

## WOLF KILL RATES: PREDICTABLY VARIABLE?

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Abundance and diversity of the prey assemblage affects ability of predators to successfully capture and kill prey; such variation is a fundamental driver of ecosystem dynamics because per-capita consumption rate strongly influences stability and strength of community interactions. Descriptions of predatory behavior in this context typically include the functional response, specifically the kill rate of a predator as a function of prey density. Thus, a major objective in studying predator-prey interactions is to evaluate the strength of numerous factors related to kill rate of a predator, and subsequently determine forms of its functional response in natural systems because different forms have different consequences for ecosystem dynamics. Recent controversies over the nature of predation focus on respective roles of prey and predator abundance in affecting a functional response. However, resolution requires more direct measures of kill rates in natural systems. We estimated wolf (*Canis lupus*) kill rates in a tractable and newly established wolf-elk (*Cervus elaphus*) bison (*Bison bison*) system in the Madison headwaters area of Yellowstone National Park during winters 1998-1999 to 2006-2007 to document the transition from over seven decades without wolves

to a well-established top predator population. Wolf abundance, distribution, and prey selection varied during the study concurrent with variations in demography, distribution, and behavior of elk and bison. These dynamics enabled us to evaluate factors influencing variations in wolf kill rates and the forms of their functional response.