

# Mapping coexistence and conflict between sheep herders and carnivores in Blaine county, Idaho



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## BACKGROUND

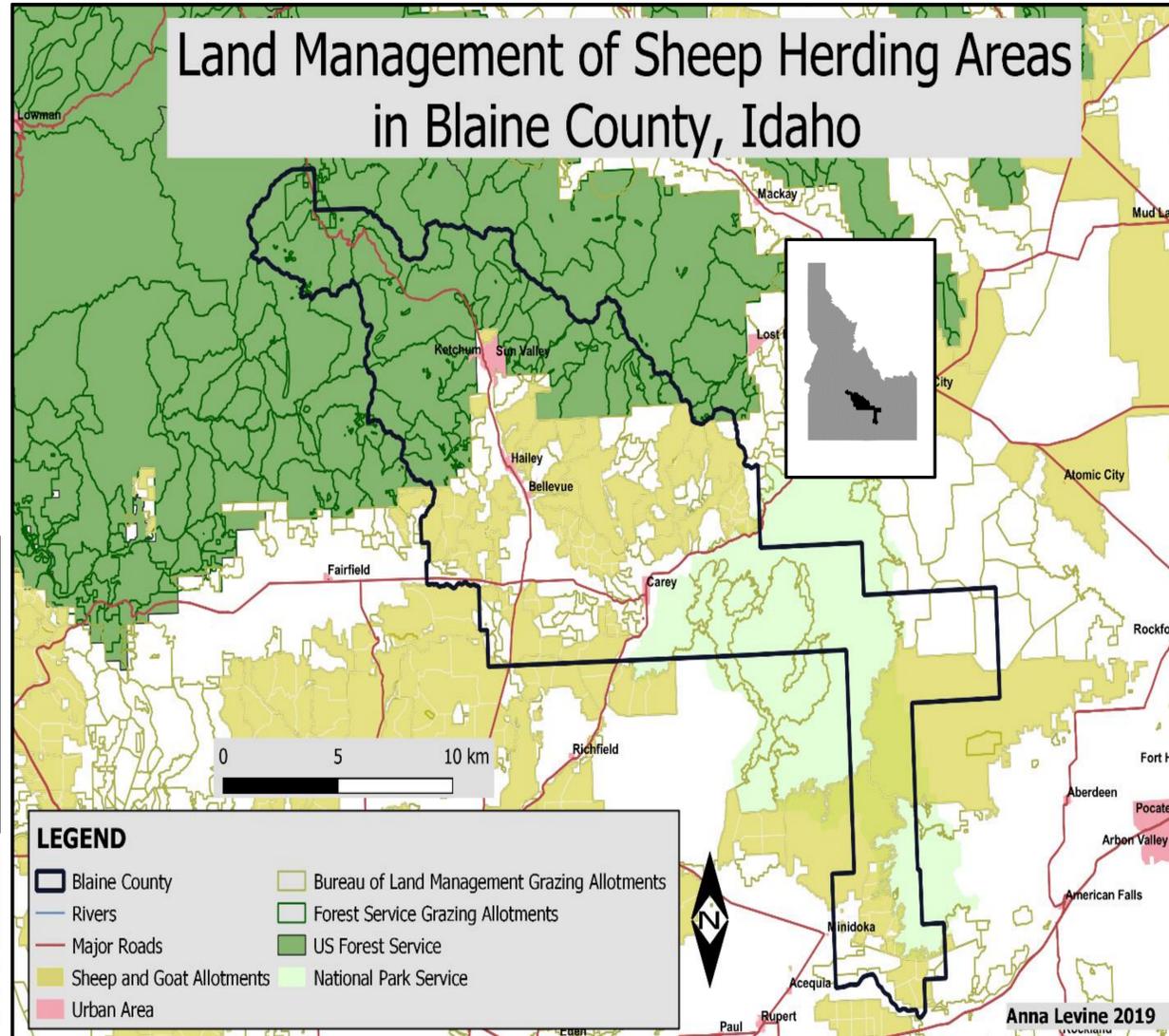
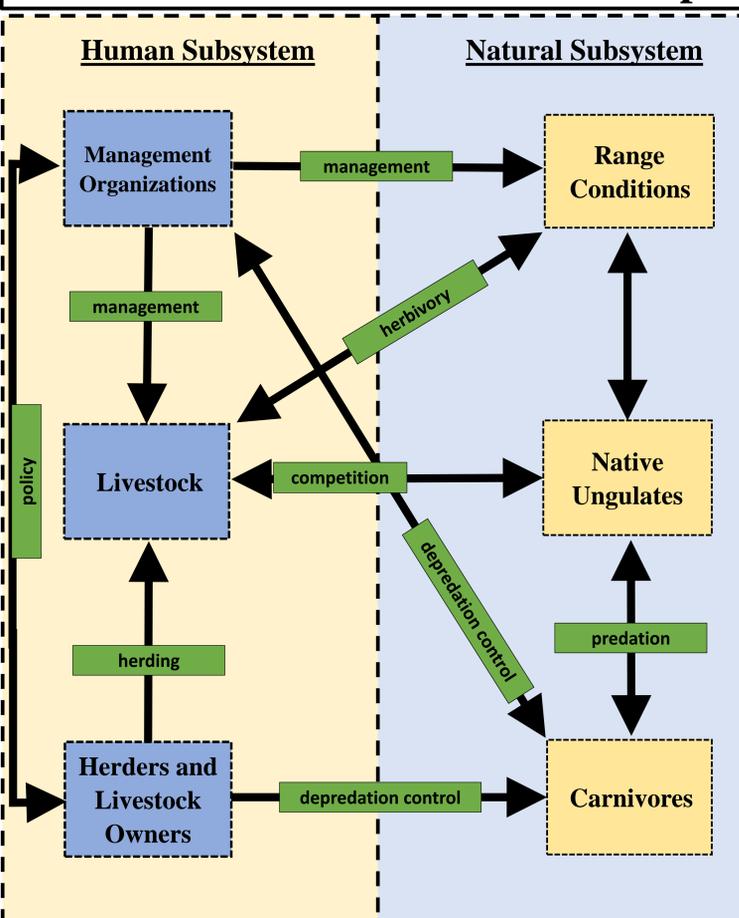
- Concerns for the safety of humans, livestock, and game animals have driven management policies of extirpation of terrestrial carnivores in the US<sup>1</sup>
- Data indicate that carnivores play essential roles in maintaining processes that support ecosystem stability<sup>2</sup>

**6,700:** number of sheep and lambs lost to depredation in Idaho, 2016<sup>3</sup>  
**\$1.36 million:** economic value of sheep and lambs lost to depredation in Idaho, 2016<sup>3</sup>

## PROBLEM

- It is unknown if and how human-carnivore coexistence is feasible in the context of sheep herding.
- The reciprocal ecological and social impacts of herding, carnivores, native ungulates, and rangeland floristic health are unclear.

## Coupled Human and Natural Systems of Carnivore-Livestock Relationships<sup>4</sup>



Surface land management by managing agency in Blaine County, Idaho. The majority of Blaine County is publicly owned land managed by the US Forest Service and the US Bureau of Land Management.

## RESEARCH QUESTIONS

- In what ways and where is livestock herding compatible with ecological integrity?
- How, and to what extent, does grazing effect rangeland and carnivore ecology?
- Where, when, and why do herders and livestock owners move sheep?
- By what criteria do herders and livestock owners make spatial decisions?

## HYPOTHESES

- Herders and carnivores minimize conflict through spatial and temporal niche partitioning
- Herders consider rangeland health and carnivore presence in their spatial use decisions
- Depredation events follow spatial and temporal patterns
- Herders and livestock owners view certain species of carnivores with a level of risk that is disproportionate to their rate of livestock depredation

## PROPOSED METHODS

- Identify spatial, temporal, and social patterns in herder activity through participatory and GIS mapping of herder movements
- Identify herder decision-making strategies and risk perceptions
- Map depredation events and other sites of importance

## IMPLICATIONS

- Improve conservation and coexistence strategies
- Reduce depredation events
- Spatial ecology can be used to inform community and behavioral ecology in a human-dominated landscapes
- Contribute to the need for case-studies of CHANS

## Casualties of Conflict, Idaho State

Carnivore	Killed/Euthanized (2017) <sup>5*</sup>	Sheep Depredated (2016) <sup>6#</sup>
Bears	6	200
Bobcats or lynx	1	-
Coyotes	3,477	4,200
Dogs	1	600
Foxes	22	-
Mountain lions	5	200
Wolves	29	800

## EXPECTED OUTCOMES

- An understanding of where, when, and why sheep are grazed in particular locations
- An understanding of where, when, and why depredation occurs
- Spatially explicit coexistence strategies

## REFERENCES

<sup>1</sup>Bruskotter, J. T., Treves, A., & Way, J. (2014). The Challenge of Conserving Carnivores in the American West. In B. S. Steel (Ed.), *Science and Politics: An A-Z Guide to Issues and Controversies*. Thousand Oaks, CA: CQ Press.

<sup>2</sup>Ripple, W. J., Estes, J. A., Beschta, R. L., Wilmers, C. C., Ritchie, E. G., Hebblewhite, M., ... Wirsing, A. J. (2014). Status and Ecological Effects of the World's Largest Carnivores. *Science*,(2014).

<sup>3</sup>2016: National Agricultural Statistics Survey Press Release(2017). *Idaho Sheep and Lamb Losses Total 28,500 Head in 2016*. United States Department of Agriculture. Olympia, WA.

<sup>4</sup>Carter, N. H., Viña, A., Hull, V., McConnell, W. J., Axinn, W., Ghimire, D., & Liu, J. (2014). Coupled human and natural systems approach to wildlife research and conservation. *Ecology and Society*, 19(3).

<sup>5</sup>Animal and Plant Health Inspection Service. (2017). Animals Dispersed / Killed or Euthanized / Removed or Destroyed / Freed. Retrieved 03/30/19 from <https://www.aphis.usda.gov>. \*intentional kills only.

<sup>6</sup>National Agricultural Statistics Survey Press Release. *Idaho Sheep and Lamb Losses Total 28,500 Head in 2016*. (2017). United States Department of Agriculture. Olympia, WA. #sheep and lambs combined.