Drivers of Variation in Pronghorn Population Dynamics in Montana

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Conserving pronghorn populations is a high management priority in Montana, given the important ecosystem functions they perform and recreational opportunities they provide. Pronghorn populations in the early 2000s were generally at or above objective across Montana; however, population declines in recent decades have left many populations below objective. Our goal was to identify the vital rates most associated with pronghorn population change to inform management decisions and facilitate recovery of pronghorn across the state. We developed integrated population models (IPMs) for each of 9 hunting districts to estimate pronghorn abundance and vital rates, and to identify the vital rates most associated with population change from 2004 - 2022. Variability in 4-month recruitment explained the most variation in pronghorn population growth; however, adult female survival had the largest proportional impacts. Populations usually increased when adult female survival was >0.75 and 4-month recruitment was >0.72, but these associations were largely mediated by one another. There was considerable uncertainty in the factors affecting vital rates; however, increased snowdepth was associated with reduced adult survival, and increased NPP was associated with increases in adult survival and 4-month recruitment in some hunting districts. Our results suggest pronghorn management should prioritize manipulation of adult female survival rates to achieve population objectives. IPM results were highly sensitive to assumptions regarding knowledge and confidence in aerial counts and harvest; thus, we recommend assessing the survey and inventory program to assess confidence in aerial counts and reduce uncertainties in results.