
USING HUNTER SURVEY DATA TO ESTIMATE WOLF POPULATION SIZES IN MONTANA, 2007-2009

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Reliable knowledge of the status and trend of carnivore populations is critical to their conservation. In the Northern Rocky Mountains, wildlife managers need a time- and cost-efficient method for monitoring the large, growing population of gray wolves (*Canis lupus*) at

a state-wide scale. We explored how hunter survey data could be incorporated into a multi-year patch occupancy model framework to estimate the abundance and distribution of wolf packs, wolves, and breeding pairs in Montana for 2007- 2009. We used hunter observations of wolves to estimate the probability that a given landscape patch was occupied by a wolf pack, and used additional data/models in combination with occupancy model output to provide estimates of total number of wolves and number of breeding pairs. Our modeling framework also allowed us to examine how geographic and ecological factors influenced occupancy and detection of wolf packs. Our models provided estimates of number of packs, number of wolves, and number of breeding pairs that were within 20 percent of Montana Fish, Wildlife, and Parks minimum counts for 2007-2009. We found occupancy was positively related to forest cover, rural roads, and elevation and detection probability was positively related to hunter effort and forest cover. We believe that patch occupancy models based on hunter surveys offer promise as a method for accurately monitoring elusive carnivores at state-wide scales in a time- and cost-efficient manner.