The Effect of Winter Weather Events on Wolf (Canis lupus) Movement on the Fond du Lac Reservation

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This study was done to determine how the frigid snow covered winters in Northeastern Minnesota affect wolf movement. The hypothesis was: If wolf movements are compared, then wolves [1] would move the farthest per movement on average right after the storm event, [2] less as the snow depth increased and [3] the least during a cold snap. Using ArcGIS pro shapefiles were organized to generate wolf location maps and points to line to retrieve movement data. A program was written in Python to align wolf movement with winter weather parameters: high and low temperature, snow depth in inches, and snow fall events. My hypothesis [1] was not supported. Wolves would move the farthest per movement on average right after the storm event. Three days after the storm had passed the wolves moved significantly less than the average winter movement ($p<.001$). Then the wolves returned to their winter movement per movement. My hypothesis [2] was supported. Wolves would move less as the snow depth increased. There was a significantly negative correlation ($r=-.16$) with a p-value of $p<.001$ between snow depth and wolf movement, indicating that as snow depth increased wolf movement per movement significantly decreased. My hypothesis [3] was not supported. There was no difference in wolf movement during a cold snap compared to normal winter movement. It was surprising that as the winter storm approached, wolf movement decreased each day. This appears to indicate that the wolves were able to sense the oncoming storm before it arrived.

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