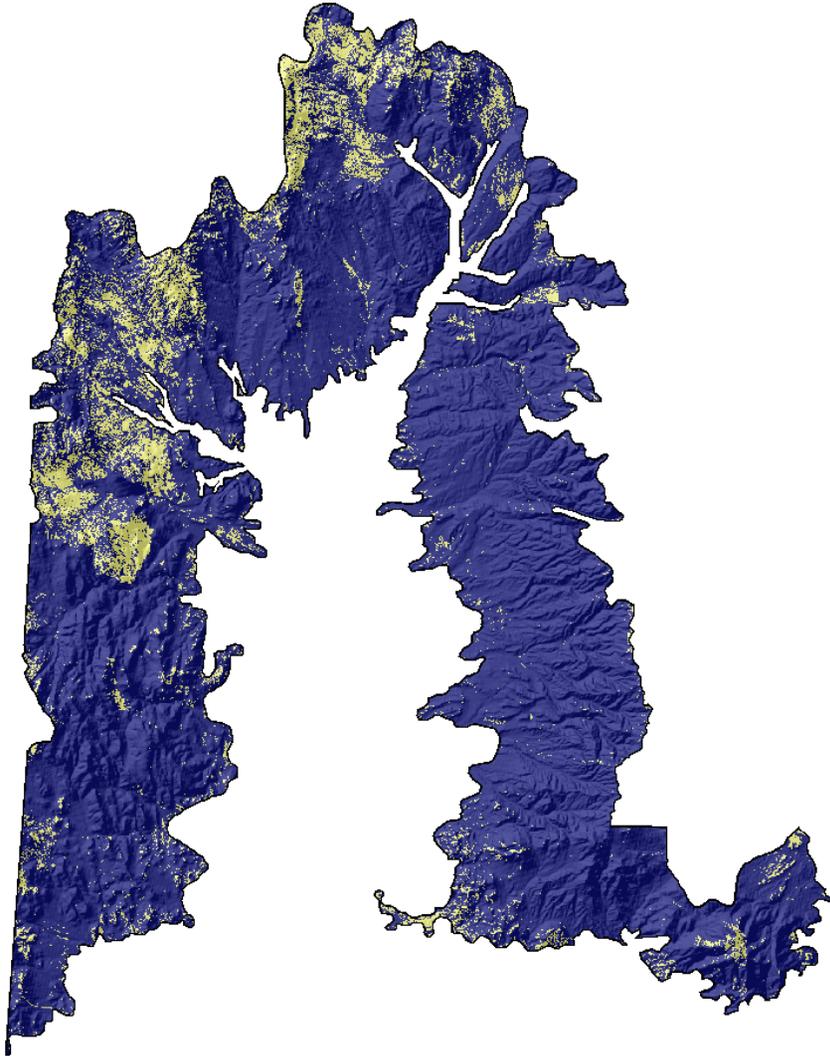
# Juniper Expansion



# Juniper Expansion



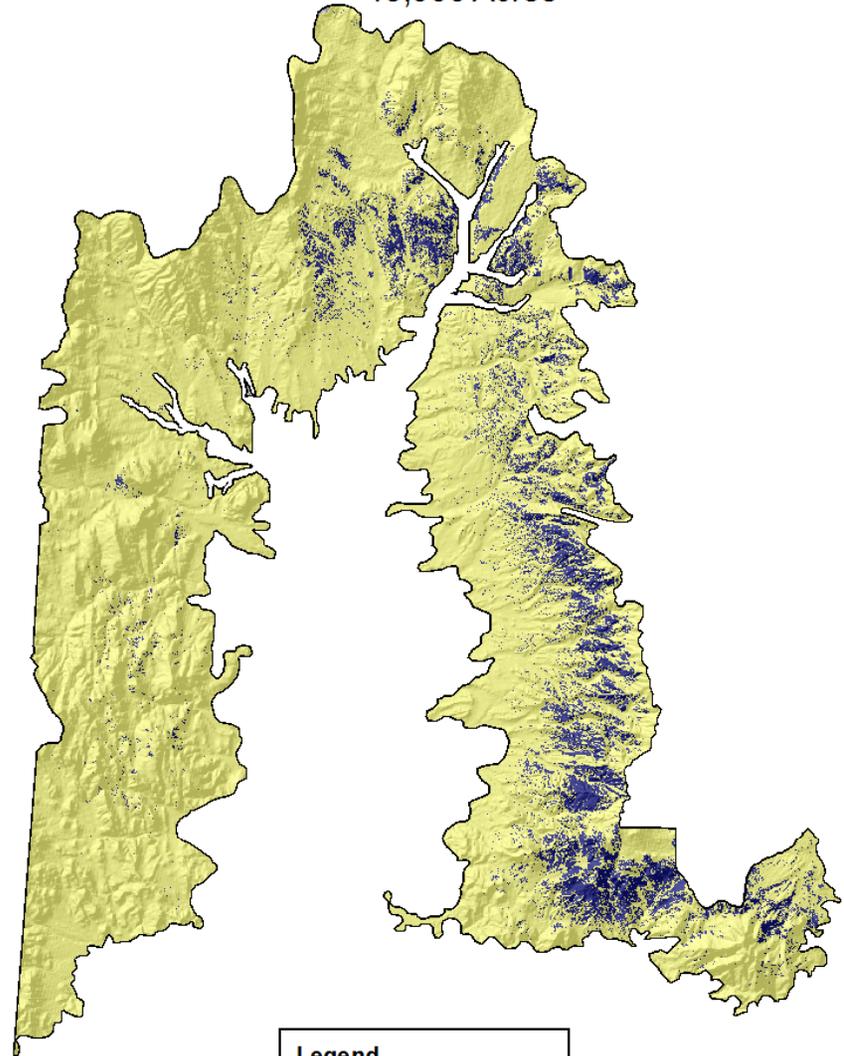
Juniper Extent 2011  
142,000 Acres



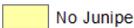
2 1 0 2 4 6 8 10  
Miles



Juniper Extent Pre-Settlement  
15,000 Acres



**Legend**

 No Juniper  Juniper

**Phase I**



**Phase II**



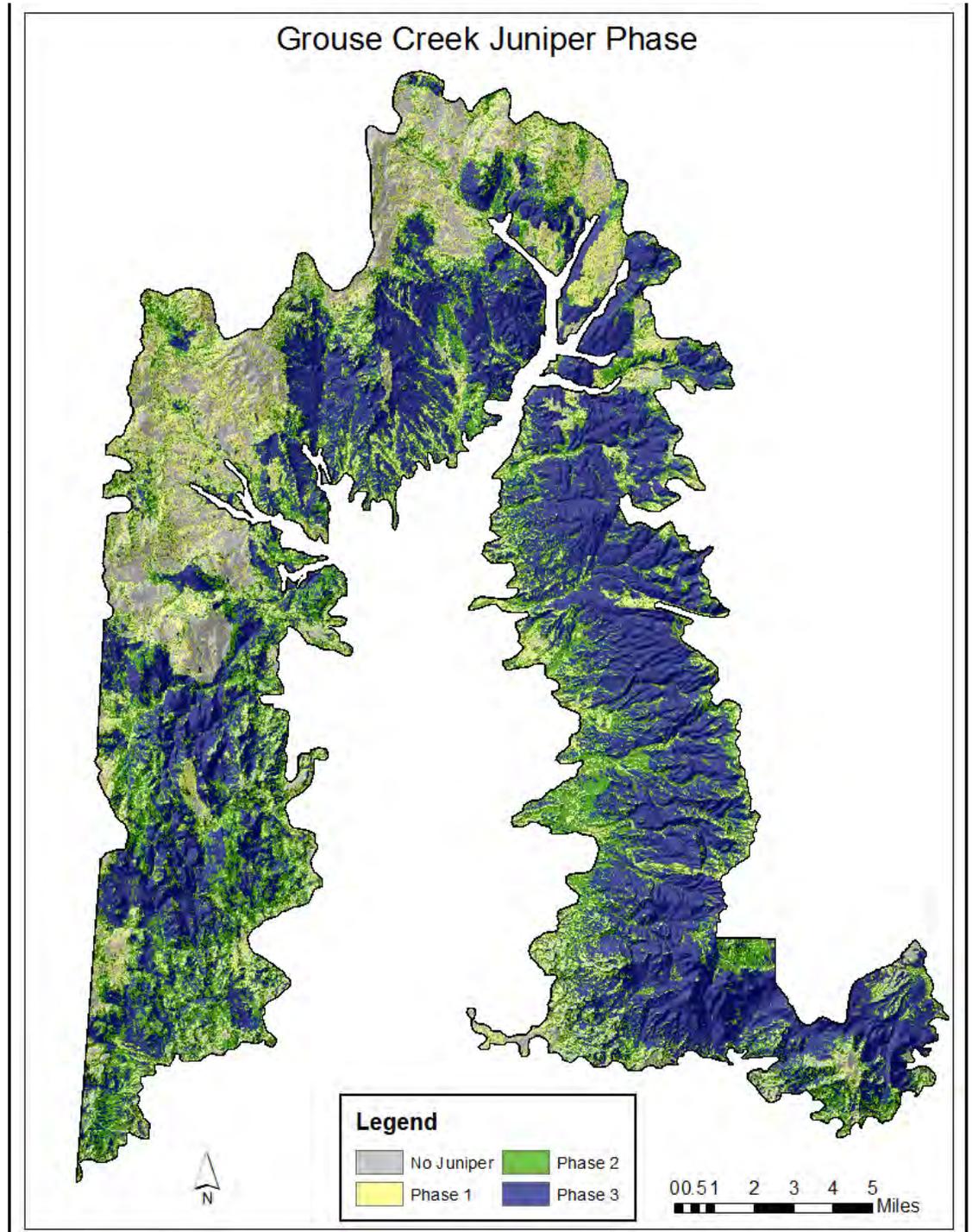
**Phase III**



## Effects of Juniper Phases

Phases	Water Cycle	Diversity	Sage Grouse	Herbage
I	None	Slight	Large	Slight
II	Slight	Sight	Large	Moderate
III	Large	Large	Large	Large

Acres  
Phase 1 = 27,000  
Phase 2 = 43,000  
Phase 3 = 72,000



# Juniper Expansion has effect the Grouse Creek Watershed

- Environmental
  - Water
  - Diversity
  - Sage Grouse habitat
  - Ranching

# Effect of Juniper Treatment



## Closed Canopy Woodland

- 4 % Herb. Cover
- 75 kg/ha herb. biomass
- PG density, 2-3 m<sup>-2</sup>
- 20 plant species
- Not Sage Grouse Habitat

## 2003 - Twelve Years after Cutting

- 30 % Herb. Cover
- 1100 kg/ha Herb. Biomass
- PG density, 10-12 m<sup>-2</sup>
- 30-40 plant species
- Sage Grouse Habitat

# Sculpting the Juniper Forest

What if  $\frac{1}{2}$  was cleared

- Water
- Diversity
- Sage Grouse habitat
- Ranching

# Sculpting the Juniper Forest

What if ½ was cleared

## – Water

- Evaporation
- Spring Flow
- Wildlife/Livestock

## – Diversity

- Birds (dickey)
- Mule deer

## – Sage Grouse habitat

- 50-250% Increase in Grouse

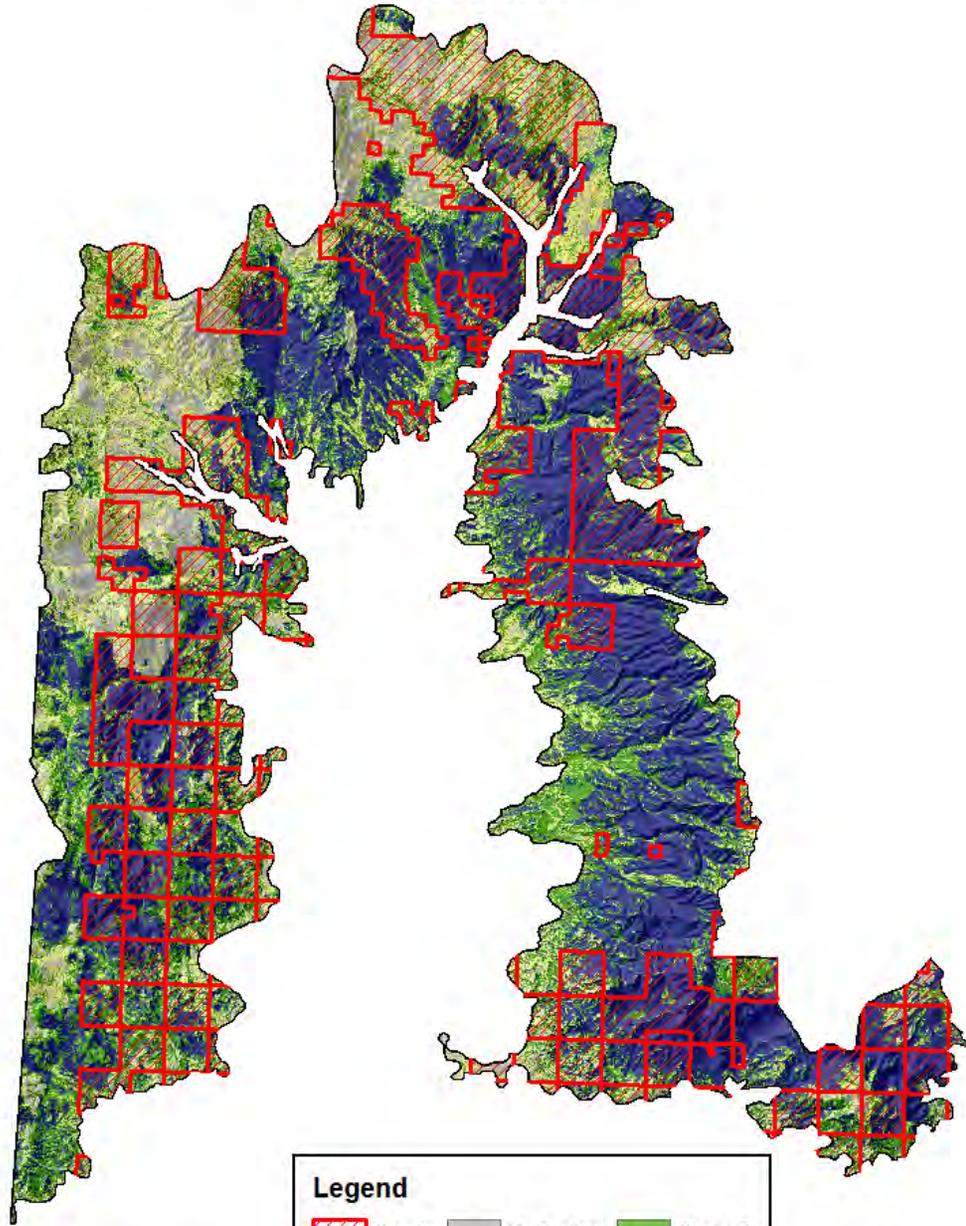
## – Ranching

- 18,000 AUMs \$.25-1.5 million/Yr

# Barrier to Treatment

- Environmental Concerns
- Money

# Grouse Creek Juniper (Private Ownership) 53,000 Acres



### Legend

-  Private
-  No Juniper
-  Phase 2
-  Phase 1
-  Phase 3



# What ORC Can do for WBCRMP

- Answer landscape questions
  - Support management decisions e.g. allotment renewal
  - Show where the best areas of water development would be for grazing management and estimate stocking rate.
  - Where to treat juniper to have the greatest effect for sage grouse, ranching, water and diversity.
  - Help find funding for treatments and market the additional environmental values.
  - Outreach