TEMPERATURE MEDIATED SURVIVAL IN NORTHEASTERN MINNESOTA MOOSE[1]

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ABSTRACT

The earth is in the midst of a pronounced warming trend and temperatures in northern Minnesota are projected to increase. Moose (*Alces alces*), a species restricted to northern Minnesota, are intolerant of heat and increase their metabolic rate to regulate their core body temperature. We hypothesized that moose survival rates would be a function of the frequency and magnitude that ambient temperatures exceeded the upper critical temperature of moose. We collected data on annual and seasonal moose survival in northeastern Minnesota between 2002 and 2008 and compared these data with a temperature metric. We found that models based on January temperatures consistently explained greater than 78% of the variability in spring, fall, and annual survival. Models based on late spring temperatures also explained an equally high proportion of survival during the subsequent fall. Warm season temperatures were important in explaining survival during the subsequent winter. Based on these results we believe that as temperatures continue to rise, the distribution of moose could shift northward out of Minnesota.

[1] Abstract of paper submitted to Journal of Wildlife Management
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