

HIGHWAY CROSSING AND MORTALITY PATTERNS OF BLACK BEAR FOR WILDLIFE PASSAGE PLANNING IN NORTHWEST MONTANA^{TWS}

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Our understanding of the effects of highways on wildlife connectivity is limited due to a lack of detailed data on animal movements within transportation corridors. Prior to highway construction in my study area, we used hourly locations from GPS collars to (1) analyze spatial and temporal characteristics of crossing locations, (2) compare crossing frequencies to traffic volumes and crossing speeds to average speeds, (3) compare crossing behavior among classes of bears, and (4) assess the spatial distribution of crossing, road-kill, and planned passage locations. Results indicate that adult females and subadult males crossed highways more frequently than adult males. Both food-conditioned and non food-conditioned bears crossed highways, but food-conditioned bears crossed more frequently. Logistic regression analyses revealed that the odds of a bear crossing was more likely (1) at night, 2) near stream intersections and areas with higher stream density, (3) in open habitat areas closer to cover or areas with a higher percentage of cover within 200 m, and 4) closer to human development. Crossing activity was highest when movement rates were lowest and negatively correlated with traffic. Speed during crossings was higher than during non-crossing times. Crossing and road-kill locations were clustered. Crossings were significantly closer to road-kill and planned passage locations than random locations. Highways served as a partial barrier to wary bears, which crossed seldom-to-none, but were fully permeable to food-conditioned bears, which crossed frequently. Food-conditioned bears, however, carry a higher mortality risk due to an increased likelihood of management removal or vehicle collision.