

Modeling Potential Gray Wolf Habitat in the Grand Canyon Ecoregion

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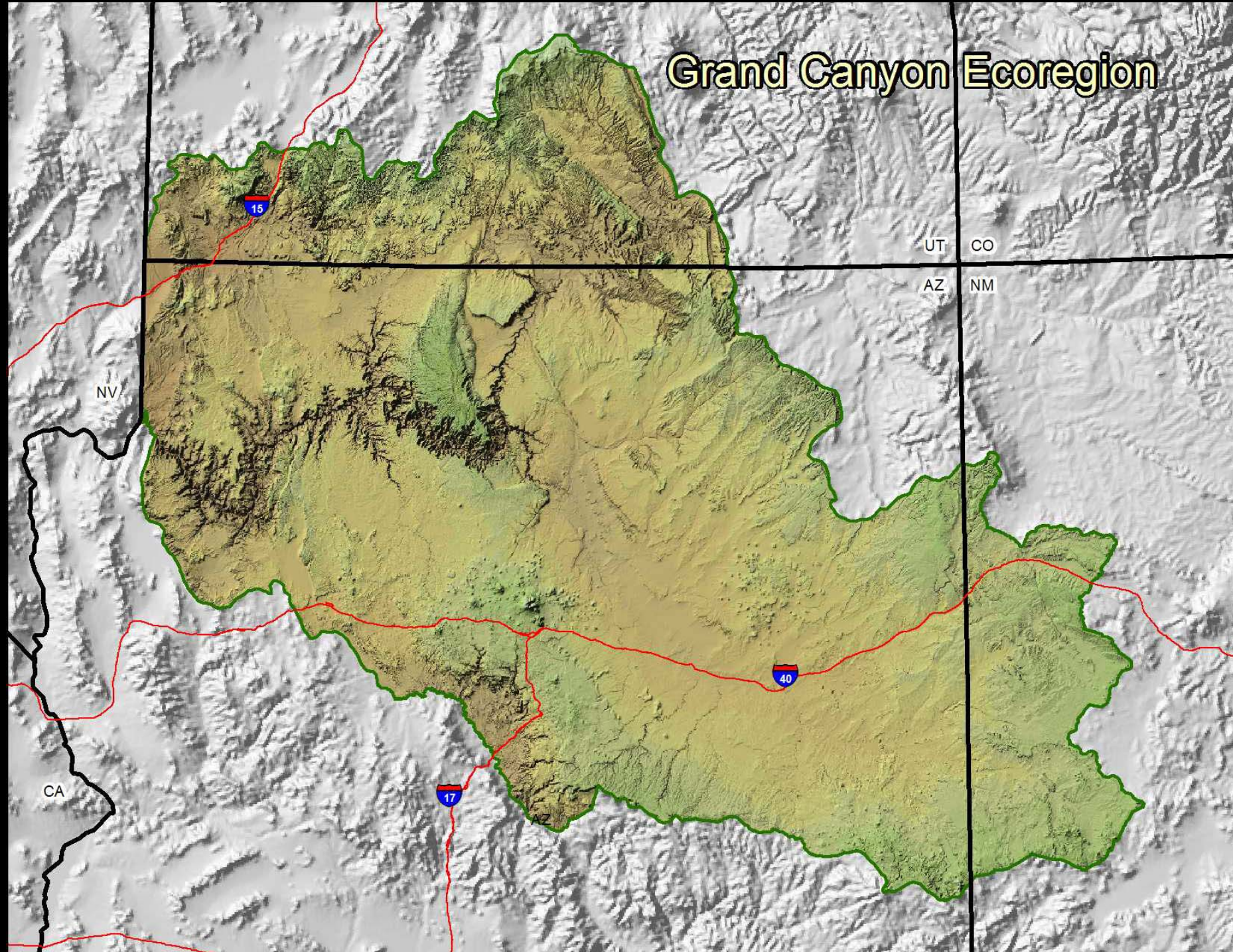
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Grand Canyon Ecoregion

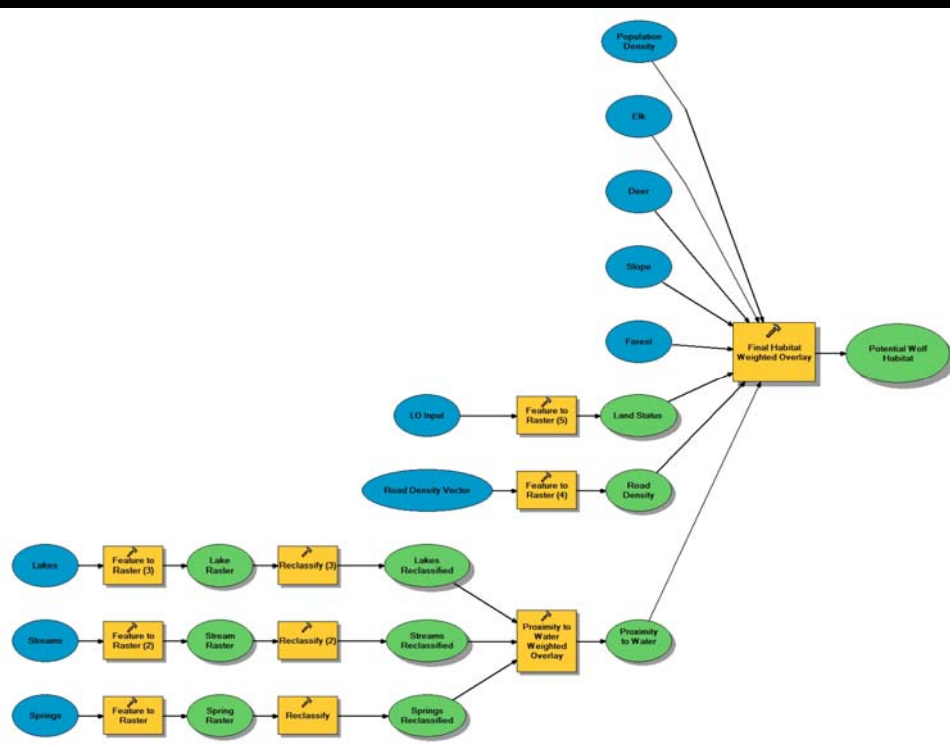


SW HISTORIC DISTRIBUTION



METHODOLOGY

- Based on “course screen”, landscape-scale, spatial modeling of wolf habitat (e.g., Ratti et al. 1999; Wydeven et al. 1998)
- Six biophysical and socioeconomic factors related to wolf sustenance (food) and security (safety) considered (cf. Fuller et al. 1992):
 - Biophysical Factors = Vegetation cover, water availability, prey densities
 - Socioeconomic factors = human population, road density, and land status



Roads






Roads can provide access to otherwise undisturbed areas where humans may harass or kill wolves

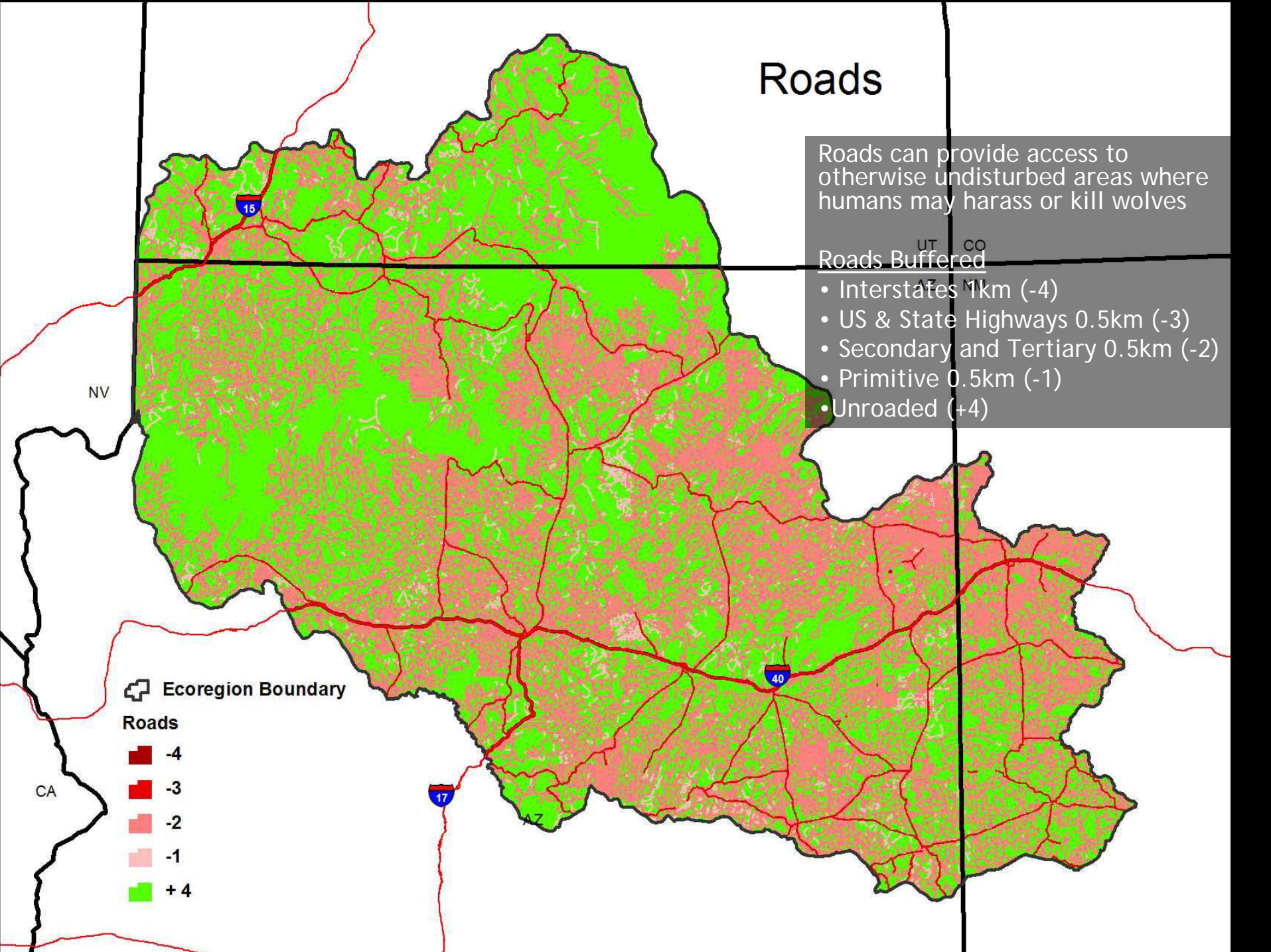
Roads Buffered

- Interstates 1km (-4)
- US & State Highways 0.5km (-3)
- Secondary and Tertiary 0.5km (-2)
- Primitive 0.5km (-1)
- Unroaded (+4)

 Ecoregion Boundary

Roads

-  -4
-  -3
-  -2
-  -1
-  +4



Population Density

*Census Block
2000 Census*

An important determinant of habitat suitability (or security) for large carnivores is human population density (Merrill et al. 1999)

AZ NM
A human population density greater than 12-13 persons/km² will limit wolf occupation (Mladenoff et al. 1995)

> 12 km² (-4)
4 - 12 km² ((+1)
< 4 km² (+4)

 Ecoregion Boundary

Population Density



CA

NV

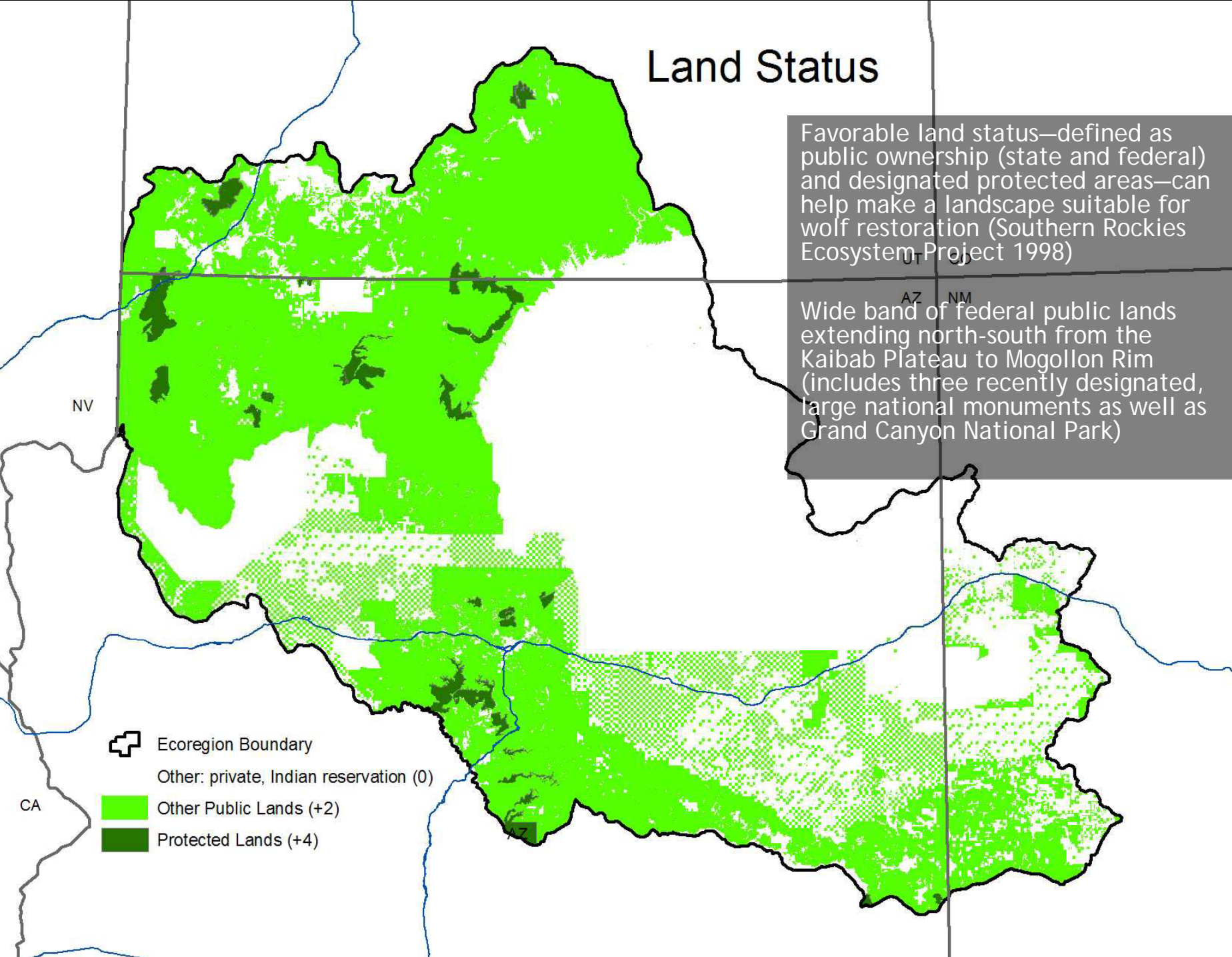
AZ

NM

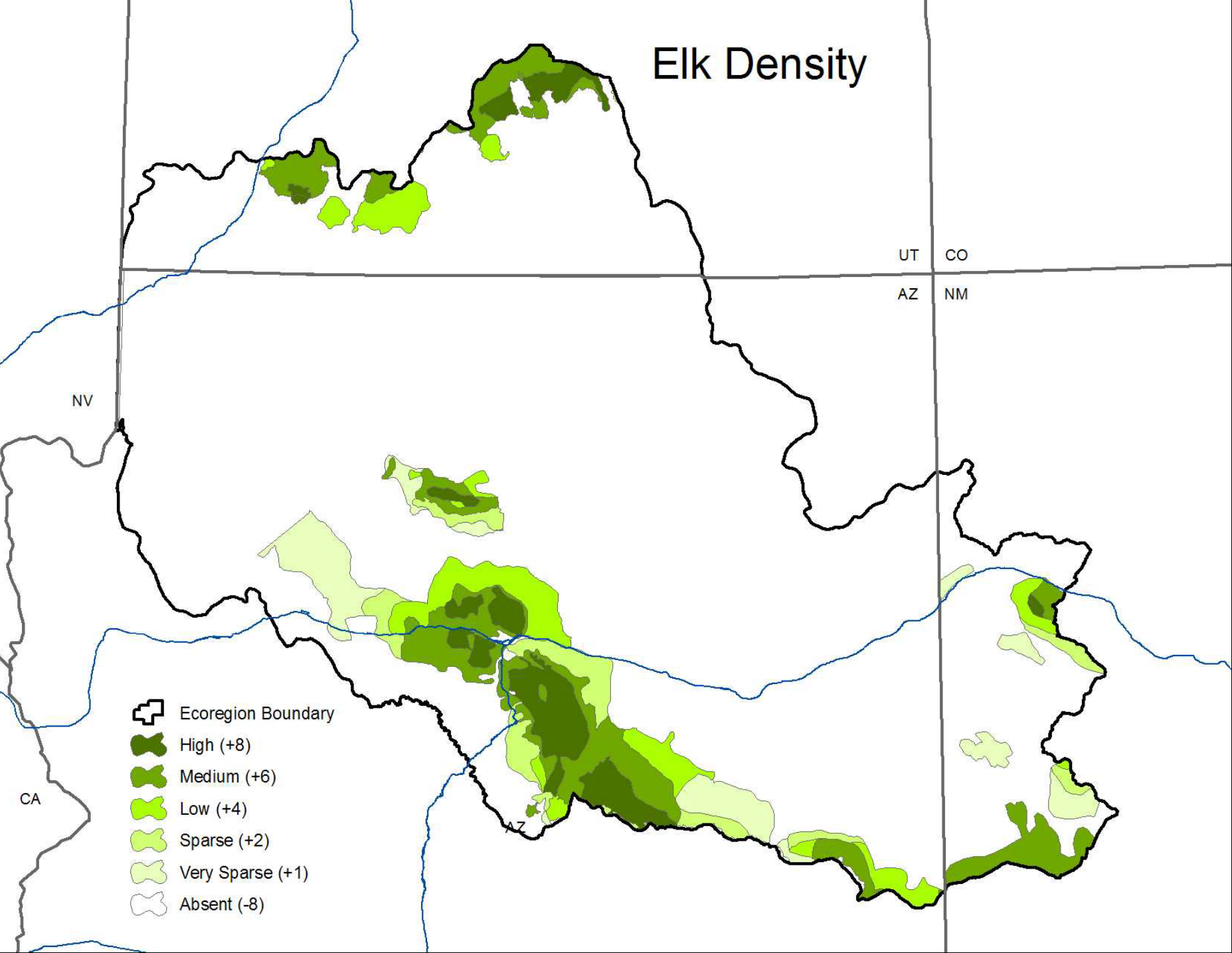
Land Status

Favorable land status—defined as public ownership (state and federal) and designated protected areas—can help make a landscape suitable for wolf restoration (Southern Rockies Ecosystem Project 1998)

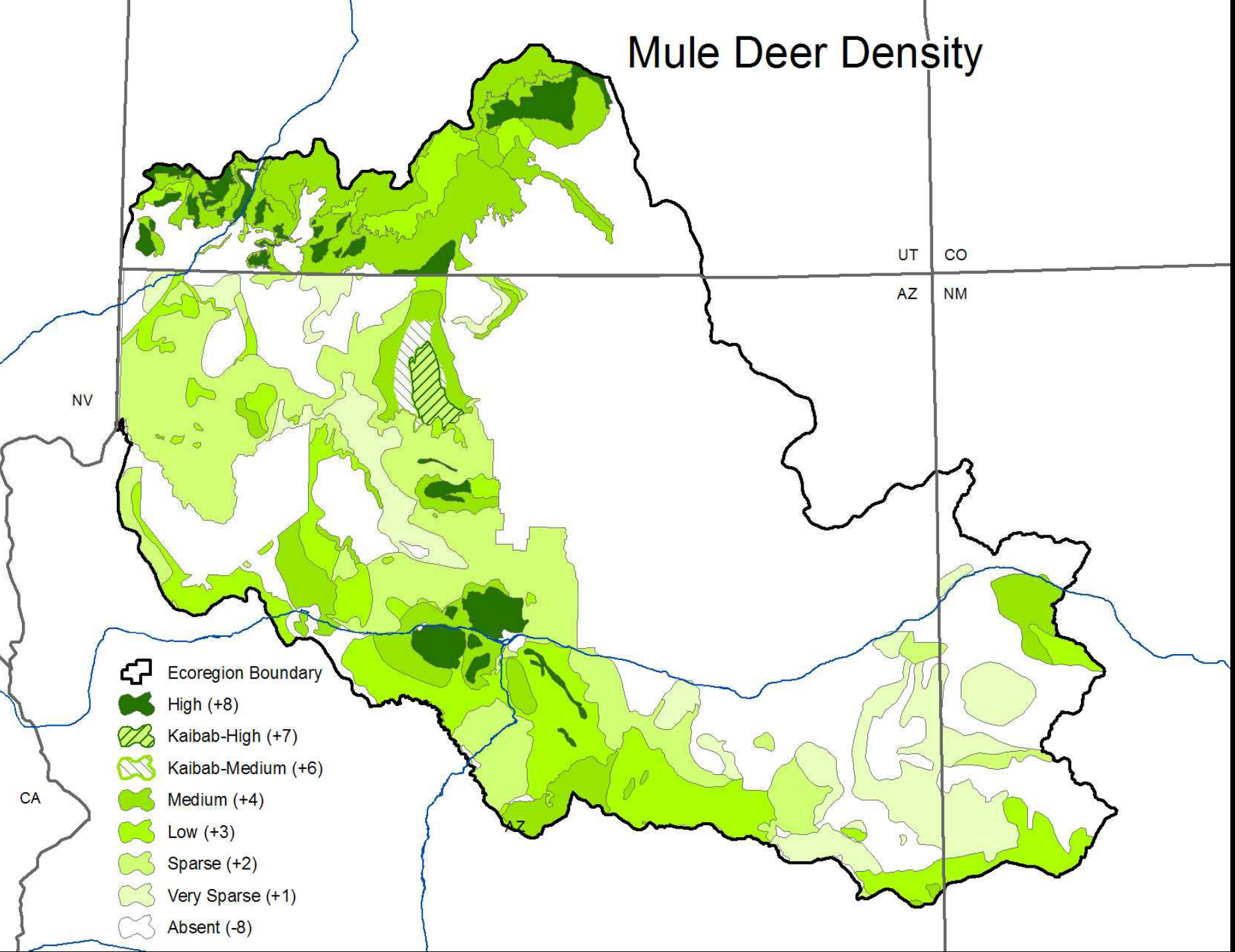
Wide band of federal public lands extending north-south from the Kaibab Plateau to Mogollon Rim (includes three recently designated, large national monuments as well as Grand Canyon National Park)



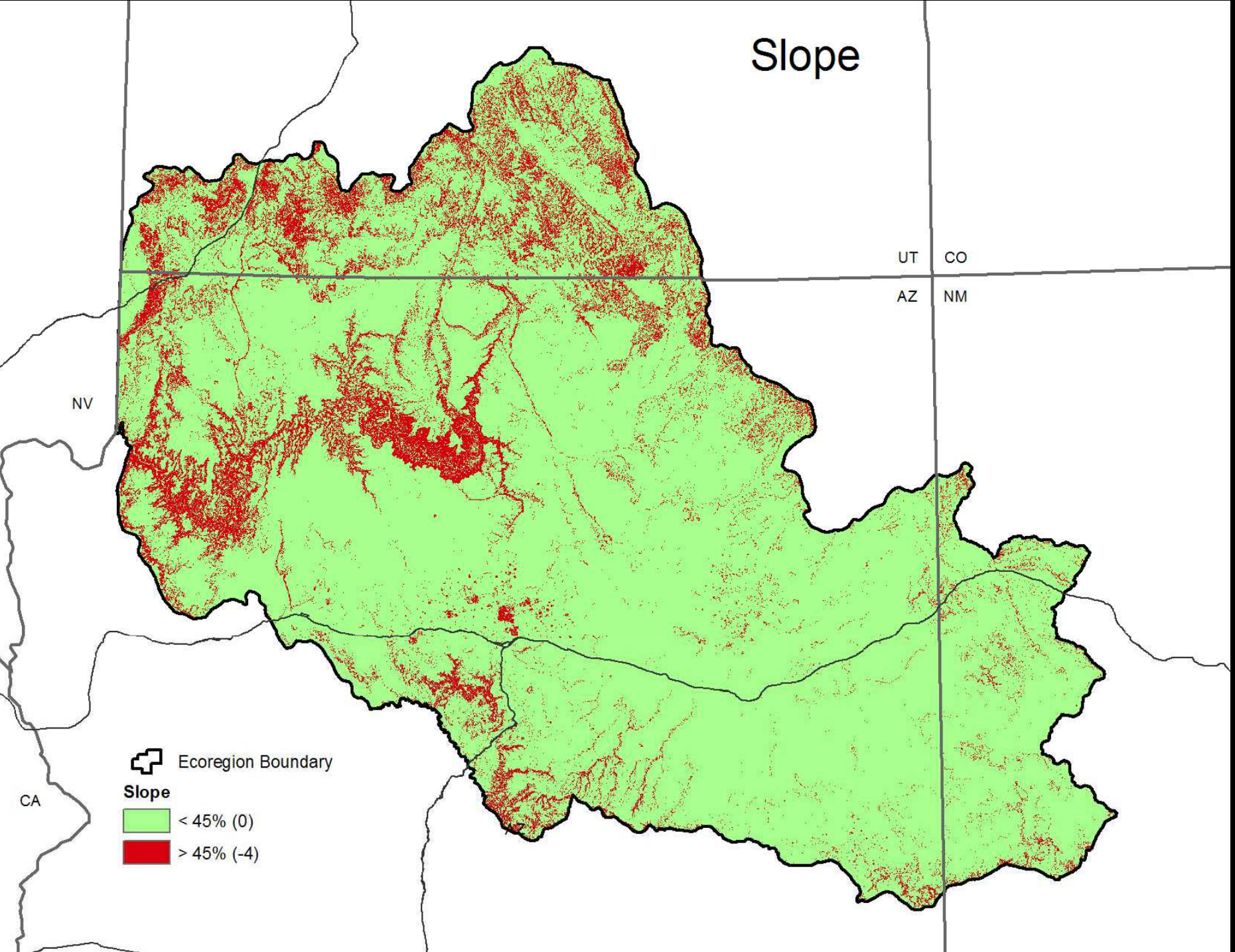
Elk Density



Mule Deer Density



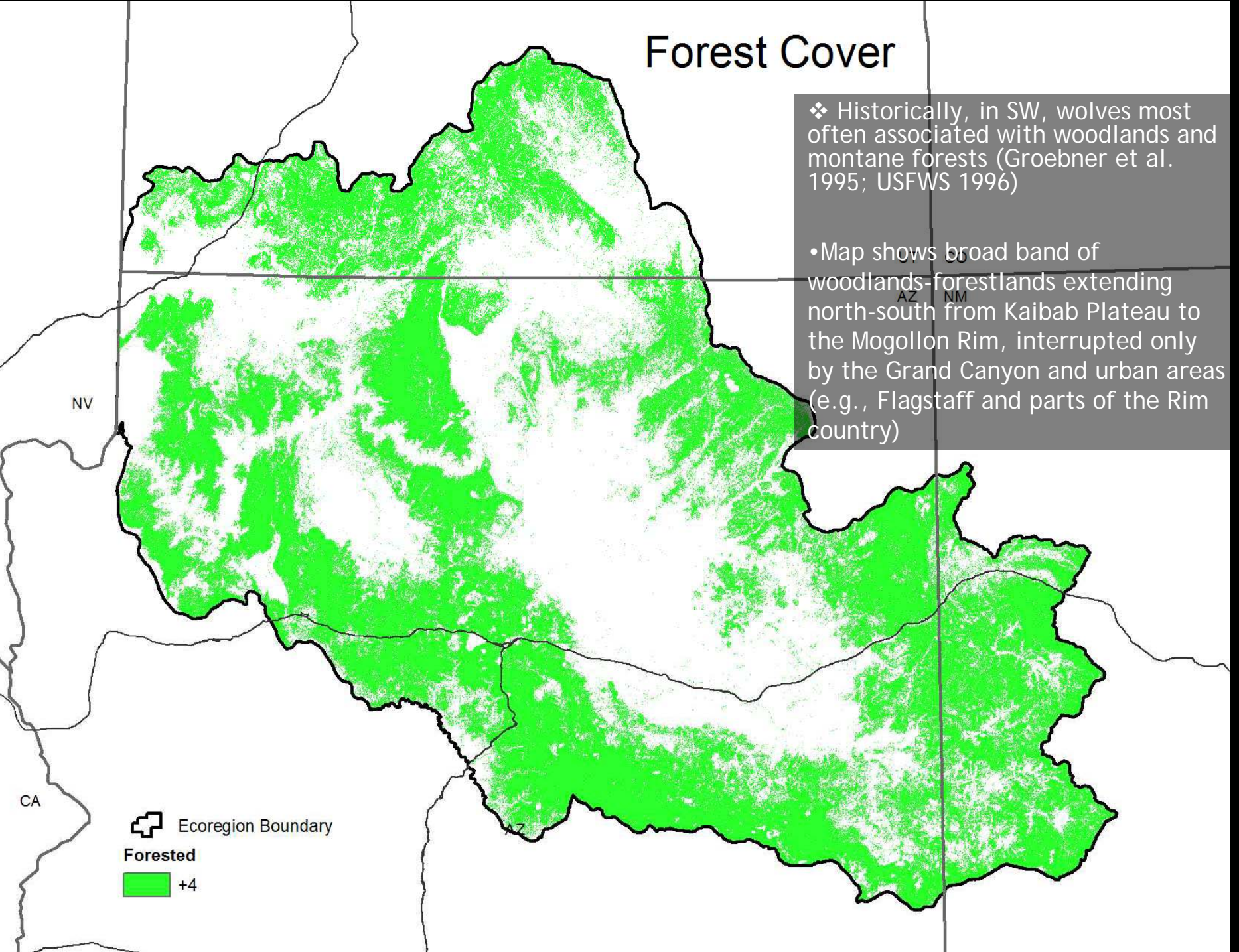
Slope



Forest Cover

- ❖ Historically, in SW, wolves most often associated with woodlands and montane forests (Groebner et al. 1995; USFWS 1996)

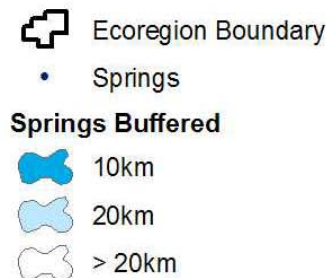
- Map shows broad band of woodlands-forestlands extending north-south from Kaibab Plateau to the Mogollon Rim, interrupted only by the Grand Canyon and urban areas (e.g., Flagstaff and parts of the Rim country)



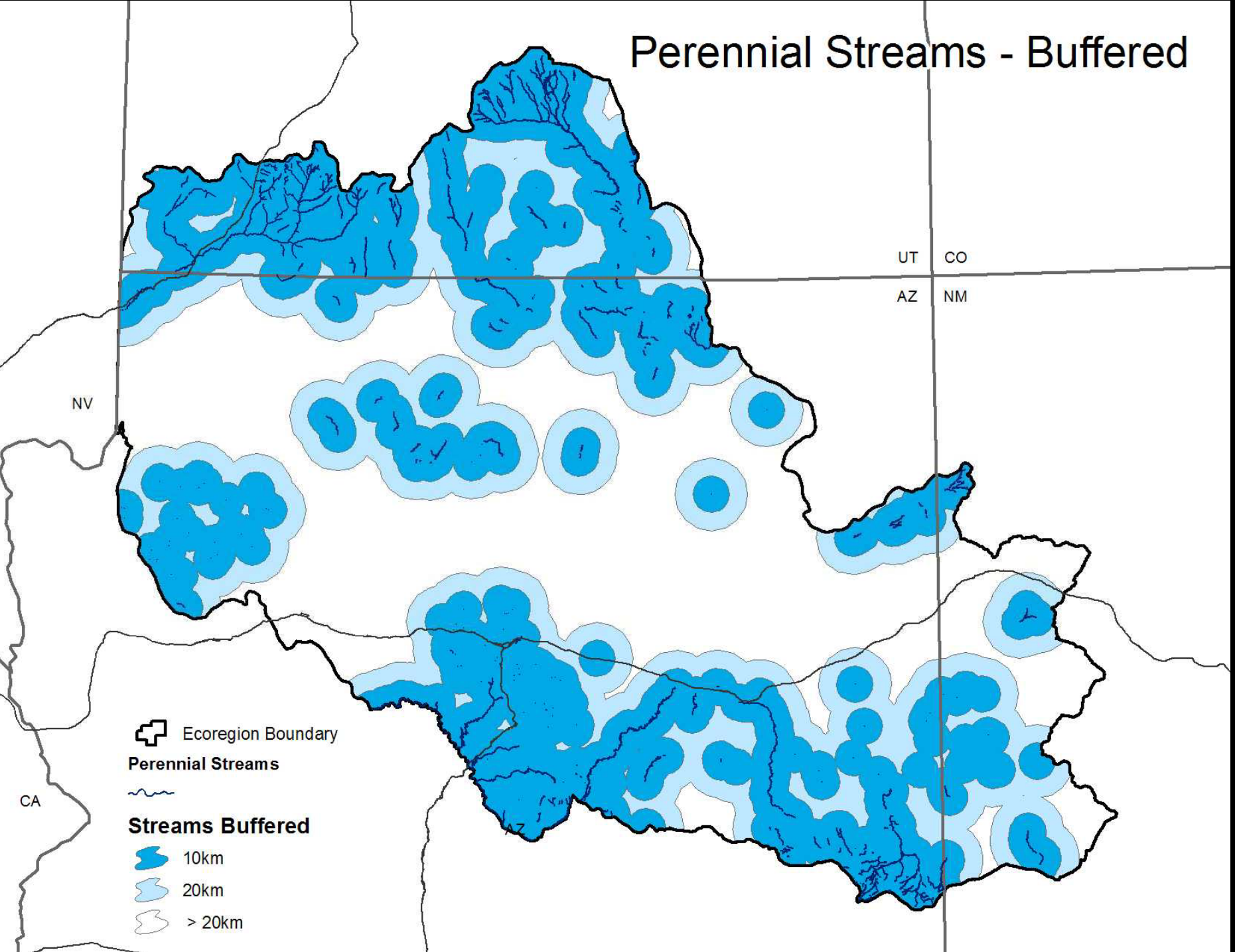
Springs

❖ Several studies in SW (USFWS, 1996) and elsewhere (Quinby et al. 1999) have suggested that availability of free water is an important determinant of gray wolf abundance and distribution

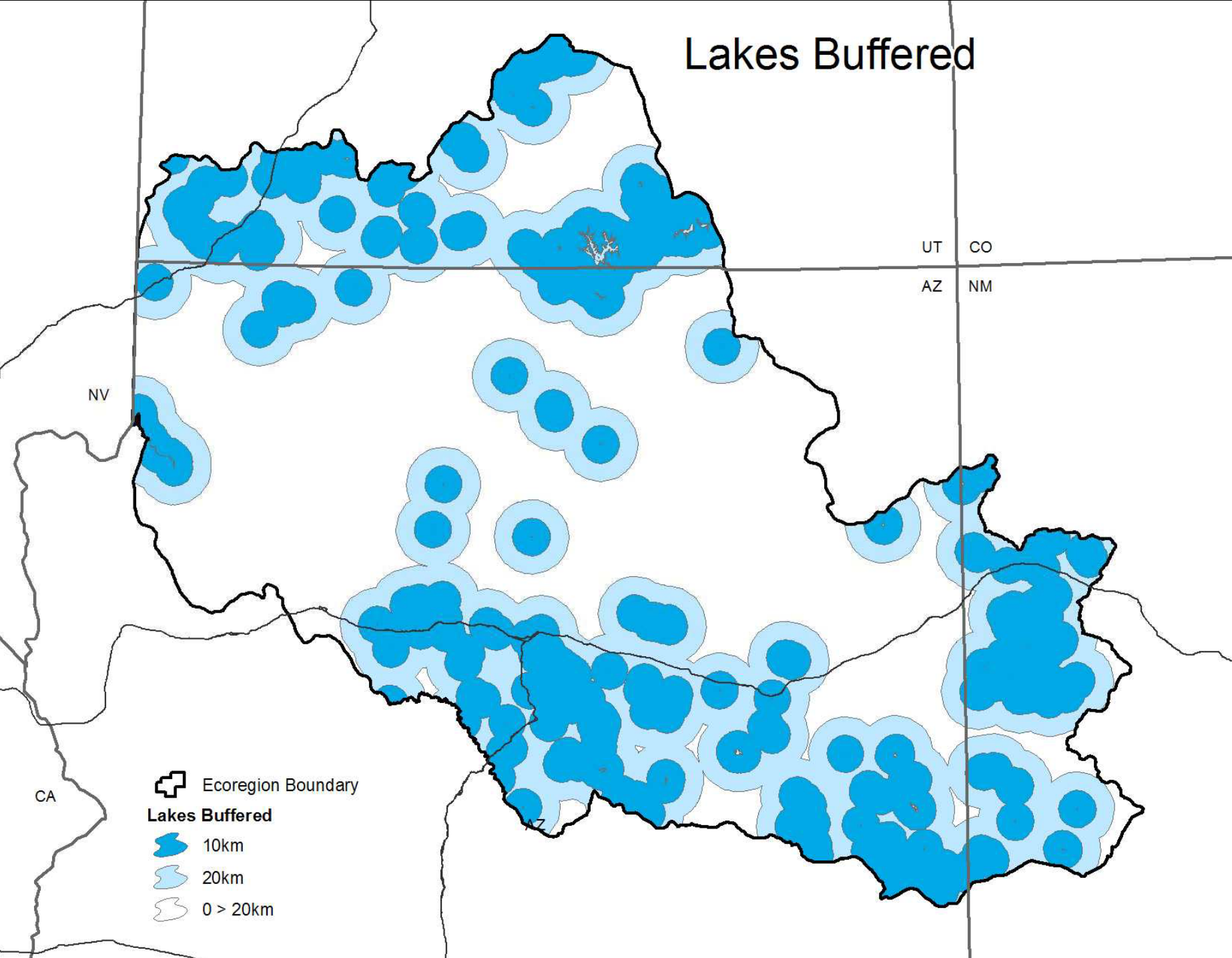
Map shows that springs and streams (e.g., Colorado River), supplemented by water sources constructed for livestock and wildlife, are widespread throughout GCE



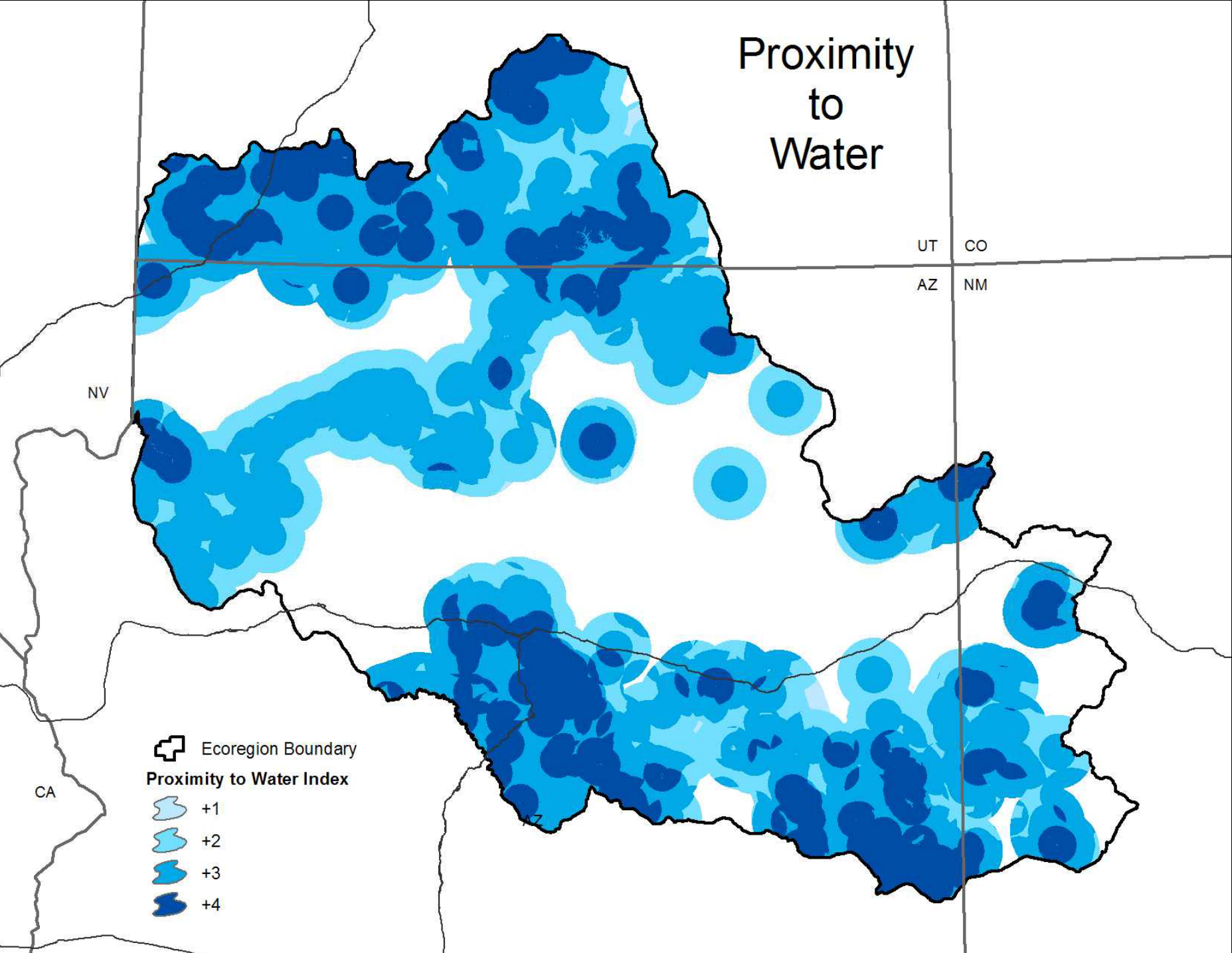
Perennial Streams - Buffered



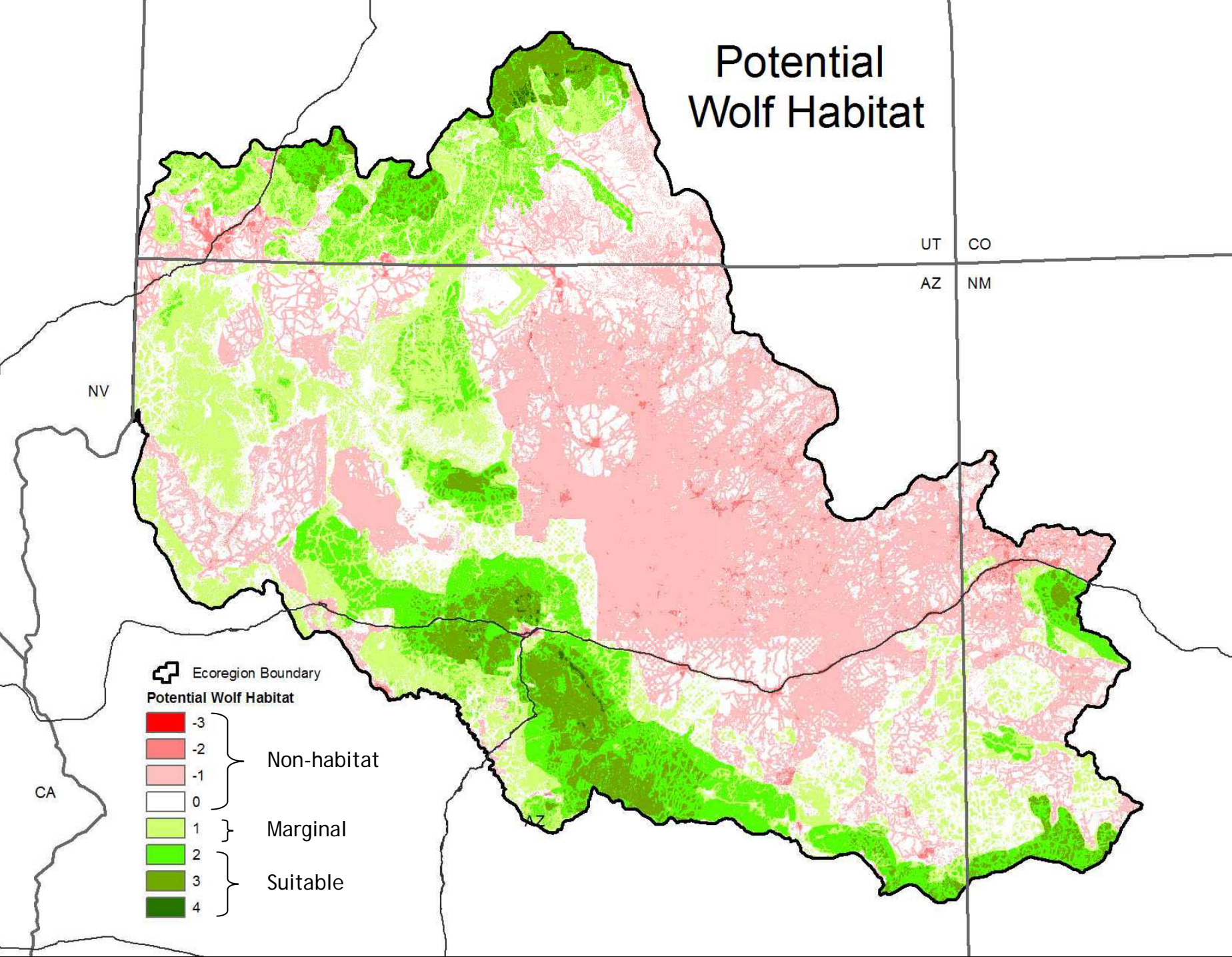
Lakes Buffered



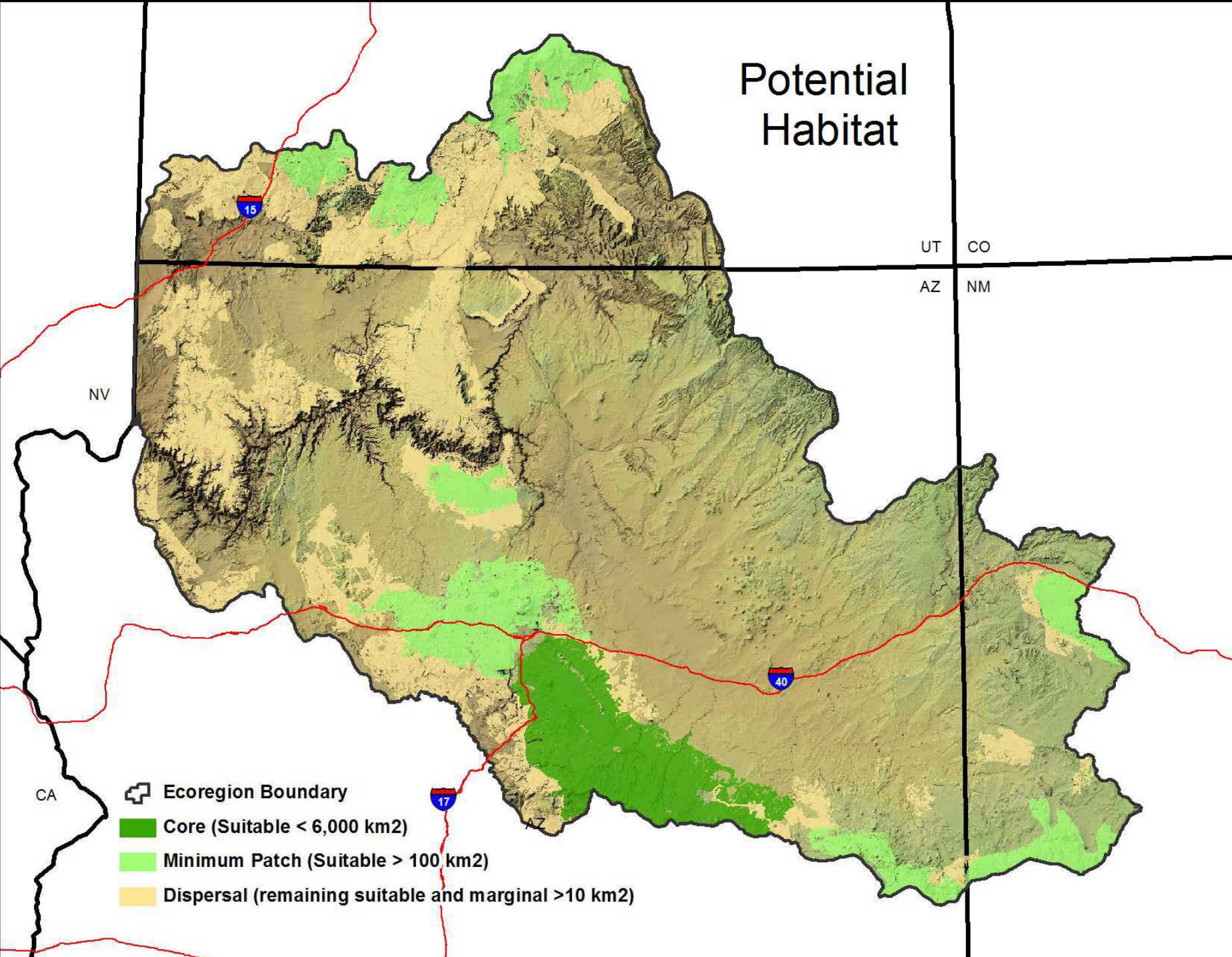
Proximity to Water



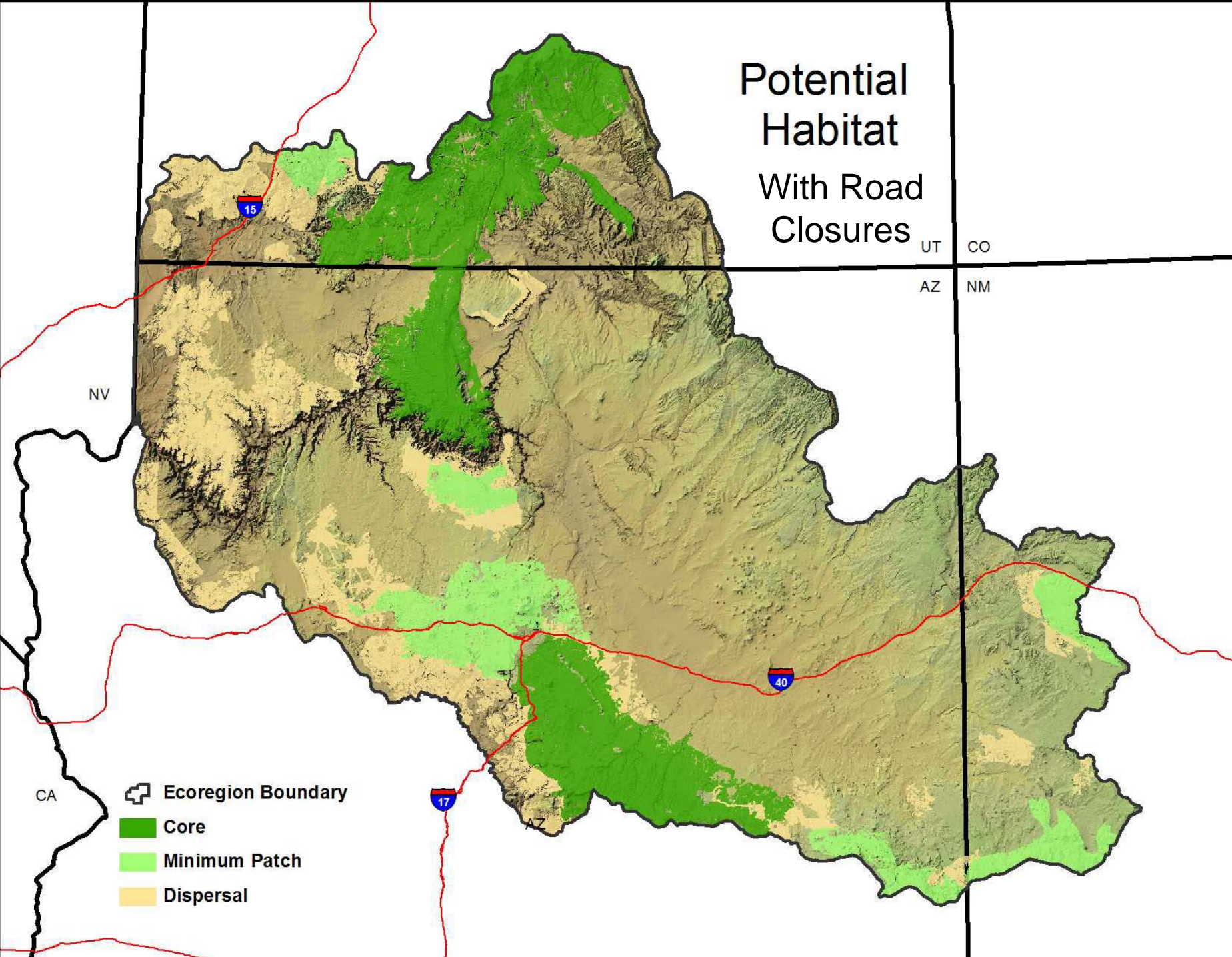
Potential Wolf Habitat



Potential Habitat



Potential Habitat With Road Closures



Thank You...Questions???



Kurt Menke
Bird's Eye View - GIS Services
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