



The distribution and movements of sharp-tailed grouse during spring and summer in relation to rest-rotation grazing
by Chris A Yde

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 of sharp-tailed grouse distribution and movements was conducted on two types of grazing systems in Phillips County, Montana from 1975-1976. The results from a four pasture rest-rotation system were compared to those from two pastures within a deferred-rotation system. Twelve permanent and two transient dancing grounds were located during the spring of 1976, with eighty-nine grouse trapped and marked on ten of the grounds. Brood size averaged larger for 1975 than for 1976, with the West Hotchkiss Unit (rest-rotation) averaging 1 and 2 additional chicks per brood for 1975 and 1976, respectively, than the East Garland Unit (deferred-rotation). Cover board readings initiated at dancing ground sites in 1976 demonstrated a difference in vegetational cover among pastures, among sites within the pastures, and among months, with the greatest variance occurring among the months. A continual decrease in vegetational cover was observed from June 1 to September 30, with one exception. Photo plots taken in conjunction with the cover board readings illustrated the same trends, and allowed for the identification of the plant species responsible for the differences between readings. Photo plots within deciduous shrub thickets illustrated that intense grazing caused deterioration of the vegetation within the thickets, less intense grazing caused slight damage, and rest allowed for some improvement. Cover board readings taken at grouse observation sites within the grass-uplands indicated that the sharptailed grouse were selecting for areas of better vegetation than that located at the dancing ground sites. The general pattern of grouse use was extensive use of the grasslands in the spring with a movement toward the shrub thickets during the summer, and then increased use of the grasslands in the late summer and early fall. Twenty-two of twenty-five observations of marked grouse were made within one mile of the dancing ground on which they had been marked. The other three were within two miles of the respective dancing ground. There was no observed difference in movements of sharptails within the two types of grazing systems. September sharp-tailed grouse food habits were determined for the two years of study, with a higher percentage of animal material present than usually reported for the fall. There was also a shift in the species composition of the plant material noted between the two years.

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SPRING AND SUMMER IN RELATION TO REST-ROTATION GRAZING

by

Chris A Yde

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

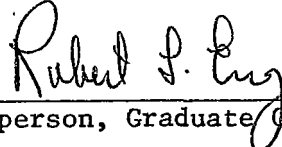
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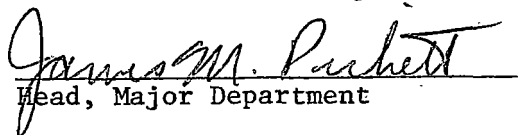
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ABSTRACT

A study of sharp-tailed grouse distribution and movements was conducted on two types of grazing systems in Phillips County, Montana from 1975-1976. The results from a four pasture rest-rotation system were compared to those from two pastures within a deferred-rotation system. Twelve permanent and two transient dancing grounds were located during the spring of 1976, with eighty-nine grouse trapped and marked on ten of the grounds. Brood size averaged larger for 1975 than for 1976, with the West Hotchkiss Unit (rest-rotation) averaging 1 and 2 additional chicks per brood for 1975 and 1976, respectively, than the East Garland Unit (deferred-rotation). Cover board readings initiated at dancing ground sites in 1976 demonstrated a difference in vegetational cover among pastures, among sites within the pastures, and among months, with the greatest variance occurring among the months. A continual decrease in vegetational cover was observed from June 1 to September 30, with one exception. Photo plots taken in conjunction with the cover board readings illustrated the same trends, and allowed for the identification of the plant species responsible for the differences between readings. Photo plots within deciduous shrub thickets illustrated that intense grazing caused deterioration of the vegetation within the thickets, less intense grazing caused slight damage, and rest allowed for some improvement. Cover board readings taken at grouse observation sites within the grass-uplands indicated that the sharp-tailed grouse were selecting for areas of better vegetation than that located at the dancing ground sites. The general pattern of grouse use was extensive use of the grasslands in the spring with a movement toward the shrub thickets during the summer, and then increased use of the grasslands in the late summer and early fall. Twenty-two of twenty-five observations of marked grouse were made within one mile of the dancing ground on which they had been marked. The other three were within two miles of the respective dancing ground. There was no observed difference in movements of sharptails within the two types of grazing systems. September sharp-tailed grouse food habits were determined for the two years of study, with a higher percentage of animal material present than usually reported for the fall. There was also a shift in the species composition of the plant material noted between the two years.

INTRODUCTION

The range of the sharp-tailed grouse (*Pedioecetes phasianellus jamesii*) has been reduced (Aldrich 1963) with a subsequent reduction in its populations. Much of this reduction can be attributed to the implementation of intensive agricultural practices and livestock grazing. The detrimental effect of overgrazing on sharptail populations is well documented (Marshall and Jensen 1937, Hart *et al.* 1950, Brown 1966b, Pepper 1972, Sisson 1976). Rest-rotation grazing (Hormay and Talbot 1961) provides for systematic rest from grazing with the long-term goal of range improvement. This grazing system is being implemented in an increasing manner on National Resource Lands, but the effects of this system on sharp-tailed grouse populations has not been well documented. This study was initiated in June 1975 to determine how a four pasture rest-rotation grazing system affects the distribution and movements of the sharp-tailed grouse. Field work was conducted from mid-June to mid-September 1975 and mid-March through September 1976.

DESCRIPTION OF THE STUDY AREA

The study was conducted on the Cottonwood Grazing Association, located approximately twenty miles north of Malta, Phillips County, Montana (Figure 1). The West Hotchkiss Unit (Study Area) consisted of approximately 26,000 acres, divided into five pastures, ranging in size from 2120 to 7060 acres. Although this unit contained five pastures, it was treated as a four pasture rest-rotation system with pastures one-east and one-west undergoing the same treatment within a given year. A second area, the East Garland Unit was divided into four pastures, two of which were used for comparison with the study area. These two pastures were approximately 2400 and 2800 acres, respectively. This unit was administered under a deferred-rotation system but, because of limited availability of water, irregular rather than systematic grazing periods were employed.

The study area consists of uplands which drop off, through rolling to sharply rolling land to the major drainages which bisect the area. The area is dominated by northern grasslands with sagebrush creek bottoms as described for the glaciated plains of eastern Montana (Payne 1973 and Ross 1976). The soils of the area are dominated by loams to clay loams overlaying a clay subsoil (Southard 1969). Topography and soils of the East Garland Unit are basically similar to those of the study area, but the unit contains many deeply

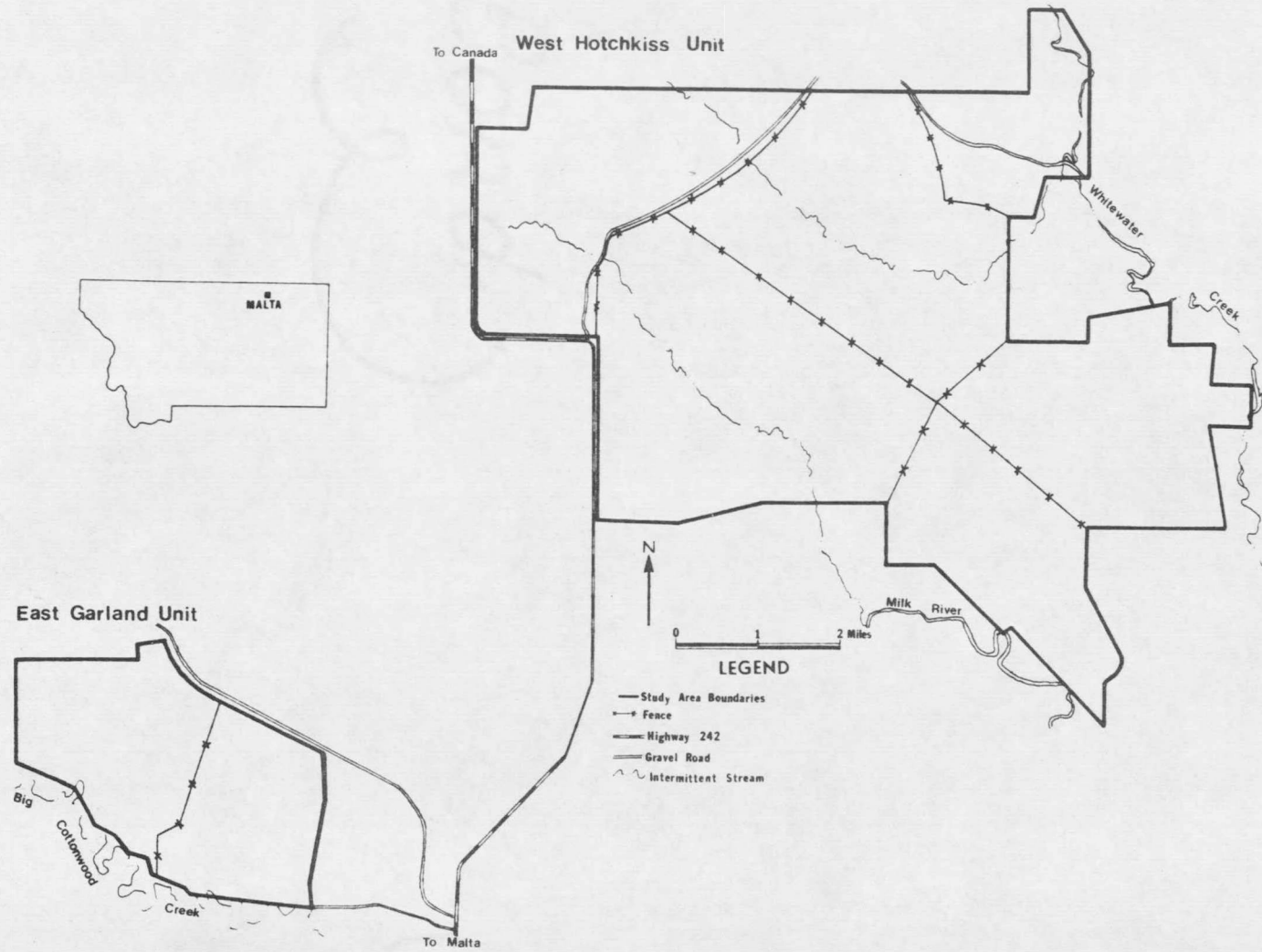


Figure 1. Map of the two areas of study.

entrenched breaks which creates more of a badlands appearance (Gieseke 1926).

The climate is characterized by low rainfall, great temperature extremes, and a large number of sunny days (Gieseke 1926). The climatological data were recorded at the towns of Turner and Whitewater, and the station Forks 4 NNE (U. S. Department of Commerce 1975-76). The mean annual temperature is 40.0 F and the mean annual precipitation is 11.65 inches. Below normal temperatures occurred in 1975, while above normal temperatures occurred in 1976. Above average precipitation was received at all three stations in 1975. In 1976, Turner received below average, Whitewater approximately average, and Forks 4 NNE, slightly above average precipitation.

The entire area is used primarily for cattle production. The systems within the Cottonwood Grazing Association Allotment are grazed from approximately May 1 through October 31. The area has a history of moderate to heavy grazing by livestock. As the Association purchased private land, management plans were written and revised to include the majority of the public and private land within the Association boundaries. The East Garland area was originally placed within an allotment management plan in April 1969. New water improvements are being planned so that this deferred-rotation system may ultimately become a rest-rotation system. The

private land within the West Hotchkiss Unit was purchased in 1973. A rest-rotation system was implemented during the 1974 grazing season, and will continue under current management plans. In 1976 many new water impoundments were established to provide water throughout the pastures, and to distribute the grazing more uniformly within each pasture.

Vegetation Types

Vegetation characteristics and the topography were used to classify the vegetation of the area into three types similar to those described by Martinka (1967) and Dusek (1971). The extent of each major type and subtype is shown in Figures 2 and 3. A reference plant collection prepared by Dusek (1971) aided in identification of the vegetation comprising the various types and subtypes. Booth (1950) and Booth and Wright (1959) were used as the basis for the common and scientific nomenclature.

Grass-Uplands Type

This type was found on the benchlands within the area. Topography ranged from flat to rolling, characteristic of glaciated areas. There was evidence of old abandoned croplands present in various locations, however, all but one had reverted to native vegetation. The one exception, approximately 60 acres located in

