



Range relationships of mule deer, elk and cattle on a rest-rotation grazing system during winter and spring
by Thomas James Komberec

A thesis submitted in partial fulfillment of the requirements for the degree of MASTER OF SCIENCE
in Fish and Wildlife Management
Montana State University
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Abstract:

A study was conducted in the timbered breaks adjacent to the Missouri River, northcentral Montana, during the summer of 1974 and the winter and spring of 1975 to obtain quantitative data on populations, range use and food habits of mule deer, elk and cattle within an area managed by rest-rotation grazing. Seven major habitat types consisting of eleven plant communities were recognized. Numbers, productivity, distribution, and range use of mule deer and elk were determined from one early winter helicopter survey, two fixed-wing airplane surveys and regular ground observations. The fawn:doe ratio was 54.8 for mule deer and the cow:calf ratio was 70.0 for elk in late January 1975. Numbers and distribution of mule deer during the study showed no consistent trends in relation to grazing by cattle and pasture treatments. Numbers and distribution of elk during this study were greatly influenced by grazing of cattle. Elk moved from areas of previous use when cattle began using the area. Home ranges of four marked mule deer were largest for the two adult males and smallest for the female and male fawn. Three radio-collared elk had home ranges much larger than those of the mule deer, with the male having a home range more than twice as large as the home ranges of two female elk.

The Artemisia-Agropyron habitat type was used most often by both mule deer and elk during winter and spring and by cattle during spring.

Marked mule deer and elk used the Pinus-Juniperus habitat type most often during both winter and spring. Mule deer, elk and cattle all used 0-10 degree slopes most often during winter and spring. Mule deer and elk preferred southerly exposures during both seasons while cattle used ridge tops and coulee bottoms most often. Food habits were determined from feeding site examinations, supplemented with one cow rumen sample. Browse, forbs, grasses and forbs, browse, grasses was the order of importance of forage classes used by mule deer in winter and spring, respectively. Forbs, grasses, browse was the order of importance of forage classes used by elk in winter. Grasses, forbs, browse was the order of importance of forage classes used by cattle during spring. Yellow sweetclover was the most important forb in the diet of each of the three ungulates. Western wheatgrass was the most important grass in the diet of both elk and cattle. Interspecific relationships, effect of rest rotation grazing and management recommendations of mule deer, elk and cattle on a rest rotation grazing system were discussed.

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RANGE RELATIONSHIPS OF MULE DEER, ELK AND CATTLE ON A REST-
ROTATION GRAZING SYSTEM DURING WINTER AND SPRING

by

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A thesis submitted in partial fulfillment
of the requirements for the degree

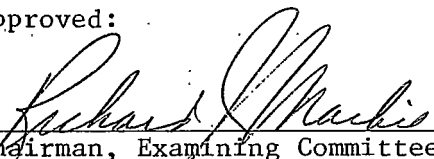
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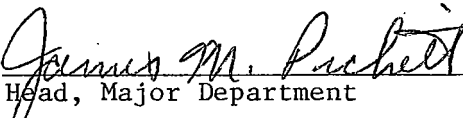
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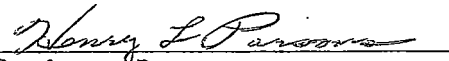
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ABSTRACT

A study was conducted in the timbered breaks adjacent to the Missouri River, northcentral Montana, during the summer of 1974 and the winter and spring of 1975 to obtain quantitative data on populations, range use and food habits of mule deer, elk and cattle within an area managed by rest-rotation grazing. Seven major habitat types consisting of eleven plant communities were recognized. Numbers, productivity, distribution, and range use of mule deer and elk were determined from one early winter helicopter survey, two fixed-wing airplane surveys and regular ground observations. The fawn:doe ratio was 54.8 for mule deer and the cow:calf ratio was 70.0 for elk in late January 1975. Numbers and distribution of mule deer during the study showed no consistent trends in relation to grazing by cattle and pasture treatments. Numbers and distribution of elk during this study were greatly influenced by grazing of cattle. Elk moved from areas of previous use when cattle began using the area. Home ranges of four marked mule deer were largest for the two adult males and smallest for the female and male fawn. Three radio-collared elk had home ranges much larger than those of the mule deer, with the male having a home range more than twice as large as the home ranges of two female elk. The *Artemisia-Agropyron* habitat type was used most often by both mule deer and elk during winter and spring and by cattle during spring. Marked mule deer and elk used the *Pinus-Juniperus* habitat type most often during both winter and spring. Mule deer, elk and cattle all used 0-10 degree slopes most often during winter and spring. Mule deer and elk preferred southerly exposures during both seasons while cattle used ridge tops and coulee bottoms most often. Food habits were determined from feeding site examinations, supplemented with one cow rumen sample. Browse, forbs, grasses and forbs, browse, grasses was the order of importance of forage classes used by mule deer in winter and spring, respectively. Forbs, grasses, browse was the order of importance of forage classes used by elk in winter. Grasses, forbs, browse was the order of importance of forage classes used by cattle during spring. Yellow sweetclover was the most important forb in the diet of each of the three ungulates. Western wheatgrass was the most important grass in the diet of both elk and cattle. Interspecific relationships, effect of rest rotation grazing and management recommendations of mule deer, elk and cattle on a rest rotation grazing system were discussed.

INTRODUCTION

Rest-rotation grazing (Hormay and Talbot 1961) has been increasingly employed by range and other land managers to relieve overgrazing and improve vegetation while maintaining maximum production of livestock on rangelands. The benefits of rest-rotation grazing for livestock and rangeland vegetation have been well documented (Hickey 1966). Little is known as yet of the possible effects or influences of rest-rotation grazing of livestock on habitat values for wildlife or on wildlife-livestock relationships.

During the summer of 1973, the Montana Department of Fish and Game initiated a study of the range relationships of mule deer (*Odocoileus hemionus*), elk (*Cervus canadensis*), and cattle (*Bos taurus*) on the Nichol's Coulee Resource Conservation Area, a rest-rotation grazing system for cattle in northcentral Montana (Knowles 1975). The objectives of the study were to obtain quantitative data on mule deer, elk, and cattle distribution, movements, range use, and food habits within the Nichol's Coulee Area, and to establish basic criteria to assist range and wildlife managers in planning and conducting sound multiple-use management on a rest-rotation grazing system. Knowles (1975) described range relationships of mule deer, elk, and cattle on the area during summer and fall. My study, conducted full-time during the summer of 1974 and from January through

June, 1975, considered these relationships during winter and spring.

DESCRIPTION OF THE STUDY AREA

The 88,810 acre Nichol's Coulee RCA study area (Fig. 1) is located in Phillips County, about 55 miles southwest of Malta, Montana. Knowles (1975) described the general physiographic and climatic characteristics of this area as well as the primary features of the rest-rotation grazing system. Ownership of land and grazing capacities are listed in Appendix Table 27. The grazing formula for the study area is shown in Appendix Figure 10, and order of treatments within and between years is given in Appendix Figure 11.

Climatological data for the period January through June, 1975 (Table 1) were obtained from the U. S. Department of Commerce Weather Station Roy 24 NE (Mobridge), located 17 miles southwest of the study area. Except for January, the mean monthly temperatures were an average of 3.62° F less than the corresponding 11 year monthly means; the range of deviation of monthly temperatures from normals was minus 1.0 for May to minus 6.8 for February. Northwest winds averaging 5 to 10 miles-per-hour with gusts to 30 miles-per-hour were common during winter and early spring. Eighty-four percent of the 41.5 inches of snowfall from January through June 1975 occurred during March and April, while 85.5 percent of total precipitation for the same period fell during April, May, and June.

