



Use of vegetative types, migration, and hunter harvest of the Sun River elk herd, Montana
by Harold D Picton

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 at Montana State College

Montana State University

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Abstract:

A study of the summer usage of vegetative types, migration and harvest of the Sun River elk herd in Montana was conducted during 1957 and 1958. One hundred and ninety elk were individually tagged and marked to facilitate movement and harvest studies. Discussion of the usage of five vegetative types and three subtypes was based upon observations of 2,544, elk, during the summers of 1957 and 1958. Observations of elk movement as influenced by hunting and weather conditions were made. Some of the relationships regarding three hunting seasons, during which the elk of this herd were harvested each year, were discussed. Two types of colored plastic ear' markers were compared as to durability.

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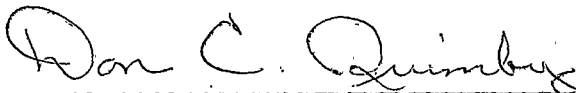
Master of Science in Fish and Wildlife Management


at

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Approved:


Head, Major Department


Chairman, Examining Committee


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The Author

Harold D. Picton was born October 6, 1932 in Bowman, North Dakota. In 1942 he moved to Red Lodge, Montana where he graduated from high school in 1950. From 1950 to 1954 he attended Montana State College, Bozeman, Montana, receiving a Bachelor of Science degree in Fish and Wildlife Management during June of 1954. During the summer of 1953 he was employed by the Montana Fish and Game Department as a student assistant. Following graduation he was again employed by the Montana Fish and Game Department as a Junior Biologist until he was called to active duty in the United States Air Force in 1955. While on active duty with the Air Force, he attended the School of Aviation Medicine and served as a hospital administrative officer. After release from the military service in 1957 he was employed by the Montana Fish and Game Department as a Biologist until January of 1958.

The writer began graduate studies at Montana State College in January 1958. This thesis fulfills part of the requirements for the Master of Science degree in Fish and Wildlife Management at Montana State College.

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ABSTRACT

A study of the summer usage of vegetative types, migration and harvest of the Sun River elk herd in Montana was conducted during 1957 and 1958. One hundred and ninety elk were individually tagged and marked to facilitate movement and harvest studies. Discussion of the usage of five vegetative types and three subtypes was based upon observations of 2,544 elk during the summers of 1957 and 1958. Observations of elk movement as influenced by hunting and weather conditions were made. Some of the relationships regarding three hunting seasons, during which the elk of this herd were harvested each year, were discussed. Two types of colored plastic ear markers were compared as to durability.

INTRODUCTION

One of Montana's largest elk herds ranges south of Glacier National Park in the upper drainage of the Sun River. Near to extinction at the turn of the century, the Sun River herd increased to its present level of about 3,000 by the 1930's (Rognrud, 1950). The harvest from this herd during the hunting seasons of 1957 and 1958 was about 850 and 650, respectively. In the summer, the elk range along the Continental Divide in the heart of the 990,000 acre Bob Marshall Wilderness area. The winter range utilized by most of the herd is located 14 miles west of Augusta in Lewis and Clark county. This winter range consists of about 18,000 acres of land purchased for the purpose ^{by} of the Montana Fish and Game Department.

To provide basic information for the continuing management of this herd, a study of its movements and relations to vegetative types was undertaken. This study was conducted on a full time basis from June to September of both 1957 and 1958 with supplemental observations made at other times during the period February 25, 1957 to November 26, 1958. The writer was employed by the Montana Fish and Game Department under project W-74R during the study.

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METHODS

Two different types of colored plastic ear markers were used to permit the field recognition of individual animals in movement studies. During the winter of 1957, seventy-seven elk were captured in corral type traps on their winter range. Each of these was marked with a colored plastic streamer held in the ear with a metal stock tag. These markers were similar to those used by Egan (1957) on deer and Rouse (1957) on elk. Twenty-seven elk calves caught during the springs of 1957 and 1958 and 86 elk trapped in the winter of 1958 were marked with a plastic streamer in one ear and a colored sheet plastic marker (Johnson, 1951) in the other. Records of the Montana Fish and Game Department indicated a few animals in the herd that had been tagged and marked before 1957. The marked elk were "aged" into four groups (calves, yearlings, 2 1/2 years and older) by dentition (Quimby and Gaab, 1957).

The marked elk were identified in the field with the aid of binoculars and a 20-power spotting scope. Tag recoveries from hunter killed elk were made at checking stations.

The elk herd was followed to the summer range. Saddlehorses and a packstring were used to establish basecamps but the majority of observations were made while on foot. The passes used by elk to cross the Continental Divide were periodically checked for tracks during the summer and following the opening of the September hunting season west of the Continental Divide. An airplane was used to determine elk distribution and to check the passes along the divide for movement signs following early snowstorms. An index to the late fall migration of 1957 was provided by weekly ground trend counts on the winter range, which was closed to hunting.

The basis for the vegetative description of the study area was provided by aerial observations and ground travel. A more detailed study of certain vegetative features was made in the upper basin of Moose Creek drainage. Twenty, two by five decimeter plots were selected along two, 100-foot transects in each of three vegetative subtypes. Plant coverage in the plots was determined by ocular estimate (Daubenmire, 1959). These transects were intended to provide a rough illustration of the subtypes rather than a detailed analysis of species composition. As an indication of the elk use received by the area, pellet group counts were made on a four foot strip along each transect. All elk observations made during the study were recorded according to the vegetative type in which they were seen.

THE STUDY AREA

The known range of the Sun River elk herd includes about 1,200 square

miles of rugged terrain in the upper portions of the Sun River, and adjacent portions of the Dearborn, the South Fork of the Flathead, and the Middle Fork of the Flathead River drainages.

The typical mountain topography consists of parallel reefs or ridges running north and south. These reefs slope on the west and are abrupt on the east. The cliffs of the eastern faces are as much as a thousand feet in height. Because of this topography the elk migration, which is primarily east and west, is confined to certain routes determined by passes through the reefs.

The area selected for the summer studies consisted of about 350 square miles of the northwestern corner of the Sun River drainage as well as adjacent portions of the White River and Spotted Bear River drainages of the South Fork of the Flathead River system (Fig. 1). The eastern boundary is formed by the North Fork of the Sun River which flows in a broad valley at an elevation of about 5,300 feet. From this valley, the terrain slopes up on the west and south to the Continental Divide, formed by the 8,500 foot peaks and ridges of the Lewis and Clark Range. According to Deiss (1941) this range was formed by the Lewis overthrust which placed Proterozoic and Paleozoic shales and limestones on top of the much younger Mesozoic sediments. The eastern face of the Continental Divide is a row of glacially sculptured cliffs of Paleozoic limestone that underlies the White River basin to the west. In the southern half of the study area, these 1,000-foot cliffs are known as the Chinese Wall (Fig. 2) and form a barrier 15 miles long which can be crossed only through one minor pass. Major pass areas exist at each end of the Chinese Wall. In the northern

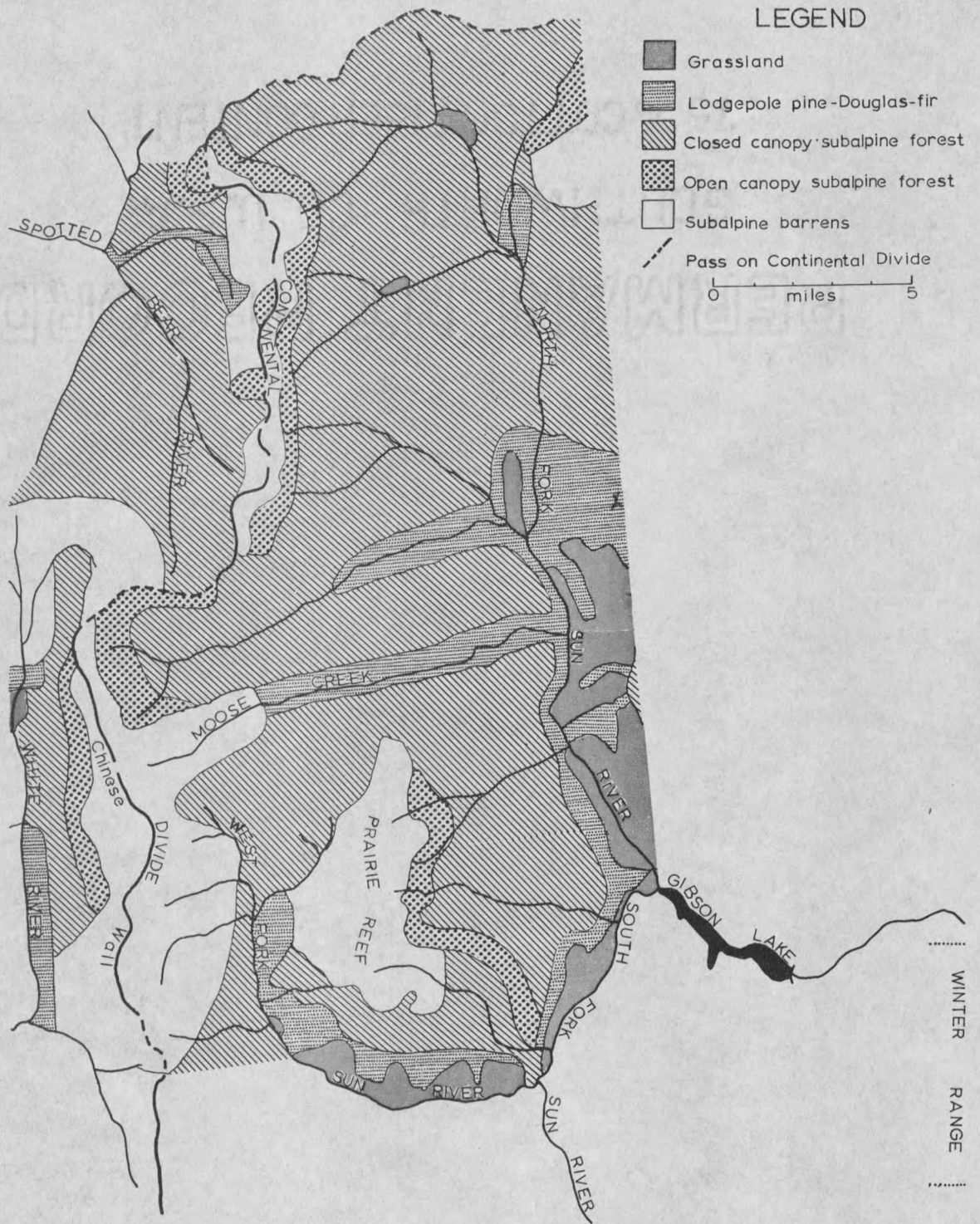


Fig. 1. The study area showing vegetative types.

half of the study area, the Continental Divide continues as a series of cliffs which can be crossed through four major and two minor passes. The section of the Continental Divide which forms the northern edge of the study area is a forested ridge which can be readily crossed by elk (Fig. 1).

The entire study area lies within the Bob Marshall Wilderness Area from which motor driven and wheeled vehicles have been excluded. The area lying between the North and South Forks of the Sun River and the Continental Divide is in the Sun River Game Preserve, established in 1913 to protect the Sun River elk herd.

The described winter range of the herd is located at an elevation of about 5,000 feet in the warm chinook belt along the eastern edge of the mountains, where they rise abruptly from the Great Plains.

Records of the weather station at Gibson Dam, about midway between the winter range and the summer study area, indicated an average annual precipitation of 17.24 inches. The long term annual mean temperature at the 4,590 foot elevation was 41.7 degrees with a high of 88 and a low of -42 degrees Fahrenheit.

Big game animals other than elk found in the study area were mule deer, white-tailed deer, bighorn sheep, mountain goats, black bear and grizzly bear.

The Vegetation

In this study, five vegetative types and three subtypes were recognized (Fig. 1).

Grassland: This type covered a relatively small portion of the study area at elevations of 4,800 to 5,300 feet. The southern half of the area adjacent to the North Fork of the Sun River was the most extensive area covered. Usually the type consisted of grassy flats with scattered aspen (Populus tremuloides) and lodgepole pine (Pinus contorta). Several large areas had been seeded to timothy (Phleum pratense) as an erosion control measure following the elimination of cattle grazing in the early 1930's (Cooney, 1939). Resembling the bunchgrass prairie of the winter range, some of the characteristic native plants were bluebunch wheatgrass (Agropyron spicatum), Idaho fescue (Festuca idahoensis) and shrubby cinquefoil (Potentilla fruticosa).

Lodgepole pine-Douglas-fir: In general this type formed a belt surrounding the grasslands. As mentioned by Larsen (1930) it intergraded at higher elevations into the spruce-fir subalpine forest. Englemann spruce (Picea englemanni) and alpine fir (Abies lasiocarpa) occupied the more mesic sites. The lodgepole pine-Douglas-fir (Psuedotsuga menziesia) type occupied relatively little area but was found in scattered stands throughout the study area. The chief character used in its recognition was the presence of an understory of pinegrass (Calamagrostis rubescens). It was previously classified by Cooney and Redman (1934) as "coniferous timber with food".

Subalpine forest-closed-canopy: To permit the differentiation of use by elk, the subalpine forest was divided by means of the understory into the closed-canopy type (Fig. ³2) and the open-canopy type (Fig. ⁴3).

