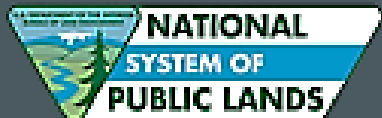


Taking a Regional Perspective

1

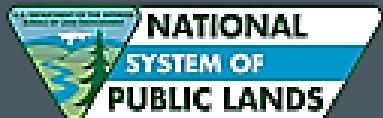


Landscape Approach Implementation

Monument Management Plan Amendment - Livestock Grazing

2

- An opportunity to investigate select regional trends within the ecoregion
 - ▣ Regional context on many issues
 - ▣ Intactness (aquatic & terrestrial)
 - ▣ Regional perspective on connectivity
 - ▣ Climate change predictions
 - ▣ Soil crust probability distributions
 - ▣ Productivity/Foraging estimates



Landscape Approach Implementation

GSENM Objects & Values: Quantified in COP

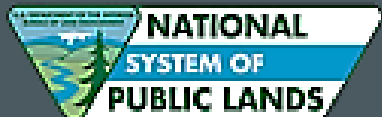
3

□ General/Social

- ▣ Vast & austere landscape
- ▣ Rugged & remote
- ▣ Unspoiled natural area, natural processes unaltered by man

□ Biological/Ecological

- ▣ Soil Crust
- ▣ Wildlife diversity & Terrestrial wildlife (Bighorn Sheep/Lion)
- ▣ Terrestrial ecosystem (Pinyon Juniper)



Landscape Approach Implementation

PLANNING AREA

- BLM
- BLM Planning Area not Monument
- Indian Reservation
- National Park Service
- Private or other
- State
- Forest Service
- MMP-A/EIS planning area
- BLM GSENM
- Communities
- Major road or highway
- State line
- County boundary

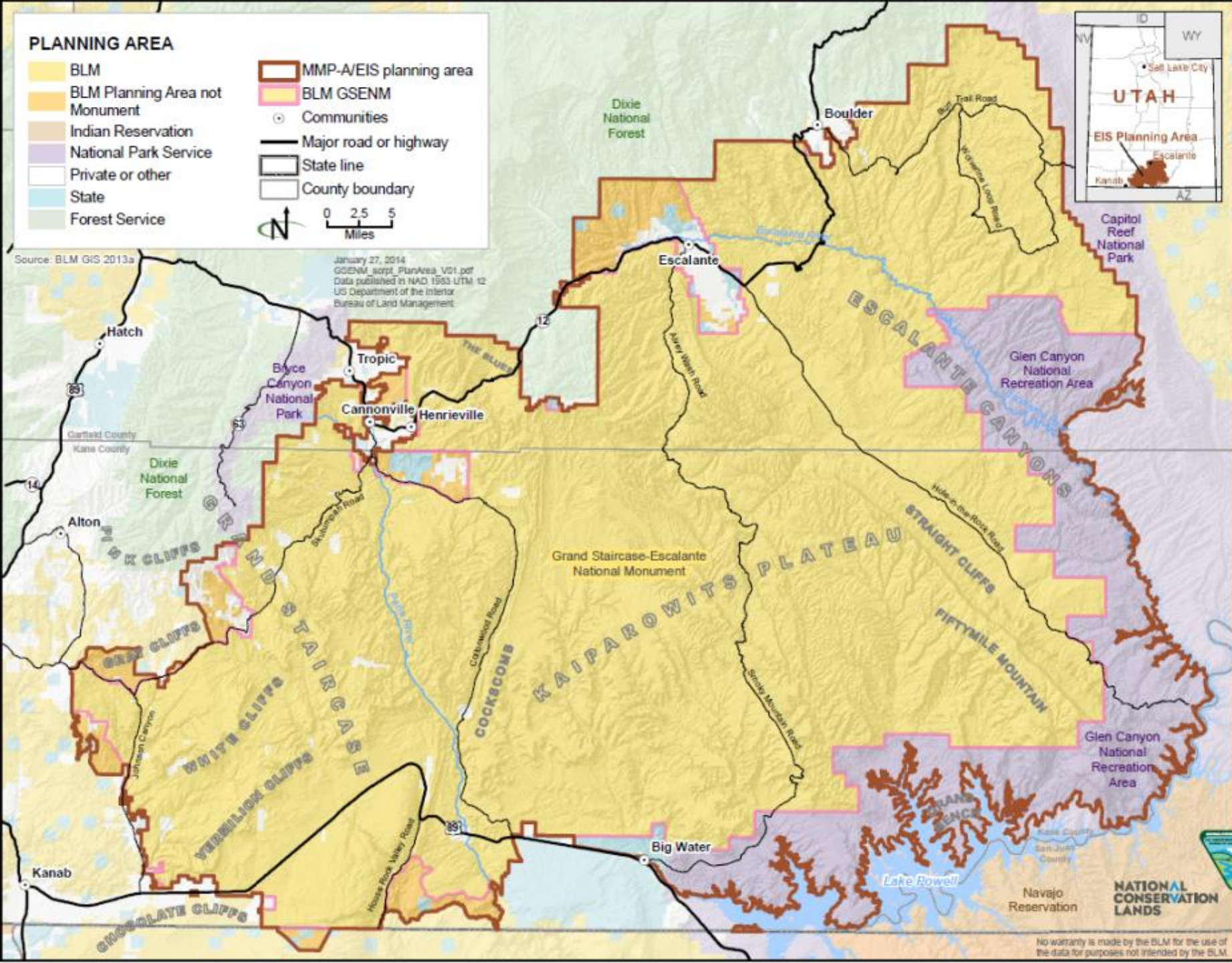


0 2.5 5
Miles



Source: BLM GIS 2013a

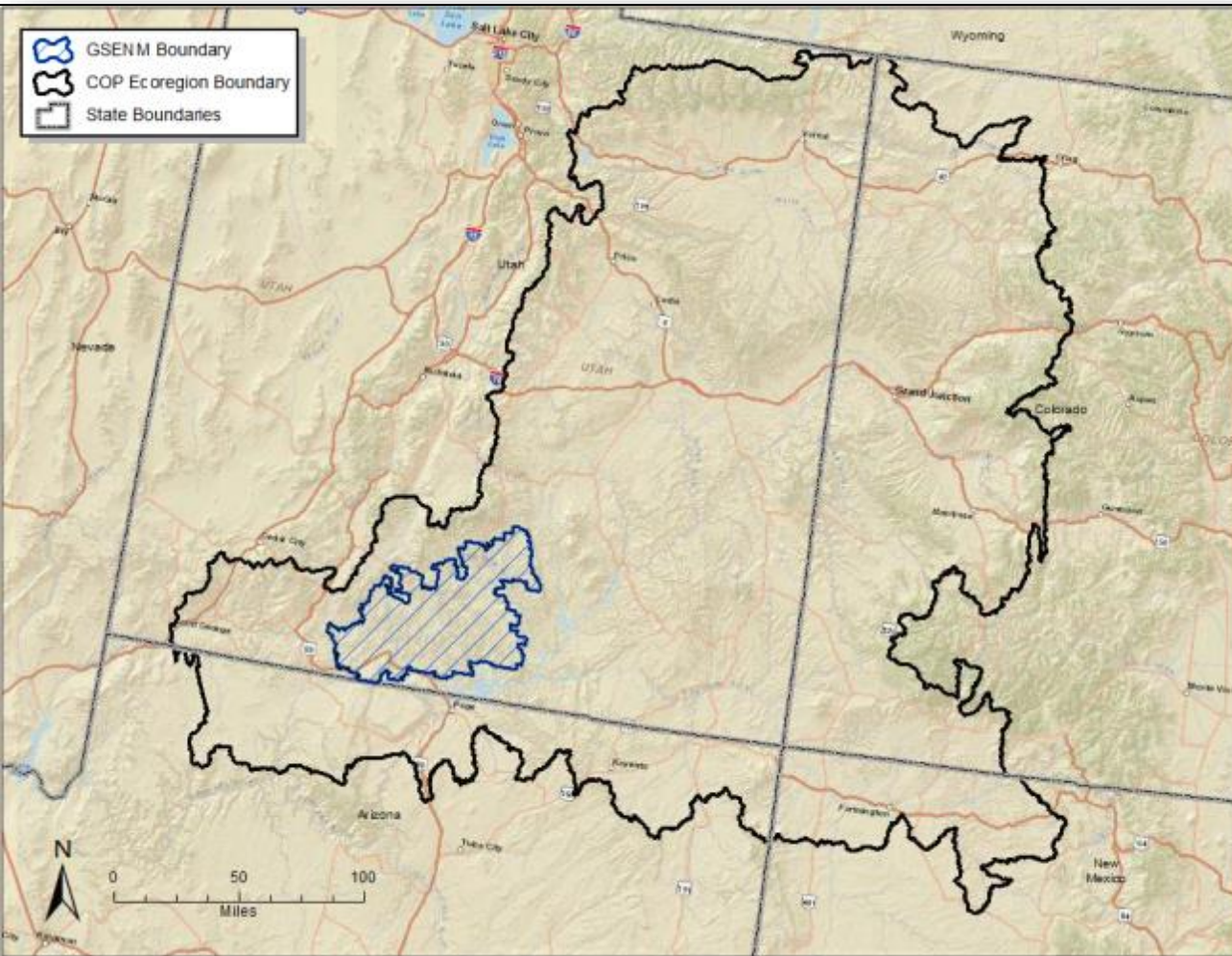
January 27, 2014
GOENM_script_PlanArea_V01.pdf
Data published in NAD 1983 UTM 12
US Department of the Interior
Bureau of Land Management



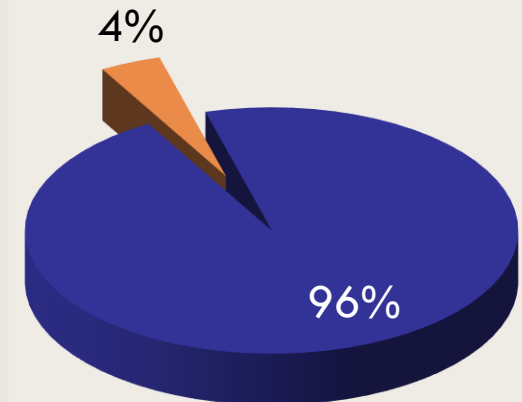
No warranty is made by the BLM for the use of the data for purposes not intended by the BLM.

Context within the Colorado Plateau Ecoregion

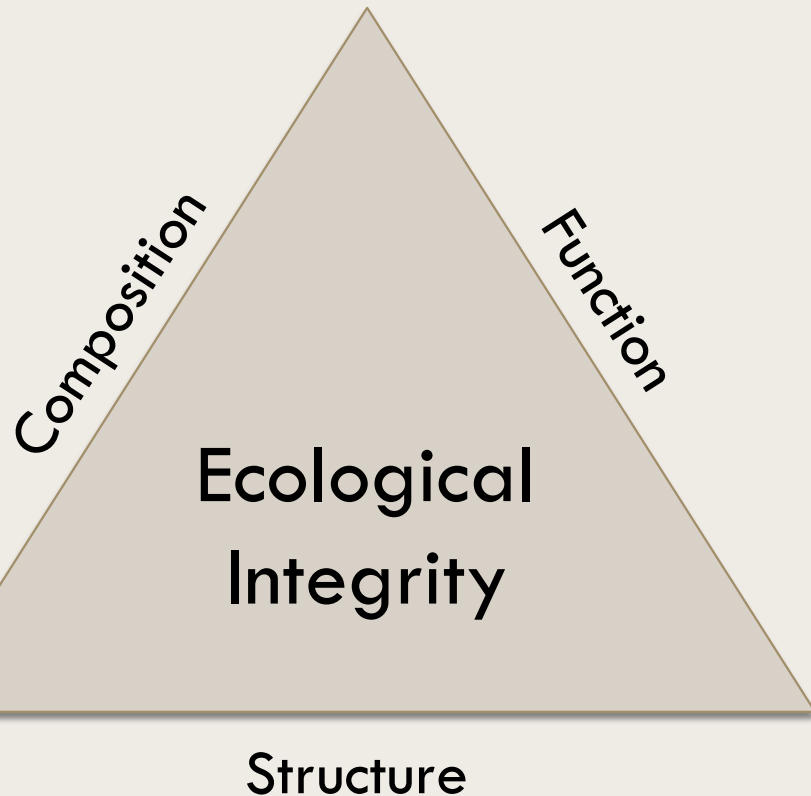
5



Grand Staircase
size relative to Colorado
Plateau Ecoregion



What is intactness?



Intactness is a quantifiable estimate of naturalness measured on a gradient of anthropogenic influence and based on available spatial data.



Quantifying Terrestrial Intactness

7

□ Key Components:

▣ Fragmentation

▣ Development

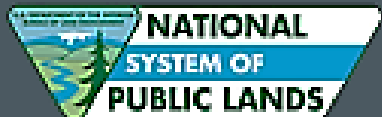
- Urban areas
- Agriculture
- Energy (mining/geothermal/oil & gas)
- Linear (roads/utilities/pipelines)

▣ Vegetation

- Fire regime departure
- Invasives

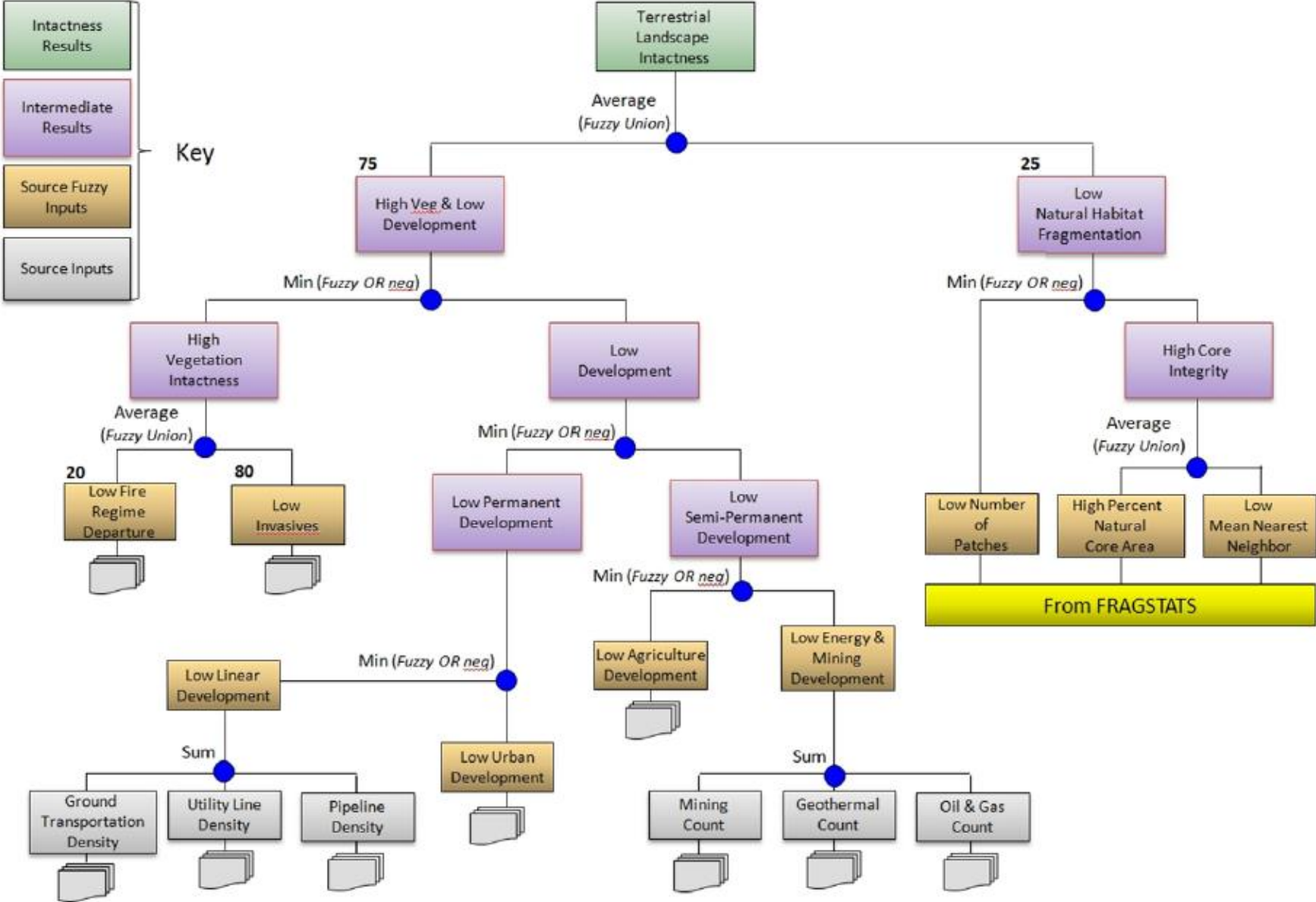


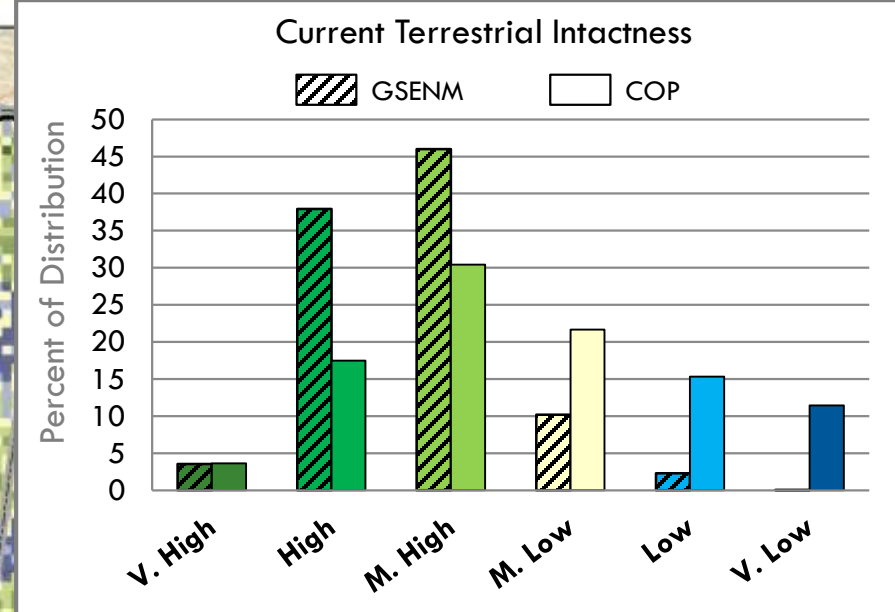
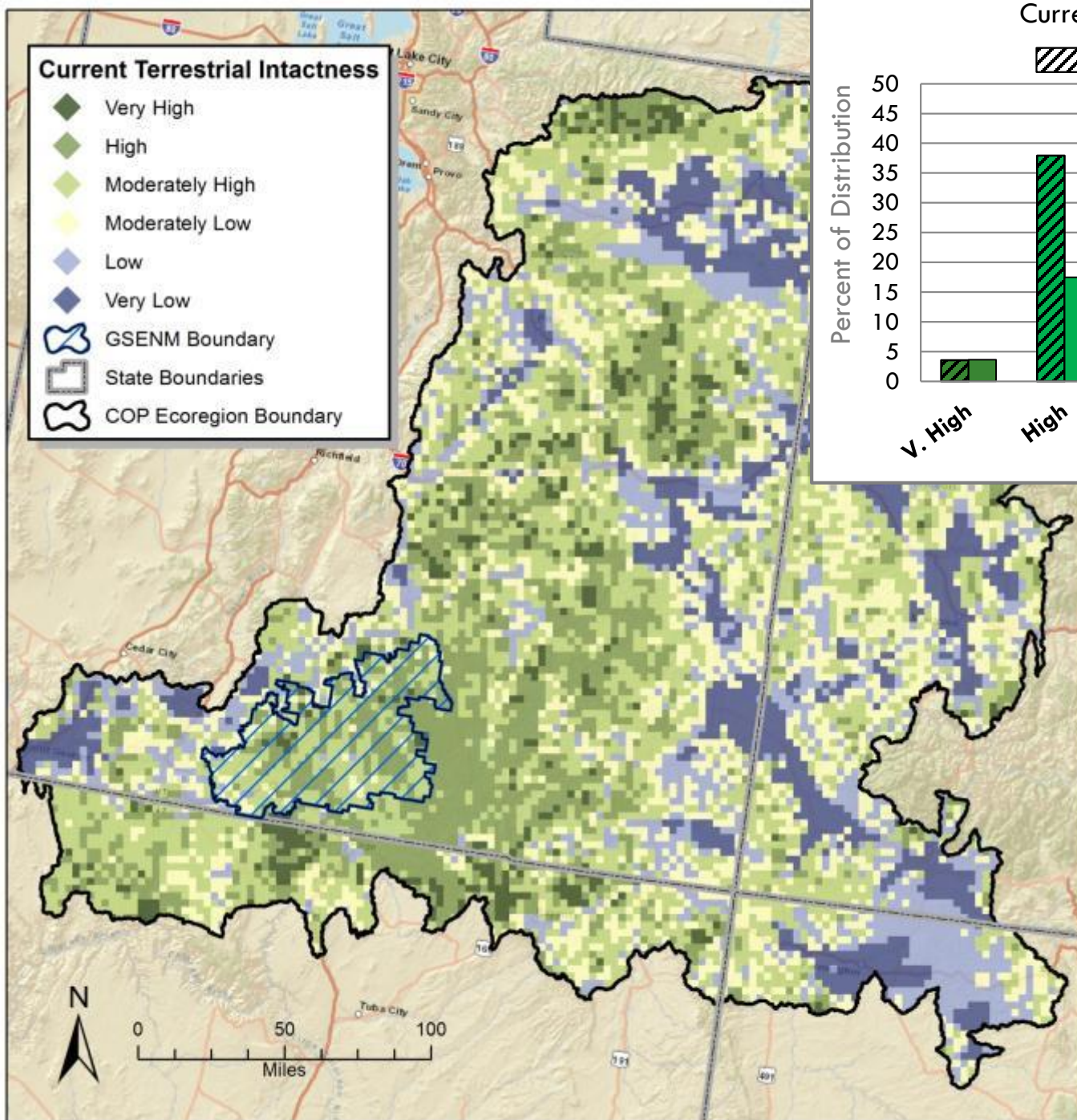
Terrestrial
Landscape
Intactness



Landscape Approach Implementation

Current Terrestrial Landscape Intactness Logic Model



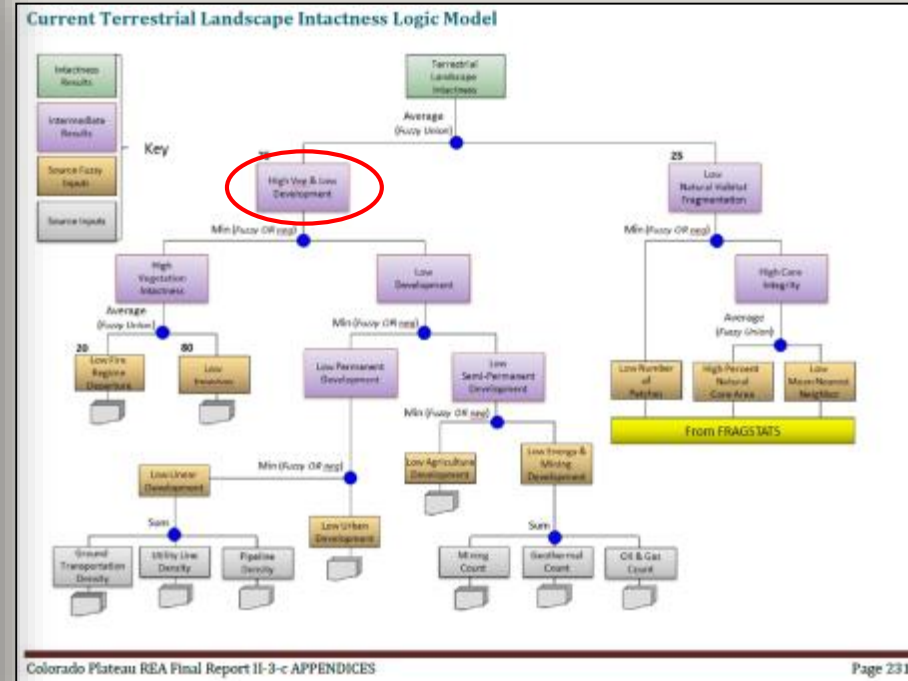
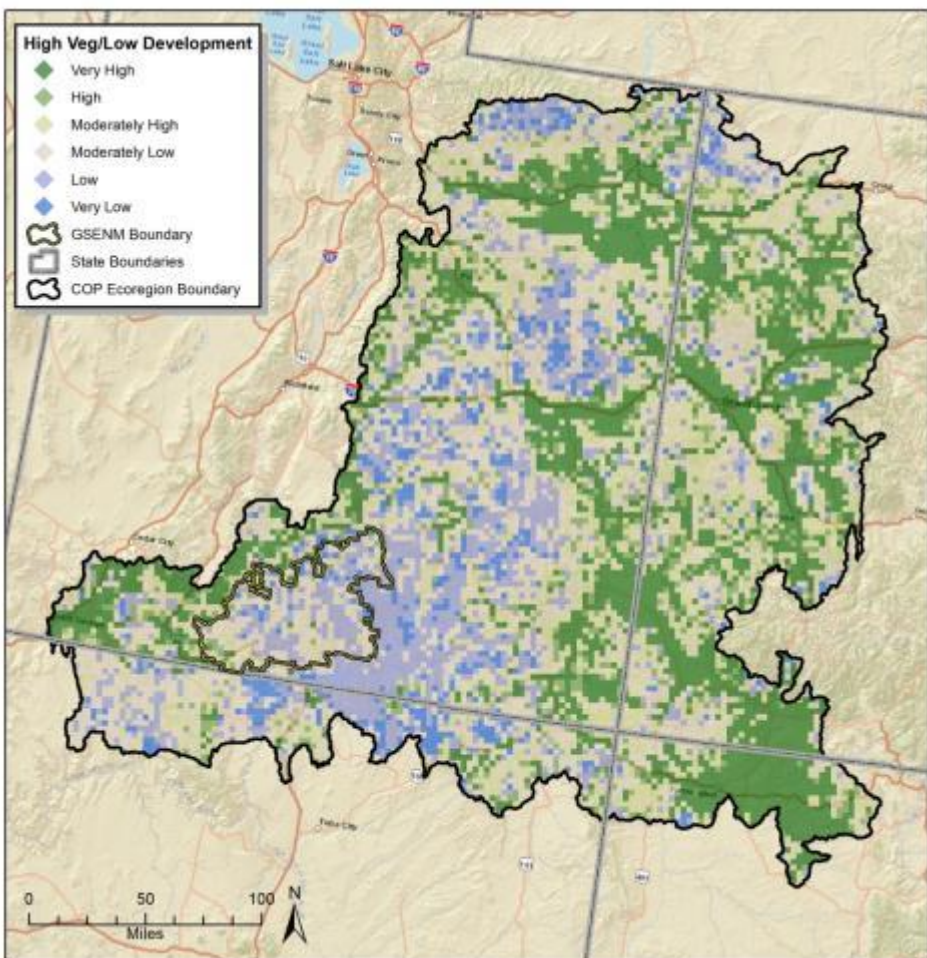


What TI components drive the TI in the GSENM?

Current Terrestrial Intactness drivers:

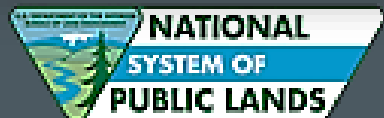
Development/Fire Regime Departure/Invasives

10



Low Fire Regime Dep.
Low Invasives
Low Development

Hi Fire Regime Dep.
Hi Invasives
Hi Development

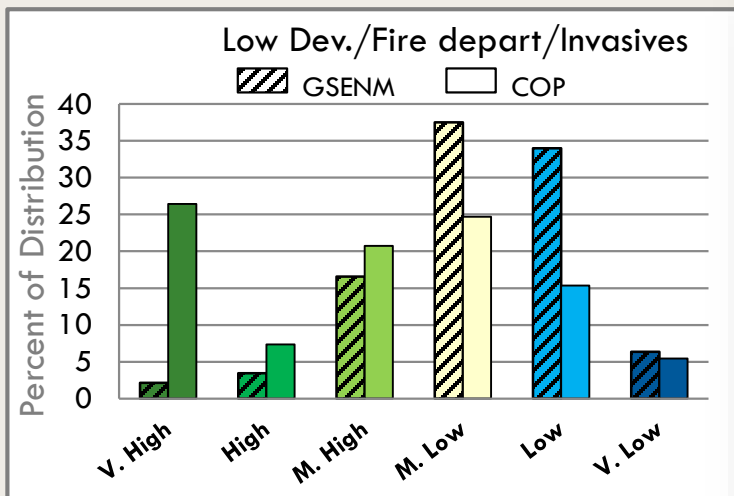


Landscape Approach Implementation

Current Terrestrial Intactness drivers:

Development/Fire Regime Departure/Invasives

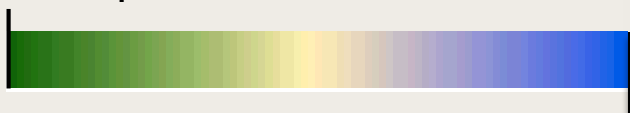
11



Hi Fire Regime Dep.

Hi Invasives

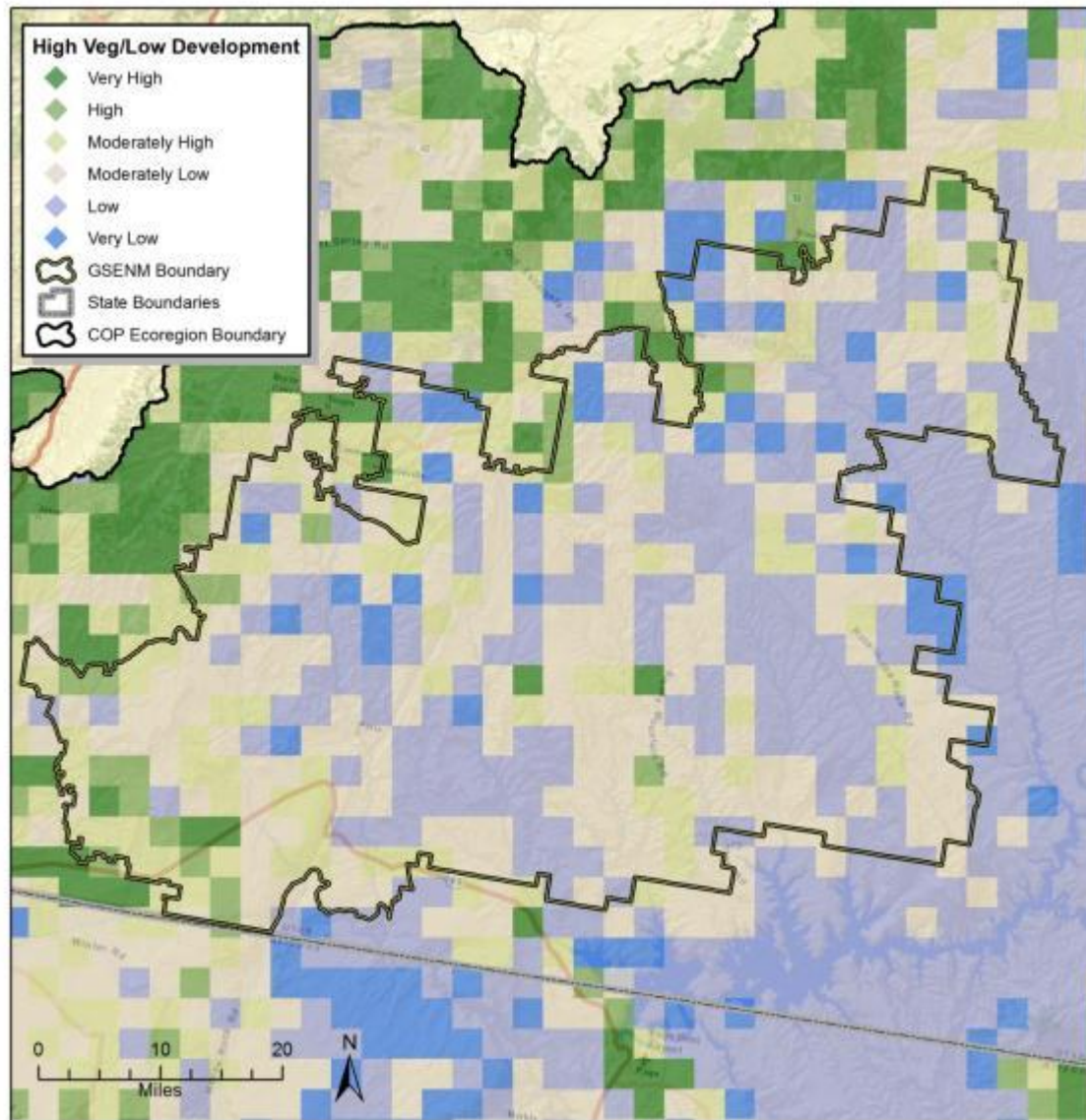
Hi Development



Low Fire Regime Dep.

Low Invasives

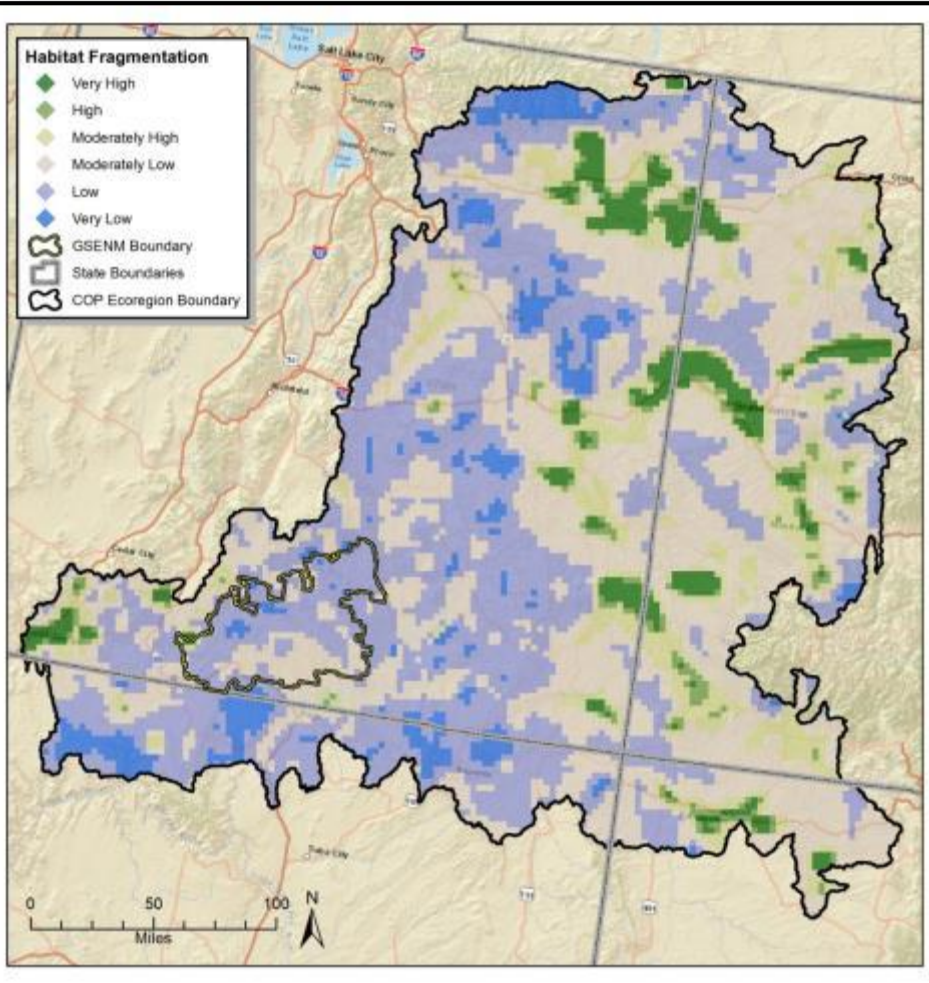
Low Development



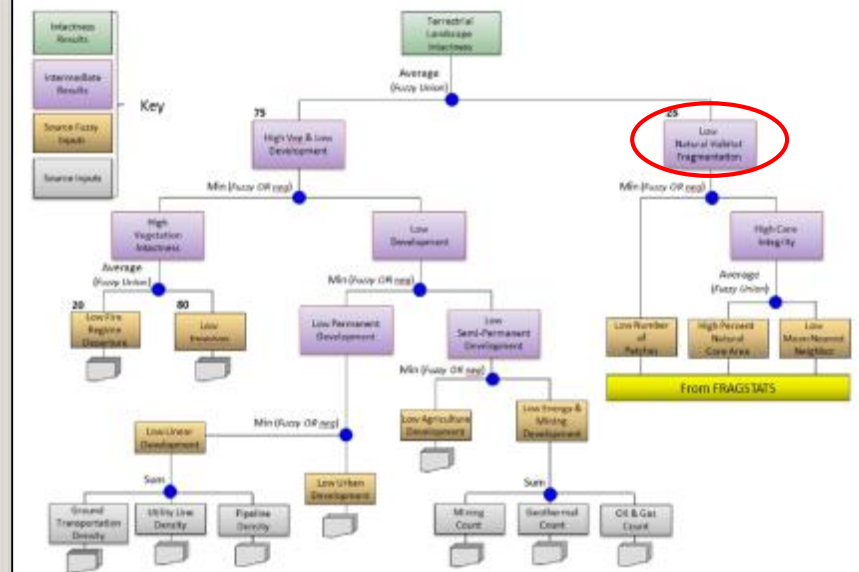
Current Terrestrial Intactness drivers:

Fragmentation (# patches, Core areas, Nearest neighbors)

12

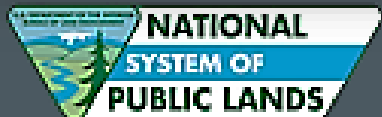


Current Terrestrial Landscape Intactness Logic Model



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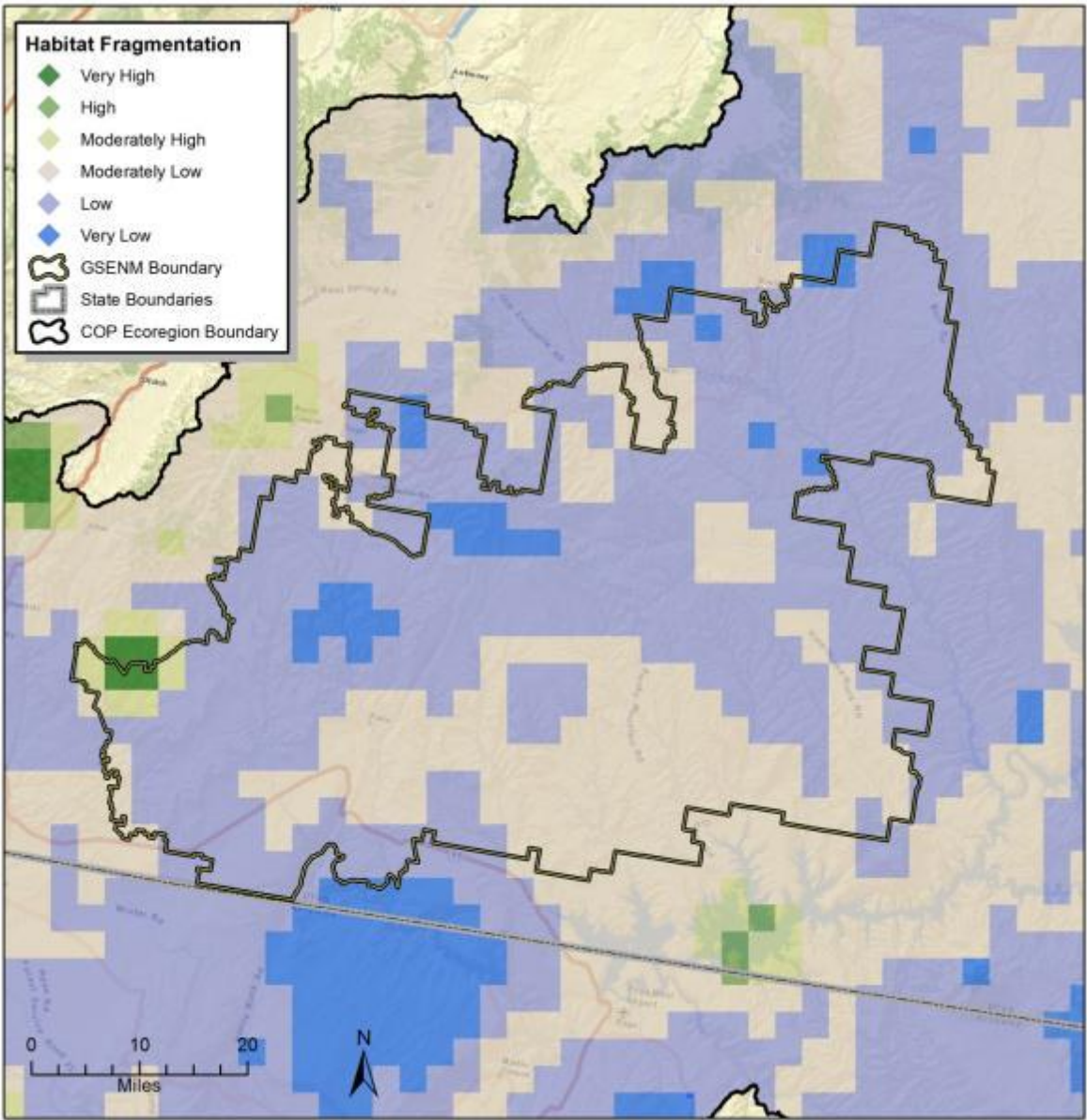
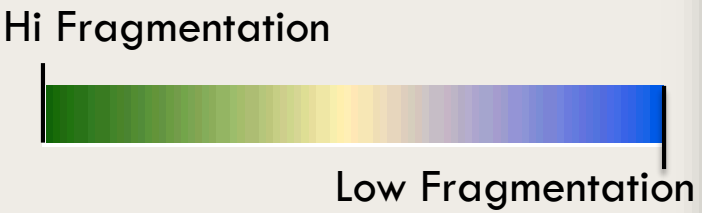
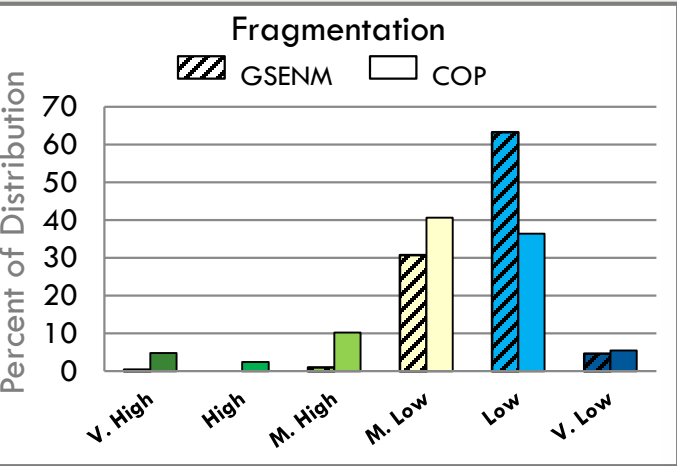


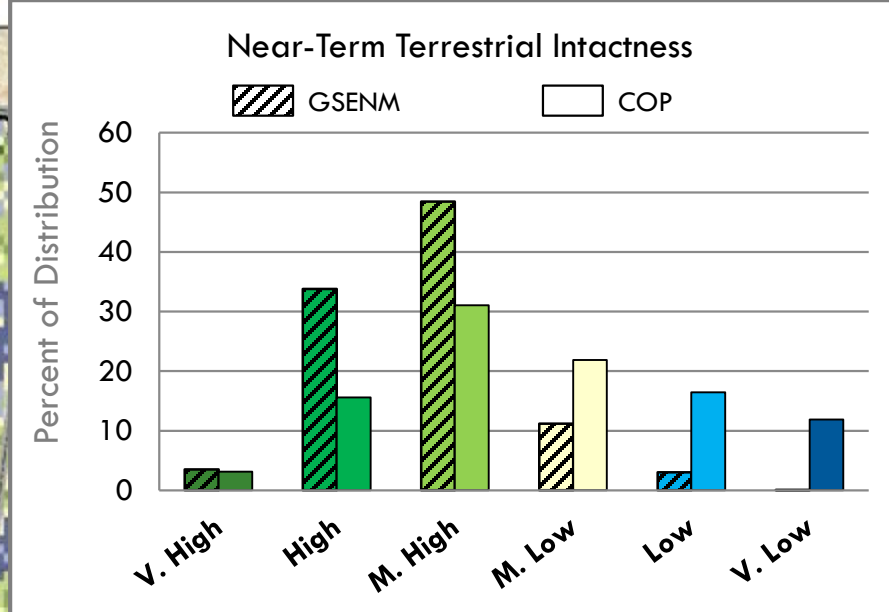
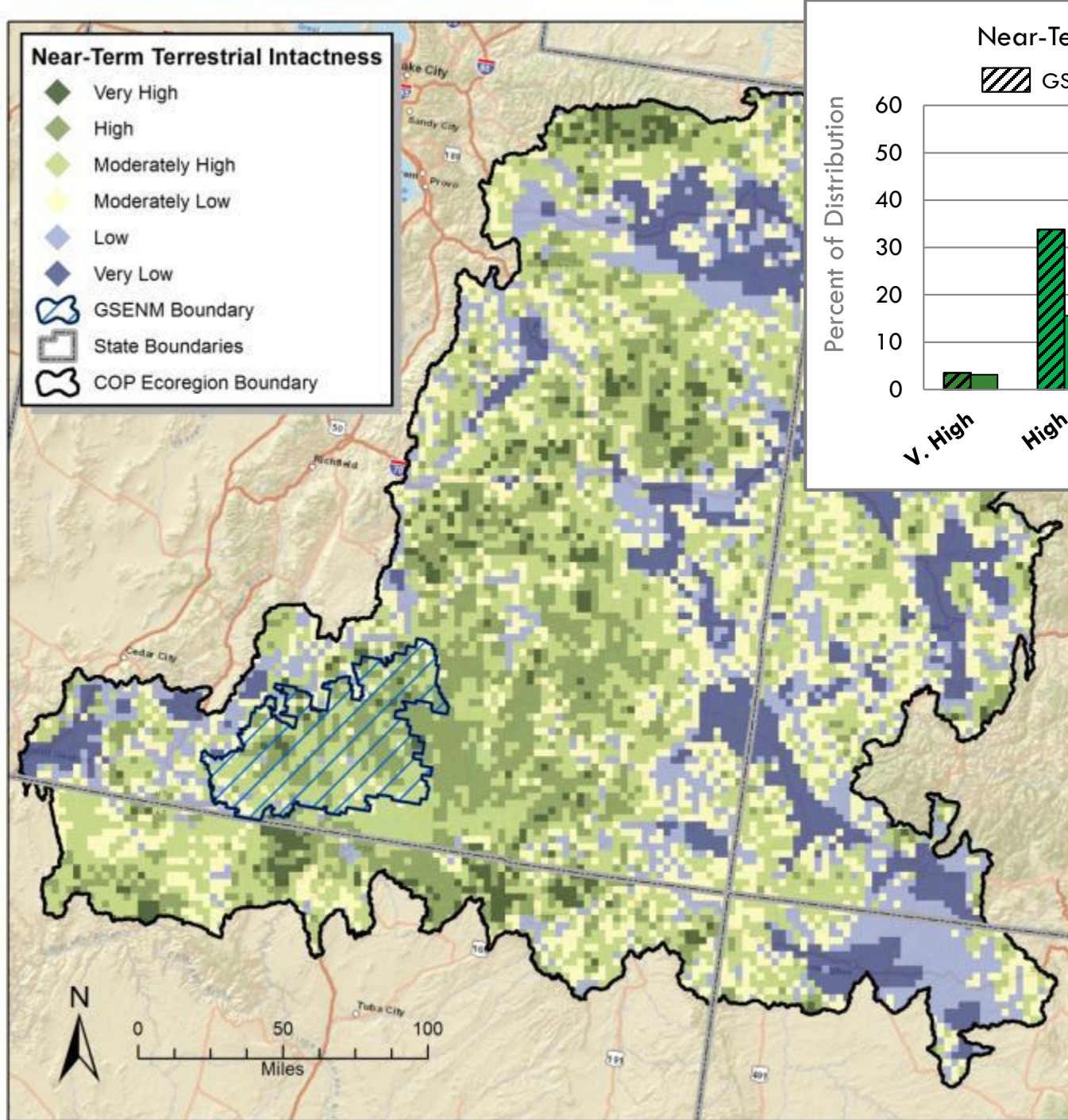
Landscape Approach Implementation

Current Terrestrial Intactness drivers:

Fragmentation (# patches, Core areas, Nearest neighbors)

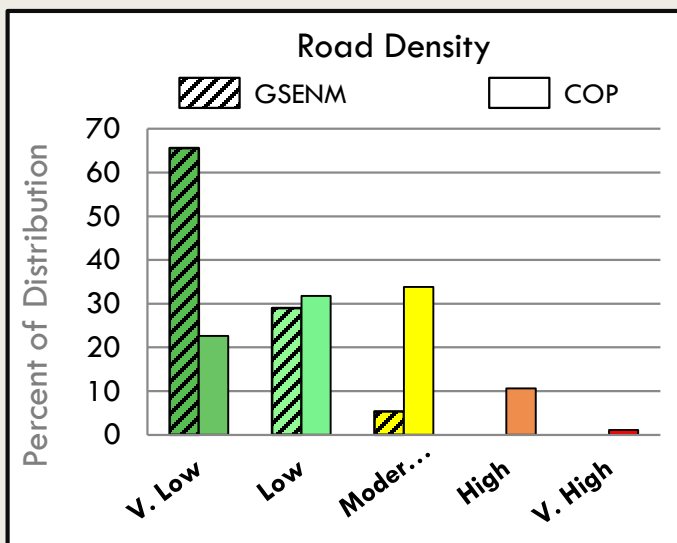
13



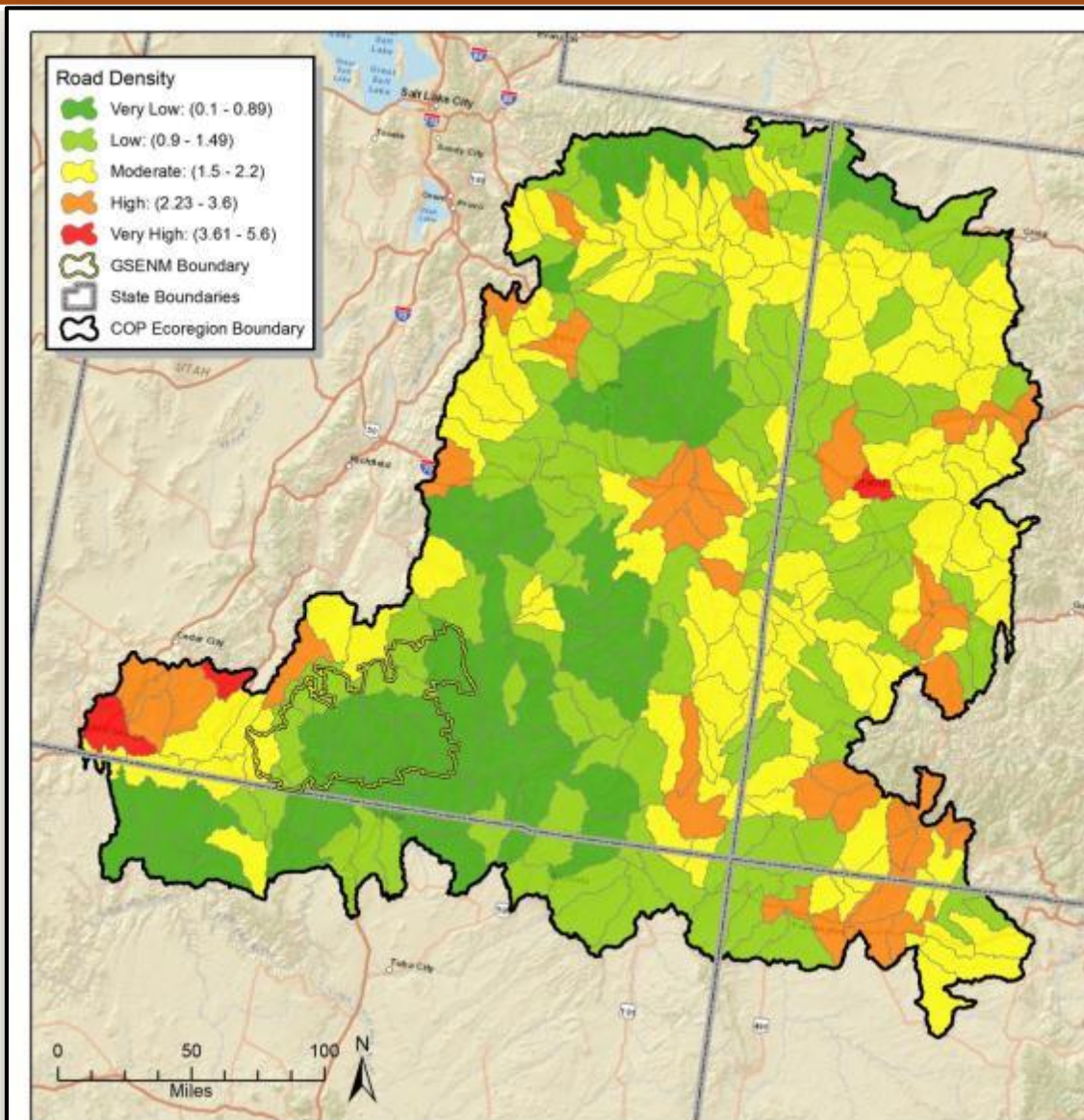


Road density as a surrogate for remoteness

15



GSENM has a significantly lower road density per HUC than the Colorado Plateau Ecoregion as a whole...



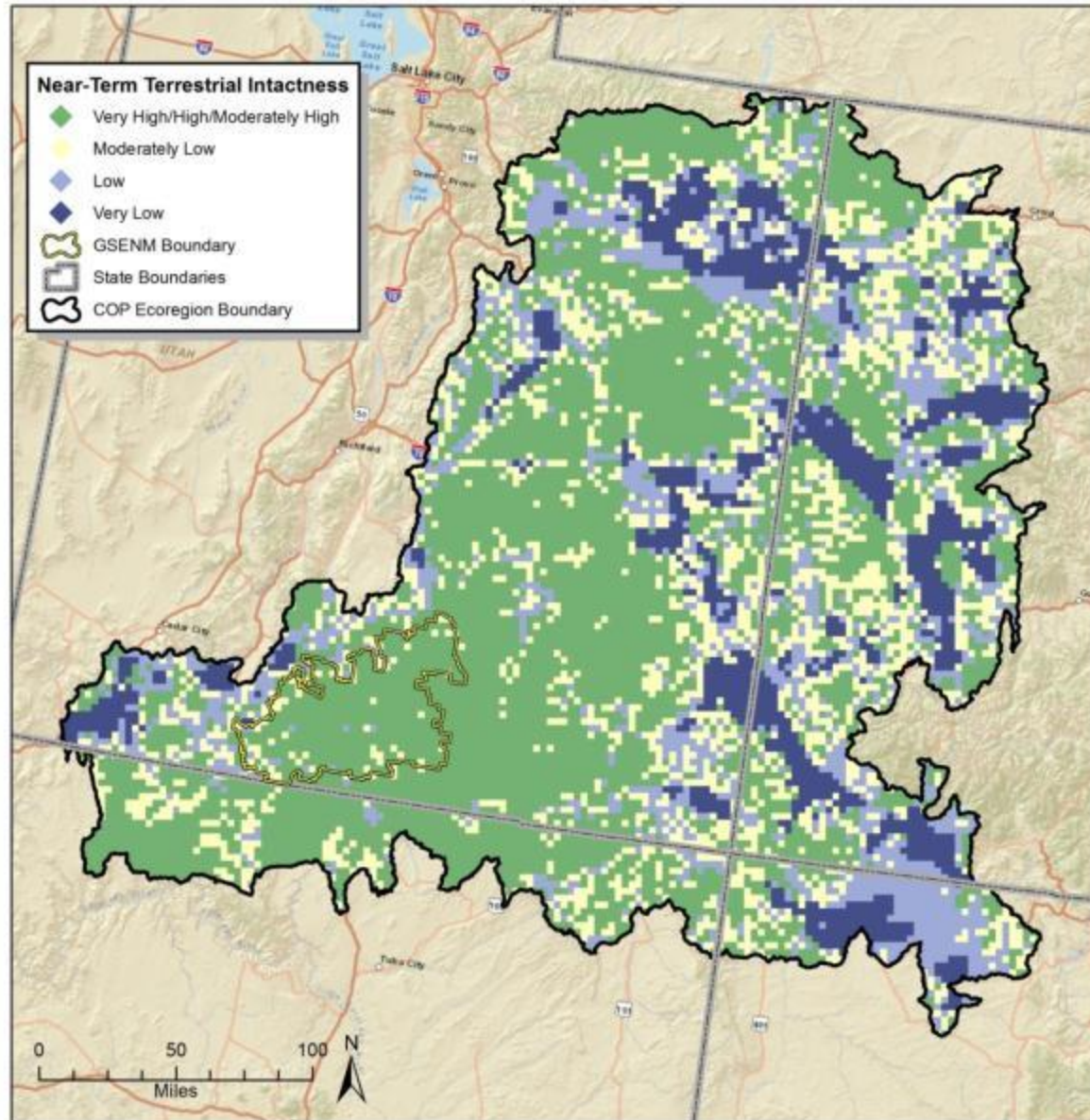
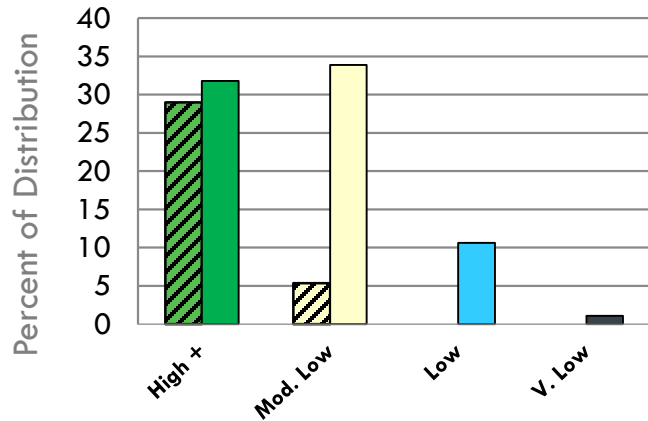
Terrestrial intactness grouped as surrogate for pristine/unspoiled areas

16

Grouped Near-Term Terrestrial Intactness

▨ GSENM

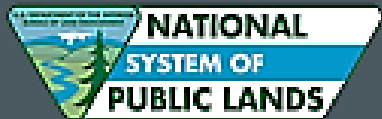
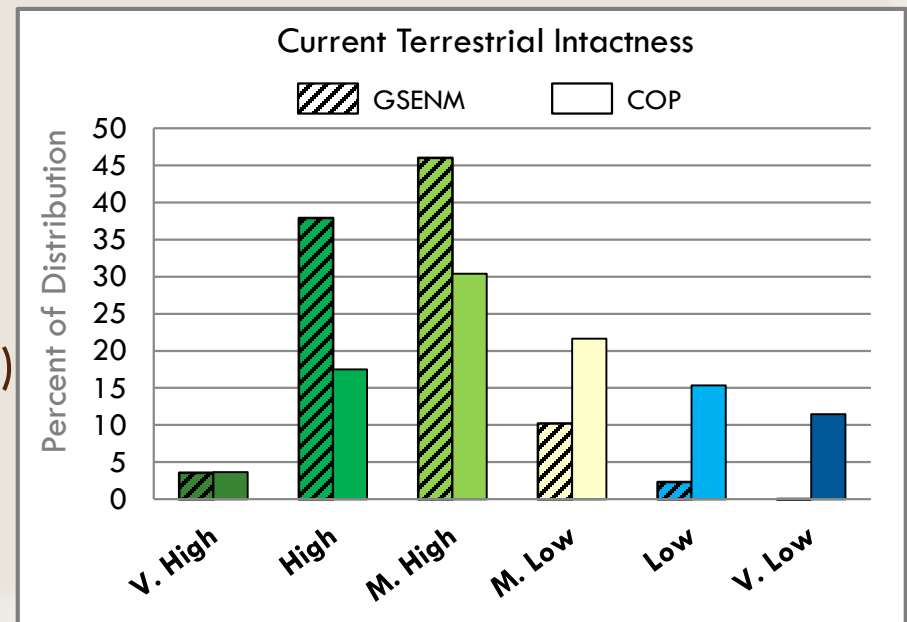
□ COP



Conclusions based upon terrestrial intactness

17

- GSENM has a relatively high terrestrial intactness compared with the Colorado Plateau ecoregion
- Supports objects & Values
 - ▣ Ruggedness (via road density)
 - ▣ Others



Landscape Approach Implementation

Quantifying Aquatic Intactness

18

□ Key Components:

▣ Alterations

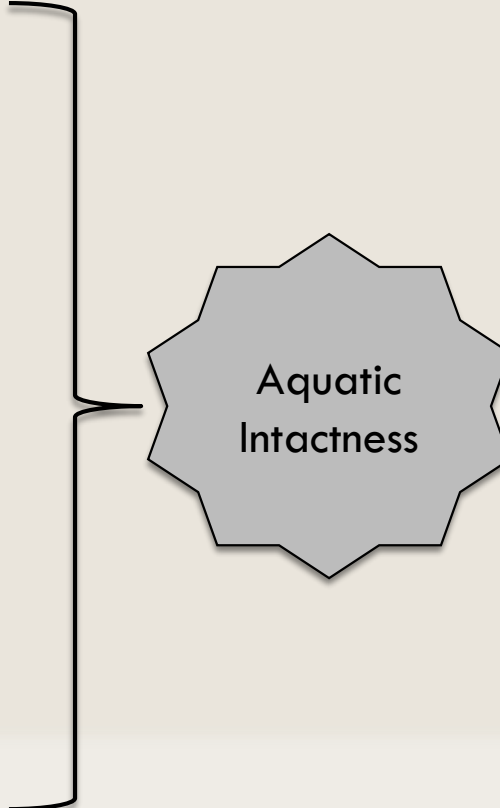
- Dams, reservoirs

▣ Land/Water Quality

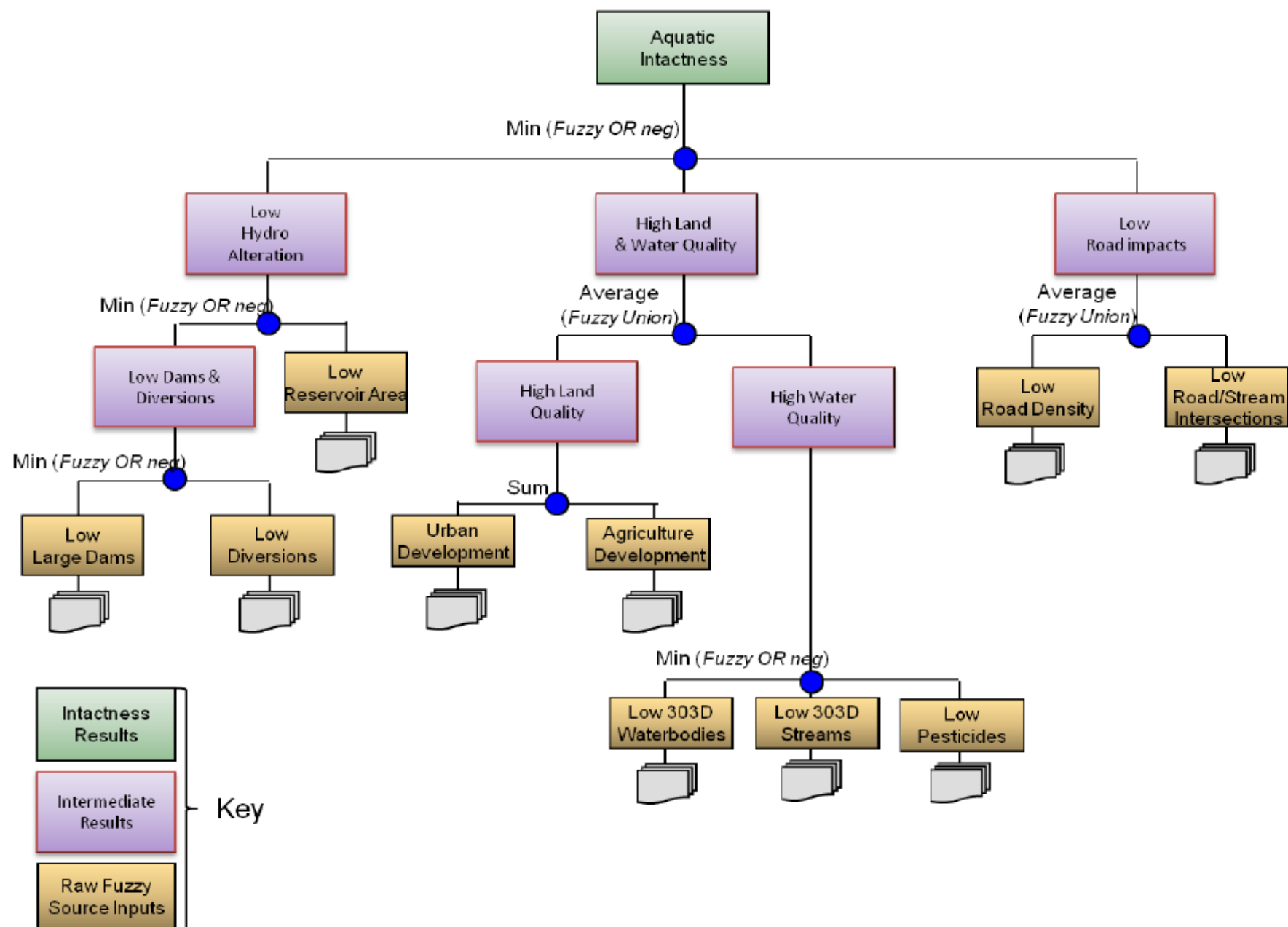
- Ag/Urban development
- 303D streams/waterbodies
- Low pesticides

▣ Road Impacts

- Road density
- Road/Stream intersections

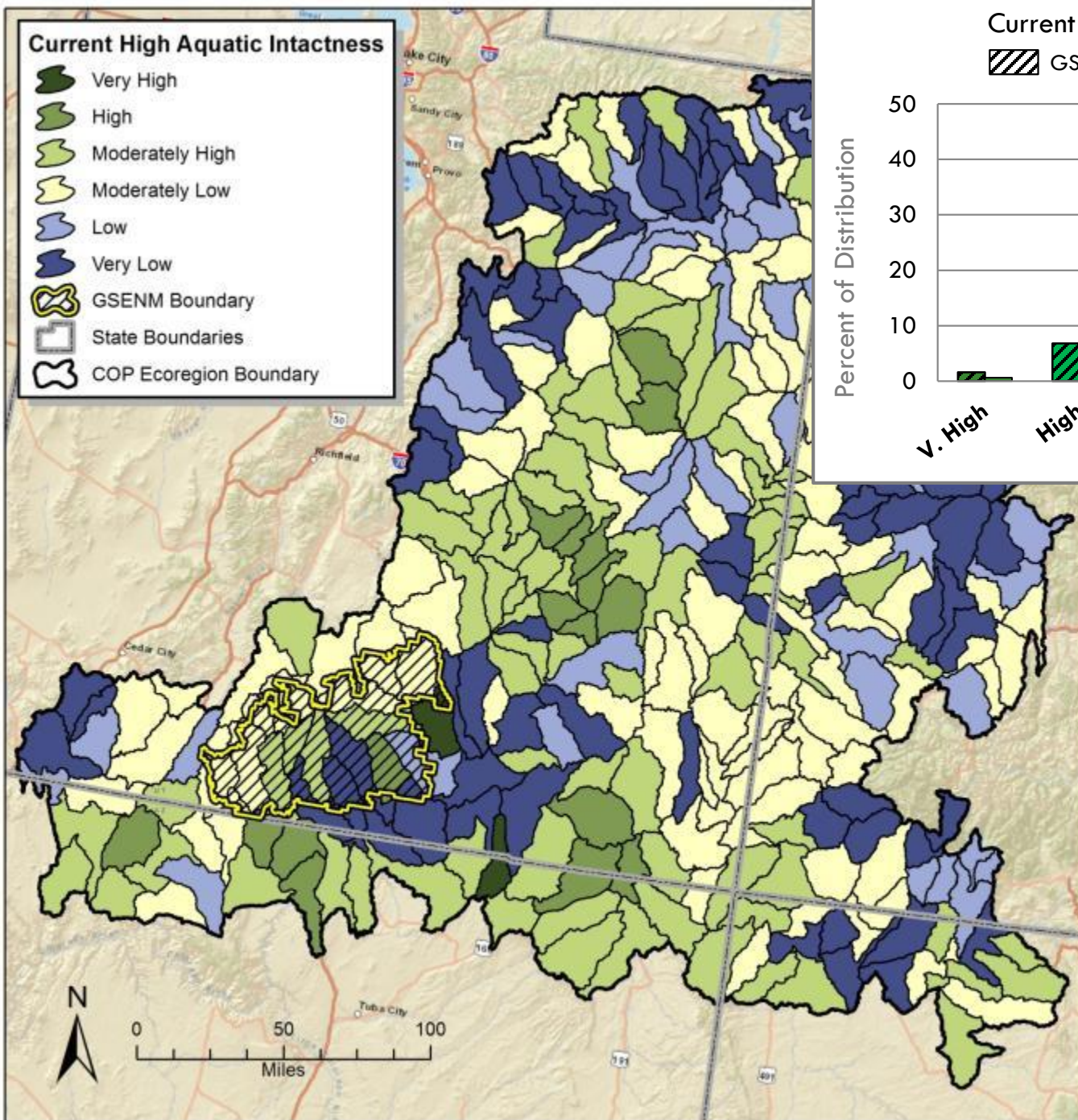
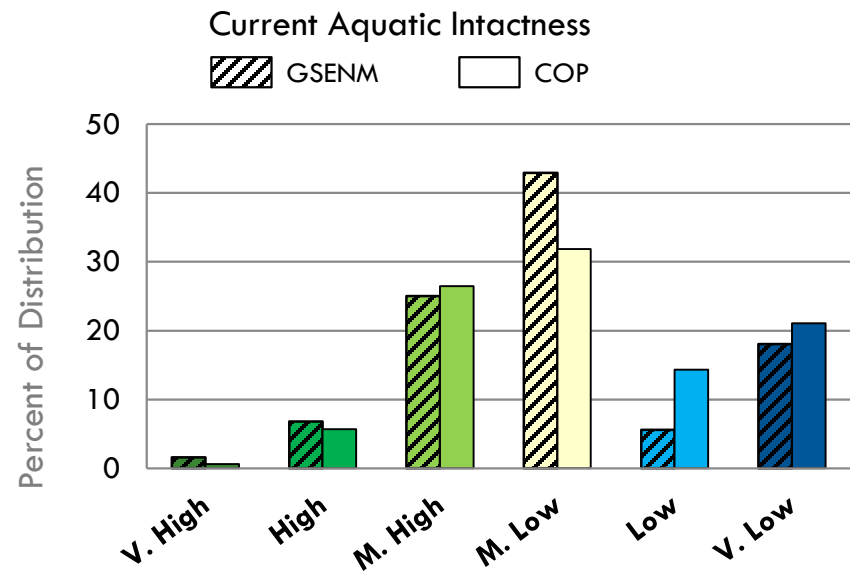


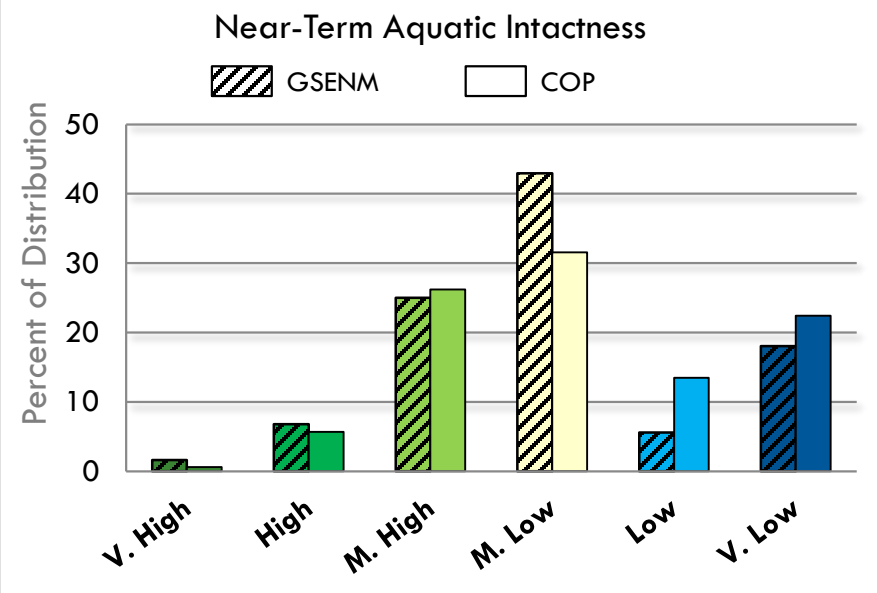
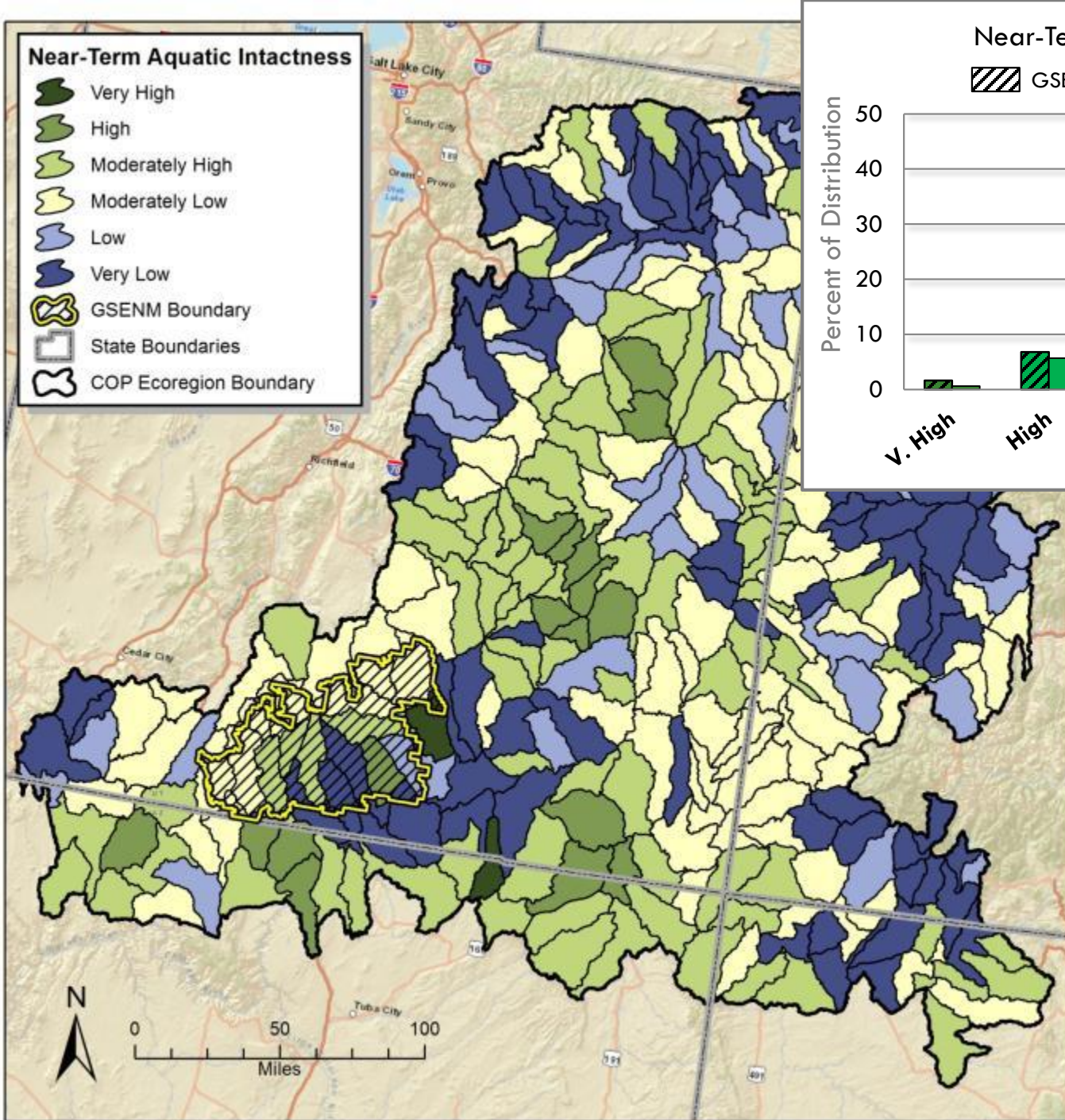
Aquatic
Intactness



Current High Aquatic Intactness

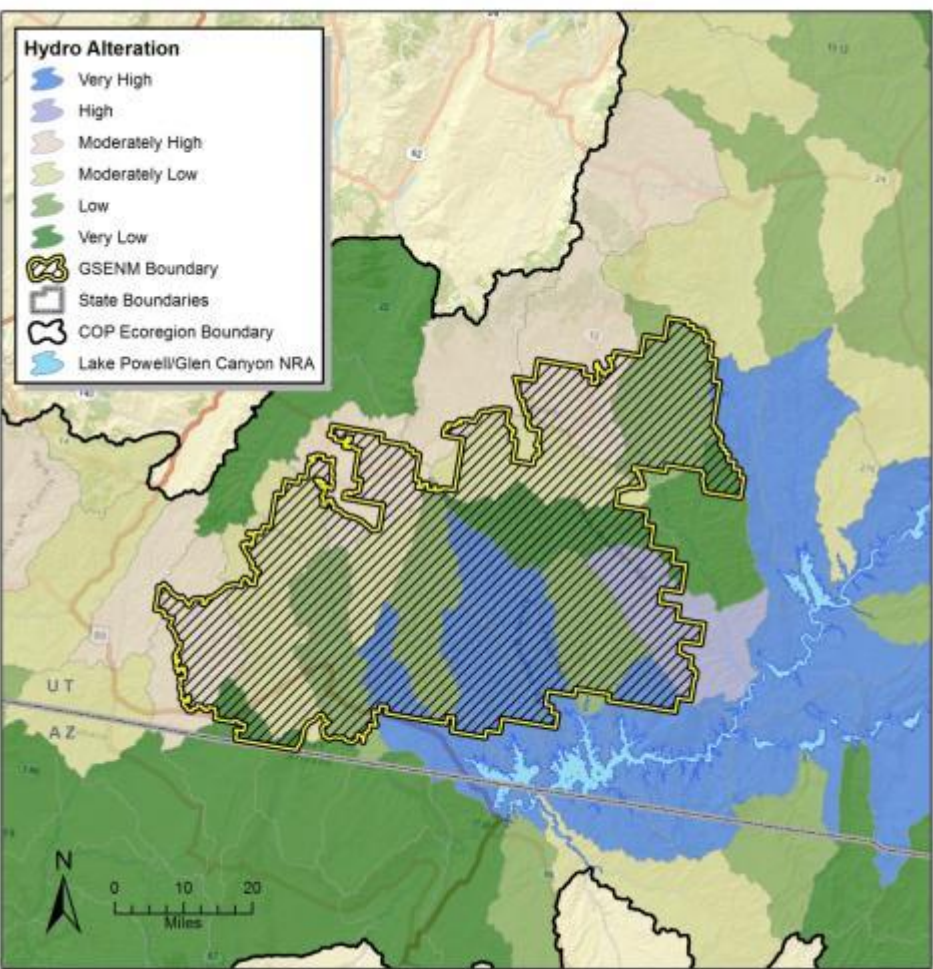
-  Very High
-  High
-  Moderately High
-  Moderately Low
-  Low
-  Very Low
-  GSENM Boundary
-  State Boundaries
-  COP Ecoregion Boundary



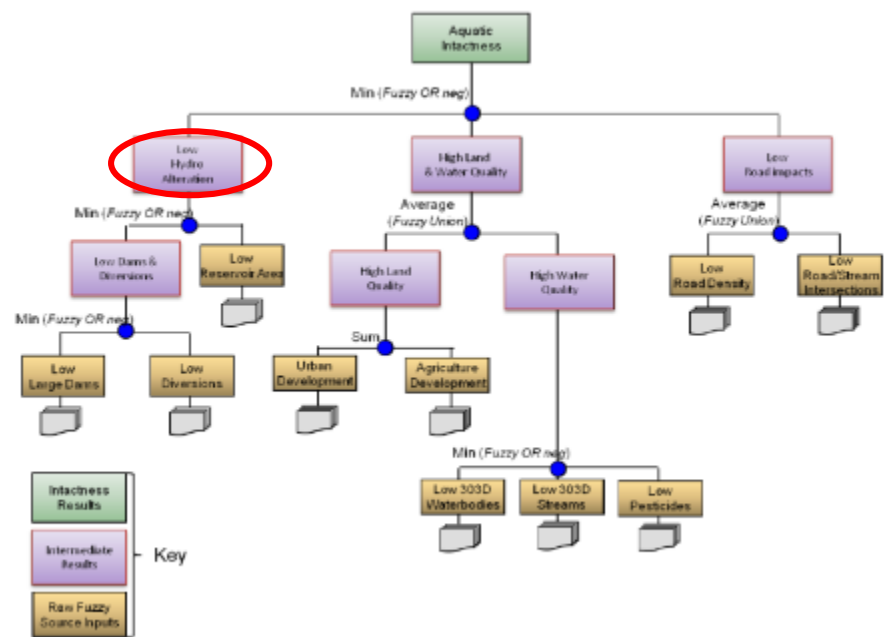


Aquatic Intactness drivers

22

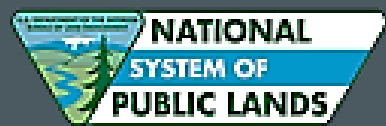


Current Aquatic Intactness Logic Model



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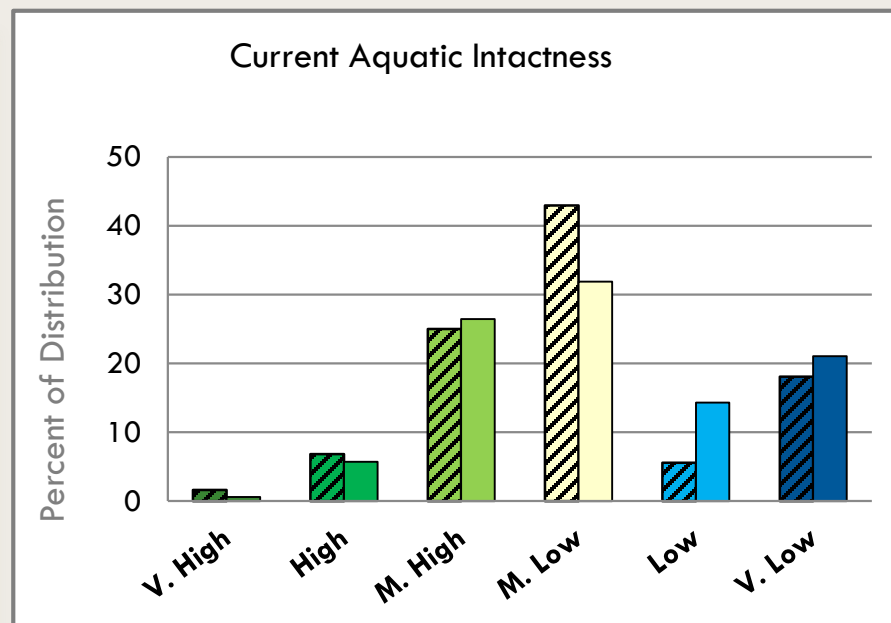


Landscape Approach Implementation

Conclusions based upon aquatic intactness

23

- ❑ Artificially low!
- ❑ Presence of reservoir drives down entire HUC
- ❑ Modify model or use finer detail HUC's



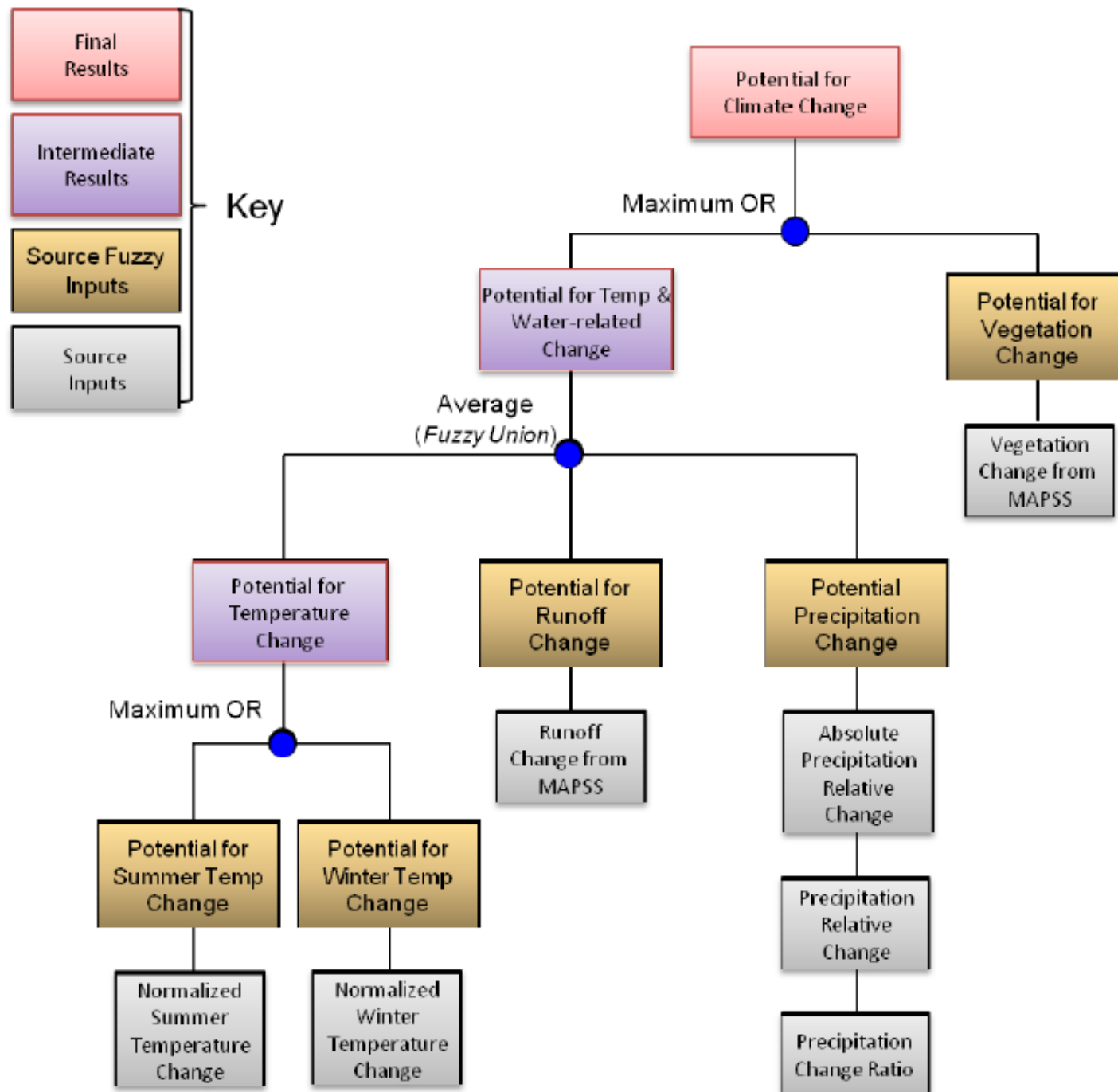
Climate Change Potential

24

- Precipitation
 - ▣ Absolute relative change
 - ▣ Relative change
 - ▣ Change ratio
- Vegetation change
- Runoff
- Winter/Summer temperature change

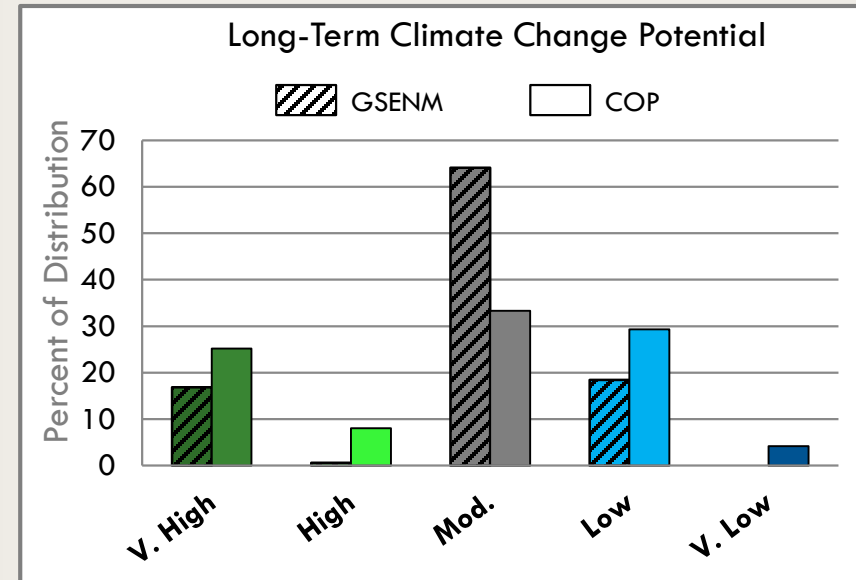
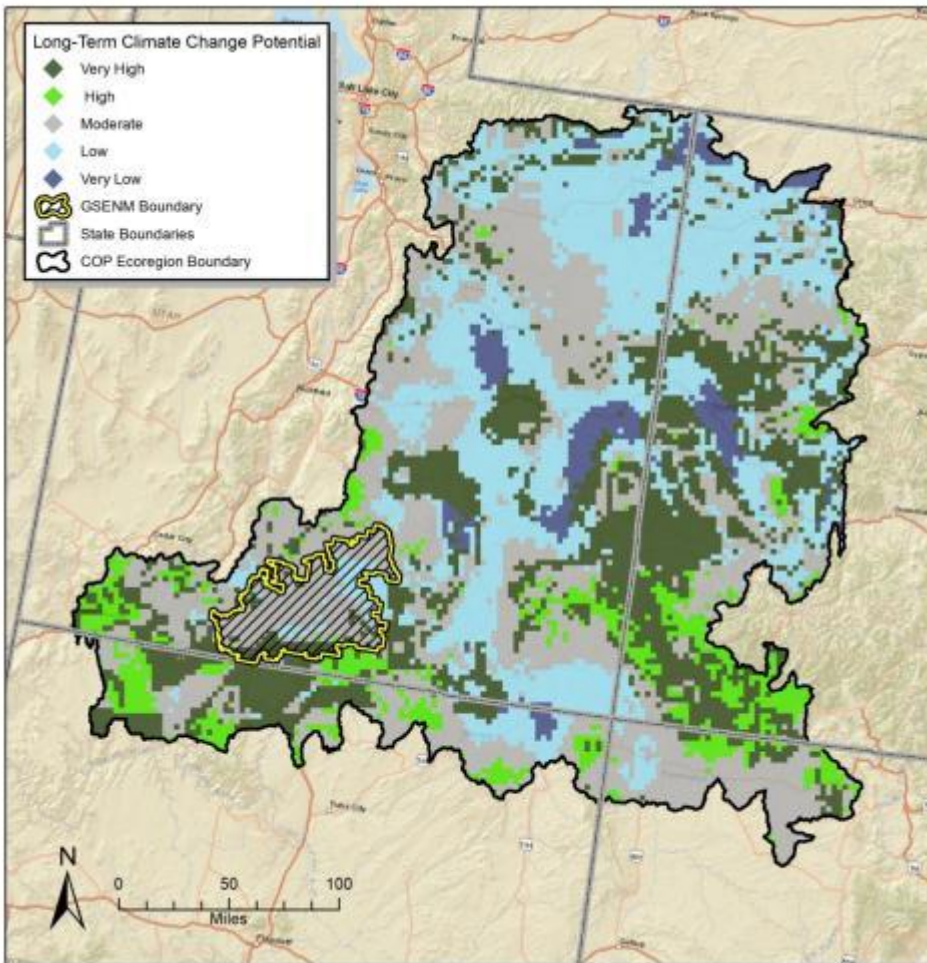


Long Term
Potential
for Climate
Change



Long Term Potential for Climate Change

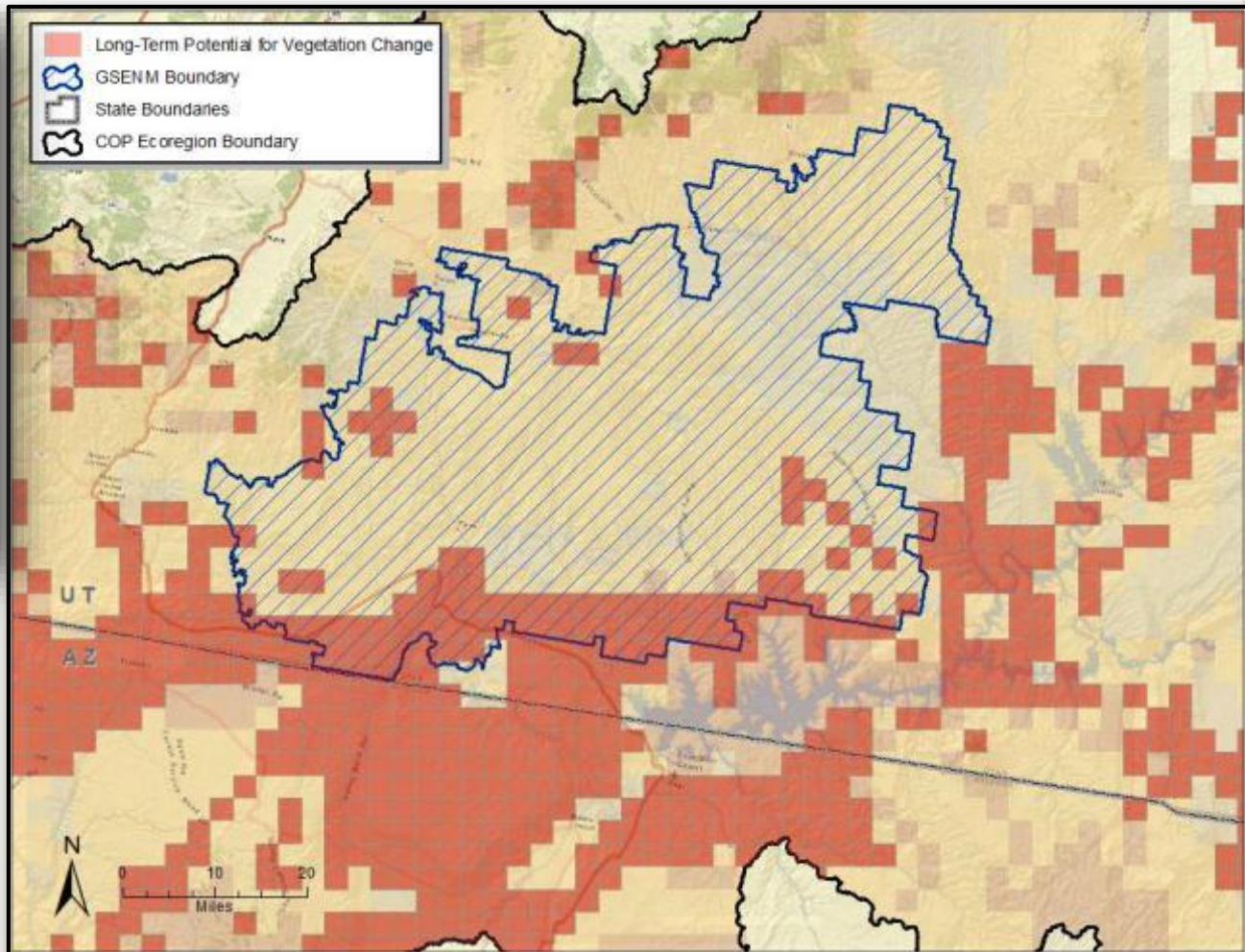
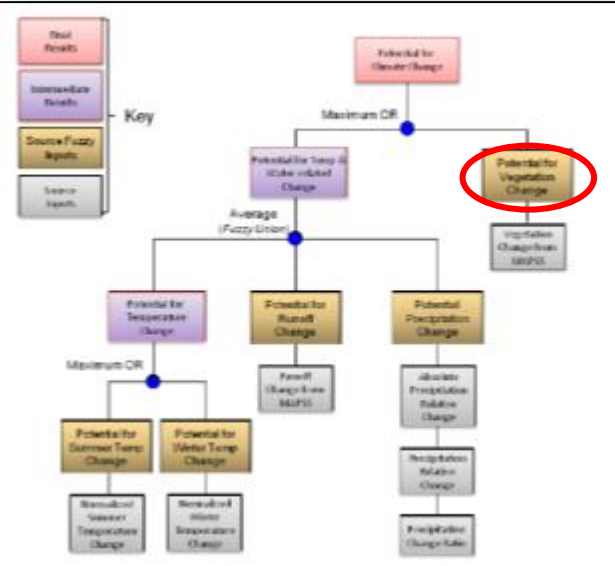
26



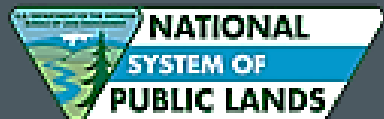
What variable(s) are driving the values found in areas in GSENM with very high potential for climate change?

Long Term Potential for Vegetation Change

27



COP REA also makes predictions on what this veg. will likely change into...



Landscape Approach Implementation

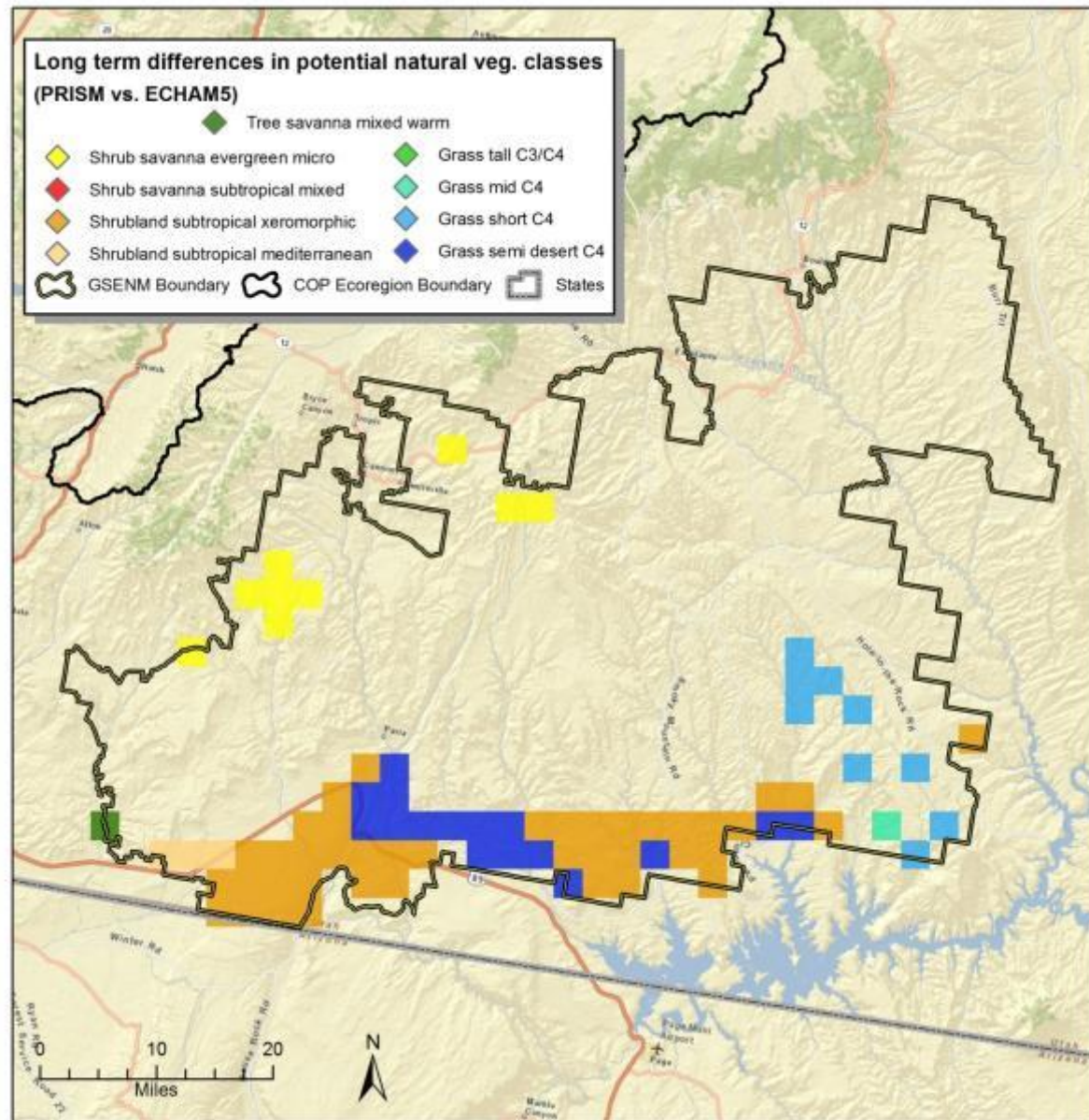
Long Term Potential for Vegetation Change

28

Vegetation types based upon MAPSS predictions from 2045-2060 ECHAM5 climate models

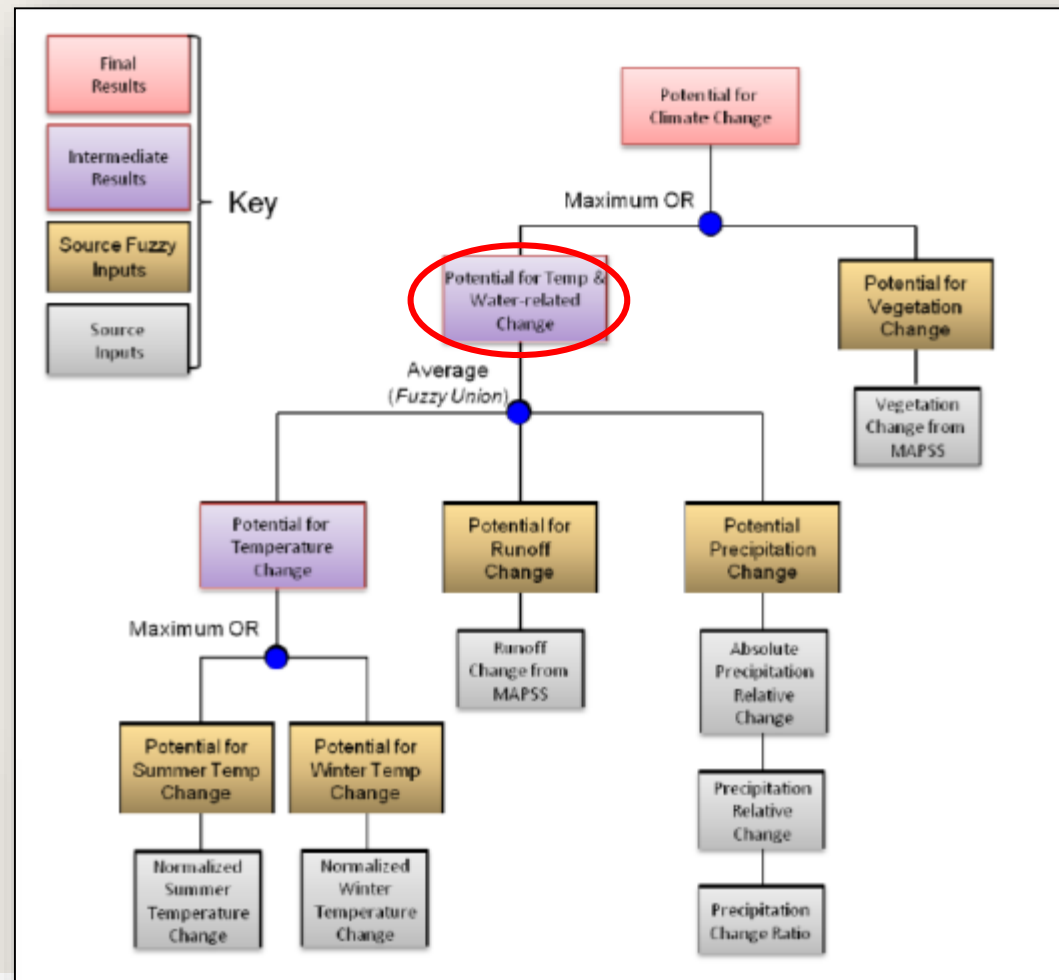
This is too specific for applications of and REA. Remember, this is originally 4000 x 4000m cell data

Perhaps..."Will tend to change into grasses & shrubs"

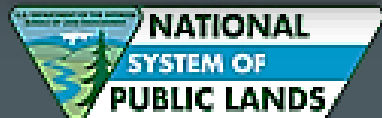


Long Term Potential for Temp/PPT Change

29



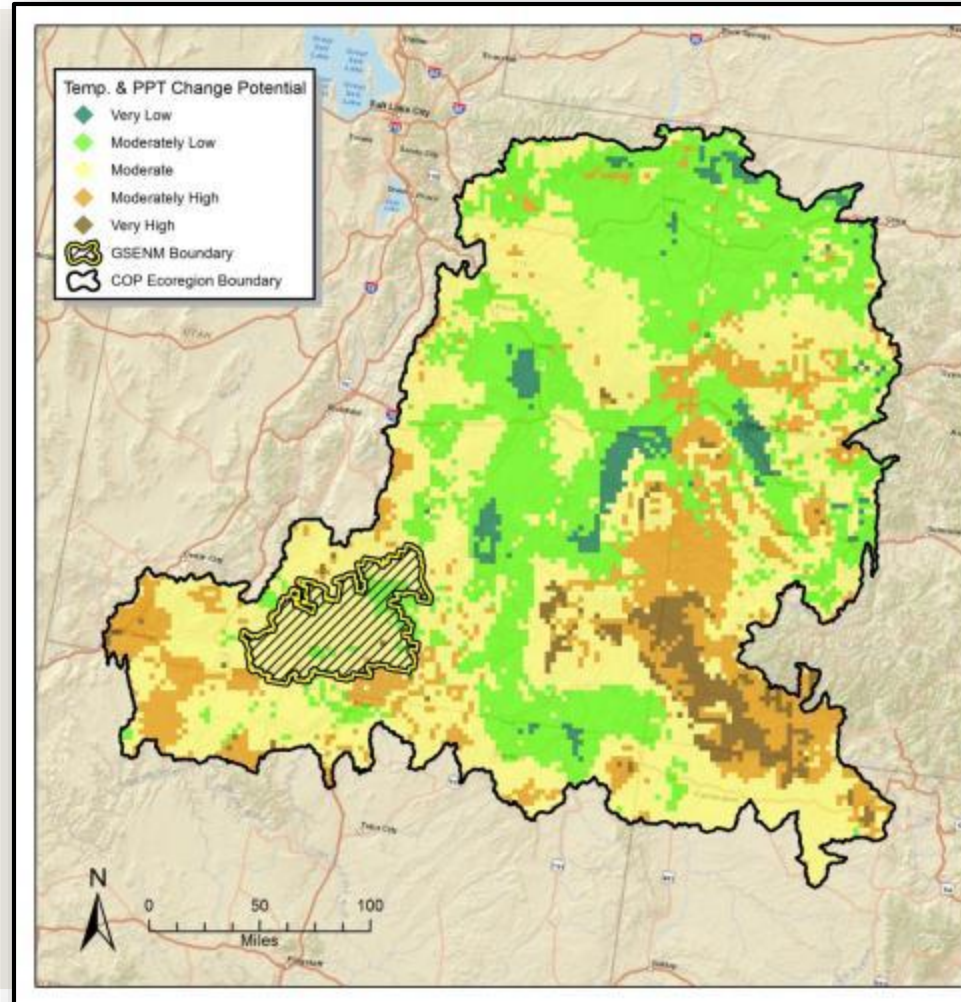
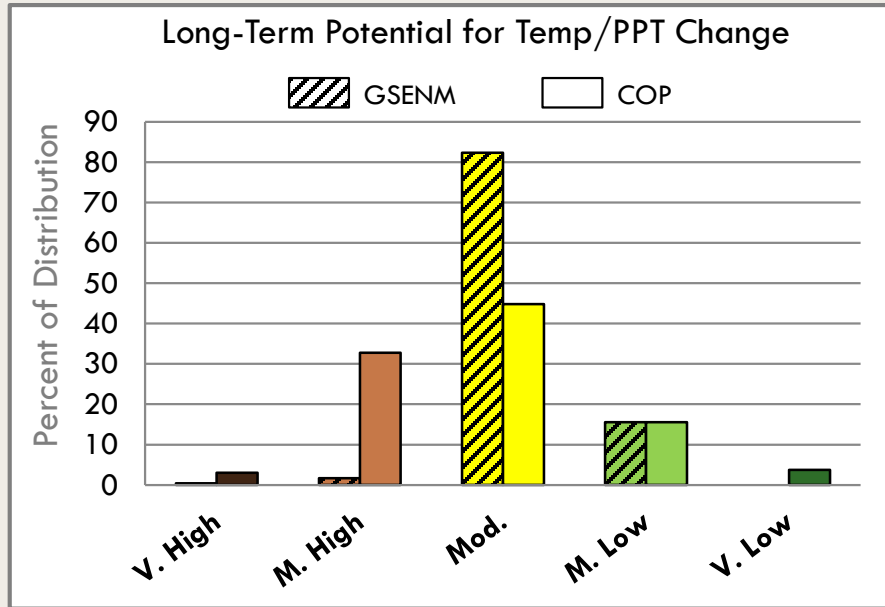
Intactness Value	Legend
-1.00 to -0.66	Very Low
-0.66 to -0.22	Moderately Low
-0.22 to 0.22	Moderate
0.22 to 0.66	Moderately High
0.66 to 1.00	Very High



Landscape Approach Implementation

Long Term Potential for Temp/PPT Change

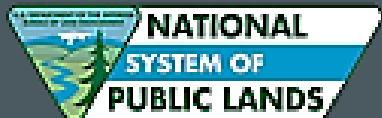
30



Climate Change conclusions

31

- Potential for vegetation change drives current results
- Climate predictions without potential vegetation change shows moderate to low potential for PPT/Temp changes
- Southern portion is at higher risk if predictions/trends in that area come true.
- Other resources: www.globalchange.gov/what-we-do/assessment.html



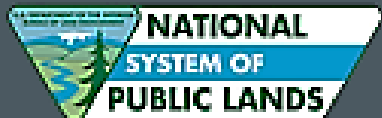
Landscape Approach Implementation

How connected is this area?

32

Connectivity modeling

- Natural blocks & corridors
- Least cost corridors
- Relationships to neighbors and other protected areas

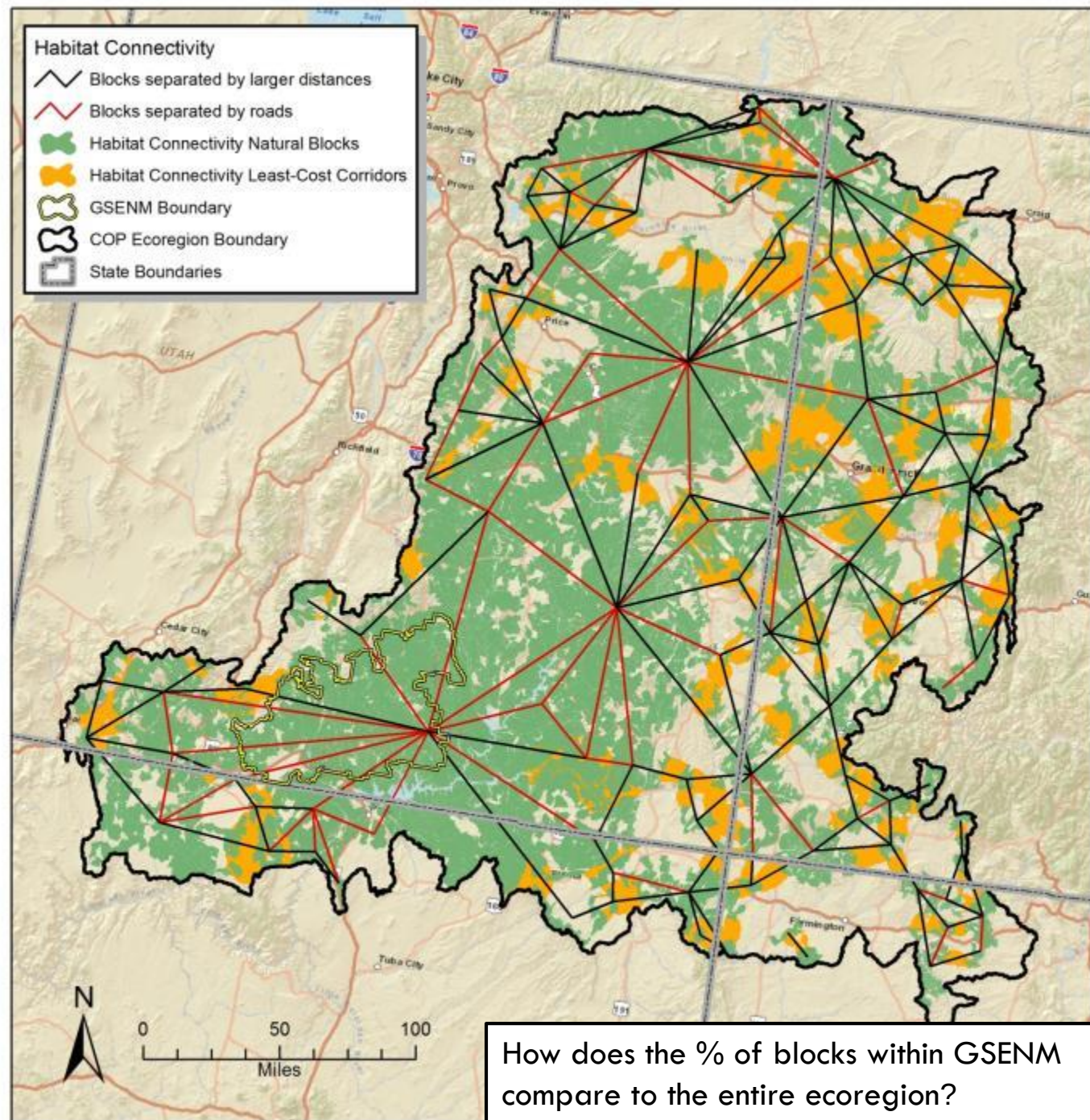


Landscape Approach Implementation

Natural Landscape
Blocks (FragStats
natural cover)

Corridor sticks: blocks
separated by large
Distances (+ roads)

Road sticks: blocks
separated by major
roads

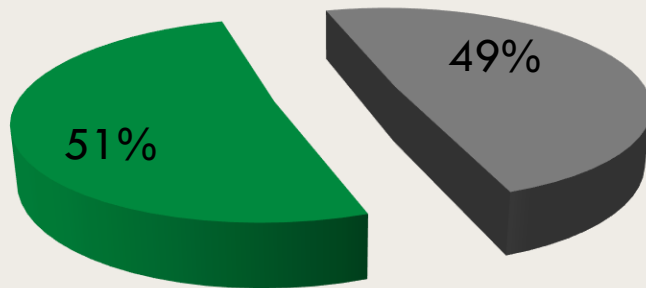


Natural Blocks comparison

34

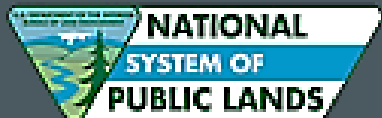
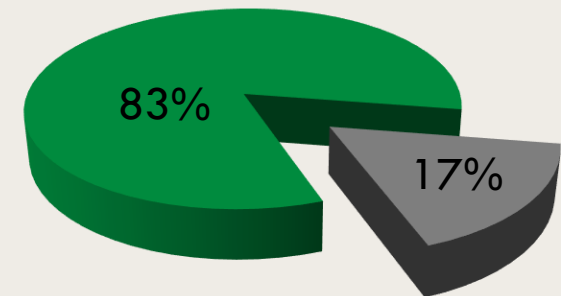
COP Habitat Connectivity Natural Blocks

■ Blocks ■ Non-Blocks



GSENM Habitat Connectivity Natural Blocks

■ Blocks ■ Non-Blocks

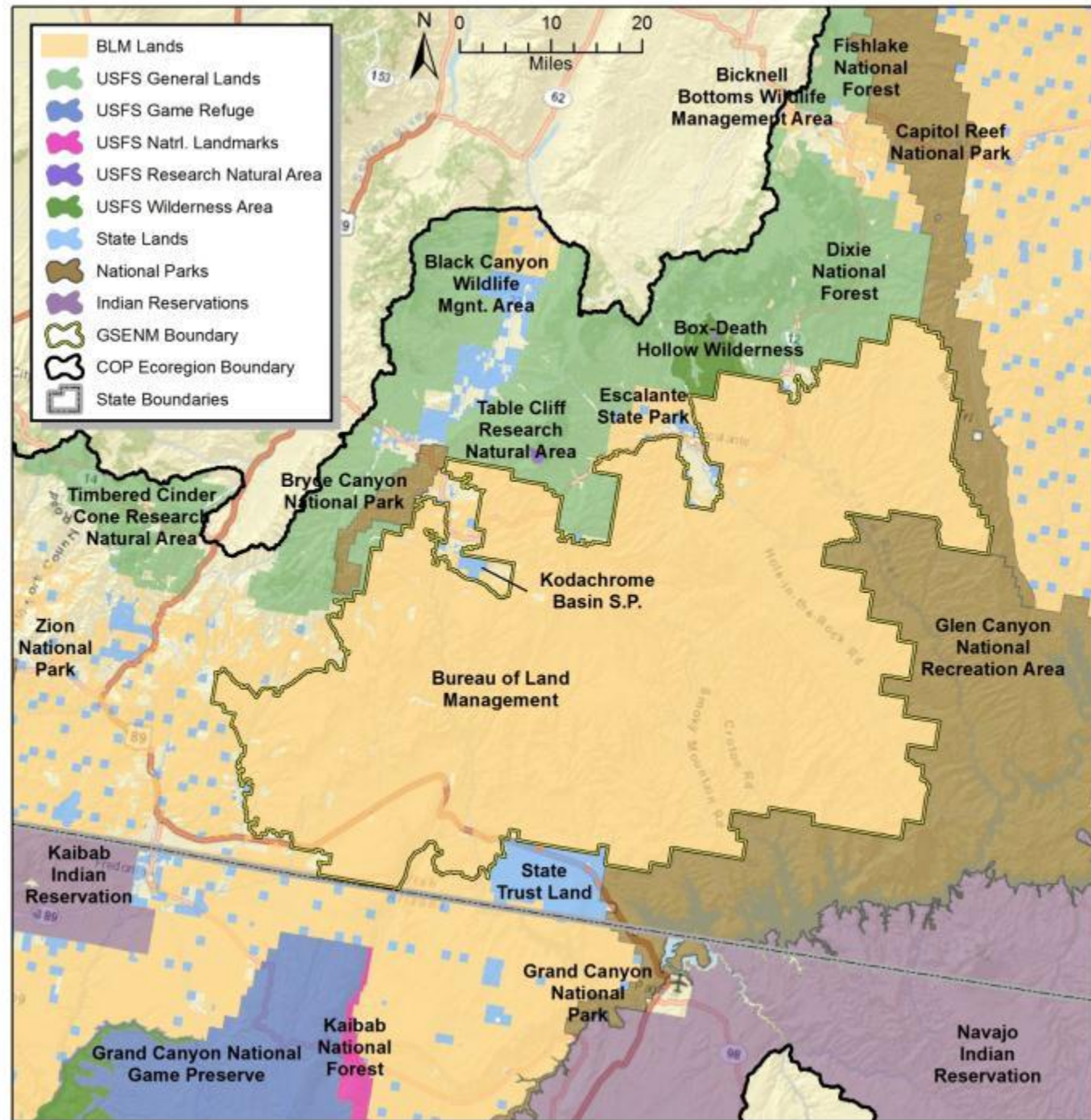


Landscape Approach Implementation

Neighbors?

35

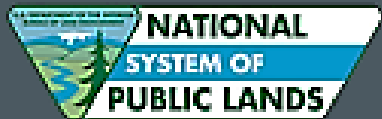
- Other BLM
- USFS
 - ▣ General
 - ▣ Wilderness
 - ▣ Research areas
- Natl. parks
- State lands
- Reservations



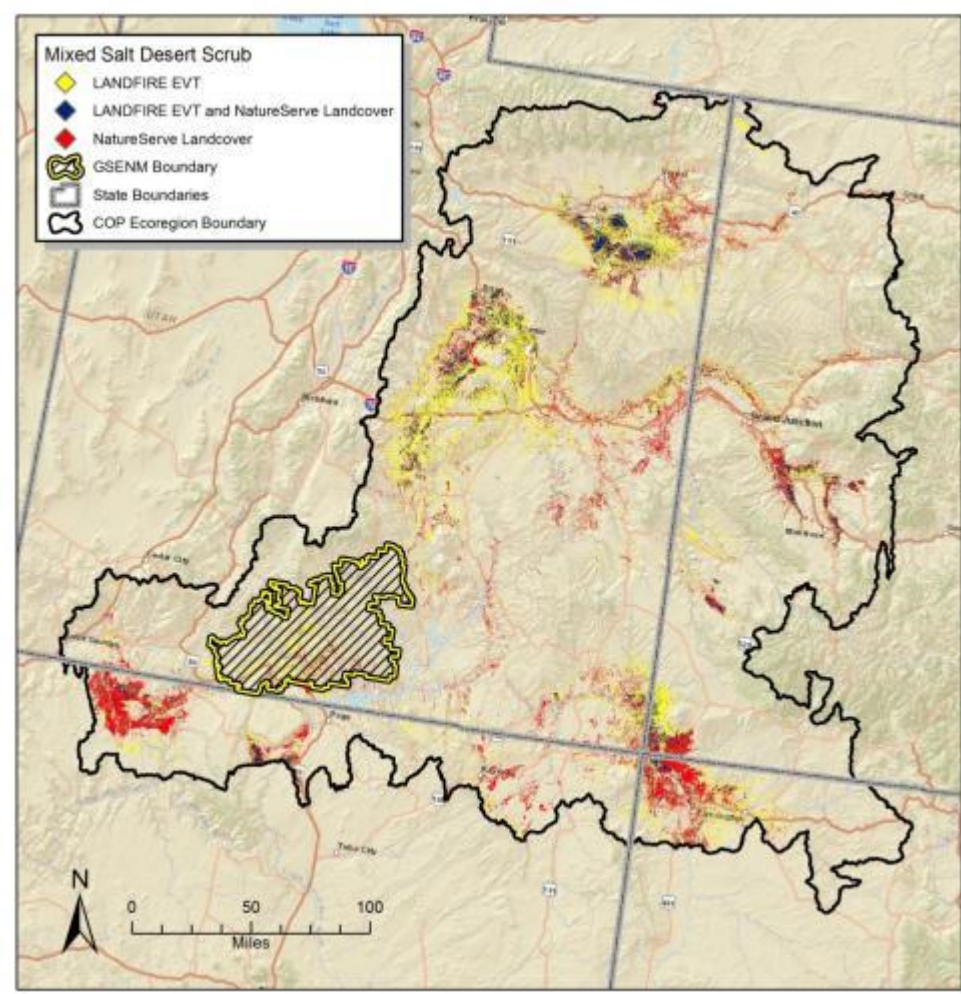
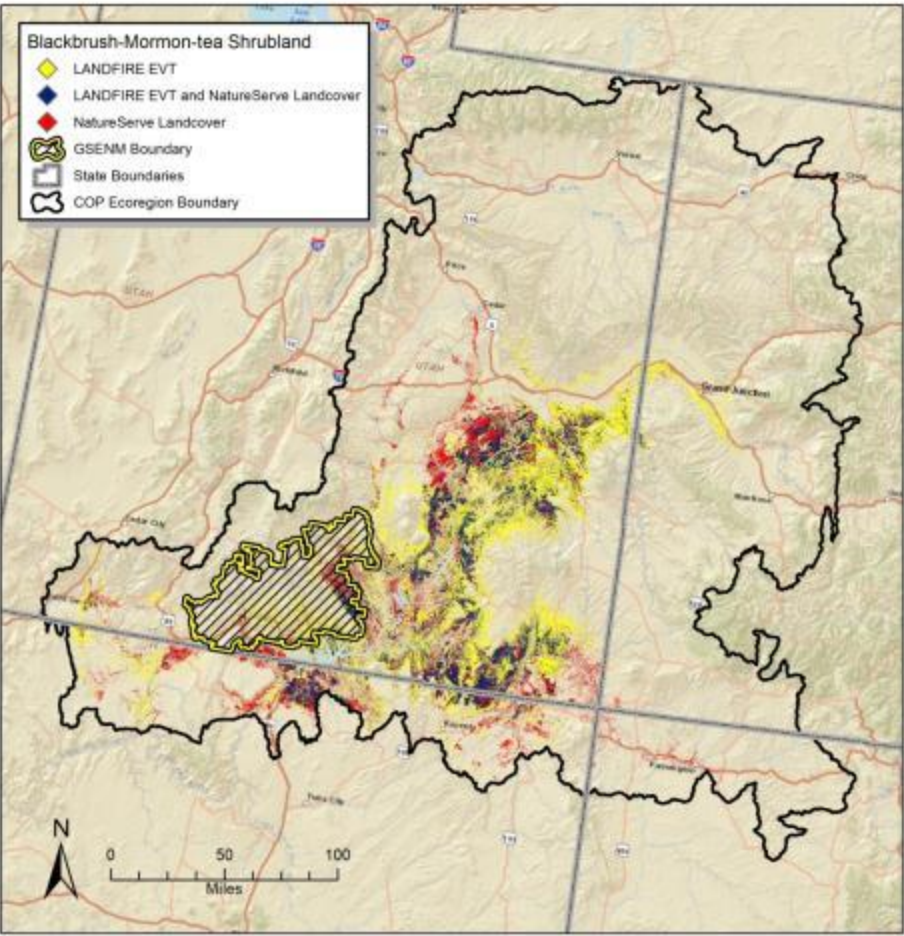
Productivity/Foraging Potential

36

- Presence of select veg
 - ▣ Blackbrush-Mormon-tea Shrub lands
 - ▣ Mixed Salt Desert Scrub
- Conditions of select veg
 - ▣ Terrestrial intactness
- NRCS Ecological Site Descriptions



Landscape Approach Implementation

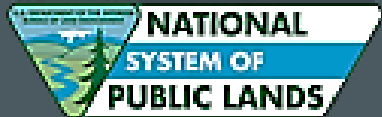


Salt Desert Shrublands

Quantifying Objects & Values

38

- ❑ Wildlife distributions/biodiversity
- ❑ Pinyon-Juniper distributions
- ❑ Sensitive soils
- ❑ Wildlife diversity

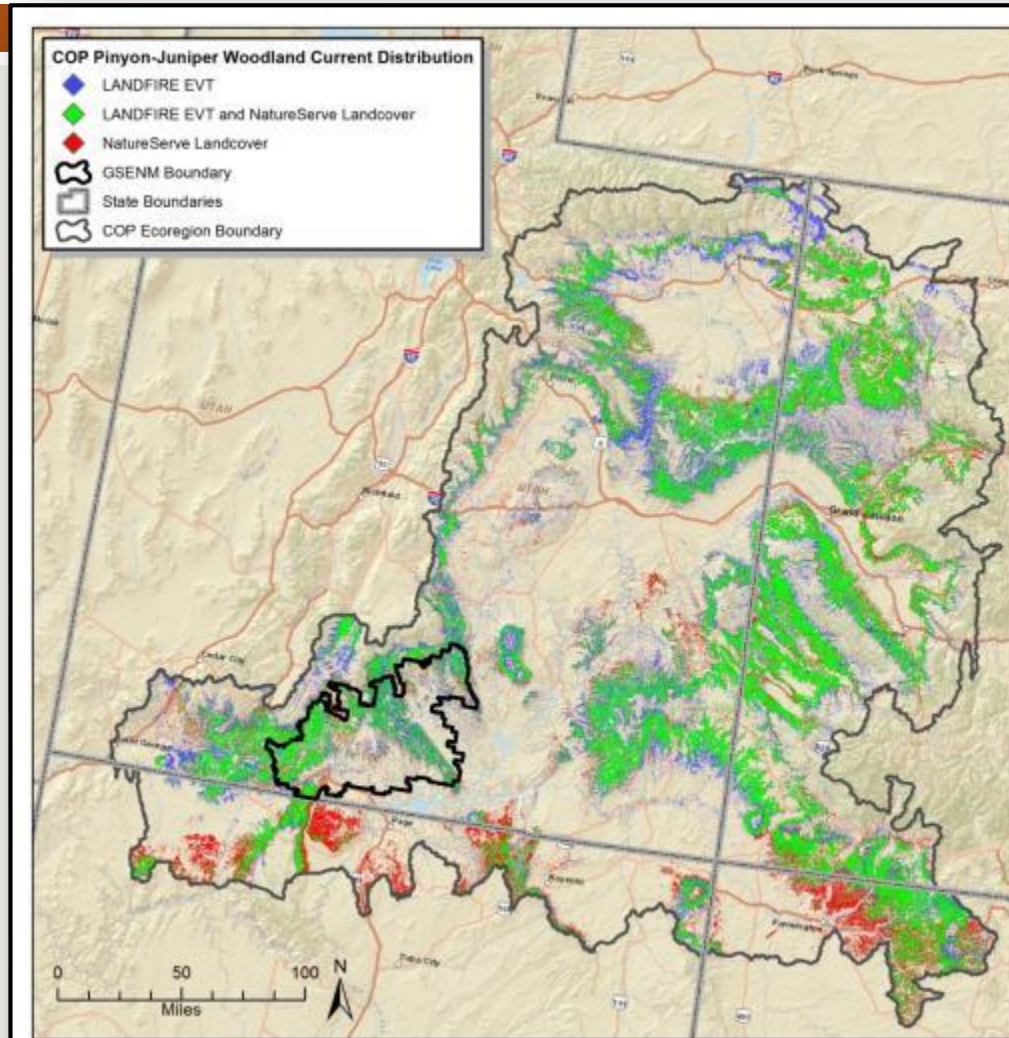


Landscape Approach Implementation

Pinyon-Juniper Woodland Distribution

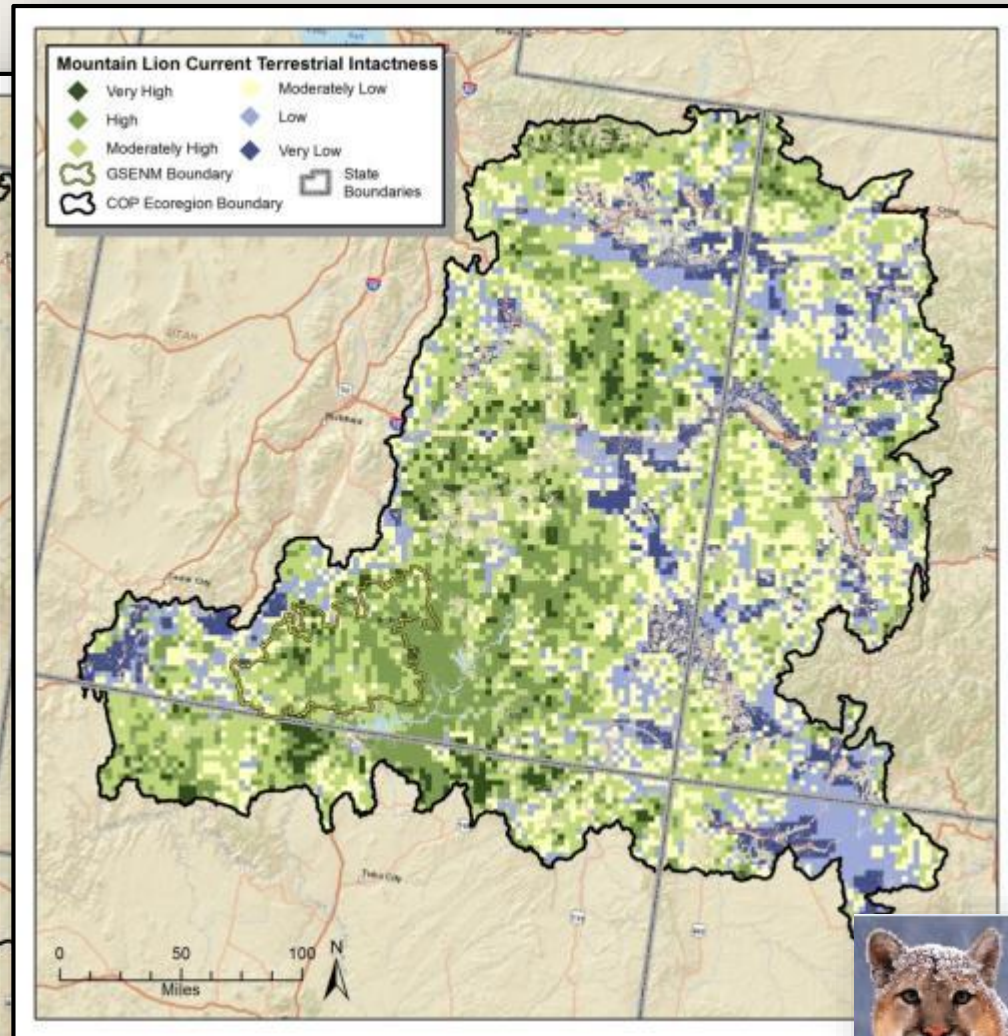
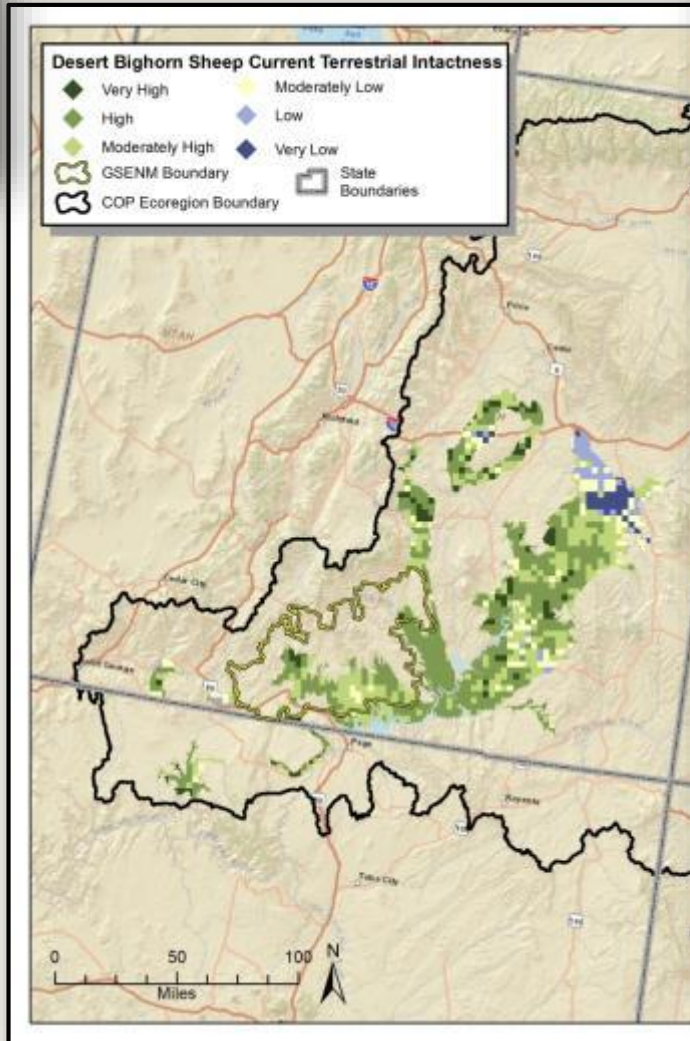
39

GSENM contains 119,215 Acres of Pinyon Juniper (both Landfire & NatureServe)



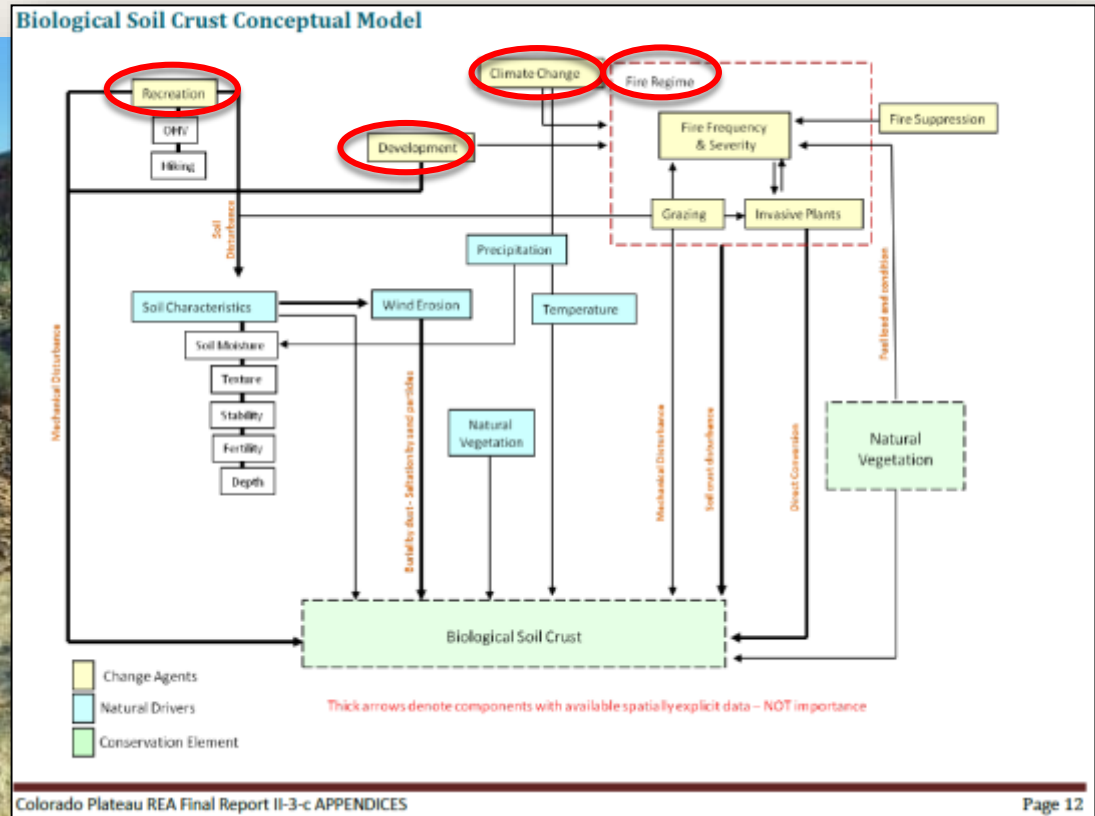
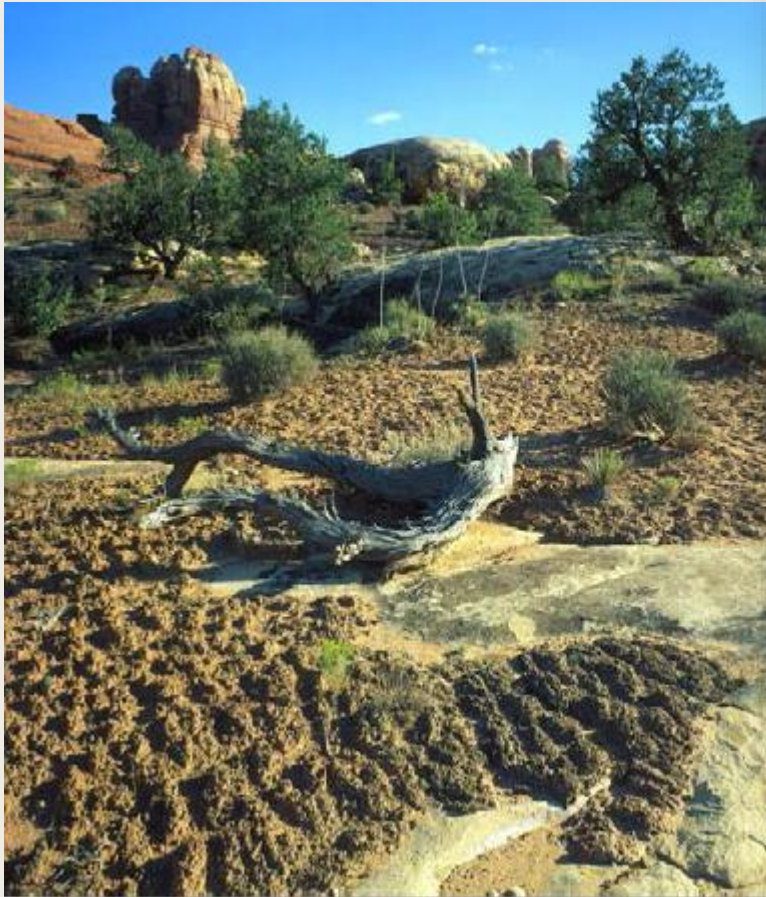
Desert Bighorn Sheep & Mtn. Lion

40



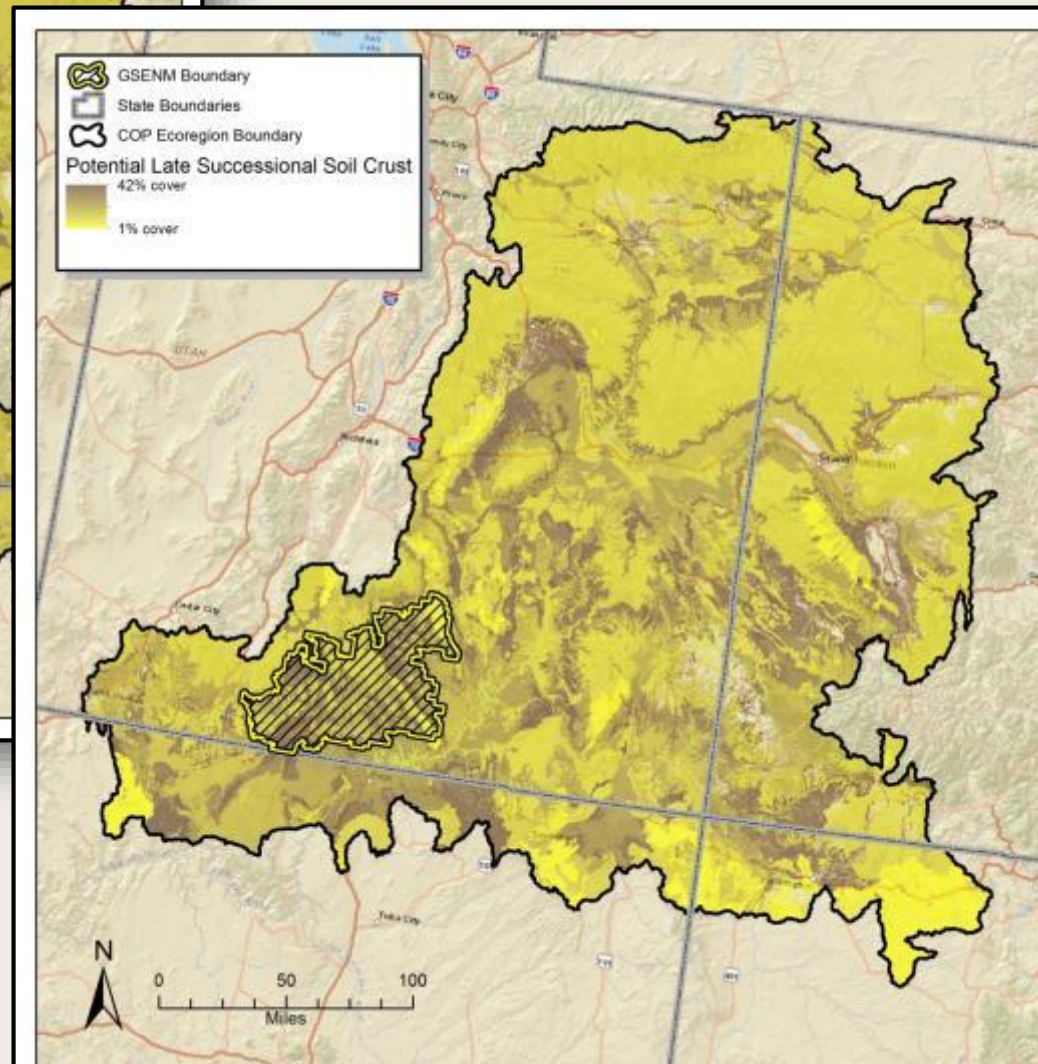
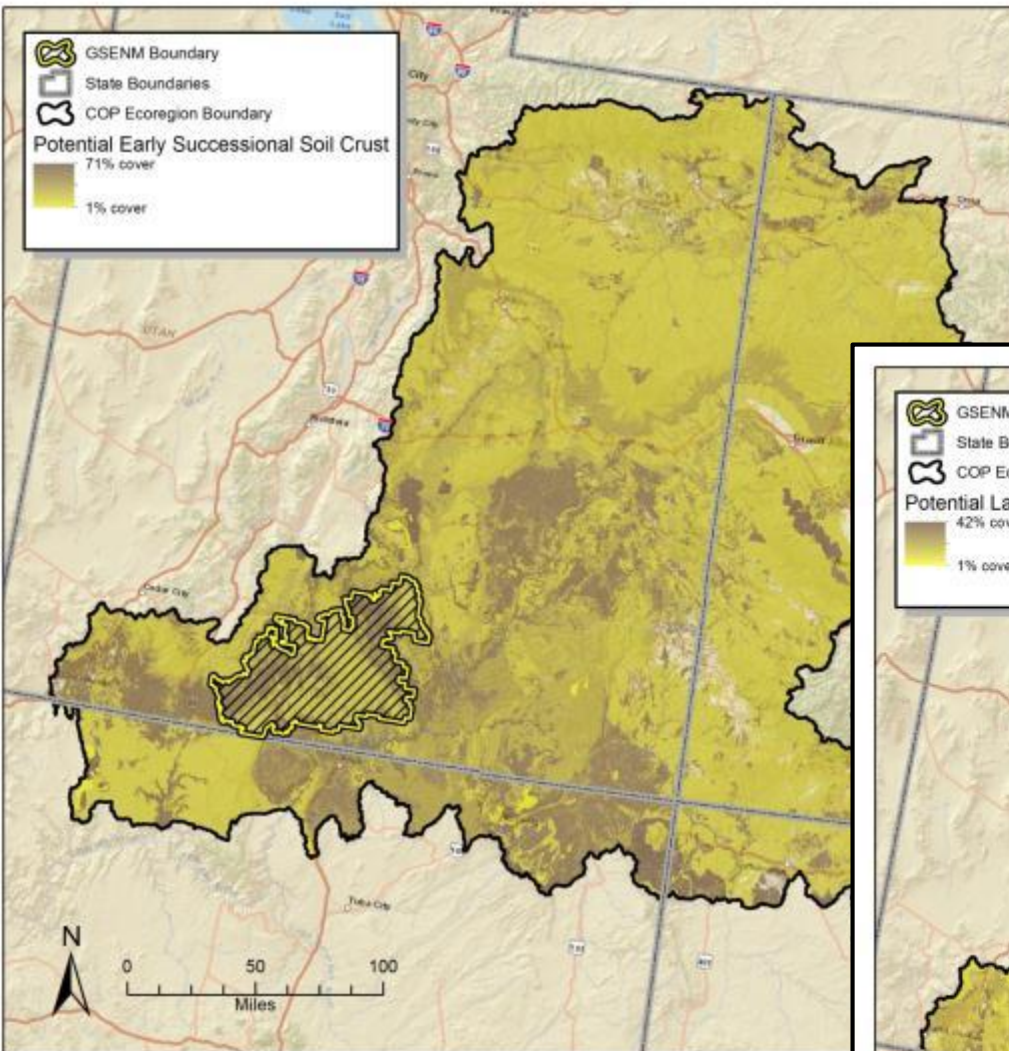
Sensitive Soils

41



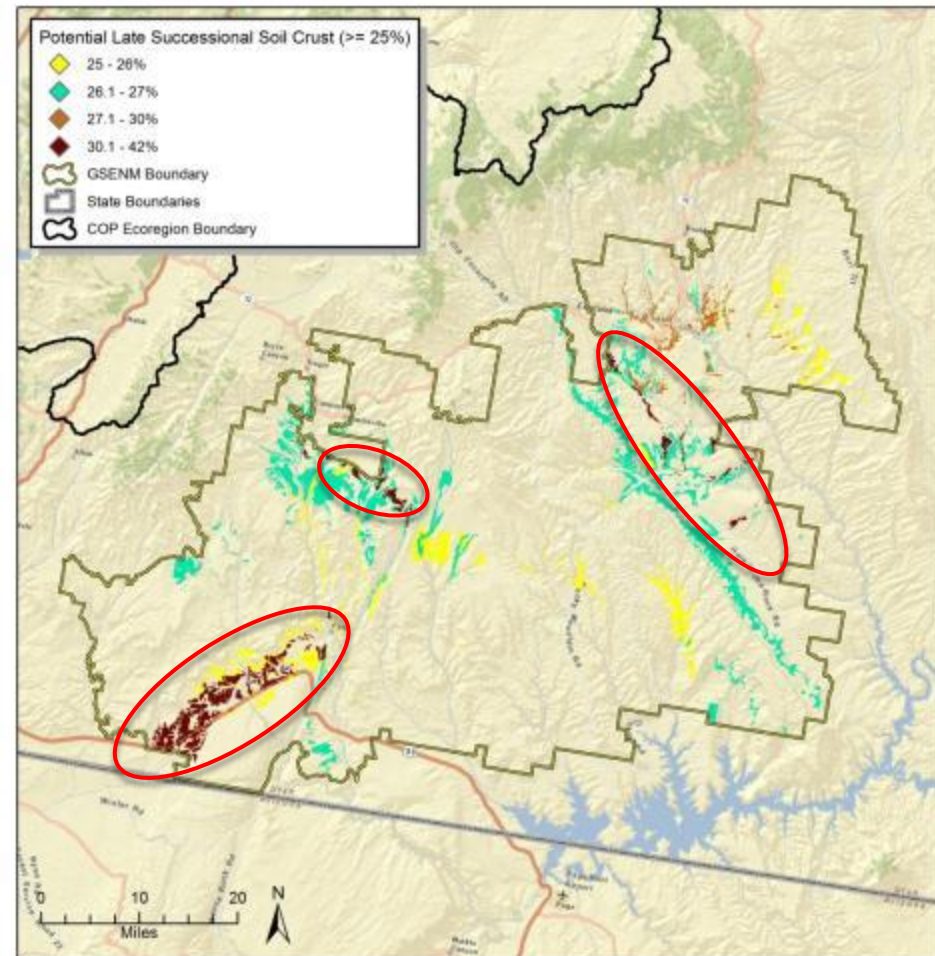
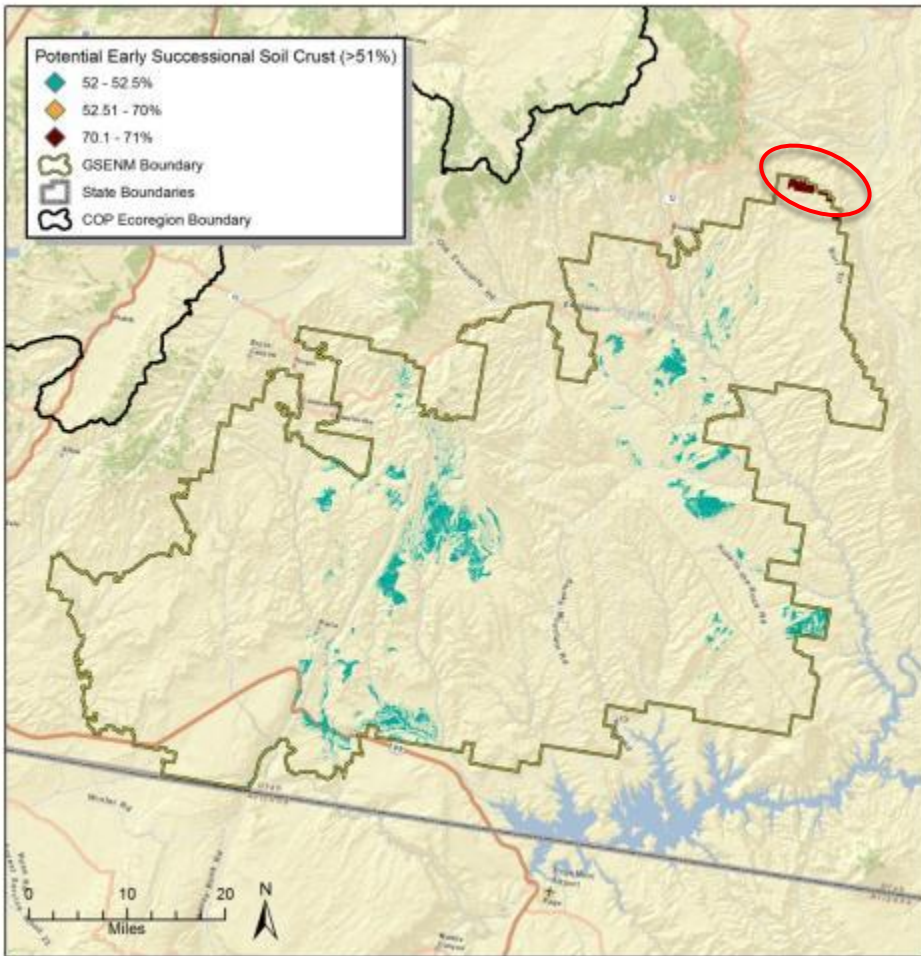
This model covers a 'least disturbed' scenario...

This dataset is slightly different, can extract local scale information..



Potential soil crust survey priorities

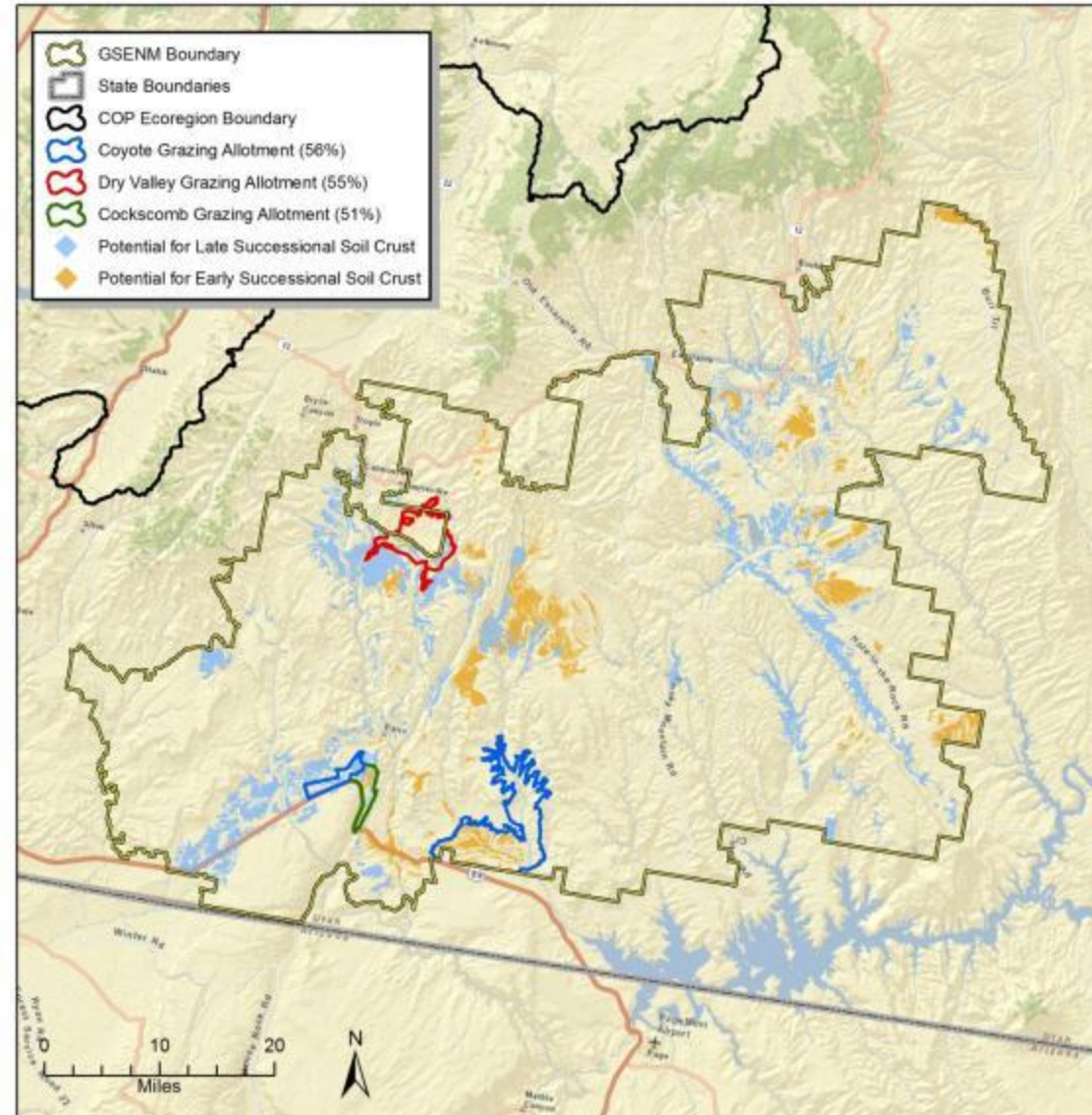
43



Soil crust & grazing potential conflicts

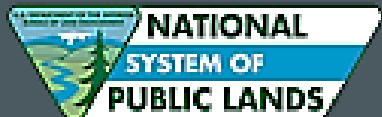
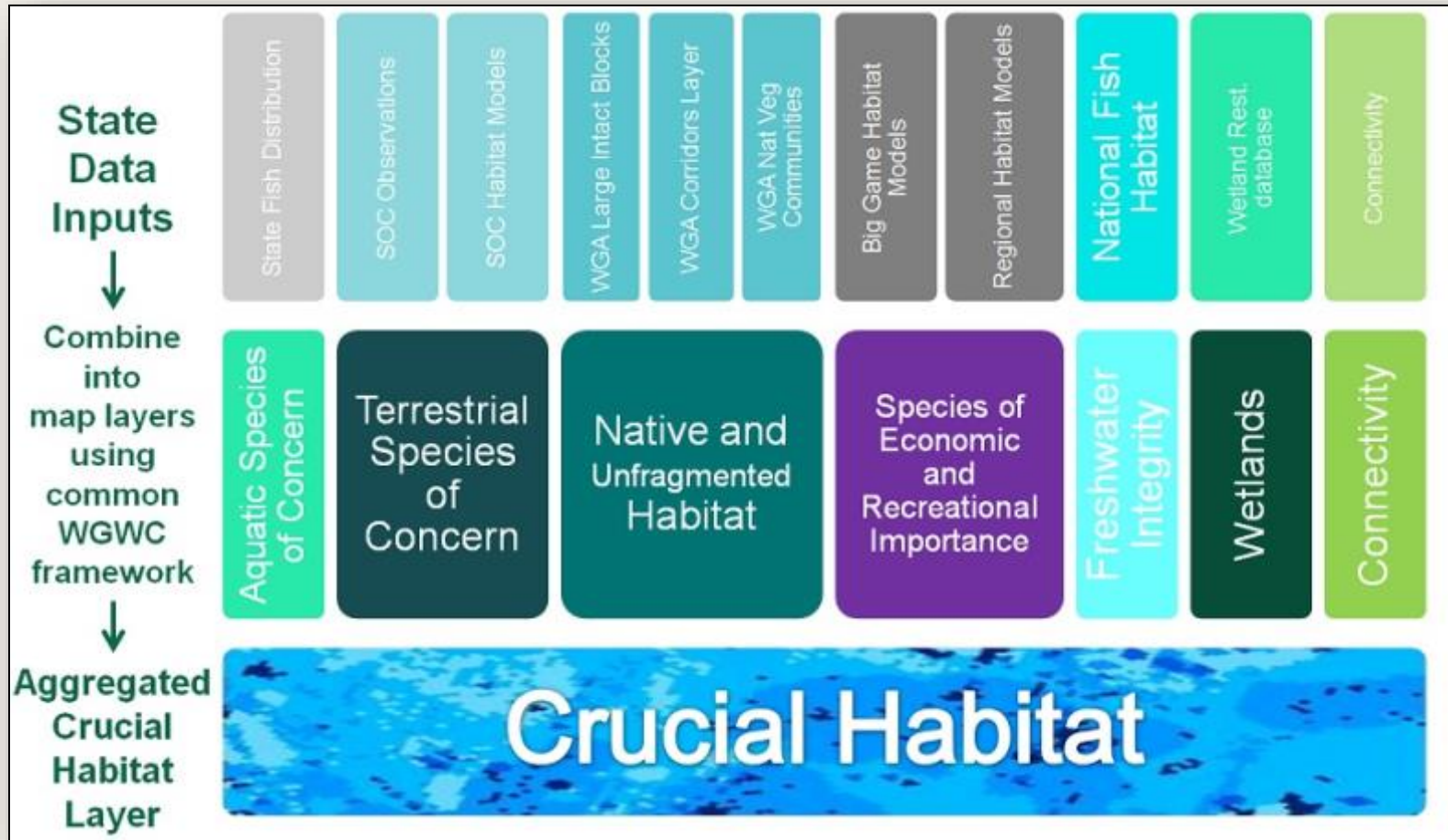
44

Where allotments overlap with sensitive soils, these are the 3 largest in percentage



Western Governors' Crucial Habitat Assessment Tool (CHAT)

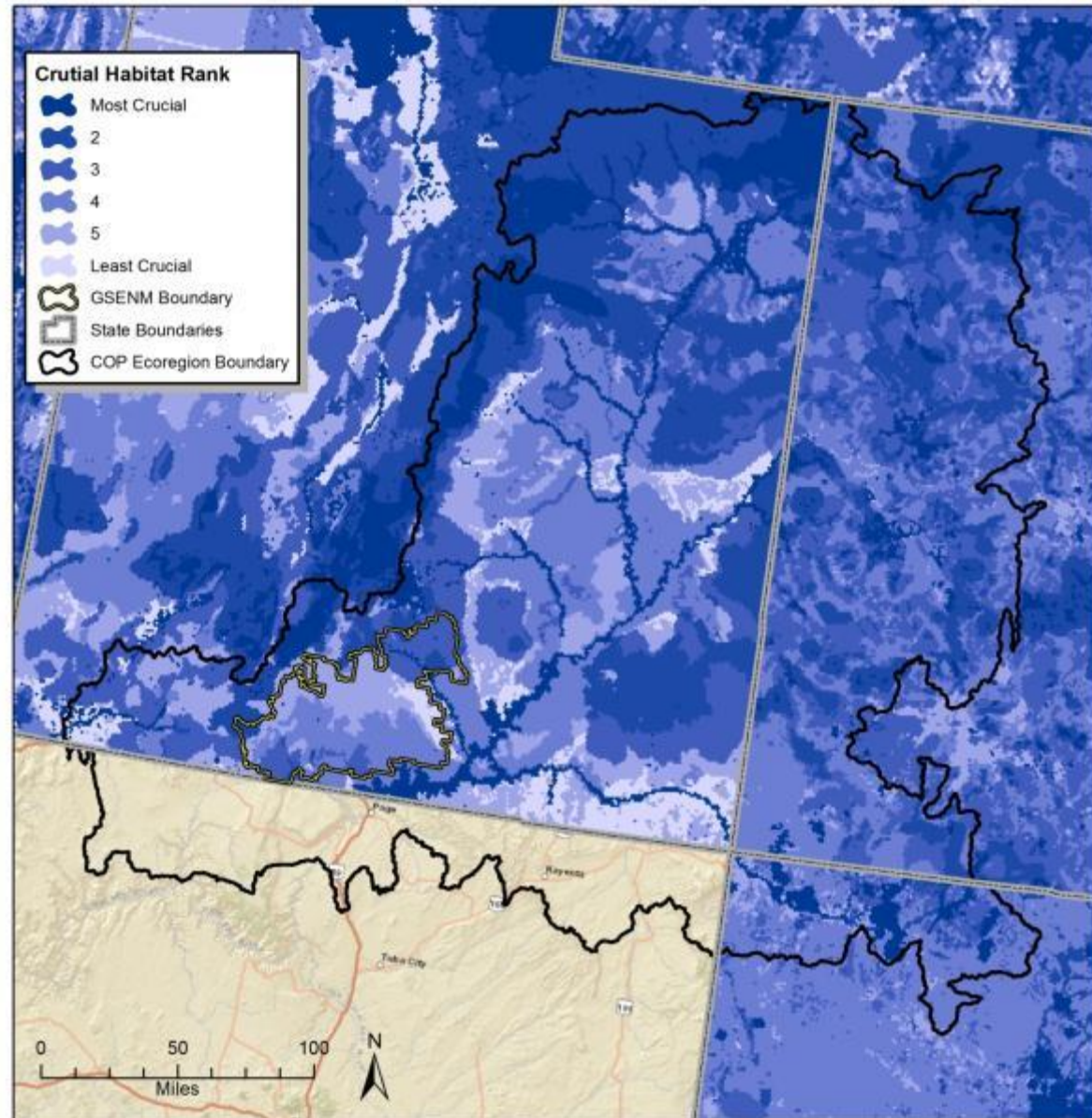
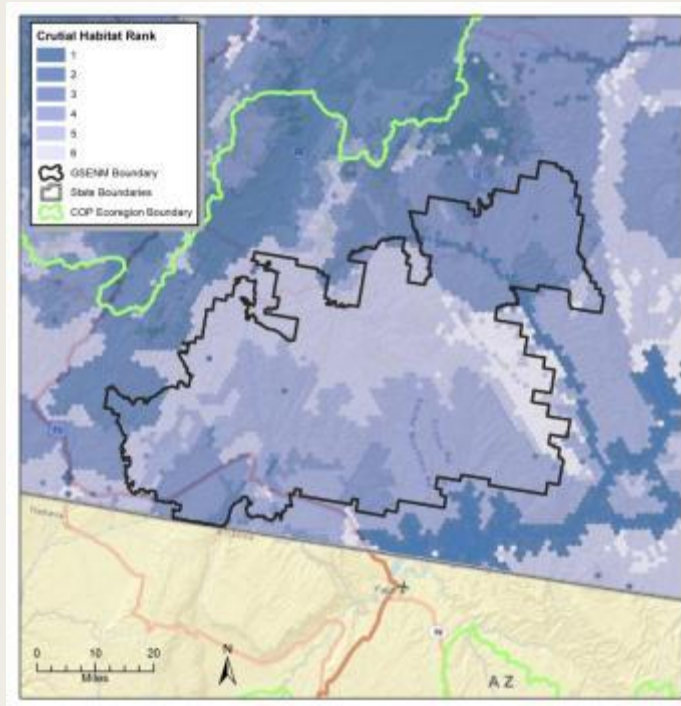
45



Landscape Approach Implementation

WGA: Crucial Habitat Assessment Tool (CHAT)

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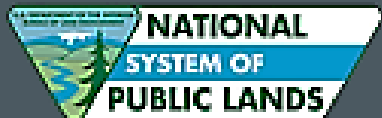
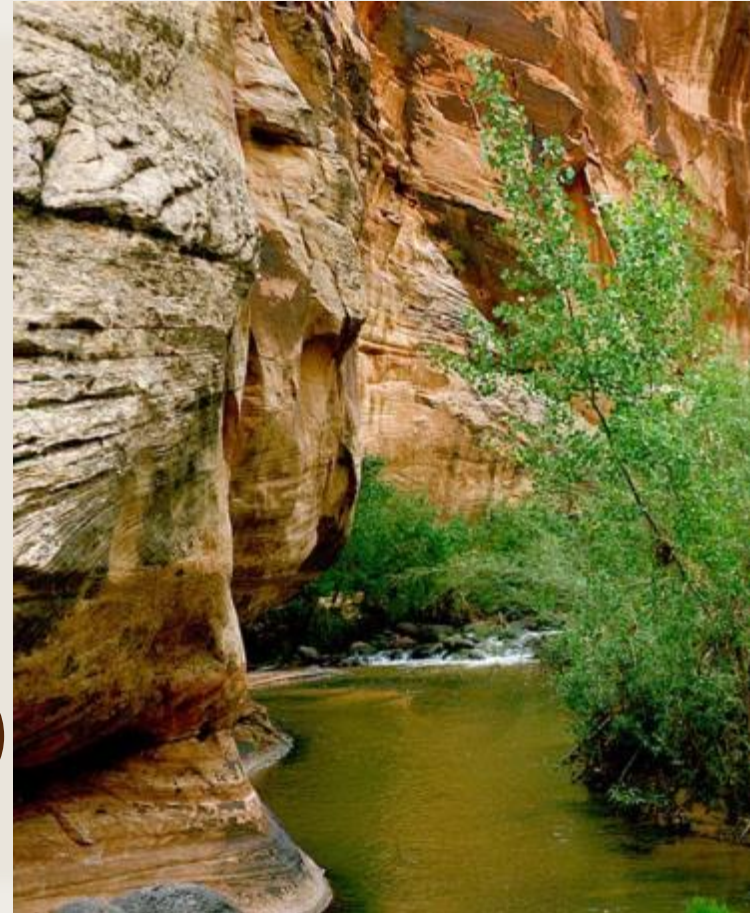


*Az CHAT data requested....

GSENM: The “New” Island of Green

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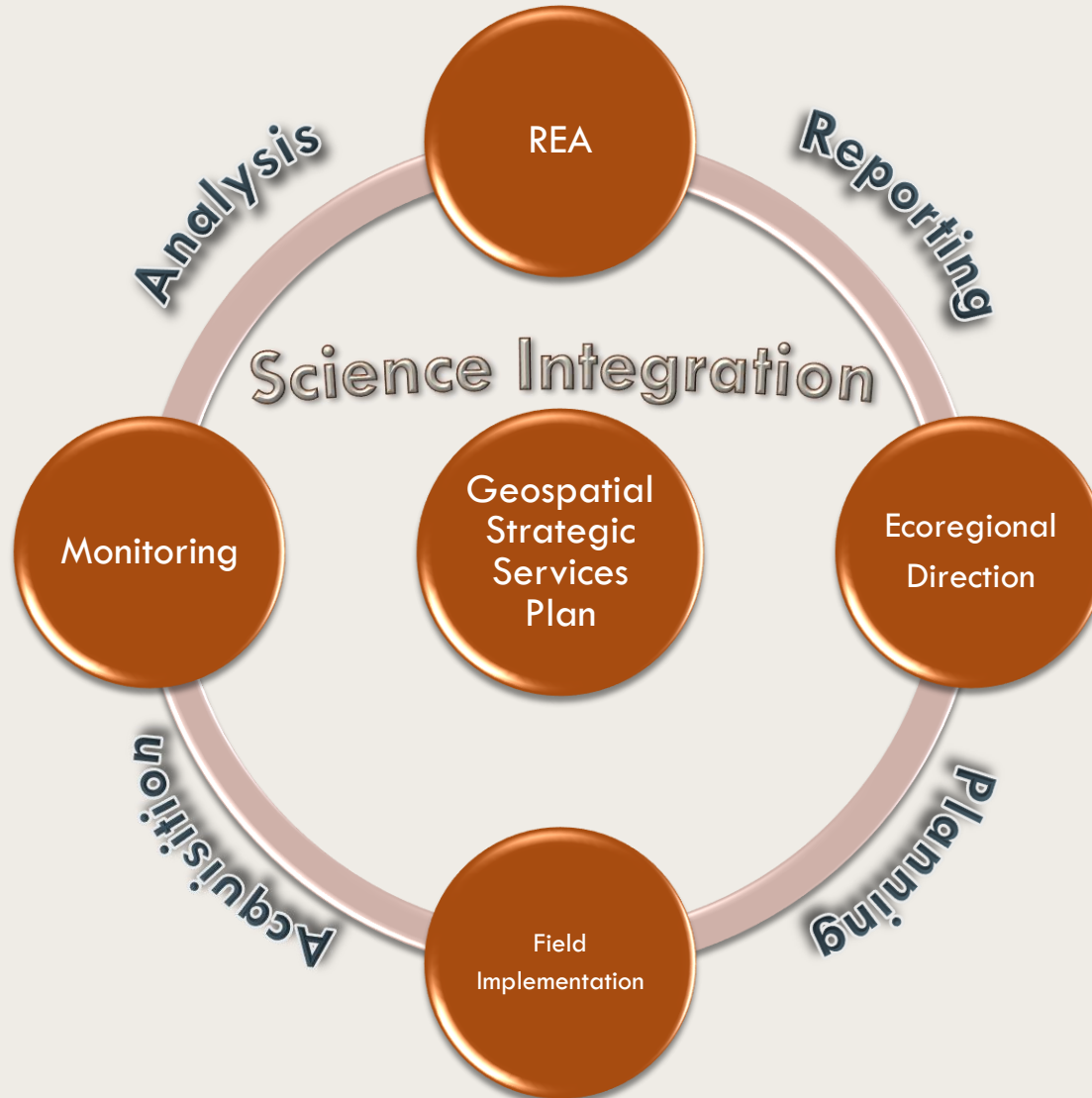
- High terrestrial intactness
- High connectivity value
- Low potential for climate change
- High probability of sensitive soils
- Quantifiable objects & values
- Presence of desirable terrestrial groups (blackbrush/mixed salt desert)



Landscape Approach Implementation

BLM's Concept Landscape Approach

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Questions?

