



Range use and relationships of mule deer on the west slope of the Bridger Mountains, Montana
by William Frederick Schwarzkoph

A thesis submitted to the Graduate Faculty 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 on the west slope of the Bridger mountains in southwestern Montana from January 1972 through April 1973. Objectives were to provide current information on range use, food habits, population characteristics and whether changes in ecological relationships have occurred since the study of Wilkins in 1956 on the same area. The vegetation of the area was classified into four major zones: Bunchgrass Prairie, Douglas Fir, Spruce-Fir and Alpine. Canopy coverages and frequencies of occurrence of the low-growing taxa were determined for most of the types within the Spruce-Fir and Alpine Zones. Distribution of mule deer was determined from 5,687 observations of individual deer. The Spruce-Fir Zone accounted for 63 percent of the summer observations. Eighty-four and 79 percent of all observations were recorded in the Douglas Fir Zone in fall and winter respectively. The Bunchgrass Prairie Zone was most important in the spring accounting for 78 percent of the observations. Mule deer food habits were determined from the examination of 76 feeding sites and the contents of 26 rumens. Forbs constituted 83 percent of the summer diet. Nuttall violet, yellow columbine and false dandelion were important forbs. Forbs remained the most important forage class in the fall constituting 49 percent of the diet as browse increased to 40 percent. During winter, grass and browse were equally important constituting 43 and 44 percent respectively. Green grass was utilized extensively on open, south-facing slopes as early as January. Douglas Fir, Rocky Mountain juniper and big sagebrush increased in usage as winter progressed and usage of bitterbrush decreased. Browse, forbs and grass constituted 44, 28, and 28 percent of the spring diet respectively. These food habits generally paralleled those reported for this area in the early 1950's. An average kidney fat index for 14 hunter-killed deer in the fall was .84 compared to .08 for four winter-killed deer. A fawn/doe ratio of 57/100 was calculated for the period August 15 to September 15 on the summer range. The fawn/doe ratio on the winter range in December was 68/100. A loss of 8-9 fawns/100 does was discovered during the months January through April, 1972 and 1973. A population estimate of 173 based on observations of marked deer came very close to estimates of 175 and 171 from air and ground counts respectively. An average activity radius and winter home range for mule deer was calculated to be 418 yards and 226 acres respectively. Mule deer appeared to extend their range in early spring.

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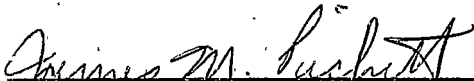
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Approved:


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FRONTISPIECE: THE ROCKY MOUNTAIN MULE DEER (*Odocoileus hemionus hemionus*).

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ABSTRACT

A study was conducted on the west slope of the Bridger mountains in southwestern Montana from January 1972 through April 1973. Objectives were to provide current information on range use, food habits, population characteristics and whether changes in ecological relationships have occurred since the study of Wilkins in 1956 on the same area. The vegetation of the area was classified into four major zones: Bunchgrass Prairie, Douglas Fir, Spruce-Fir and Alpine. Canopy coverages and frequencies of occurrence of the low-growing taxa were determined for most of the types within the Spruce-Fir and Alpine Zones. Distribution of mule deer was determined from 5,687 observations of individual deer. The Spruce-Fir Zone accounted for 63 percent of the summer observations. Eighty-four and 79 percent of all observations were recorded in the Douglas Fir Zone in fall and winter respectively. The Bunchgrass Prairie Zone was most important in the spring accounting for 78 percent of the observations. Mule deer food habits were determined from the examination of 76 feeding sites and the contents of 26 rumens. Forbs constituted 83 percent of the summer diet. Nuttall violet, yellow columbine and false dandelion were important forbs. Forbs remained the most important forage class in the fall constituting 49 percent of the diet as browse increased to 40 percent. During winter, grass and browse were equally important constituting 43 and 44 percent respectively. Green grass was utilized extensively on open, south-facing slopes as early as January. Douglas Fir, Rocky Mountain juniper and big sagebrush increased in usage as winter progressed and usage of bitterbrush decreased. Browse, forbs and grass constituted 44, 28, and 28 percent of the spring diet respectively. These food habits generally paralleled those reported for this area in the early 1950's. An average kidney fat index for 14 hunter-killed deer in the fall was .84 compared to .08 for four winter-killed deer. A fawn/doe ratio of 57/100 was calculated for the period August 15 to September 15 on the summer range. The fawn/doe ratio on the winter range in December was 68/100. A loss of 8-9 fawns/100 does was discovered during the months January through April, 1972 and 1973. A population estimate of 173 based on observations of marked deer came very close to estimates of 175 and 171 from air and ground counts respectively. An average activity radius and winter home range for mule deer was calculated to be 418 yards and 226 acres respectively. Mule deer appeared to extend their range in early spring.

INTRODUCTION

Mule deer (*Odocoileus hemionus*) using the Armstrong winter range on the west slope of the Bridger mountains were studied during 1955 and 1956 by Wilkins (1957). His study of range use and food habits was made at a time when the mule deer population had reached a peak in numbers. Since that time many intensive studies of mule deer in other areas of Montana have been completed. No further work has been done in the Bridger mountains.

Since Wilkins' study the mule deer population has declined. Hunting pressure has been light due to the steep and roadless terrain. Virtually no current information is available concerning the population characteristics, range use habits or movements of this herd. The objectives of this study were to provide current information on range use, food habits, seasonal distribution and population characteristics. The findings should aid in determining whether essential changes in ecological relationships have occurred since the studies of Wilkins and provide an information base for future management of mule deer in the Bridger mountains.

The study was conducted during the summer and fall of 1972 and winter of 1973. Part-time work was carried out during the winter and spring of 1972.

DESCRIPTION OF THE STUDY AREA

The study area (Fig. 1) of approximately 10 square miles, lies on the west slope of the Bridger Mountain Range of southwestern Montana, 20 miles northeast of Bozeman. The range extends from the Bridger Canyon northward in a gently curving arc for 23 miles to Blacktail Mountain. It's highest point is Sacagawea peak with an elevation of 9,665 feet. McMannis (1955) described the Bridger Range as exposed sedimentary rocks from Beltian time to Recent. On the study area these sedimentary rocks specifically range from Precambrian time through Mississippian and consist of shale, limestone, sandstone, and siltstone. Sediments at the base of the mountains consist of valley fill and alluvial gravels from Quaternary time. Isostatic arching in Oligocene time produced normal faults on the west side of the Bridger range.

Approximately 75 percent of the study area is publicly owned and administered by the U. S. Forest Service. The terrain is very steep with relief of 1,000 feet commonly occurring within a distance of 1/2 mile. Relief elevations range from 5,200 to 9,500 feet. North and south slopes predominate.

The study area is bordered by two creeks: North Cottonwood Creek on the north and Tom Reese Creek on the south. Both of these creeks originate in the high meadows near the divide of the range. North Cottonwood flows due west while Tom Reese flows southwesterly. The

