Effectors of Elk Summer Home-Range Size, Movement and Timing of Fall Migration

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For decades, research has emphasized the effects of roads, trails, and human use of the landscape on wildlife habitat availability and use. Historically, studies have assessed the impacts of human perturbations on the landscape by analyzing relatively infrequent VHF radio-tracking data or by track and fecal surveys. The deployment of 49 GPS radio-collars on adult, female elk (*Cervus elaphus*) in the Madison Valley, Montana during the winters of 2004-2005 and 2005-2006 provided opportunity to look at elk movement on 30-min intervals over the period of an entire year. Using the high-frequency of locations provided by these collars, we estimated the effects of roads and trails on elk summer home-range size, movement on 30-min intervals throughout the year, and factors influencing the timing of elk departure from their summer home-ranges and migration to winter ranges in the Madison Valley. Preliminary results from the first year of data suggest that various levels of human access influence elk movement differently at varying periods throughout the year, that there are regional differences in these effects, and that movement levels may not be a good indicator of home-range size. Varying levels of road and trail access during the hunting seasons appear to influence timing of elk departure from summer home-ranges, in combination with snow levels and regional differences. Collection of the second year of collars in February, 2007 will provide substantially more data and should help elucidate our understanding of influences on elk movement and behavior on a year-long scale.