# Influence of Pack Size, Demography, And Human-Caused Mortality on Breeding Pair of Wolves in the northern Rocky Mountains

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The breeding pair is the reproductive unit within a wolf (*Canis lupus*) population, and is the legal and biological benchmark for wolf management. Management of the recovered wolf population in the northern Rocky Mountains (NRM) requires monitoring breeding pairs. Because pack sizes are easier to monitor than breeding pairs, we estimated the probability a pack would contain a breeding pair based on its size for wolf populations inhabiting six areas in the NRM. We also evaluated the extent to which differences in demography of wolves and levels of human-caused mortality among the areas influenced the probability packs of different sizes would contain a breeding pair. Probability curves differed among the analysis areas, depending primarily on levels of human-caused mortality and secondarily on population growth rate; population size and recent changes in population growth had little effect. Breeding pair probabilities were more uniformly distributed across pack sizes in areas with low levels of human mortality and stable populations. Probabilities were skewed towards large pack size in areas with high levels of human-caused mortality and high growth rates; small packs had little reproductive success. Our approach can be used by managers to estimate the number of breeding pairs in a population where number of packs and their size are known. Following delisiting of NRM wolves, human-caused mortality could increase, resulting in more small packs with low probability of breeding success; monitoring of breeding pairs will provide more accurate insights into population dynamics of wolves than will monitoring number of packs or individuals.