

LONG-TERM CHANGES IN ELK DISTRIBUTIONS IN WESTERN MONTANA^{TWS}

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Elk (*Cervus elaphus*) occur in herds that use almost exclusive areas during the spring through fall seasons, and these areas of use may shift over long time periods in response to increasing density. However, it is unknown if elk herds change distribution patterns over long time periods as a result of habitat modification. Our objectives were to (1) compare elk distributions in the same area before and after substantial habitat change, and (2) identify habitat characteristics related to elk distributions before and after habitat change. We compared distributions of radio-collared female elk from 1977 to 1983 and 1993 to 1996 for 2 elk herds. We used simple and multiple linear regression, and a Poisson regression modeling approach to determine relationships between numbers of elk locations within grid cells, at 3 different scales, and habitat variables. Elk distributions shifted between the 2 studies and road variables were important in explaining these shifts. Open roads were negatively correlated with elk locations, and elk were more tolerant of roads during the second study than during the first. Increased densities of closed roads were important in explaining decreased use of grid cells from first study to the next. Elk distributions were seasonally related to forested vegetation classes. Effective management of elk herds may require regular assessment of their distribution patterns, perhaps as frequently as every 10 years. Road closures are an important management tool. However, the long-term impact of closed roads on elk distributions warrants additional study.