Patterns and Spatial Prediction of Livestock Predation by Grizzly Bears on the Blackfeet Reservation

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Human caused mortality is a primary limiting factor in carnivore conservation globally. A large proportion of predator persecution is the result of retaliation due to lost livestock. If carnivore conservation is to succeed then the economic burden on livestock producers needs to be ameliorated. Proactively preventing livestock depredation is perhaps the most effective method to solve conflicts compared to reactively relocating problem animals or reimbursing people for losses. Large carnivores, however, range across wide areas while management dollars are limited and thus where to implement conflict prevention measures is a matter of triage. To prioritize conflict prevention efforts we examined 23 years of data on livestock depredation by grizzly bears (*Ursus arctos*) across the Blackfeet Indian Reservation. Since 1993 livestock loss by grizzlies has increased an average of 6% per year and depredations were positively associated with warmer weather. Additionally, we forecasted spatial risk by estimating the relative probability of livestock loss across the reservation. Using logistic regression models we tested remotely sensed landscape variables to understand how habitat features influence the risk of depredation by bears. We found that locations closer to trees had the highest chance of livestock loss. Furthermore, places closer to perennial and seasonal water also had increased risk. Topography also influenced depredation probability with lower elevations and gentler slopes having increased risk. In all, our results will provide 1) managers a clear path in prioritizing areas to receive conflict prevention resources, and 2) livestock growers a knowledge of how to distribute animals to reduce risk.