

Linking elk movement patterns to forage availability and predator avoidance in northern Wisconsin.

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Ungulate movement patterns have been suggested to be primarily influenced by foraging, dispersal, and reproduction. However, animals may also increase travel to reduce predictability on the landscape by predators. We used spatial linear regression to examine how step lengths and turning angles of seven elk, equipped with GPS radio collars in northern Wisconsin, were influenced by local forage biomass and distance to nearest wolf-territory center. The analysis was conducted at two temporal resolutions; 20-minute, and four-hour intervals between location fixes. Habitat variables were quantified at 60- and 300-m radii around the beginning location of each step. Cross validation was used to assess the predictive strength of statistical models over space and time. Results indicate that step lengths were shorter and turning angles greater in areas of high forage biomass relative to low forage biomass areas. In areas close to wolf-territory centers step lengths increased, but turning angles varied only as a function of forage biomass. Predictive strength was better over time than over space, indicating that animals living under different habitat conditions respond to the landscape in different ways. While elk may attempt to be vigilant and cryptic if a predator encounter is imminent, results of this study suggest that an increase in travel may reduce predictability on the landscape, and lower the probability of encountering a predator.