

# **Genetic variability, demography, and habitat selection in a reintroduced elk (*Cervus elaphus*) population**

by

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## **ABSTRACT**

Understanding factors that influence genetic variability, demographic vital rates, and resource selection is important for conservation and management of wildlife populations. I examined factors influencing microsatellite variability, demographic vital rates, and habitat use for a reintroduced elk (*Cervus elaphus*) population at Fort Riley, Kansas based on data collected from 2003 – 2007. Levels of allelic richness, observed heterozygosity, and expected heterozygosity for the Fort Riley population were intermediate to other North American elk populations. Genetic variability in restored North American elk populations was not well explained by founding population size, number of founding populations, or number of years since the last translocation. I examined the influence of demographic vital rates on the rate of population change to test the hypothesis that variability in calf survival has a greater influence on rates of population change than adult survival. Survival for prime-age adult elk had the highest stage-specific elasticity value, but life-stage simulation analysis indicated that variation in calf survival had the highest correlation with variation in population growth rate. These results suggest that calf survival varies temporally and is the vital rate most directly related to variation in population growth rate for this population. I assessed the relative influence of risk-related and resource-related factors on elk habitat selection by comparing predictor variables included in top resource selection function models at the landscape and home range scales. All predictor variables, with the exception of fall and spring prescribed burns, were included in top models across seasons at both spatial scales. Elk selected low elevation areas, gentle slopes, edge habitat, and areas close to streams at both spatial scales. At the landscape scale, elk generally avoided roads and preferred areas on or near Fort Riley. At both spatial scales, elk used riparian woodlands more frequently than grasslands and selected for agricultural crops when seasonally available. These findings do not support the idea that risk-related factors are the primary determinant of elk habitat use at the landscape scale as has been found for ungulates in areas with natural predators.