

# Methods for Biodiversity Impact Analysis at Regional and Local Scales

IAIA Biodiversity and Ecosystem Services - February 8, 2013

Key  
Partners



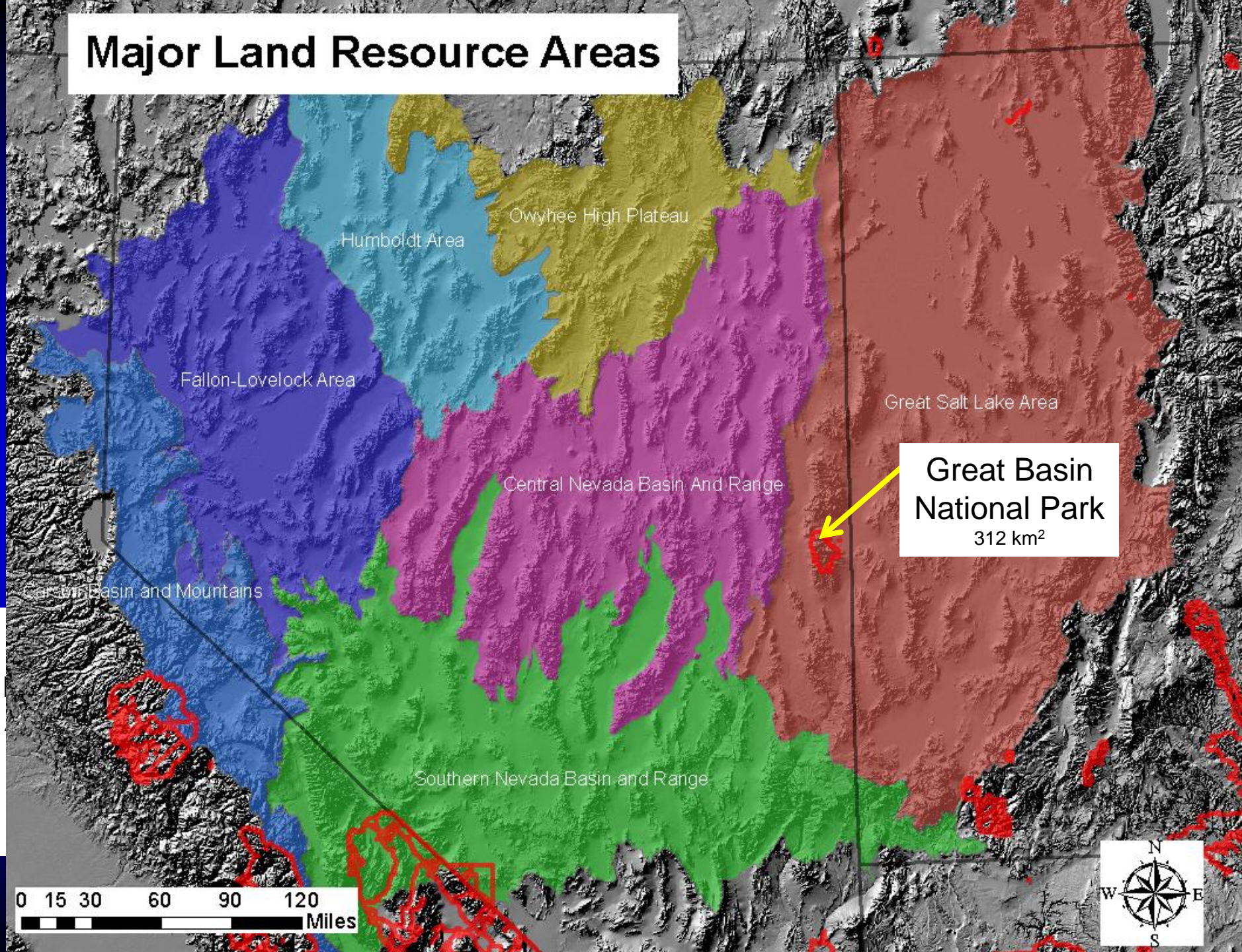
*Patrick Comer, Chief Ecologist*

# Approaches and Methods

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1. Representing Biodiversity in Landscape Assessment
2. Ecological Integrity Assessment
3. Assessments at Regional and Local scales

# Major Land Resource Areas





# Rapid Ecoregional Assessments

## ◆ *Where are they?*

- Resources/Elements: Biodiversity, etc.
- Change Agents/Stressors: Development, fire, invasive species, climate change effects
- Places: managed lands

## ◆ *How are they doing?*

- 'Footprint analysis' and Ecological integrity assessments

## ◆ *How are they changing?*

- 2025 Development scenarios & ecol. integrity
- 2060 Climate change forecasts

# “Coarse Filter/Fine Filter” Approach for identifying Focal Resources

- **Ecological Systems**

- Characteristic landscape patterns and processes



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- **Focal Habitats**

- Rare Species assemblages
- Rare community types
- Sensitive habitats relative to common use: e.g., wind erodible soils



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- **Focal Species**

- Imperiled & vulnerable species










# Local Species by HUC



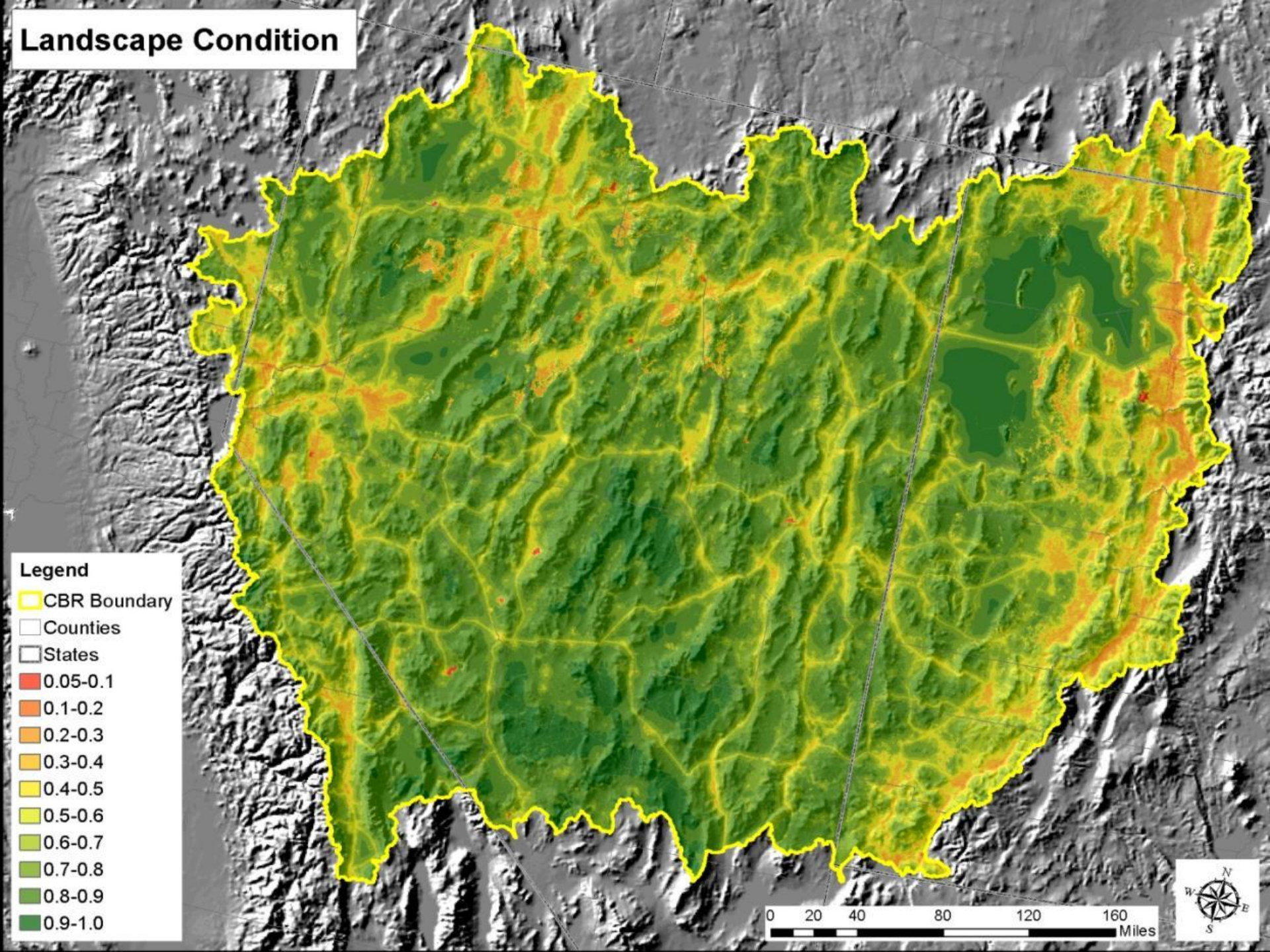
## Legend

### COUNTOFEGT

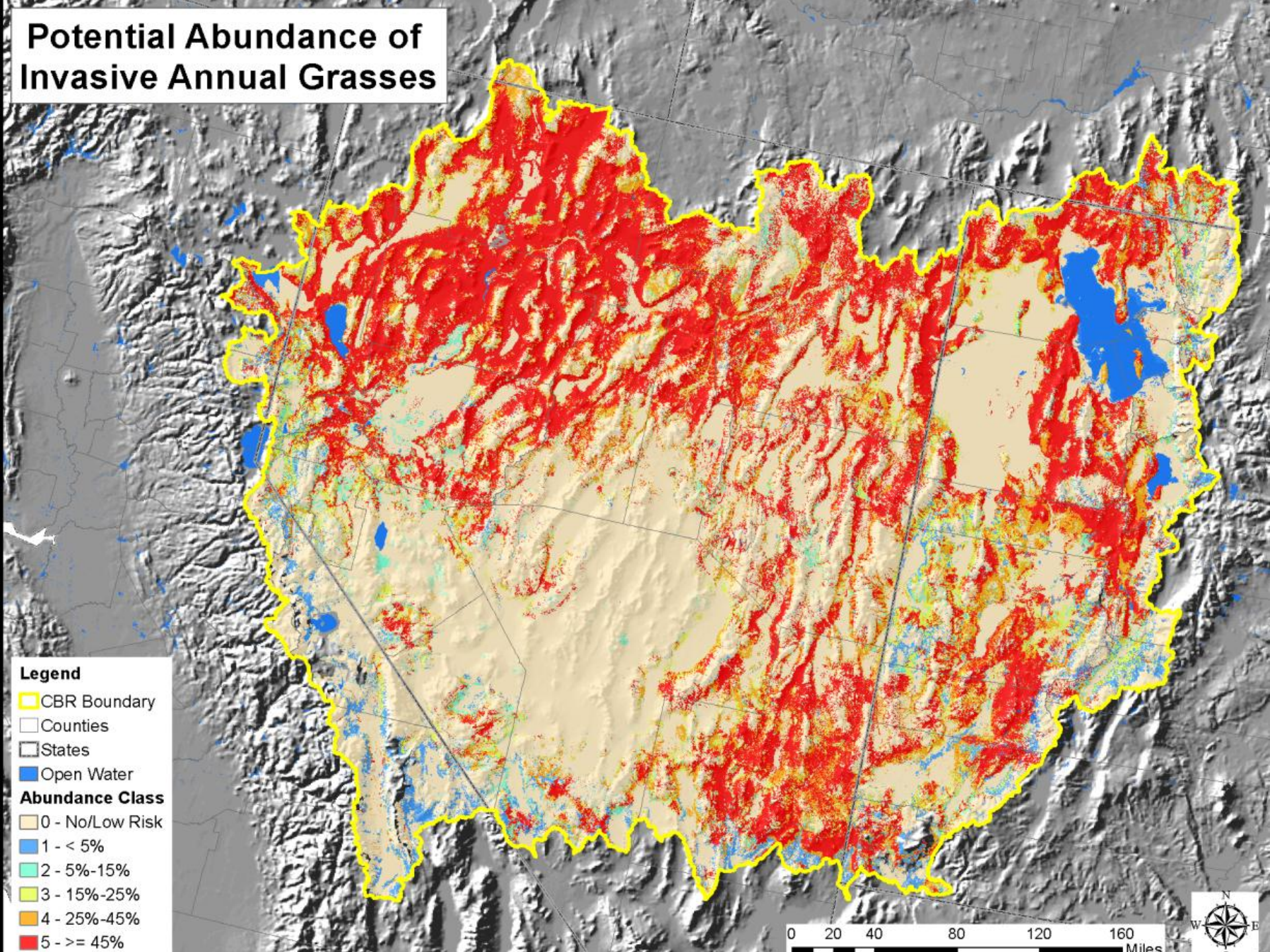
	1 - 4
	5 - 10
	11 - 18
	19 - 29
	30 - 47
	state border
	CBR_MBR boundary

0 25 50 100 150 200 Miles

# Landscape Condition



# Potential Abundance of Invasive Annual Grasses



# Ecological Integrity - Conceptual Model

## Indicator Levels 1-3

### Stress

- ↑ Fragmentation
- ↑ Invasive Grasses
- ▲ Fire Regime
- ▲ Grazing Regime
- ↑ Soil Disturbance

### Indicators

#### Level 1 (spatial models)

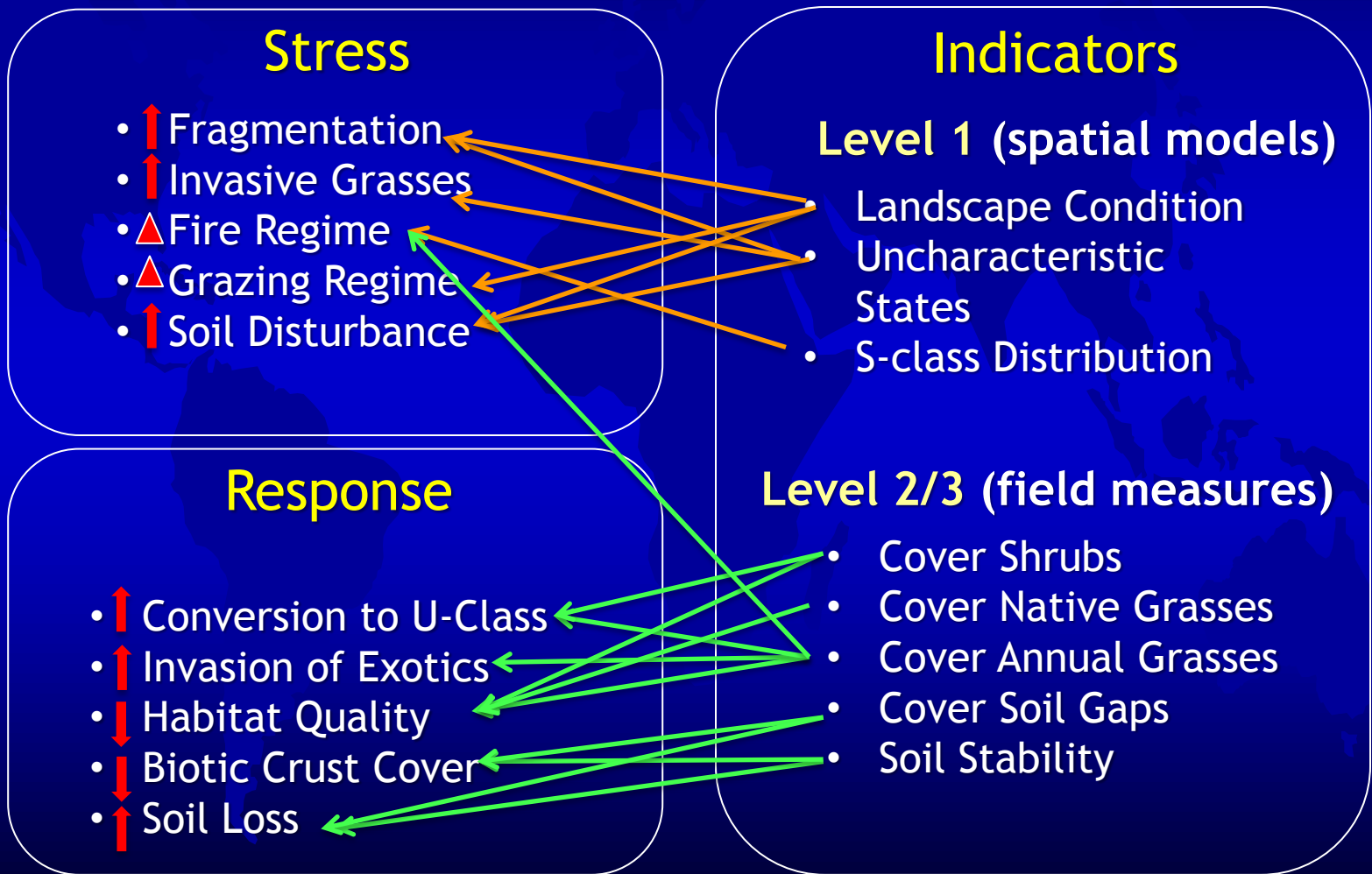
- Landscape Condition
- Uncharacteristic States
- S-class Distribution

### Response

- ↑ Conversion to U-Class
- ↑ Invasion of Exotics
- ↓ Habitat Quality
- ↓ Biotic Crust Cover
- ↑ Soil Loss

#### Level 2/3 (field measures)

- Cover Shrubs
- Cover Native Grasses
- Cover Annual Grasses
- Cover Soil Gaps
- Soil Stability



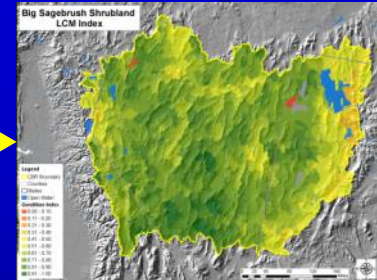
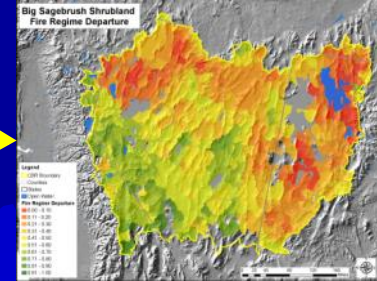
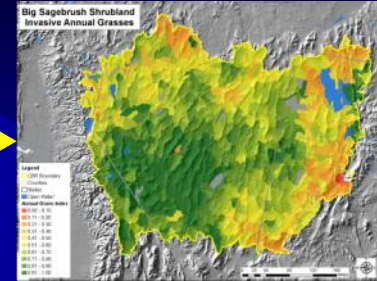
## Focal Resources



## Stressors



## Ecological Integrity Scores



Habitat  
alteration  
Fragmentation  
Removal

Spatial  
reporting of  
impacts and  
trends

### Conceptual Models

link stressors,  
response, to  
measurable  
indicators

### Spatial Models

use geoprocessing  
steps to measure  
and report  
indicators

# Big Sagebrush Shrubland Fire Regime Departure

## Legend


 CBR Boundary


 Counties


 States


 Open Water


## Fire Regime Departure


 0.00 - 0.10


 0.11 - 0.20


 0.21 - 0.30


 0.31 - 0.40


 0.41 - 0.50

 0.51 - 0.60

 0.61 - 0.70

 0.71 - 0.80

 0.81 - 0.90

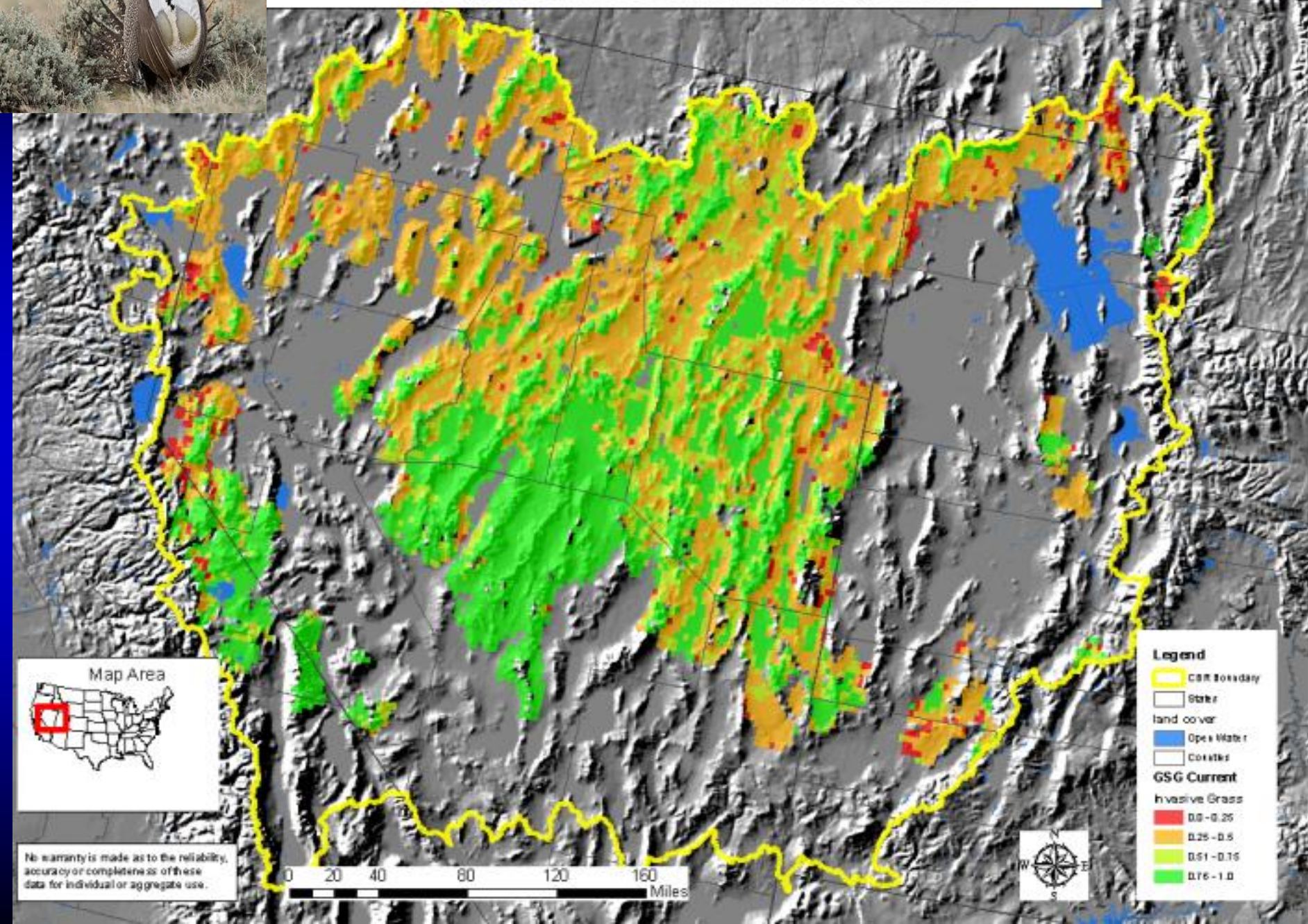
 0.91 - 1.00

0 20 40 80 120 160 Miles

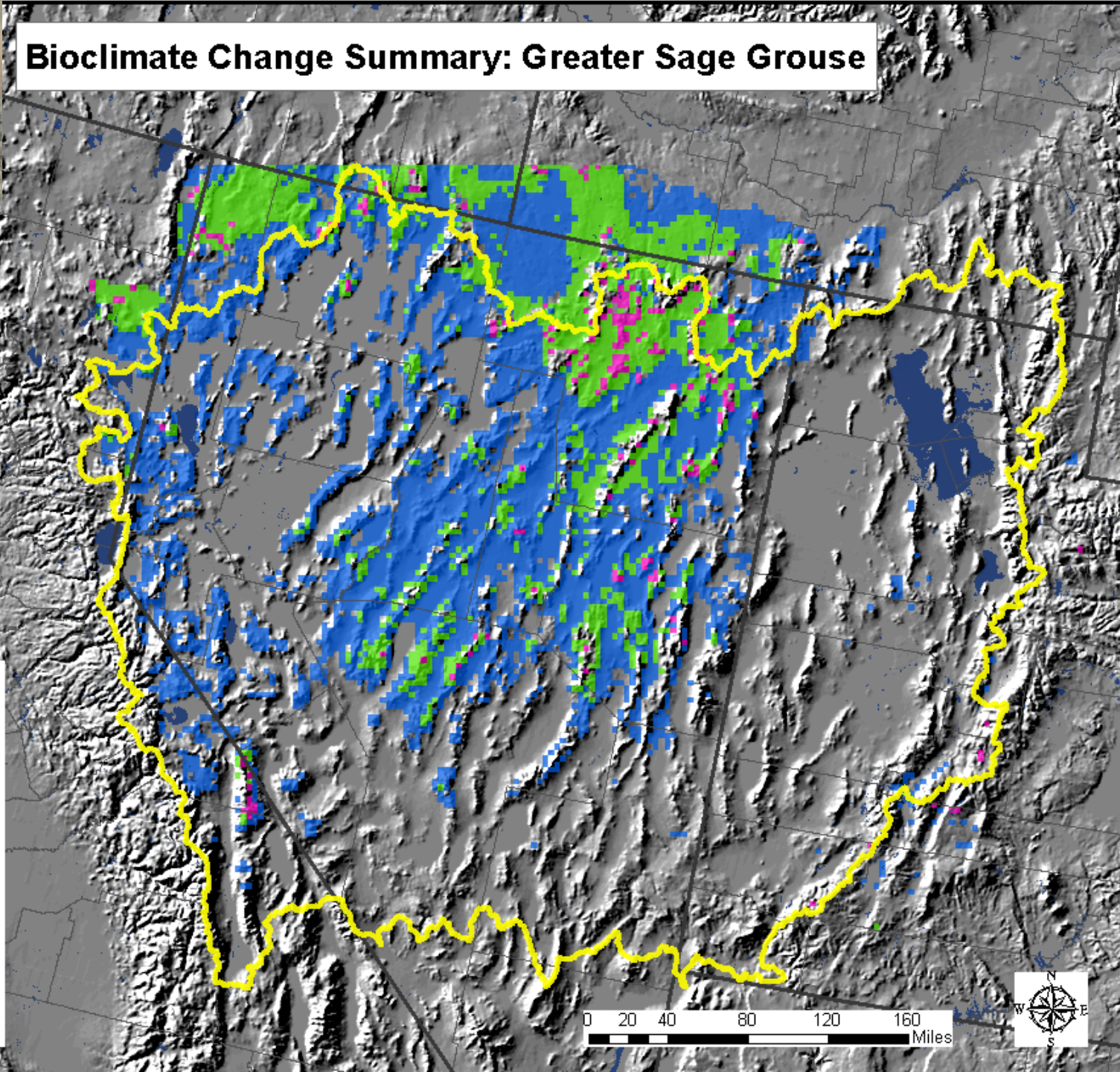


# Central Basin and Range Rapid Ecoregional Assessment

## Ecological Status Assessment: Greater Sage-Grouse



# Bioclimate Change Summary: Greater Sage Grouse

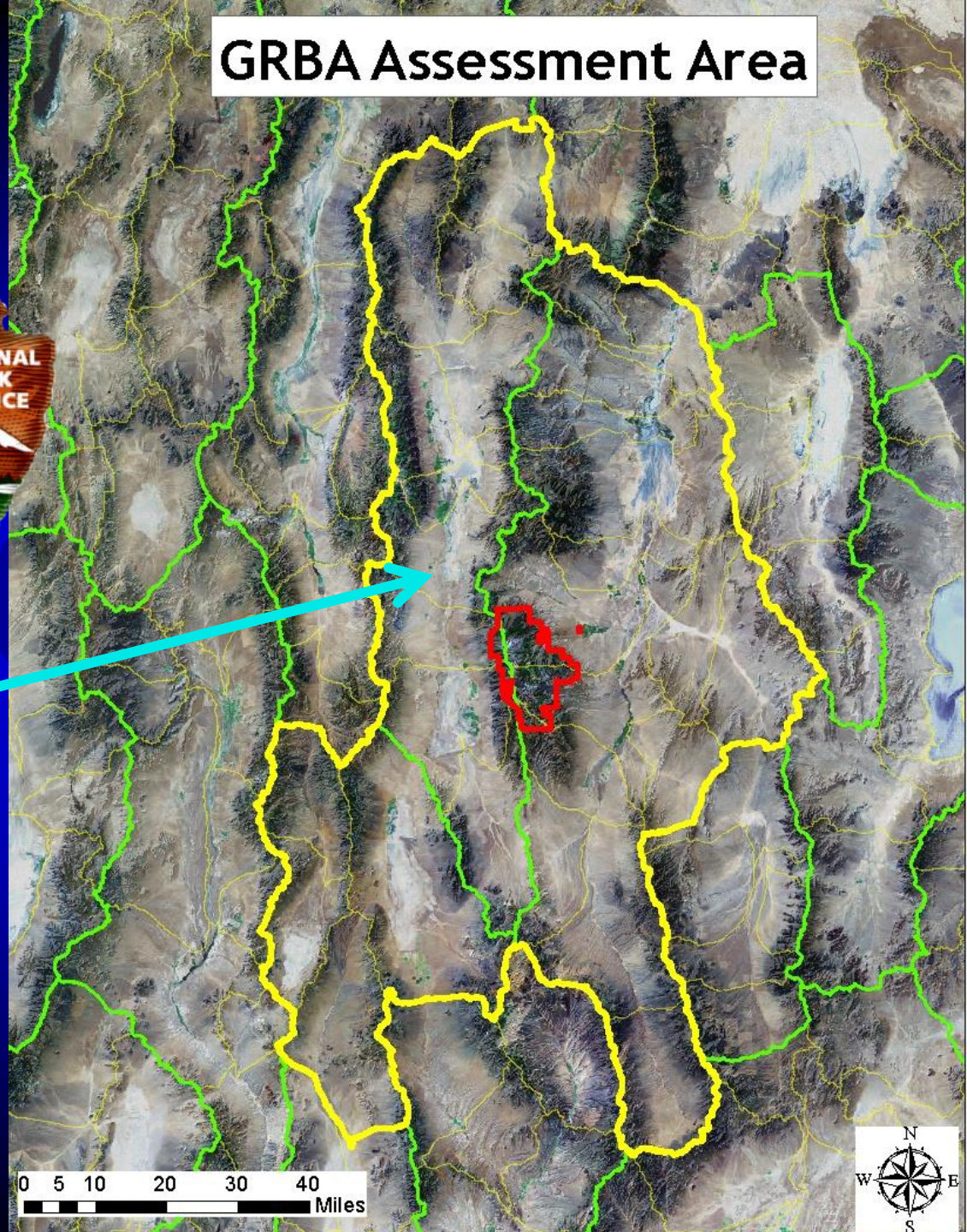


◆ Park Resource Distributions

◆ Stressor effects on Park Resources



GRBA Assessment Area



# GRBA- Focal Resources

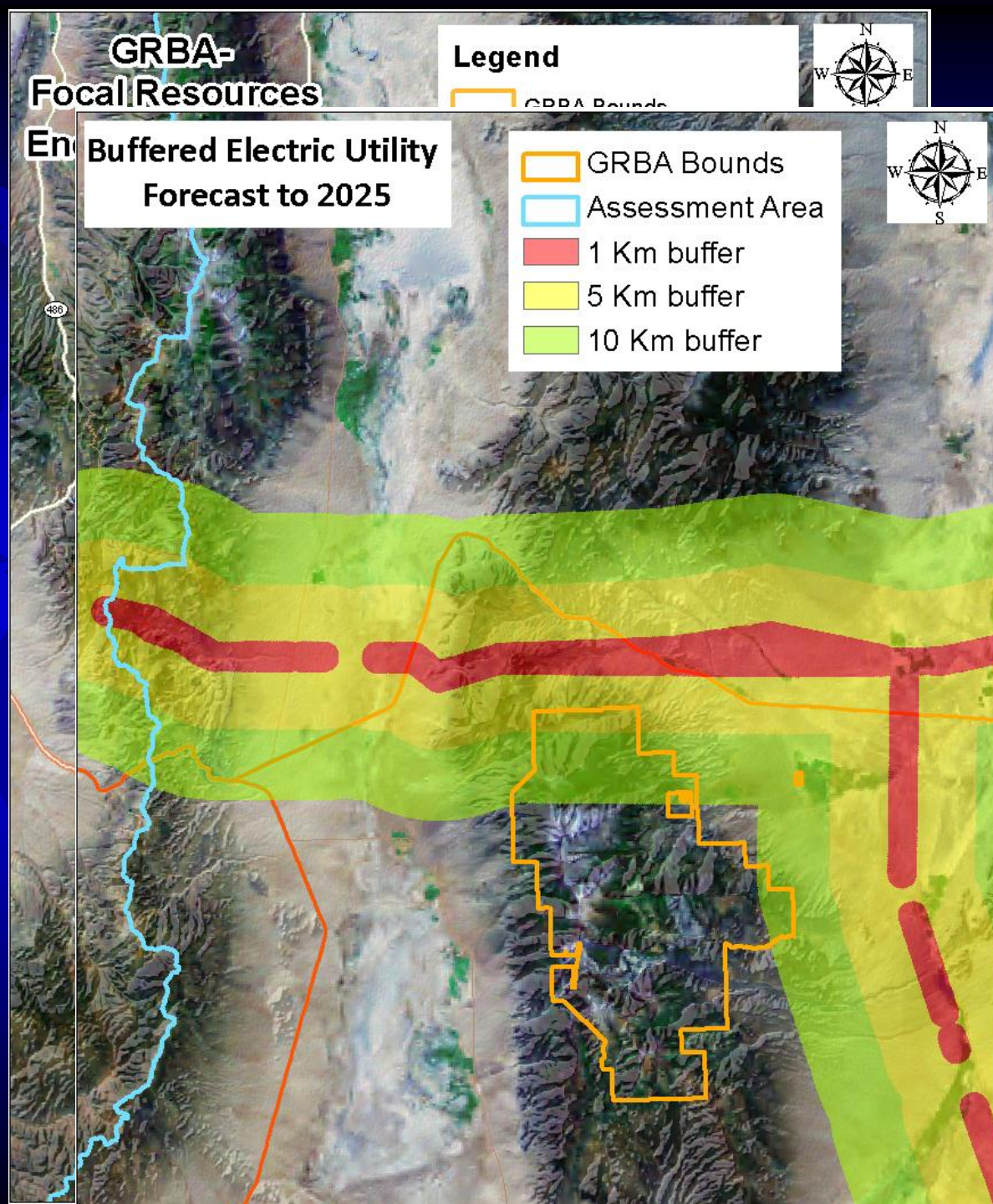
## Legend

GRBA Bounds

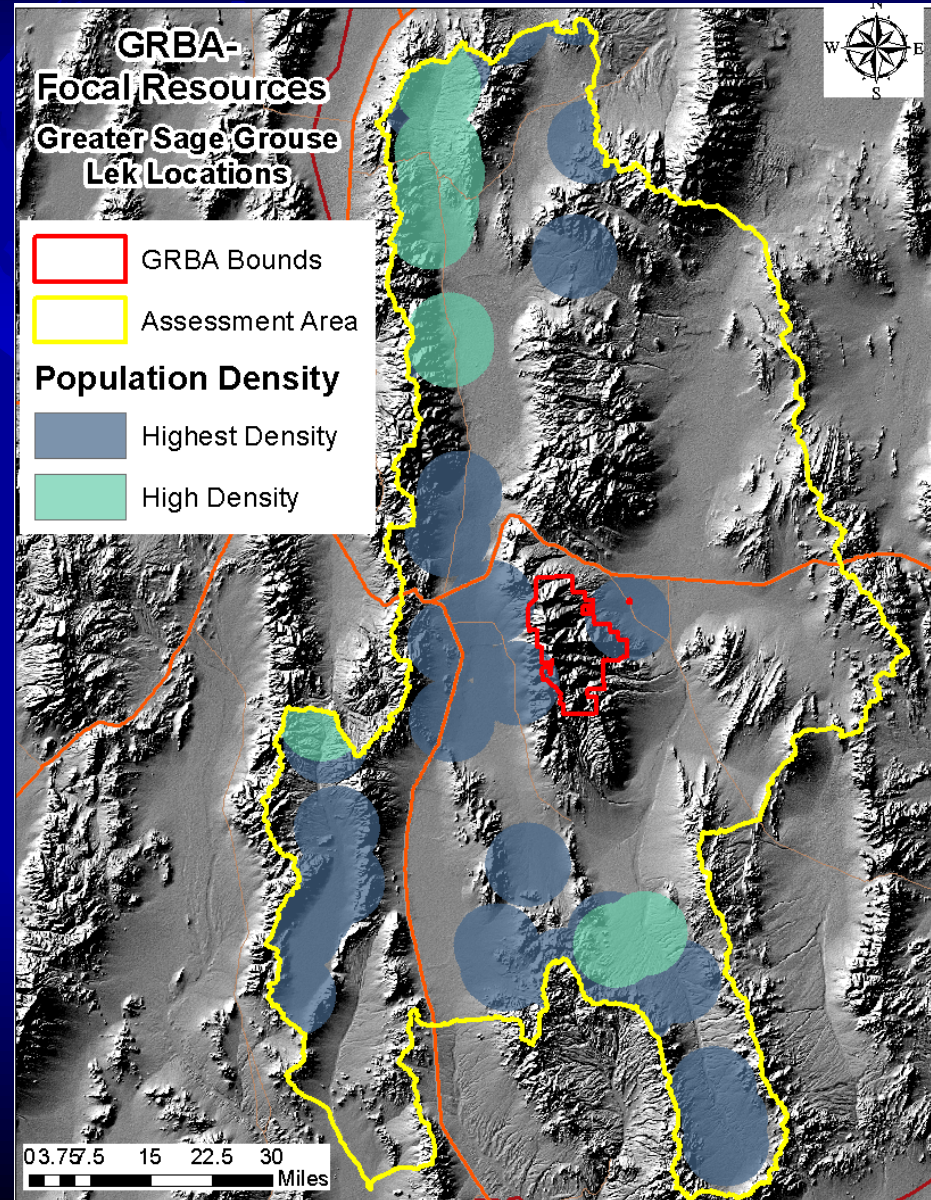
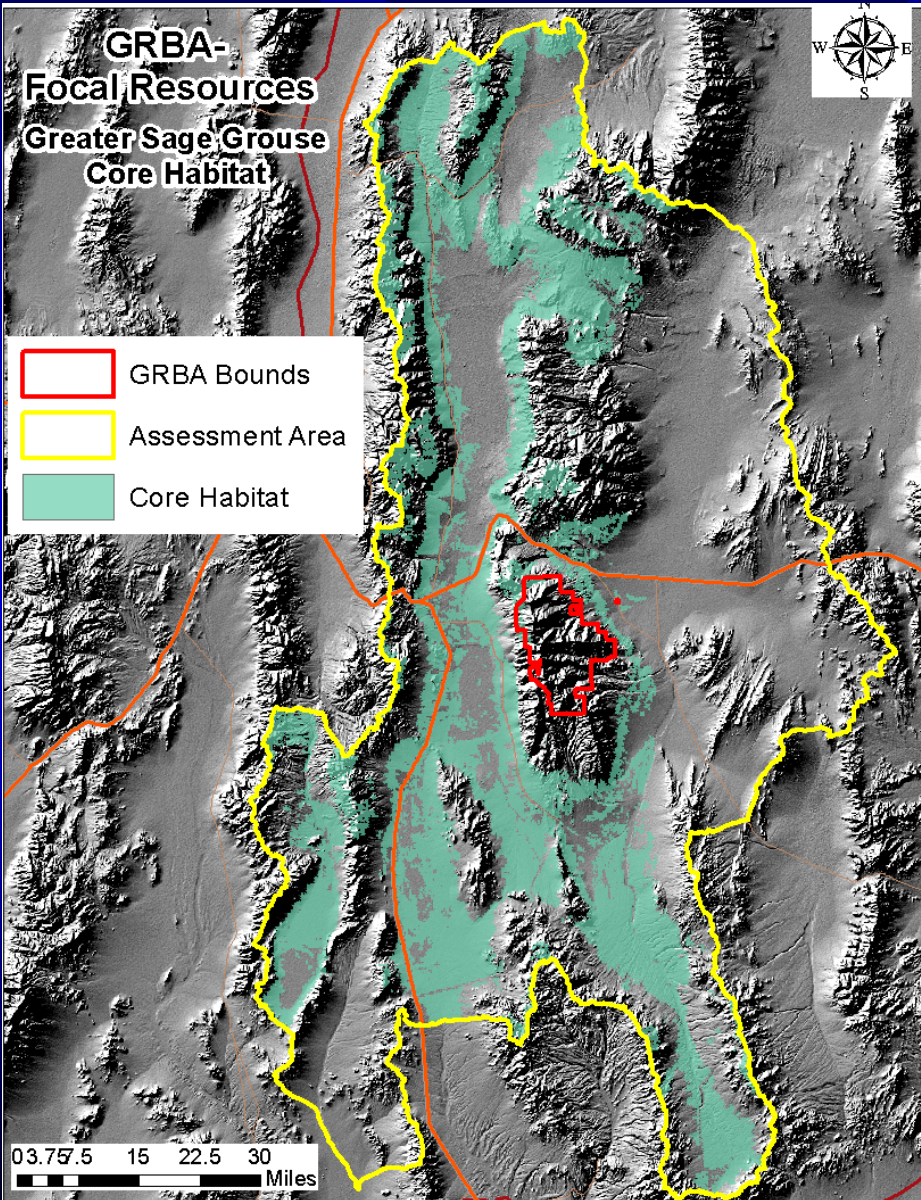


## En Buffered Electric Utility Forecast to 2025

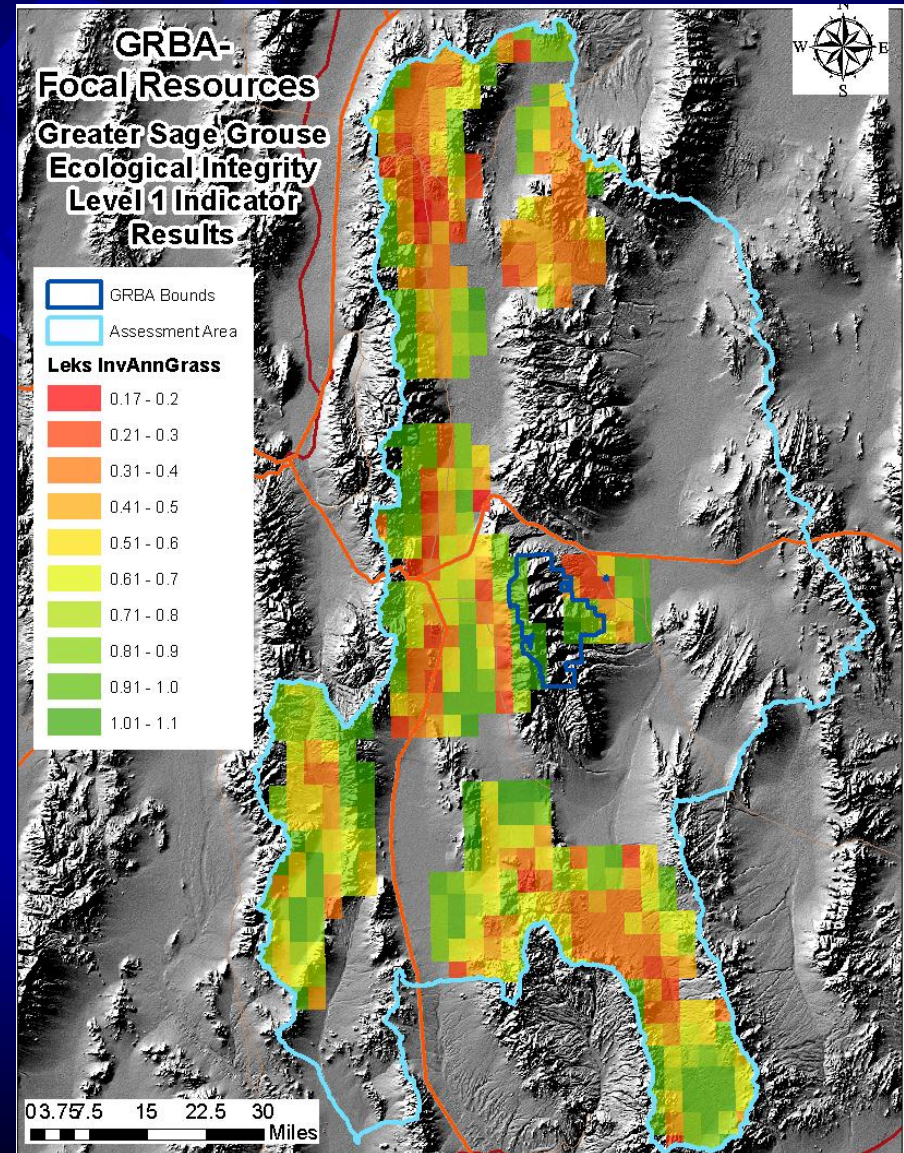
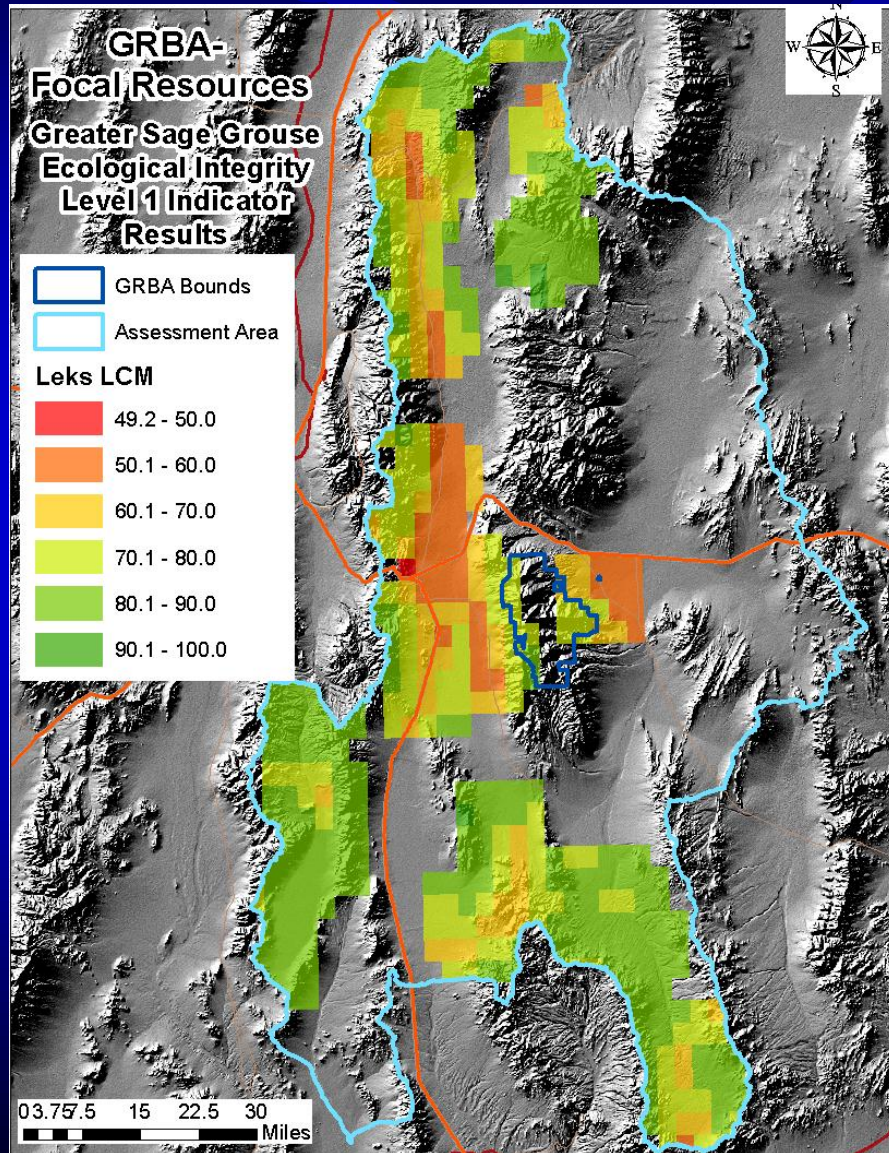
- GRBA Bounds
- Assessment Area
- 1 Km buffer
- 5 Km buffer
- 10 Km buffer



# Greater Sage Grouse Distributions



# Level 1 Integrity Indicators Scores



# Conclusions

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1. Coarse-filter/fine-filter approach is robust for representing biodiversity
2. Ecological integrity assessment applies well to regional and local scales
3. Modeling options are expanding rapidly for impact assessment
4. National investments in remote sensing data remain critical



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Bureau of Land Management Rapid Ecoregional Assessment

[http://www.blm.gov/wo/st/en/prog/more/Landscape\\_Approach/reas/cbasinrange.html](http://www.blm.gov/wo/st/en/prog/more/Landscape_Approach/reas/cbasinrange.html)

National Park Service Natural Resource Condition Assessment

<http://www.nature.nps.gov/water/nrca/index.cfm>