

The Gunnison and Greater Sage Grouse have a life-threatening flaw in their habitats! This flaw could stop their populations from ever recovering--and at the worst could cause their extinction--"Zombies"!

A “Zombie ecosystem” is where you only have old plants and no young plants or seedlings. The easy method to detect Zombies, is to measure the basal diameter of 100 plants in a population, and separate the diameters into categories, like 0-1 inch, 1-2 inches, 2-3 inches, and form an age-pyramid.

You have Zombies when your age pyramid is upside down

Here is an example of a Zombie ecosystem in Bluebunch wheatgrass (*Pseudoroegneria spicata*) north of Reno Nevada, that has been that way for a long time, maybe decades: (# of plants):

Diameter:

0-2 inches = 0

2-4 inches = 0

4-6 inches = 0

6-8 inches = 3

8-10 inches = 10

10-12 inches = 8

12-16 inches = 9

>16 inches = 0

Zombies are native grass and other perennial native plant populations that are the living dead--they stopped producing seedlings and reproducing decades ago, even though they produce viable seeds every year. These Zombies will eventually age out and die, leaving a massive vacancy that can very easily be filled by exotics like cheatgrass, and wipe out the native forb chick food-plants, and sagebrush plants.



Also, the exotics can cause more fires, wiping out more critical habitat, and so on.



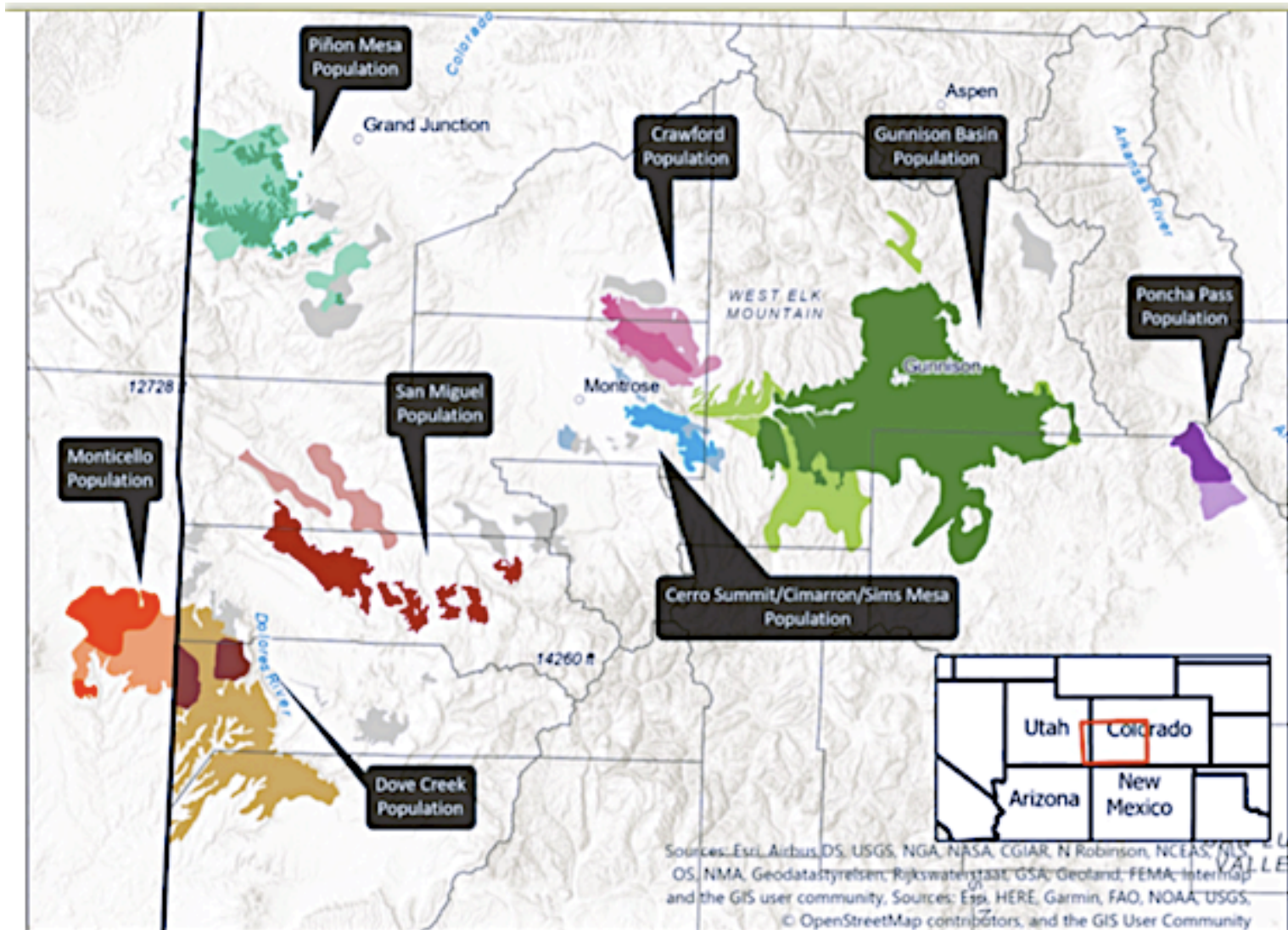
The cause is domesticated animal grazing of arid grasslands over time, removing the surface organic matter and nutrients below the levels required by native plant seedlings for their survival.

Test	Result	Strongly Acidic	Moderately Acidic	Slightly Acidic	Neutral	Slightly Alkaline	Moderately Alkaline	Strongly Alkaline	Qualitative Lime
pH	6.5 s.u.								None

EXTRACTABLE NUTRIENTS

Test	Result	Sufficiency Factor	SOIL TEST RATINGS					NO3-N
			Very Low	Low	Medium	Optimum	Very High	
Available-N	33 ppm	0.4						8 ppm
Phosphorus (P) - Olsen	14 ppm	0.2						
Potassium (K)	592 ppm	2.1						
Potassium - sat. ext.	1.4 meq/L							
Calcium (Ca)	2720 ppm	0.9						
Calcium - sat. ext.	7.7 meq/L							
Magnesium (Mg)	370 ppm	0.9						
Magnesium - sat. ext.	2.6 meq/L							
Copper (Cu)								
Zinc (Zn)								
							NH4-N	
							25 ppm	
							Total Exchangeable Cations(TEC)	
							172 meq/kg	

We need to survey for Zombie ecosystems across the entire ranges for both the Gunnison and the Greater Sage Grouse populations, and determine where the Zombies are lurking, and what will be needed to fix that problem.





A reproducing native grass population, Indian Rice grass north of Reno.
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Fire photo from USDA ARS, GUSG population map is USFWS Recovery Plan.**