



Summer habitat use by Columbian sharp-tailed grouse in western Idaho
by Victoria Ann Saab Marks

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:

Summer habitat selection by Columbian sharp-tailed grouse (*Tympanuchus phasianellus columbianus*) was studied near Mann Creek, western Idaho, from 1983-1985. Vegetative and topographic measurements were recorded at 716 flush sites of 15 radio-tagged grouse and at random sites within the major cover types in the study area. The mean size of spring-to-autumn home ranges was 1.87 km². Of nine cover types identified in the study area, individual grouse used big sage (*Artemisia tridentata*) more than or in proportion to availability, low sage (*A. arbuscula*) in proportion to availability, and avoided shrubby eriogonum (*Eriogonum* spp.) sites. Properties of the big sage cover type (e.g., moderate vegetational cover, high plant species diversity, and structural diversity) were probably important factors determining the selection of big sage areas by grouse. Grouse used areas of dense cover (i.e., mountain shrub and riparian cover types) primarily for escape cover. Compared with random sites, sharptails selected areas with (1) greater density and canopy coverage of arrowleaf balsamroot (*Balsamorhiza sagittata*), (2) greater horizontal and vertical cover, (3) greater canopy coverage of decreaser forbs (as influenced by livestock grazing), and (4) greater canopy coverage of bluebunch wheatgrass (*Agropyron spicatum*) in big sage sites in 1984 and low sage sites in 1985. Arrowleaf balsamroot and bluebunch wheatgrass, both native perennials, were the most reliable herbaceous cover plants during a drought year (1985). Overall, grouse appeared to select areas that were least modified by livestock grazing. A second study area, Hog Creek, was established in 1985. The Hog Creek study area was 32 km east of Mann Creek and had been severely disturbed by livestock and agricultural development such that sharptails were very rare.

Vegetation measurements were taken at random transects at Hog Creek for comparison with the Mann Creek data. Compared with Mann Creek, the Hog Creek cover types had (1) less vertical and horizontal plant cover, (2) lower diversity of forbs and shrubs, (3) lower canopy coverage of decreaser forbs and grasses, and (4) fewer and more severely damaged mountain shrub and riparian areas. In general, habitat components that were most important to sharptails at Mann Creek were lacking or in poor condition at Hog Creek. Past land uses at Hog Creek and the habitat alterations that resulted probably are responsible for the decline in the sharptail population there.

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MONTANA STATE UNIVERSITY
Bozeman, Montana

September 1986

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ACKNOWLEDGMENTS

This study was funded primarily by the Boise District, U.S. Bureau of Land Management. Additional support was provided by the Idaho Department of Fish and Game, the Biology Department at Montana State University, and the Montana Agricultural Experiment Station. The Tarter, Nelson, and Dunham families generously granted unlimited access to their lands. I especially appreciate the friendship and cooperation provided by George and Nellie Tarter.

I thank BLM employees Alan Sands, Sam Mattise, and Jeff Marks for assisting in all phases of the study, Terri Thomason for skillfully formatting the thesis, Laurie Guntly for preparing the figures, Roger Rosentreter for helping with plant identification, Bob Stucker for providing a solar-powered field camp, and Raul Morales for field assistance. Brian Czech, Skip Lisle, and Janet Berryhill were hard-working BLM volunteers who assisted with fieldwork.

Idaho Department of Fish and Game personnel provided a variety of assistance. In particular, Lou Nelson advised on computer use and statistical analyses, Bob Autenrieth directed the initial phases of the study, Fred Edwards provided historical information on sharptails in the Hog Creek study area, and Jack Connelly secured funding during the later stages of the study.

My sincere appreciation is extended to my advisor, Dr. Bob Eng, for his support, guidance, and editorial skills. I also thank

committee members Drs. Lynn Irby, Jack Taylor, and Bob White for advice and critical reviews of the thesis. Terry Lonner, Montana Department of Fish, Wildlife, and Parks, provided tremendous help with computer use.

Without the forethought and efforts of Alan Sands, this project would not have been possible. I thank him for encouragement and friendship and for providing me with the opportunity to study sharptails. Finally, I am most grateful to Jeff Marks, my husband, for his unfailing support, patience, and guidance in the preparation of this thesis.

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ABSTRACT

Summer habitat selection by Columbian sharp-tailed grouse (Tympanuchus phasianellus columbianus) was studied near Mann Creek, western Idaho, from 1983-1985. Vegetative and topographic measurements were recorded at 716 flush sites of 15 radio-tagged grouse and at random sites within the major cover types in the study area. The mean size of spring-to-autumn home ranges was 1.87 km². Of nine cover types identified in the study area, individual grouse used big sage (Artemisia tridentata) more than or in proportion to availability, low sage (A. arbuscula) in proportion to availability, and avoided shrubby eriogonum (Eriogonum spp.) sites. Properties of the big sage cover type (e.g., moderate vegetational cover, high plant species diversity, and structural diversity) were probably important factors determining the selection of big sage areas by grouse. Grouse used areas of dense cover (i.e., mountain shrub and riparian cover types) primarily for escape cover. Compared with random sites, sharptails selected areas with (1) greater density and canopy coverage of arrowleaf balsamroot (Balsamorhiza sagittata), (2) greater horizontal and vertical cover, (3) greater canopy coverage of decreaser forbs (as influenced by livestock grazing), and (4) greater canopy coverage of bluebunch wheatgrass (Agropyron spicatum) in big sage sites in 1984 and low sage sites in 1985. Arrowleaf balsamroot and bluebunch wheatgrass, both native perennials, were the most reliable herbaceous cover plants during a drought year (1985). Overall, grouse appeared to select areas that were least modified by livestock grazing. A second study area, Hog Creek, was established in 1985. The Hog Creek study area was 32 km east of Mann Creek and had been severely disturbed by livestock and agricultural development such that sharptails were very rare. Vegetation measurements were taken at random transects at Hog Creek for comparison with the Mann Creek data. Compared with Mann Creek, the Hog Creek cover types had (1) less vertical and horizontal plant cover, (2) lower diversity of forbs and shrubs, (3) lower canopy coverage of decreaser forbs and grasses, and (4) fewer and more severely damaged mountain shrub and riparian areas. In general, habitat components that were most important to sharptails at Mann Creek were lacking or in poor condition at Hog Creek. Past land uses at Hog Creek and the habitat alterations that resulted probably are responsible for the decline in the sharptail population there.

INTRODUCTION

The Columbian sharp-tailed grouse (Tympanuchus phasianellus columbianus), one of six subspecies of sharptails, formerly ranged over most of the Intermountain region from central British Columbia south to California and Colorado (Figure 1). They are no longer found in California, Oregon, and Nevada and have been reduced to remnant populations in Washington, Montana, Utah, and Wyoming. Their stronghold apparently is in British Columbia (Miller and Graul 1980), but very little is known about the sharptails there. In the United States, they are hunted in western Colorado, eastern Washington, and southeastern Idaho.

The Columbian subspecies has undergone widespread decline in both numbers and distribution since early settlement. In 1805, Lewis and Clark reported sharptails on the sagebrush-bunchgrass plains of the Columbia River (Bent 1932). Bendire (1898) considered them to be one of the most abundant and well known game birds of the Pacific Northwest. In Idaho, their historic range included the Palouse and Camas prairies in the north, and extended into the sagebrush-bunchgrass hills of the west and south (Figure 2). Although sharptails were abundant when settlers arrived in Idaho, a marked decline was apparent by 1917 (Rust 1917). During the 1930s, Murray (1938) estimated that not more than 1,000 birds, and possibly half that number, remained in Idaho. However, because no accurate method exists to census Columbian

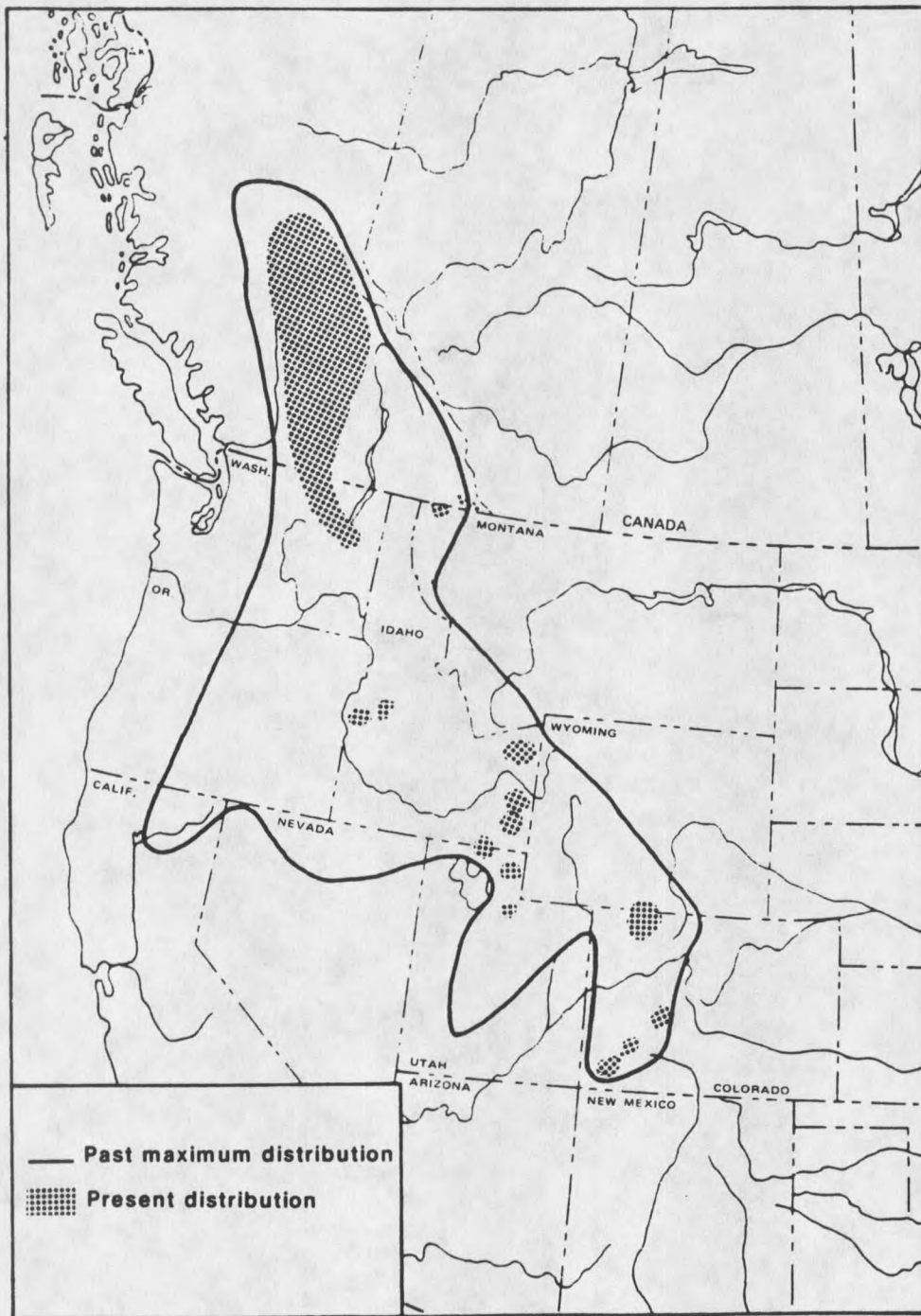


Figure 1. Past and present distribution of Columbian sharp-tailed grouse (modified from Miller and Graul 1980).



Figure 2. Past (left) and present (right) distribution of Columbian sharp-tailed grouse in Idaho (modified from Parker 1970).

sharptails, it is difficult to assess the soundness of Murray's estimate. Currently, known sharptail distribution in Idaho is restricted to the southeastern and a few locations in the western part of the state (Figure 2). Areas still occupied by sharptails are those with native grasses, forbs, and shrubs that have not been severely overgrazed (Hart et al. 1950, Parker 1970, Miller and Graul 1980).

Modifications of native habitat by livestock grazing and agriculture are thought to be the major factors in this decline (Hart et al. 1950, Yocum 1952, Buss and Dziedzic 1955, Hamerstrom and Hamerstrom 1961, Aldrich 1963, Rogers 1969, Parker 1970, Zeigler 1979). Many historic use areas were overgrazed by livestock, which reduced bunchgrasses and perennial forbs that are important components of nesting and brood-rearing habitat (Yocum 1952, Jewett et al. 1953, Evans 1968). Conversion of rangeland to cropland destroyed deciduous shrubs that are critical sources of winter food and year-round cover (Marshall and Jensen 1937, Jewett et al. 1953, Rogers 1969, Zeigler 1979).

Owing to their low numbers and limited distribution, Columbian sharptails have not been highly sought by bird hunters. Consequently, little information has been gathered on their habitat affinities. In western Idaho, sharptails occur only in Washington and Adams counties, and they have not been hunted there since 1975. In 1983, the U.S. Bureau of Land Management (BLM) initiated a three-year study on Columbian sharptails in western Idaho to determine year-round habitat requirements for use in enhancing existing populations and re-establishing this grouse within its historic range. I studied one aspect of this project, summer habitat use. Objectives were to

(1) quantify the available vegetation in terms of floristic and structural characteristics, (2) compare habitats used by grouse with those available, and (3) evaluate grouse habitat selection in relation to livestock grazing.

One major difficulty in assessing habitat selection is that most present day habitats have been modified by humans or their livestock, and optimal sharptail habitat may no longer exist in western Idaho (cf. Starkey and Schnoes 1976). Thus, even the best available habitats may not contain all the requirements of a healthy population of sharptails.

In an effort to best identify habitat features that are important to sharptails, I measured vegetation at two study areas, one in which sharptails were relatively abundant and the other in which they were very rare. The Mann Creek study area contained the largest known concentration of sharptails in western Idaho, and I have assumed that the habitat there was among the best available in western Idaho. The Hog Creek study area, located 32 km east of Mann Creek, had been severely damaged by livestock, fire, and agricultural development. Only a few sharptails remained at Hog Creek, although historical records indicated they were once abundant there. The objective at Mann Creek was to obtain detailed information on habitat selection by radio-tagged sharptails. If habitat features selected by Mann Creek sharptails indeed were critical requirements, then I would have expected some of these features to have been absent at Hog Creek, thus in part explaining why sharptails had declined there.

MANN CREEK

Study Area

Location and Physiography

The Mann Creek study area is in the Weiser River drainage of western Idaho in Washington County about 23 km north of Weiser (Figure 3). The area includes 20 km² of private holdings and a small portion of state land. Prominent geographic features include Mann Creek on the west, Fairchild Reservoir on the north, and Sage Creek on the east. Elevations range from 970-1188 m. Topography is rolling with a few steep ridges running north/south. Small knolls and ridges dissecting the area produce a diversity of aspects.

Geology and Soils

The geology and soils information was summarized from unpublished data provided by the USDA (1986). The area consists of Columbia River basalts with inclusions of fine-grained volcanoclastic material and arkosic sandstone. Major soils are shallow to moderately deep and well-drained. Soils formed in residuum and alluvium derived mainly from basalt. Slopes range from 0 to about 60%. Typically, the surface layer is a dark grayish-brown, very stony loam about 18 cm thick. The subsoil is a grayish-brown clay loam and contains 0-60% rock fragments. The soil is underlain by bedrock at 38 to 102 cm.

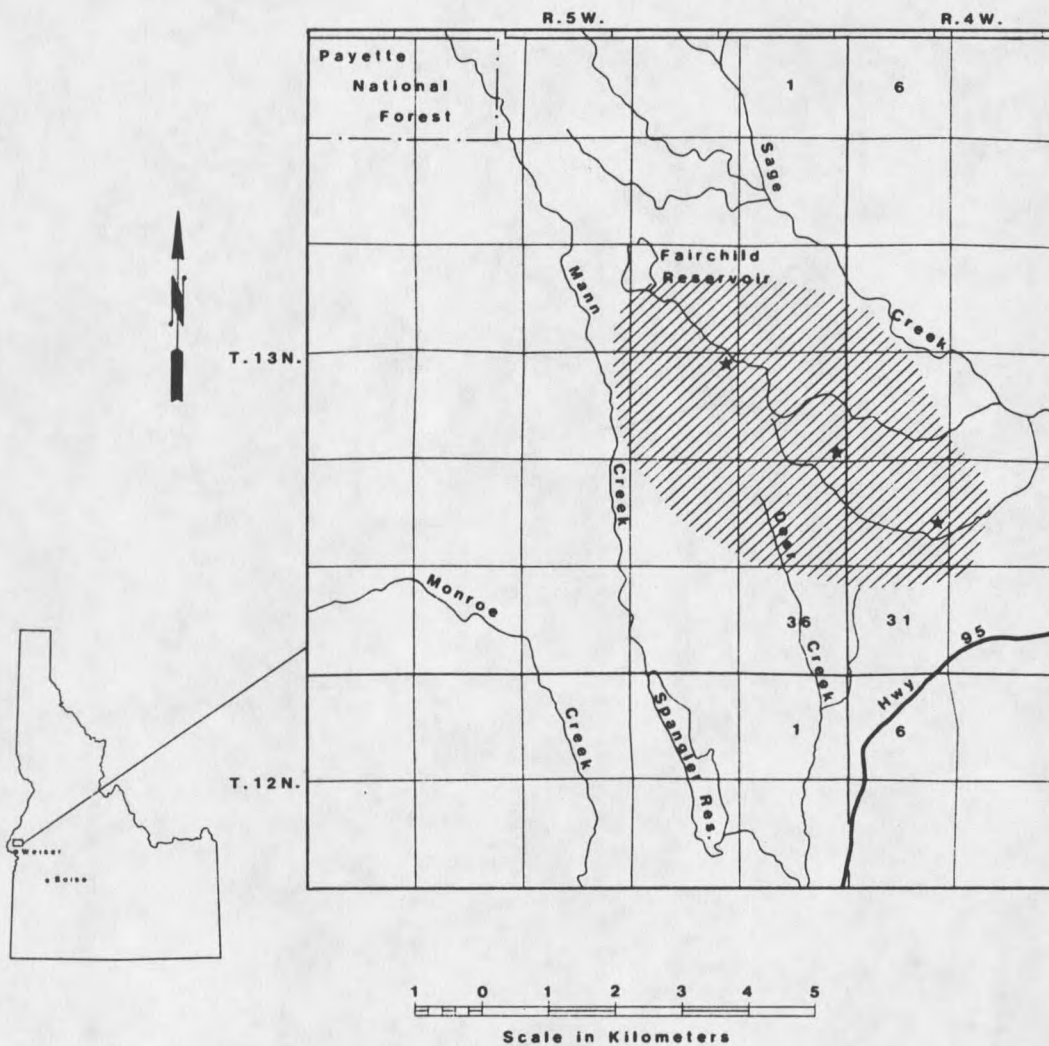


Figure 3. Mann Creek study area (shaded section) in Washington County, Idaho. Stars denote Upper, Middle, and Lower dancing grounds from upper left to lower right, respectively.

