Apr 17th, 11:00 AM - 12:00 PM

Fire on the Mountain: Impacts of First-Year Burned Habitat on Wildlife Occupancy

Dakota Vaccaro
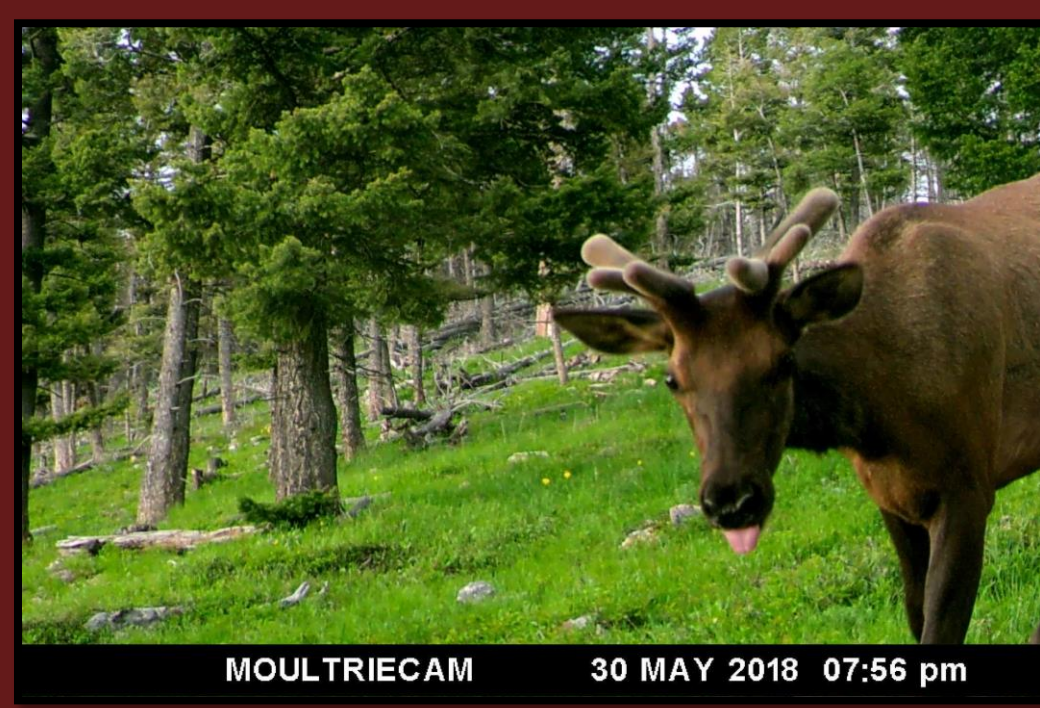*The University Of Montana*, dakotavacc@gmail.com

Vaccaro, Dakota, "Fire on the Mountain: Impacts of First-Year Burned Habitat on Wildlife Occupancy" (2019). *University of Montana Conference on Undergraduate Research (UMCUR)*. 8.
https://scholarworks.umt.edu/umcur/2019/amposters/8

Fire on the Mountain: Impacts of First-Year Burned Habitat on Wildlife Occupancy

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Introduction

• Temperatures are increasing around the world and fires are becoming more frequent. In 2017 wildfires burned over one million acres in Montana (1).

• Given the immense impacts wildfires have on habitats throughout Montana and their increasing prevalence, it is important to understand how they affect wildlife populations.

• Currently, little to no research has looked at the impacts of fire on wildlife during the year immediately following a burn. What few studies that have, only looked at prescribed fires and lack variables caused by naturally occurring wildfires.

• Research Question: How does wildlife occupancy compare in burned and unburned areas in the year following a high to mid severity wildfire?

• Fire studies are a hot topic (literally) and there is a continual need for new data to inform management decisions.

• My research will contribute new information about how wildlife use recently burned habitat patches. This will help expand the limited pool of information on fire ecology and help inform future environmental decisions regarding forest management.

Methods

• Study duration: May 15th to Aug 15th
• 2 study sites: Alice Creek (Burn Site) and Wolf Creek Ranch (Control Site). Covered ~1600 acres on each site.
• Cameras placed in medium to high severity burned areas
• Set up 15 trail cameras in each site. Moved them to new random points every 4 weeks.(Fig 1. and Fig.5)
• Conducted vegetation sampling at each camera site. Recorded vegetation cover, tree cover, forb cover, grass cover, aspect, and more.
• Used eMammal to analyze picture data.
• 5 focal species: Mule Deer, White-Tailed Deer, Elk, Grizzly Bears, Black Bears.
• Used the package "Unmarked" in program R to create detection and occupancy models. Used Akaike information criterion to select best models.
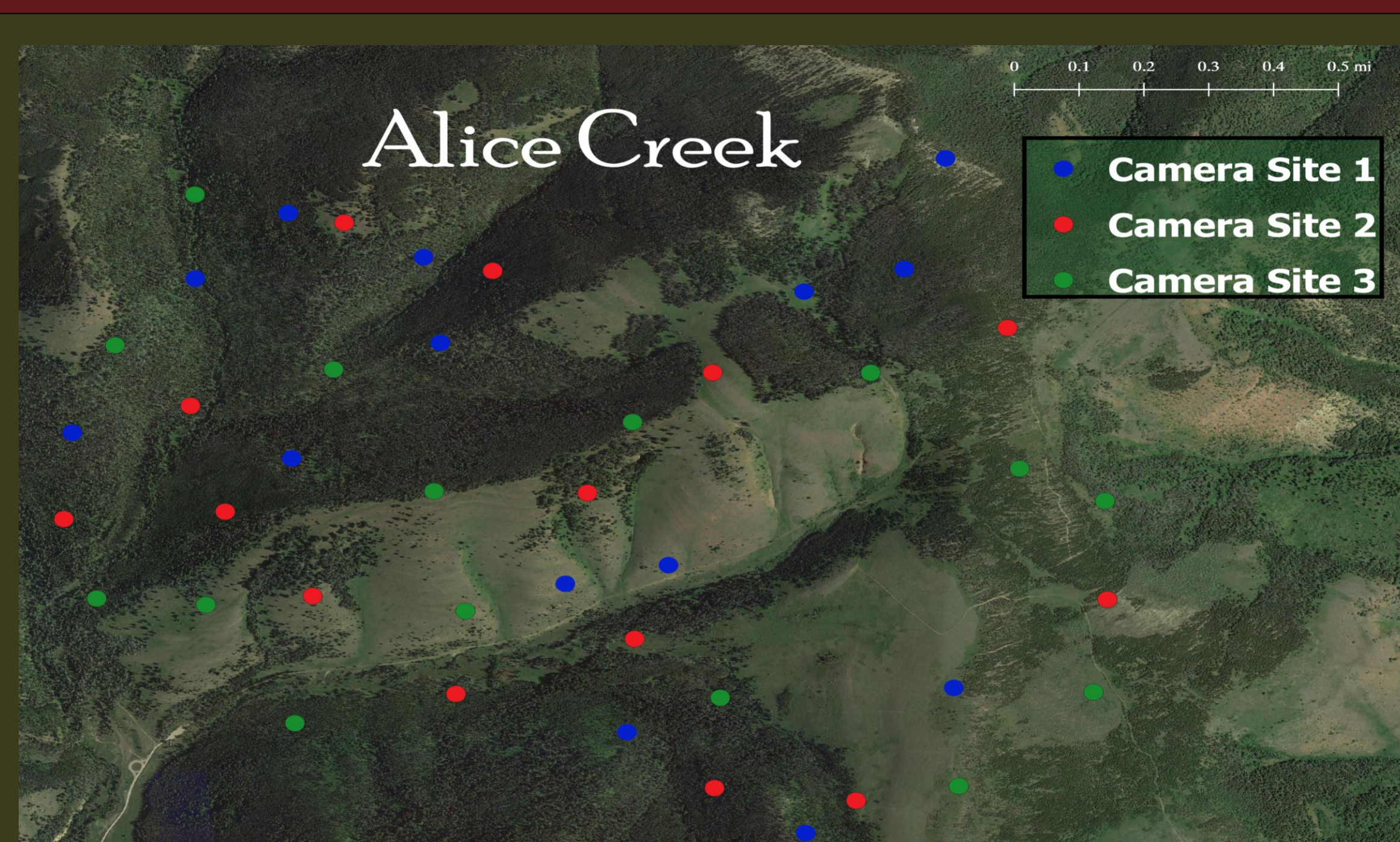

Figure 1: Distribution of cameras and rotations on Alice Creek

Findings

• Mule deer occupancy was significantly higher in unburned sites (p <.5). Mule deer preferred areas with high forb and shrub cover

• While- tailed deer occupancy did not significantly differ between burned and unburned sites (p >.5)

• Elk occupancy was significantly higher in unburned sites (p <.5)
  – Elk preferred site with high shrub and tree cover

• Black bear detections were higher in the unburned site
  – Not enough detections to run Unmarked model

• Grizzly bear detections were higher in the burned site
  – Not enough detections to run Unmarked model
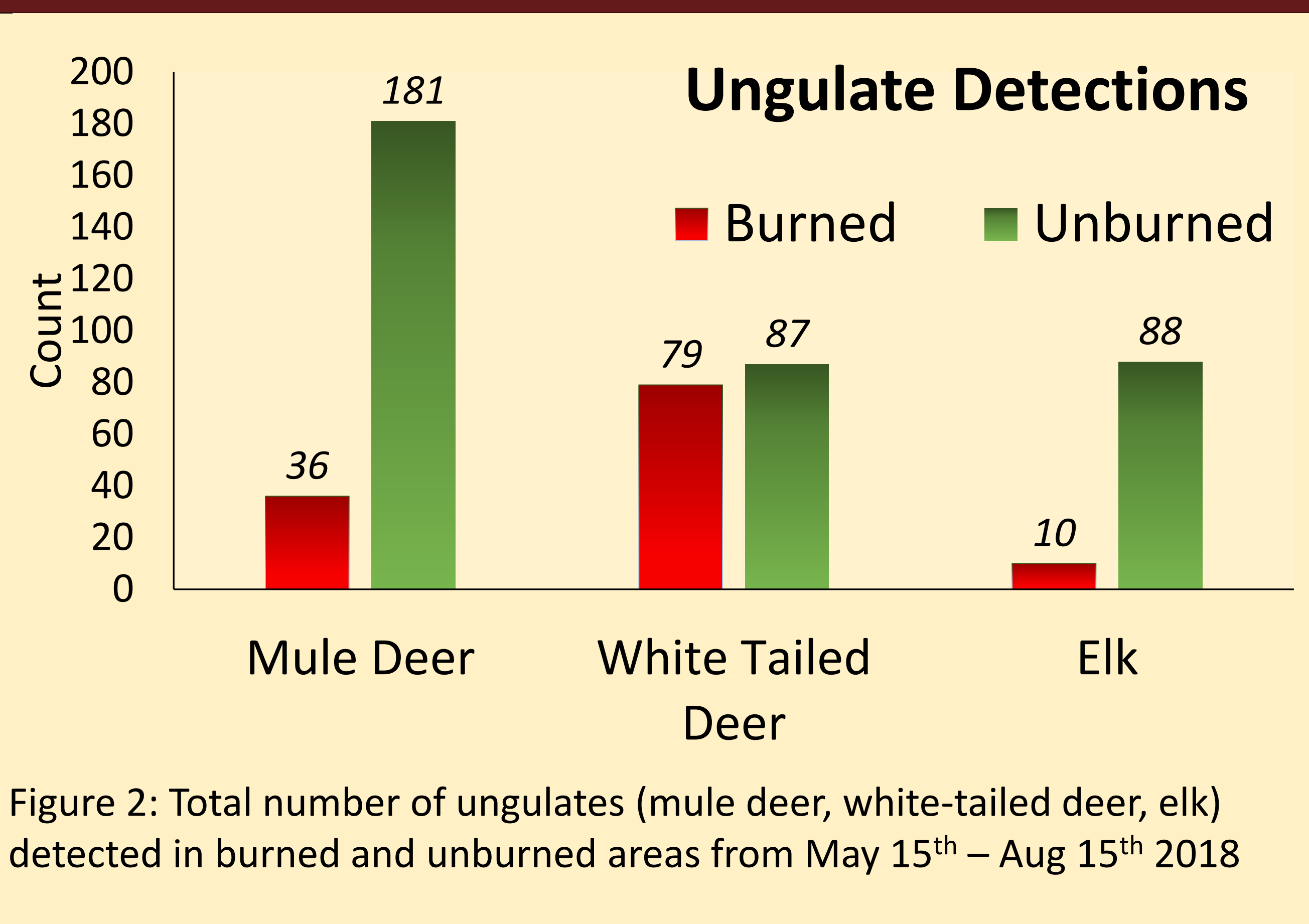• Detected twice as many different species in unburned habitat than in burned habitat

Figure 2: Total number of ungulates (mule deer, white-tailed deer, elk) detected in burned and unburned areas from May 15th – Aug 15th 2018
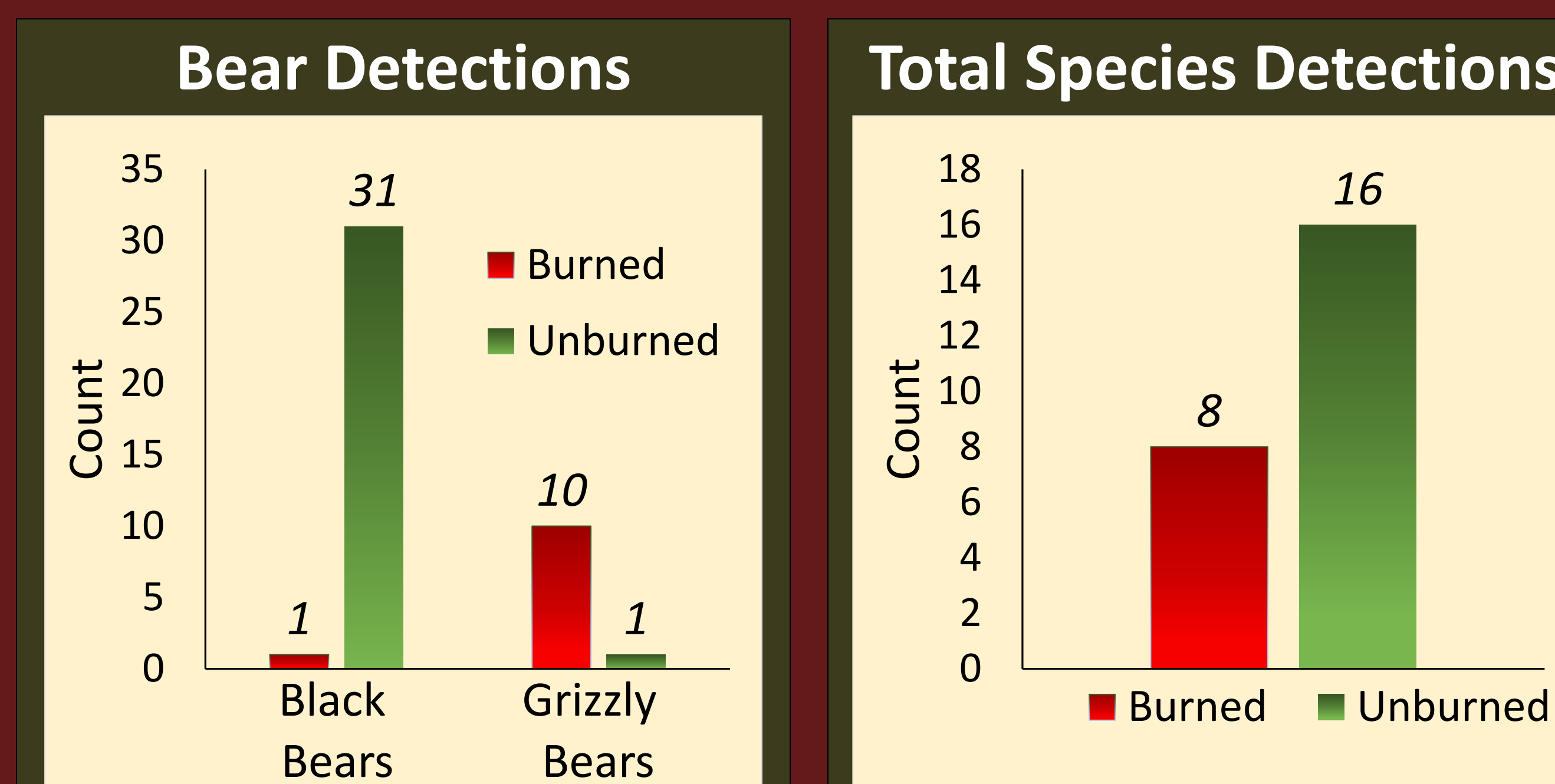

Figure 3: Total number of black bears and grizzly bears detected in burned and unburned areas from May 15th- Aug 15th 2018
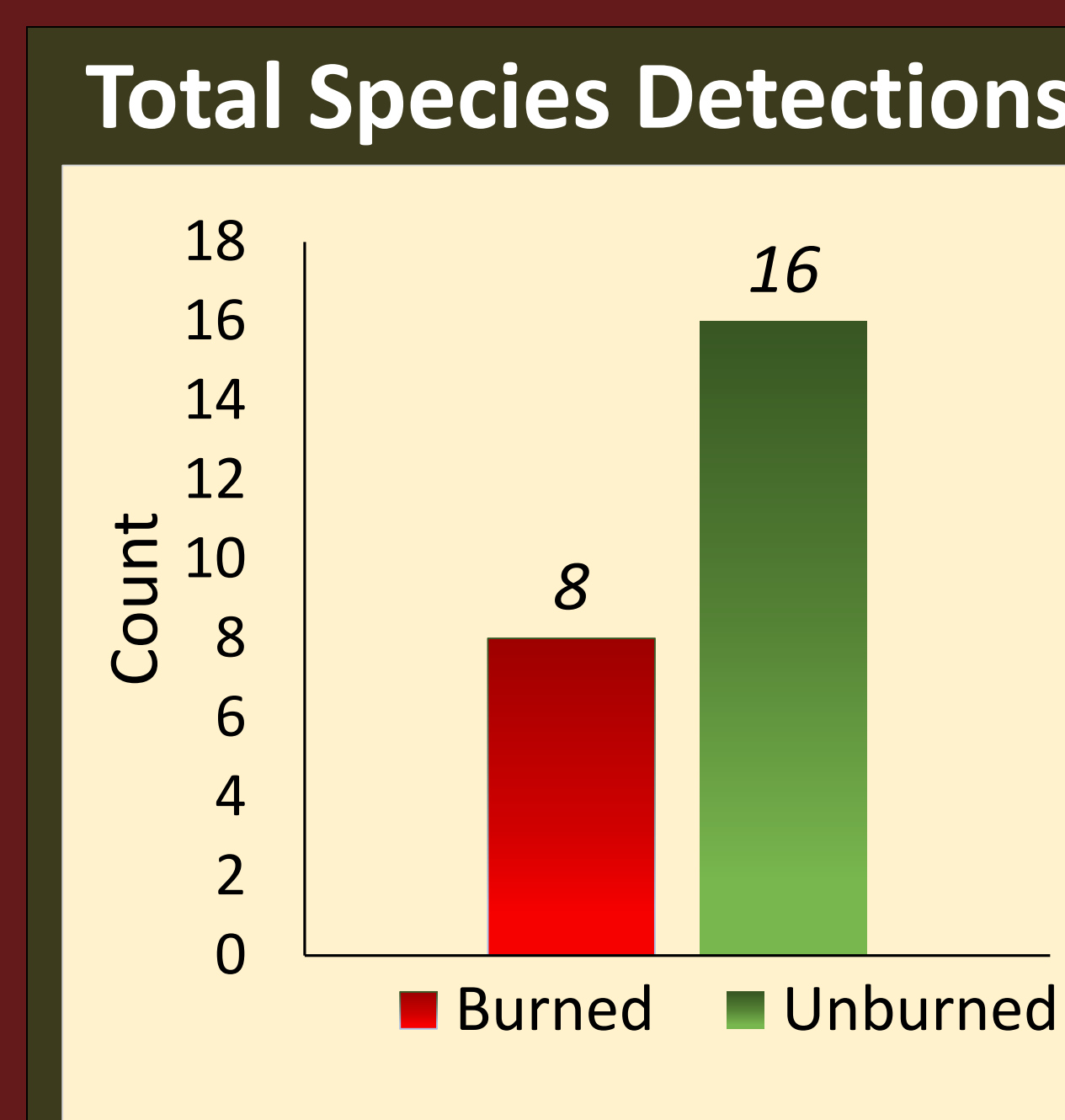

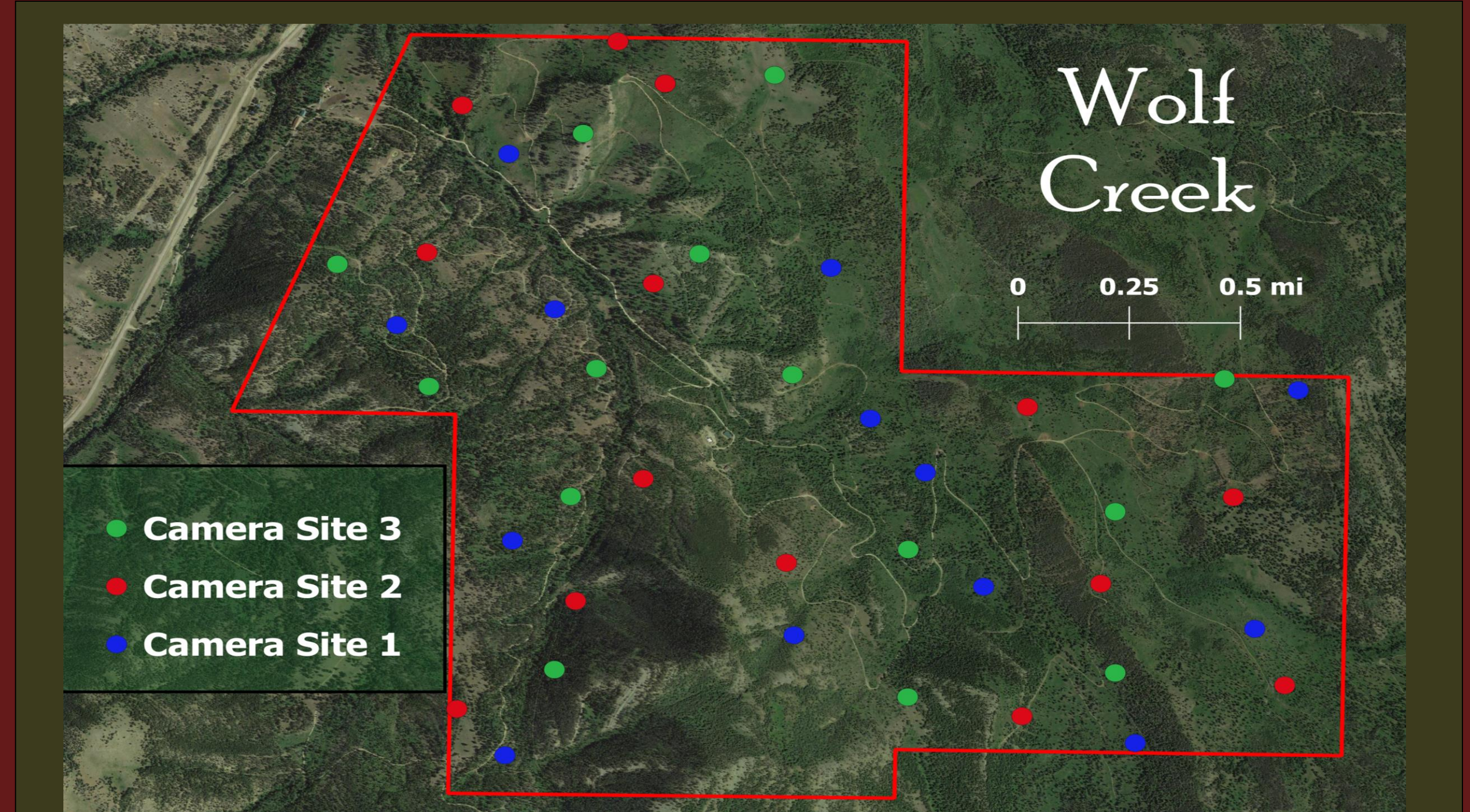Figure 4: Total number of species detected in burned and unburned areas from May 15th- Aug 15th 2018

Figure 5: Distribution of cameras and rotations on Wolf Creek Ranch

Outlook? Not Good!

• In the year following a fire, medium to high severity burns create unfavorable habitat for most species and could negatively impact wildlife populations.

• Ungulates seem to select habitat based on food availability and amount of cover from predators. White-tailed deer may be pushed out of unburned habitat by elk and mule deer, thus forcing them to use poor quality burned habitat more.

• Black bears seem to select on habitat with high shrub and tree cover. Black bears usually prefer habitat with dense vegetation and avoid open areas (2), which compliments my finding that black bears avoid burned areas.

• On the flip side, grizzly bears were the only species detected more often in burned habitat. Given the high density of bears observed in such a small range, this strongly suggests they might be attracted to resources (glacier lilies) found in the burn. However, more research is needed.

• After a medium to high severity fire, wildlife are displaced until the burn recovers. Wildlife that depend on patches of critical habitat have no place to go, which can result in population decreases and, in severe cases, local extinctions.

• Given they most species are negatively impacted by medium to high severity fires, managers should focus on preventative measures that decrease the likelihood of ignition.

Literature Cited

1. Rogge, Dana. "A Million Acres Scorched by Montana Wildfires | USDA." Oct 03, 2017.
2. Cunningham, Stanley C., et al. "Black bear habitat use in burned and unburned areas, central Arizona." Wildlife Society Bulletin (2003): 786-792.