

Wolf movements and predation in ranching landscapes of the eastern Greater Yellowstone Ecosystem

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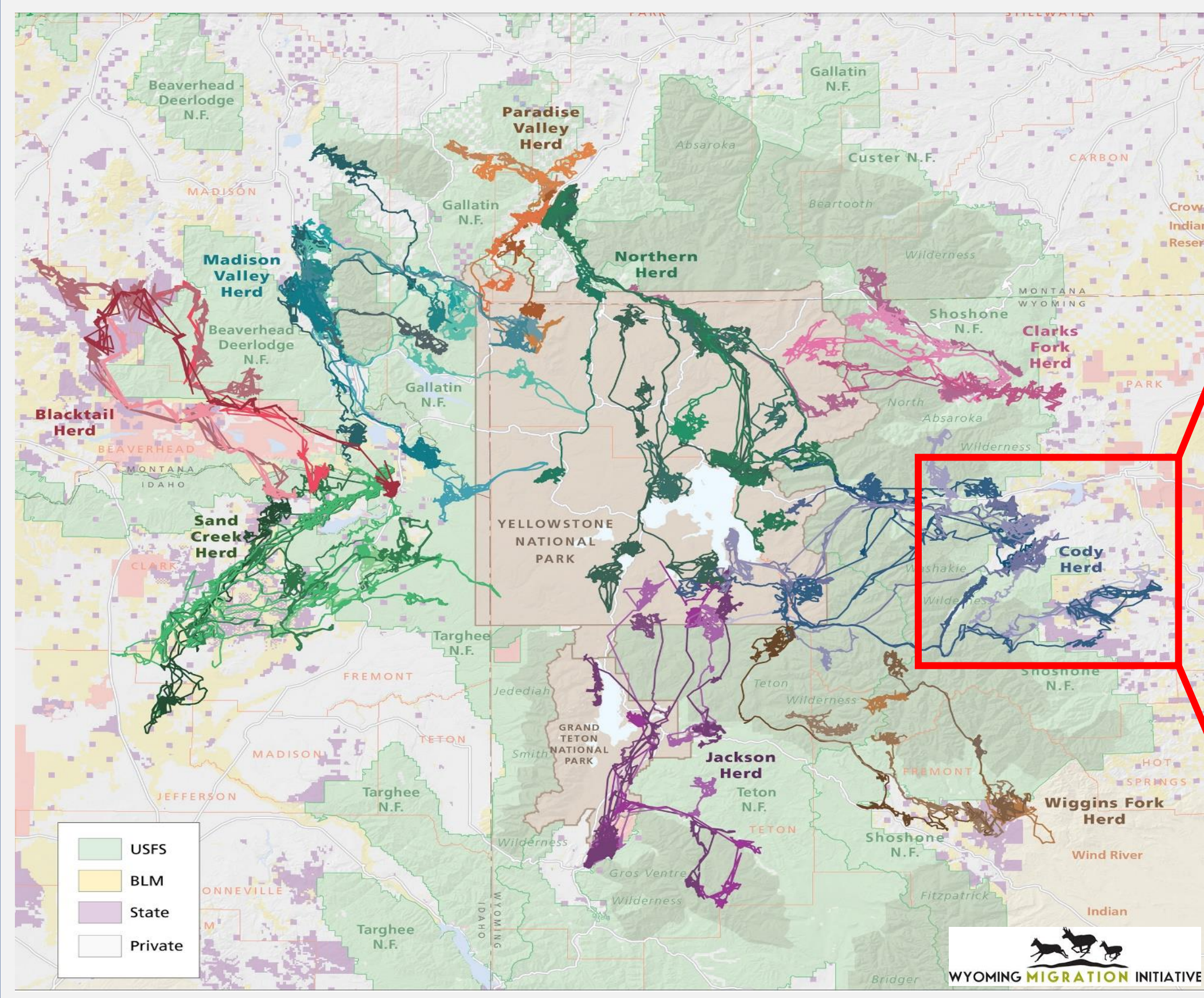


Background

- In the GYE, the expansion of wolves and grizzly bears from core wilderness areas to nearby rangelands has led to **increased predation on livestock**.
- Our research is focused on **understanding the environmental and behavioral drivers of wolf depredation** east of Yellowstone National Park near Cody, Wyoming.

Elk migrations in the GYE

Figure 1. Prey distribution and migration patterns may be one factor influencing patterns of depredation. The study area (red box) encompasses the primary winter range of the Cody elk herd.



Study Area

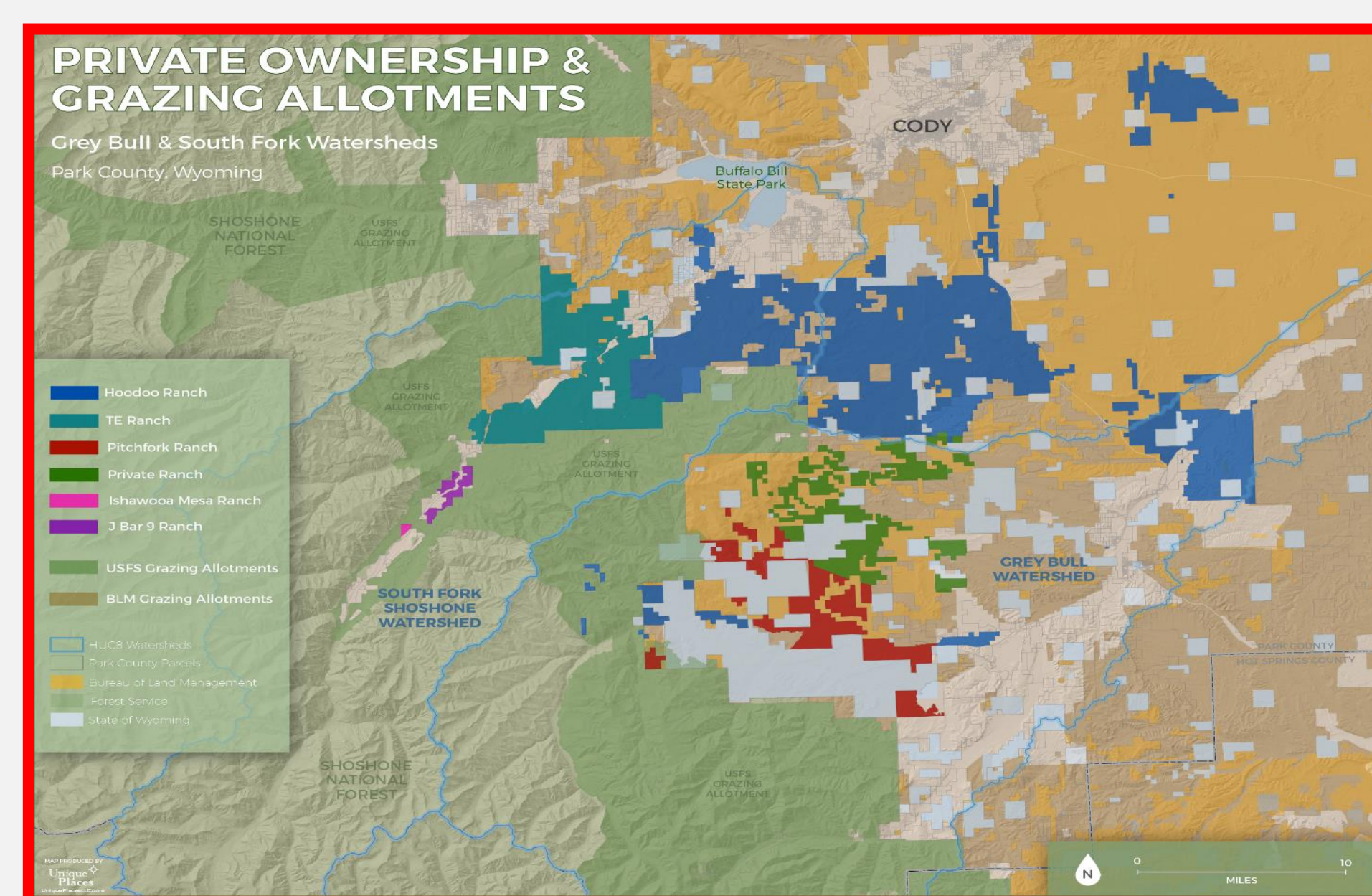


Figure 2. The approximate study area, illustrating many (but not necessarily all) ranches we anticipate engaging in this work.

Objectives

To evaluate seasonal patterns of wolf movement and predation and set up a longer term study analyzing the environmental drivers of livestock depredation risk and the ecology of wolf-cattle interactions.

Question 1: How do wolf movements change seasonally (i.e. spanning elk migration)?

Question 2: How do wolf kill rates and prey selection change seasonally?

Methods

GPS collaring by WGFD in Jan and Feb 2019

- 11 wolves – 4 wolves in 3 focal packs
- 60 cow elk (along with VITs in pregnant elk)

Cluster searching to evaluate predation patterns

- Winter (Feb-March) season for when elk are in human-dominated areas near ranches
- Summer (July-Aug) season for when elk migrate to high elevation protected areas
- Defined cluster as ≥ 2 points within 100m within 4 days
- If carcass was present, we investigated to determine cause of death and condition of the prey
- Classified each into cluster type to be used to build model



Ken Mills of WGFD puts a GPS collar on a wolf

An example of multiple clusters from a kill that was field-checked this year



Results of first winter and summer field seasons

Table 1. Breakdown of total clusters visited in winter and summer 2019. Most clusters were beds or unknown.

Cluster types	Winter	Summer	Total
Beds	115	113	228
Probable/possible wolf kills	25	15	40
Scavenge/unknown-cause mortality	7	8	15
Unknown/other	28	96	124
Revisits of old clusters/mortalities	2	5	7
Total clusters visited	177	237	414

Figure 4. Number of detected kills per age class in winter and summer field seasons. Prey species mostly consisted of elk (*Cervus canadensis*), followed by mule deer (*Odocoileus hemionus*), and also included a bighorn sheep (*Ovis canadensis*), a moose (*Alces alces*) and several beef cows (*Bos taurus*).

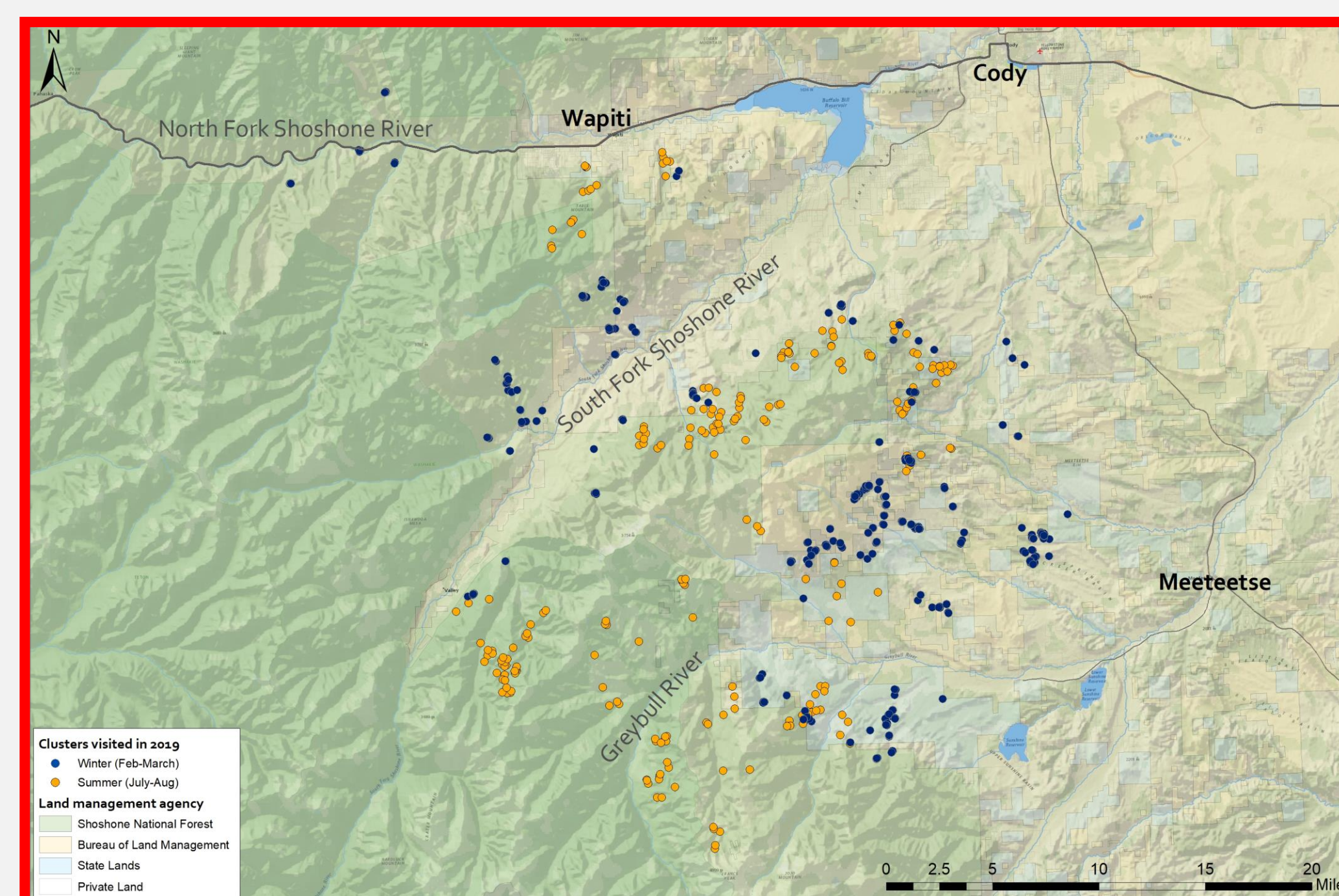
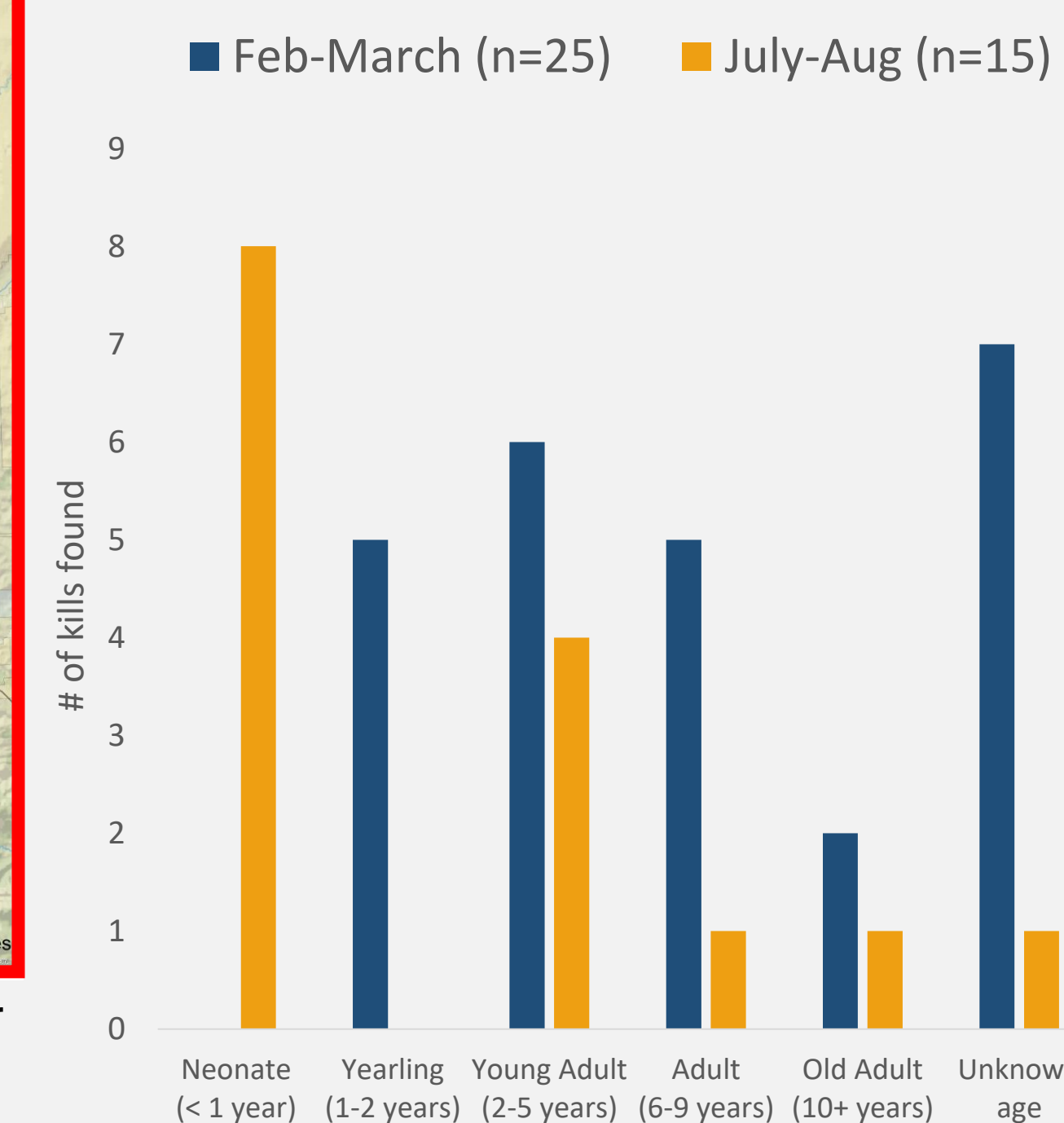
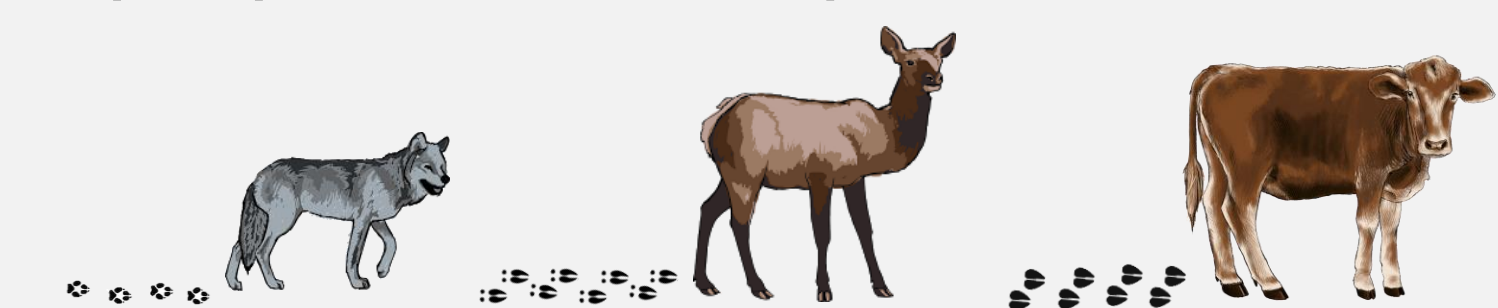


Figure 3. Map of total clusters visited in winter and summer. Winter clusters were mostly concentrated in low elevation areas, whereas summer clusters ranged from low to as high as 11,000ft.

Next Steps

- Analyze elk and wolf movement data from past years and this year
- Design interviews to pilot next year to understand barriers to conflict mitigation strategies (as a potential social science chapter)
- Assess this year's field seasons and prepare for next year



Contrasting Hypotheses (Nelson et al. 2016)

Prey tracking hypothesis: wolves are attracted to native prey, but kill co-occurring livestock

Prey scarcity hypothesis: native prey become scarce through seasonal changes (i.e. migration) or long-term declines and wolves shift to hunting livestock

Questions for you:

- Suggestions for gathering information on predation events on neonates or small prey?
- Recommendations for using wolf hair and scat samples for diet analysis?

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