
****ESTIMATING GRIZZLY BEAR USE OF LARGE UNGULATE CARCASSES WITH GPS TELEMETRY DATA**

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Ungulate meat is among the most calorie-rich food sources available to grizzly bears (*Ursus arctos*) in the greater Yellowstone ecosystem (GYE). However, the ephemeral and unpredictable nature of carcasses makes them difficult to study and their influence on grizzly bear foraging and spatial ecology is poorly understood. We developed a spatial-clustering technique specifically for detecting grizzly bear use of large ungulate carcasses using Global Positioning System (GPS) telemetry locations ($n = 54$ bear years). We used the DBScan algorithm to identify GPS clusters of individual bears ($n = 2,038$) and intersected these clusters with an independent dataset of site visits to recent bear movement paths based from randomly selected days ($n = 732$ site visits; 2004–2011) resulting in 174 clusters associated with field measured bear behavior. Using a suite of predictor variables derived from GPS telemetry locations, e.g., duration of cluster, area used, activity sensor values, re-visitation rate, we used multinomial logistic regression to predict the probability of belonging to each of the five response classes (resting, multiple-use, low-biomass carcass, high-biomass carcass, old carcass). Focusing on the high-biomass carcass category, for which our top model correctly classified 88 percent of the carcasses correctly, we applied our approach to a larger dataset of GPS data to examine trends in large-ungulate carcass using of grizzly bears in the GYE from 2002–2011. We found quantitative support for a positive effect of year and mortality adjusted white bark pine cone counts on the carcass-use index during the fall months (Sep and Oct) from 2002–2011.