



Mule deer food habits and range use in the Little Belt Mountains, Montana
by Allan L Lovaas

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 mule deer (*Odocoileus h. hemionus*) range use and food habits study was conducted in the Judith River drainage of the Little Belt Mountains, Montana, during the summer of 1956 and the winter of 1957, with some work in the fall and spring periods. Range use was determined by recording numbers of deer seen on the various vegetative types while traveling observational routes. Food habits were investigated by rumen analyses and feeding site examinations. Major differences were found in deer food habits between two types of winter ranges. Doe-fawn ratio counts were made and found to be very poor. The two methods of studying food habits gave very comparable results.

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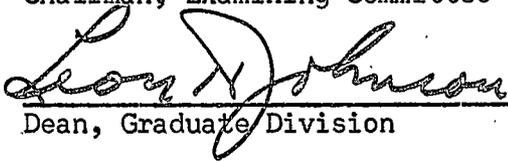
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ABSTRACT

A mule deer (Odocoileus h. hemionus) range use and food habits study was conducted in the Judith River drainage of the Little Belt Mountains, Montana, during the summer of 1956 and the winter of 1957, with some work in the fall and spring periods. Range use was determined by recording numbers of deer seen on the various vegetative types while traveling observational routes. Food habits were investigated by rumen analyses and feeding site examinations. Major differences were found in deer food habits between two types of winter ranges. Doe-fawn ratio counts were made and found to be very poor. The two methods of studying food habits gave very comparable results.

INTRODUCTION

The Little Belt Mountains of Central Montana have been an important mule deer (Odocoileus h. hemionus) area since early Montana history. Some early inhabitants, such as Jake Hoover and Charles Russell, in 1880, reportedly subsisted by selling deer and elk meat and hides to ranchers living on the foothills and prairies (Adams and Britzman, 1948). Long time residents state that the deer herds have fluctuated in size through the years. Certain ranges in the area were considered as being overstocked with deer as early as 1942 (Leopold et al., 1947). Overbrowsed plants, very poor doe-fawn ratio counts and small body size of the deer point out an overabundant herd on some winter ranges at the present time. The abundance of deer, accessibility to and within the area, and central Montana location make the Little Belts one of the most popular mule deer hunting areas in the state.

Previous to this study, no detailed investigations of the food habits and range use of the deer herd had been made, although information on deer numbers, condition, and agricultural relationships has accumulated through the years. The present investigation was on a full time basis during the summer of 1956 and the winter of 1957. Trips to the area for specimen collections were made during the fall of 1956 and the spring of 1957. The results of this study may find some use in the future management of the mule deer on this area and on similar range types.

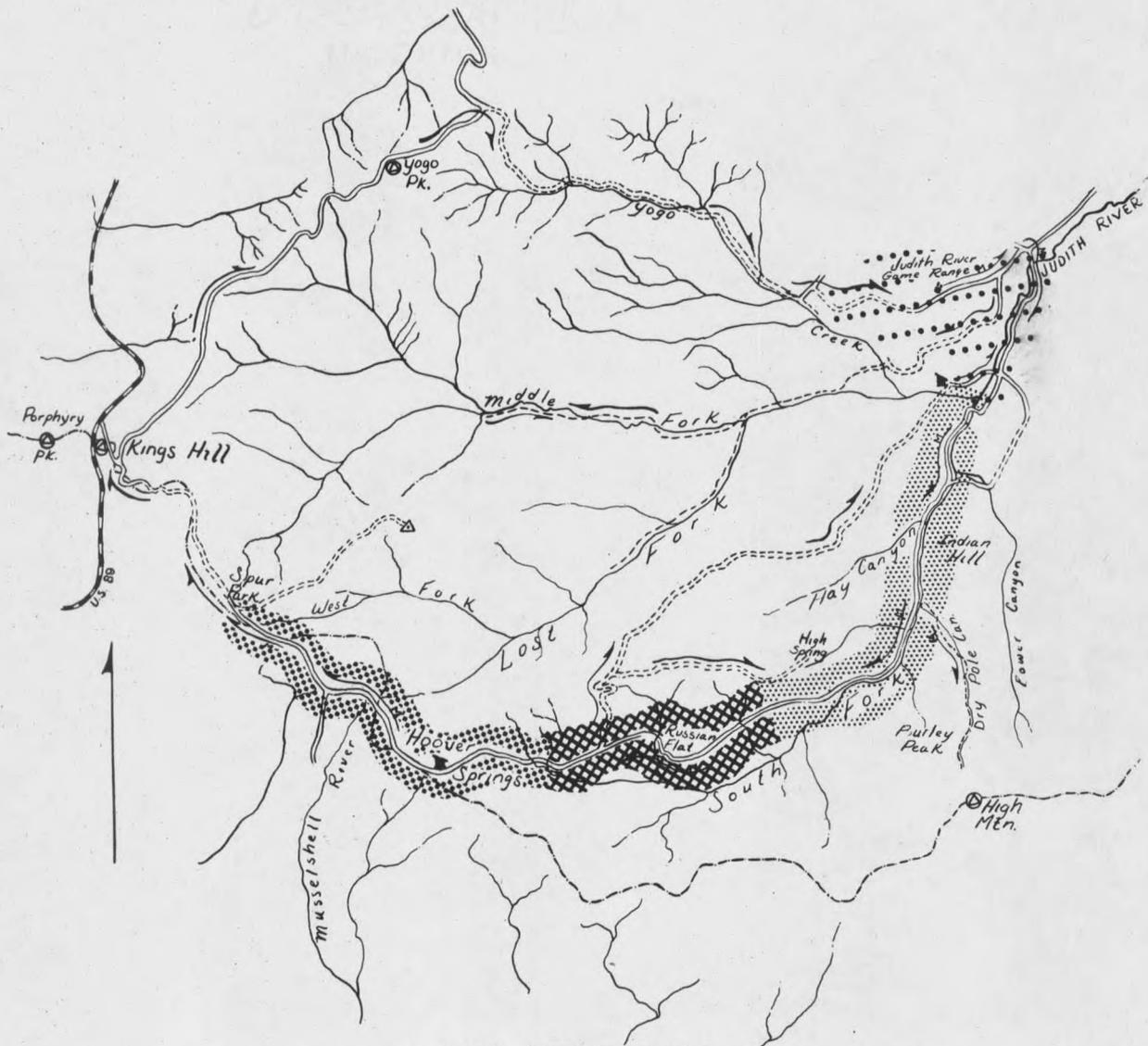
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DESCRIPTION OF THE AREA

The Little Belt Mountains are an isolated range located approximately 50 miles west-south-west of Lewistown, the geographical center of Montana. The region is described by Weed (1899) as being 60 miles across east to west and 40 miles wide on the western border, narrowing eastward to a sharp point. The average elevation is 7600 feet. The highest peak, Big Baldy, has an elevation of 9000 feet. The mountain range divide averages around 8000 feet (Weed, 1899). The mountains are plateau like with broad, flat tops prevailing. No big, broad valleys are present. The streams flow in deeply trenched courses which are open and wide in some areas and form narrow canyons in others (Weed, 1899).

The study area is included in the Judith River drainage on the eastern slopes of the mountains. During the summer of 1956, most observations were made along a route of approximately 32 miles, extending from the Judith River Game Range in the foothills, to Spur Park on the mountain range divide. The route paralleled the South Fork of the Judith River for the most part (Fig. 1). Additional observations were made along subsidiary routes in the general area at various times during the summer.



VEGETATIVE TYPES

	FOOTHILLS PRAIRIE		DOUGLAS FIR - LODGEPOLE PINE
	PONDEROSA PINE - DOUGLAS FIR		SPRUCE - FIR

SCALE - 1/2 INCH = 1 MILE

OBSERVATION ROUTES : MAIN : SUBSIDIARY
COUNTY LINE (MOUNTAIN RANGE DIVIDE)

Fig. 1. Map of the study area.

The study area in the winter of 1957 was limited to a foothill region around the Judith River Game Range, the lower 11 mile segment of the route along the South Fork, and a five mile route in Dry Pole Canyon. Additional exploratory trips were made in the vicinity.

The vegetation in the study area is varied and intergraded. Four general types were recognized with many sub-types in each. Scientific and common names of plants used in the following descriptions follow those of Booth (1950), Wright and Booth (1956), or those given by the American Joint Committee on Horticultural Nomenclature (1942).

Spruce-fir. This type occurs in the study area from about 7000 feet elevation to the divide. The main study route extends for about 10 miles through this type. The type is characterized by Engelmann spruce (Picea engelmanni) with alpine fir (Abies lasiocarpa) in the upper regions. Limber pine (Pinus flexilis) is also abundant. Douglas fir (Pseudotsuga taxifolia) and lodgepole pine (Pinus contorta) are also found. The most common shrubs are common juniper (Juniperus communis) and shrubby cinquefoil (Potentilla fruticosa). A number of open parks are found throughout the type. In the upper areas along the divide, parks with islands of alpine fir predominate (Fig. 2). An abundance of forbs is found in these parks. The most common are geranium (Geranium spp.), cinquefoil (Potentilla spp.), arnica (Arnica spp.), dandelion (Taraxacum officinale), aster (Aster spp.), lupine (Lupinus spp.), yarrow (Achillea lanulosa), pussytoes (Antennaria spp.) and showy fraseria (Frasera speciosa). Prominent grasses are Idaho fescue (Festuca idahoensis), wheatgrass (Agropyron spp.), bluegrass (Poa spp.), timothy (Phleum spp.) and timber oatgrass (Danthonia

intermedia).

A burn, which occurred in 1946, extends for about two miles along the study route. Reforestation includes some Engelmann spruce, lodgepole pine and Douglas fir. Low growing browse plants present include Oregon grape (Mahonia repens), common juniper and snowbrush ceanothus (Ceanothus velutinus). The most common forbs are aster, thistle (Cirsium spp.), goldenrod (Solidago spp.), lupine, bedstraw (Galium spp.), strawberry (Fragaria virginiana) and yarrow. Idaho fescue is a prominent grass and elk sedge (Carex geveeri) is also abundant.

Douglas fir-lodgepole pine. This type occurs at elevations of 6000 to 7000 feet. The study route extends for about eight miles through this type. Characteristic plants are Douglas fir and lodgepole pine with quaking aspen (Populus tremuloides) also prominent. Low growing browse plants found in the lodgepoles are kinnikinnick (Arctostaphylos uva-ursi), low red huckleberry (Vaccinium scoparium), common juniper, snowberry (Symphoricarpos spp.), white spiraea (Spiraea betulifolia) and Oregon grape. In the more open Douglas fir type are found common juniper, snowberry and rose (Rosa spp.). Forbs are present in relatively small numbers in the lodgepoles, mostly in small openings (Fig. 3). Present are geranium, lupine, littleleaf allumroot (Heuchera parvifolia), dandelion and raceme pussytoes (A. racemosa). Forbs are very abundant in the Douglas firs, including geranium, cinquefoil, bedstraw, arnica, yarrow and lithospermum (Lithospermum ruderales).

A large open park (Russian Flat), through which the study route extends for about 4.5 miles, is found in this type (Fig. 4). Shrubs present include



Fig. 2. Spruce-fir type, showing open park-like terrain.



Fig. 3. Dense lodgepole pine forest in Douglas fir-lodgepole pine type.

rose, shrubby cinquefoil and big sagebrush (Artemisia tridentata); prevalent forbs are aster, cinquefoil, lupine, yarrow and balsam root (Balsamorhiza sagittata). Idaho fescue, rough fescue (F. scabrella), wheatgrass, bluegrass and needlegrass (Stipa spp.) are prominent. Some patches of willow (Salix spp.) are found in moist areas.

Ponderosa pine-Douglas fir. The study route extends through this type for about nine miles, between elevations of approximately 5000 and 6000 feet. Ponderosa pine (Pinus ponderosa) and Douglas fir are the characteristic plants (Fig. 5). Other prominent trees, mostly along the stream are: quaking aspen, Rocky Mountain maple (Acer glabrum), water birch (Betula occidentalis) and cottonwood (Populus spp.). Shrubs include common juniper, Rocky Mountain juniper (J. scopulorum), Canadian buffalo-berry, shrubby cinquefoil, rose, snowberry, kinnikinnick and redshoot gooseberry (Ribes setosum). Prominent among the great variety of forbs present are geranium, cinquefoil, bedstraw, aster, yarrow, horse mint (Monarda fistulosa), goldenrod and strawberry. Grasses include timothy, brome (Bromus spp.), bluebunch wheatgrass (Agropyron spicatum) and Idaho fescue.

Foothills-prairie. This type is found mainly below the forested parts of the mountains at about 5000 feet elevation. Approximately five miles of prairie are found along the route and about seven square miles of this type are included in the winter study area. Part of this area is included in the Judith River Game Range which is an elk wintering area. The terrain is rolling and primarily open but stands of ponderosa pine and limber pine are common (Fig. 6). Creeping juniper (J. horizontalis), chokecherry



Fig. 4. Open grassy area of Russian Flats. Lodgepole pine forest in the background.



Fig. 5. Open ponderosa pine area in ponderosa pine-Douglas fir type.

(Prunus virginiana), sticky current (Ribes viscosissimum), rose, kinnikinnick, snowberry, shrubby cinquefoil and fringed sagebrush (A. frigida) are prominent browse plants. Forbs present include pussytoes, Hoods phlox, (Phlox hoodii), Erigonum (Eriogonum spp.), aster and bedstraw. The major grasses are Idaho fescue, rough fescue and bluebunch wheatgrass. Old abandoned fields in the area are seeded to bluestem wheatgrass (A. smithii) and brome grasses.

Dry Pole Canyon. Dry Pole Canyon leads south eastwardly from the South Fork of the Judith River about half way up the ponderosa pine-Douglas fir type (Fig. 1). The canyon was used as a study area in the winter period because it reportedly had been an important deer concentration area, and snow limited travel to higher elevations up the South Fork. Furthermore, the canyon rises from approximately 5000 feet elevation to 8000 feet in a distance of approximately eight miles providing conditions similar to those of the South Fork area. Representatives of all of the types mentioned except foothills-prairie are found in the canyon. An old burn is also present. A good representation of the previously mentioned trees, shrubs and forbs are found in this steep-sided canyon (Fig. 7).

METHODS

Three study methods were employed. Deer use of vegetative types was investigated by covering the study routes and wintering areas by vehicle and on foot. Numbers of deer seen on the various types were recorded.

Deer rumen analysis was used following techniques similar to, or modified from those of Saunders (1955), Cole (1956) and Wilkins (1957). Twenty-five deer (11 mature females, 5 mature males, 5 yearlings, 4 fawns)

