Spatiotemporal Variability in Biomass and Forage Quality Across a Temperate Landscape with Heterogeneous Phenology Patterns (Poster)

Erica L. Garroutte*, Ecology Department, Montana State University, Bozeman, MT
Andrew Hansen, Ecology Department, Montana State University, Bozeman, MT
Scott Creel, Ecology Department, Ecology Department, Montana State University, Bozeman, MT
Rick Lawrence, Land Resources and Environmental Science, Montana State University, Bozeman, MT
Jim Robison-Cox, Department of Mathematical Sciences, Montana State University, Bozeman, MT

Although spatial and temporal heterogeneity in grassland biomass and forage quality is well-recognized to play an important role in migratory ungulate population dynamics, attempts to directly quantify biomass and forage quality across temperate landscapes throughout the growing season are limited. It is generally recognized that biomass and forage quality are directly related to phenology, but little is known about how seasonal biomass and forage quality differs across land use and biophysical gradients with varying phenology patterns. This study uses field estimates of biomass, chlorophyll concentration, crude protein, and in vitro dry matter digestibility collected from 20, 250m^2 grassland plots throughout the

summers of 2013 and 2014 to quantify how biomass and forage quality differ across land uses and biophysical gradients in the migratory elk (*Cervus elaphus*) range in the Upper Yellowstone River Basin. Key findings were that irrigated agriculture had overall greater and longer available biomass and forage quality throughout the growing season compared to private and public grasslands with natural phenology patterns. And that areas that begin growth later in the season had overall greater biomass and forage quality than areas with mid and early phenology characteristics, but availability was shorter. These results suggest that seasonal patterns of biomass and forage quality differ with phenological characteristics across temperate landscapes. This information should be incorporated in our understanding of spatiotemporal patterns of vegetation important for studying migratory ungulate ecology and predicting the effects of climate change and human land use on vegetation dynamics in temperate landscapes.