Factors Influencing Seasonal Migrations of Pronghorn Across the Northern Sagebrush Steppe

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Globally, grassland systems have received the highest impacts from human activities, and therefore management of these systems is important for ungulate conservation. Pronghorn (*Antilocapra americana*) undertake seasonal migrations to satisfy annual life history requirements. The effects from environmental gradients and anthropogenic factors on pronghorn migrations are not well understood. My objectives were to: 1) Classify and determine metrics for various movement behaviors and states across individuals; 2) Predict multi-scale seasonal pronghorn migration pathways across the Northern Sagebrush Steppe (NSS) and integrate scales into one spatial prediction and; 3) Create pronghorn connectivity network maps across the NSS. Based on 170 animal years from collared females, 55% of individuals undertook seasonal migrations. Using between-class analysis of metrics, three distinct movement groupings were identified. Next, I modelled multi-scale migratory pathway selection in response to anthropogenic and environmental parameters. Generally, migratory pronghorn selected grasslands, intermediate slopes and south-facing aspects and avoided increased well and road densities. Pronghorn selected stopover sites with higher forage productivity values and lower well densities versus migratory pathways. I then used a scale-integrated mapping approach and found that these spatial predictions performed as well or better than single order scales to predict migration pathways. Finally, using a suite of novel approaches, I created seasonal pronghorn connectivity networks across the NSS. I concluded that multi-scale migration followed hierarchically nested theory where finer scale decisions are conditional on broader scales that can be assessed sequentially. I suggest that the pronghorn is a broad-scale focal species useful for conservation planning across the NSS.