



Ecology and management of Merriam's turkey in the long pines, southeastern Montana  
by Robert James Jonas

A thesis submitted to the Graduate Faculty in partial fulfillment of the requirements for the degree of  
DOCTOR OF PHILOSOPHY in Fish and Wildlife Management  
Montana State University  
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Abstract:

A sixteen month field study during the three year period 1961-63 was conducted to obtain information on movements, population characteristics, habitat use, life history and management of the introduced Merriam's turkey (*Meleagris gallopavo merriami*) in the Long Pines of southeastern Montana. A total of 6,271 turkeys comprising 468 flocks were classified into one of five types. Their activities were related to six described plant communities. Roost trees and nesting sites were described. Growth and productivity characteristics of the turkey population from the time of initial introduction of 18 birds in February 1955 through 1963 were discussed in relation to 1,103 turkeys removed by hunting, trapping and miscellaneous factors. Population trends, densities and productivity were related to emigration and hunter harvest. About 50 per cent annual population turnover and longevity of turkeys determined from records of 132 individually marked birds were discussed. Composition and sizes of 468 flocks were related to sex, age and activities of birds by seasons. The "fall shuffle" was described. Season, sex and age were discussed as factors influencing movements of 83 marked birds relocated 561 times.

The courtship period was divided into two sequential phases on the basis of sex, age, activity and behavior of the birds involved. Age of first breeding, hatching dates and brood survival were determined and factors affecting each were discussed. Growth rates were determined for various age classes of 72 individually marked birds. Whole weights of 263 turkeys were related to sex, age and season. Relationships between harvest, number of hunters, hunter success and weather were evaluated. Productivity and age ratios were related to hunter harvests. Seasonal food habits were discussed from data available on the contents of 243 crops and 1,604 droppings. Miscellaneous observations were made on parasites, predation and color aberrations. Merriam's turkey in the Long Pines was discussed from the standpoint of habitat management and hunting controls.

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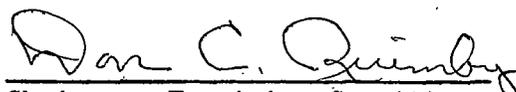
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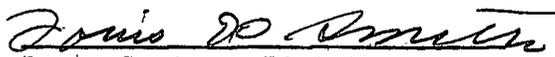
in

Fish and Wildlife Management

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MONTANA STATE COLLEGE  
Bozeman, Montana

June, 1964

## ACKNOWLEDGMENT

To the following among others, the author wishes to extend sincere appreciation for their contributions to this study: Dr. Don C. Quimby, Montana State College, who directed the study and aided in the preparation of the manuscript; Dr. Robert L. Eng, Montana Fish and Game Department, for project planning and field assistance; Dr. John H. Rumely, Montana State College, for field assistance and aid in preparation of the vegetative description; Dr. W. E. Booth, Montana State College, for aid in verification and identification of plant specimens; Mr. Joe Egan, Montana Fish and Game Department, for field assistance; Mr. Kenneth Greer, Montana Fish and Game Department, for assistance in analysis of crop contents and cooperation; Mr. Monte Supola, District Ranger, and all personnel of the Sioux District of Custer National Forest, for field assistance and cooperation; Dr. David Worley, Montana State College Veterinary Research Laboratory, for parasite identification; Dr. Gordon Clark, Rocky Mountain Laboratory at Hamilton, Montana, for identification of blood parasites; my wife, Arlene, for patience and encouragement; my children, for field assistance. The writer was supported in part by the National Science Foundation and employed by the Montana Fish and Game Department under Federal Aid Projects W-91-R-4, W-91-R-5 and W-91-R-6 during the study.

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## ABSTRACT

A sixteen month field study during the three year period 1961-63 was conducted to obtain information on movements, population characteristics, habitat use, life history and management of the introduced Merriam's turkey (Meleagris gallopavo merriami) in the Long Pines of southeastern Montana. A total of 6,271 turkeys comprising 468 flocks were classified into one of five types. Their activities were related to six described plant communities. Roost trees and nesting sites were described. Growth and productivity characteristics of the turkey population from the time of initial introduction of 18 birds in February 1955 through 1963 were discussed in relation to 1,103 turkeys removed by hunting, trapping and miscellaneous factors. Population trends, densities and productivity were related to emigration and hunter harvest. About 50 per cent annual population turnover and longevity of turkeys determined from records of 132 individually marked birds were discussed. Composition and sizes of 468 flocks were related to sex, age and activities of birds by seasons. The "fall shuffle" was described. Season, sex and age were discussed as factors influencing movements of 83 marked birds relocated 561 times. The courtship period was divided into two sequential phases on the basis of sex, age, activity and behavior of the birds involved. Age of first breeding, hatching dates and brood survival were determined and factors affecting each were discussed. Growth rates were determined for various age classes of 72 individually marked birds. Whole weights of 263 turkeys were related to sex, age and season. Relationships between harvest, number of hunters, hunter success and weather were evaluated. Productivity and age ratios were related to hunter harvests. Seasonal food habits were discussed from data available on the contents of 243 crops and 1,604 droppings. Miscellaneous observations were made on parasites, predation and color aberrations. Merriam's turkey in the Long Pines was discussed from the standpoint of habitat management and hunting controls.

## INTRODUCTION

Merriam's wild turkey (Meleagris gallopavo merriami) was first described as a subspecies in 1900 by E. W. Nelson primarily on the basis of color. The rectrices, tail coverts and lower rump feathers are white tipped in contrast to intergrades through various shades from buff to dark brown in the other subspecies. Perhaps Merriam's turkey differs from the other subspecies most significantly by its apparent success in a distinctive habitat, forests of Pinus ponderosa often associated with rugged terrain.

Originally Merriam's turkey was common in the mountains of central Colorado and southward into wide areas of Arizona, New Mexico and west Texas eastward to the Guadalupe Mountains. The ancestral range had already started to diminish by the time this subspecies was described. It was greatly reduced especially on its northern boundary where the bird nearly disappeared. Complete extirpation occurred in west Texas. Most evidence suggests that alteration of habitat was responsible for the reduction but it is probable that a combination of factors was involved. Ligon (1946) thought the population low, probably 15 per cent of the original, occurred between 1935 and 1940.

Spectacular success in reintroducing Merriam's turkey into much of its former range has been reported in recent years. Successful introductions outside the ancestral territory have been accomplished in Montana,

Wyoming, Nebraska, South Dakota, Utah, North Dakota, Idaho, Washington, Oregon and California (State bulletins and personal communications). The first six states listed have had recent hunting seasons on turkeys.

At least six turkey introductions between 1939 and 1960, by private individuals, mostly in the eastern one-half of Montana were complete failures. The sources were primarily farm-reared "wild" turkeys from eastern stock but Rio Grande turkeys (M. g. intermedia) were used once (Bergeson 1954, Egan 1964). Apparent success of transplants of wild-trapped Merriam's turkey into suitable areas of Wyoming and South Dakota encouraged personnel of the Fish and Game Department in efforts to establish this strain in Montana. The first Departmental introduction consisting of 13 birds from Colorado in November 1954 was into the Judith Mountains of central Montana. Eighteen Merriam's turkeys from Wyoming were transplanted into the Long Pines of southeastern Montana in January 1955. In October 1956 and January 1957, introductions totaling 26 birds from Wyoming were made in Powder River County.

Population growth of the Department introductions was sufficient to permit hunting and removal for transplanting. The Long Pines population has been one of the most successful, providing six either-sex fall hunting seasons and one spring gobbler season. It has also provided birds for 11 transplants in the state. Turkeys have spontaneously emigrated from there

into four more or less separate areas nearby.

Rose (1956) conducted the initial investigation to evaluate the success of the first two introductions. He reported the fate of the Judith Mountain transplant as being uncertain, but the Long Pines population gave early indications of remarkable success. He provided general information about the birds, and in 1957 as an employee of the Montana Fish and Game Department conducted a trap-mark-release program.

As turkey populations expanded and additional transplanting occurred it became evident that quantitative information was needed about Merriam's turkey in the northern extension of its range. In this study, data were gathered on movements, population characteristics, habitat use and life history. Marked individuals were used as much as possible to secure this information. The Long Pines study area was selected because it is almost an island of habitat, largely public land and has one of the most successful populations. The writer was in the field nearly full-time for 16 months: June through December 1961, June through September 1962 and March through September 1963. Occasional short visits were made to the area at other times. Laboratory work yielded information about crop contents, parasites, weights and other measurements.

## PHYSIOGRAPHY OF THE AREA

The Long Pines Division of Custer National Forest in southeastern Montana, approximately 65,000 acres, encloses a forested "L"-shaped ridge 1,200 feet above the surrounding plains. This ridge extends about 15 miles north-and-south and 11 miles across its base. It divides Box Elder Creek drainage to the west from the Little Missouri River drainage to the east (Figure 1). From 4,300 feet at ridge-top (Tri Point Lookout), rolling hills extend to the plains north and east, whereas precipitous slopes and sharply cut canyons mark the western and southern margins. Parent rocks are Tertiary clay and sandstone deposits which form mostly "gumbo" soils and some locally restricted sands. The former are high in clay and alkali content, with high runoff and low water penetration. Shallow, rocky soils are common.

Most drainageways have running water only during the spring runoff or after heavy rains. There are numerous natural springs, small seeps and beaver ponds as well as about 40 small catch-basin reservoirs and 70 stock-watering tanks developed by ranchers and Forest Service personnel.

The mean annual temperature is 44.1° F. Extremes are -43° F (February 1936) to 108° F (July 1936). The average annual precipitation is 13.27 inches, over one-half of which falls during the months of May, June and July. Annual precipitation maximum and minimum are 21.97" (1963) and 6.35" (1936). Departures in total annual precipitation from the long-term

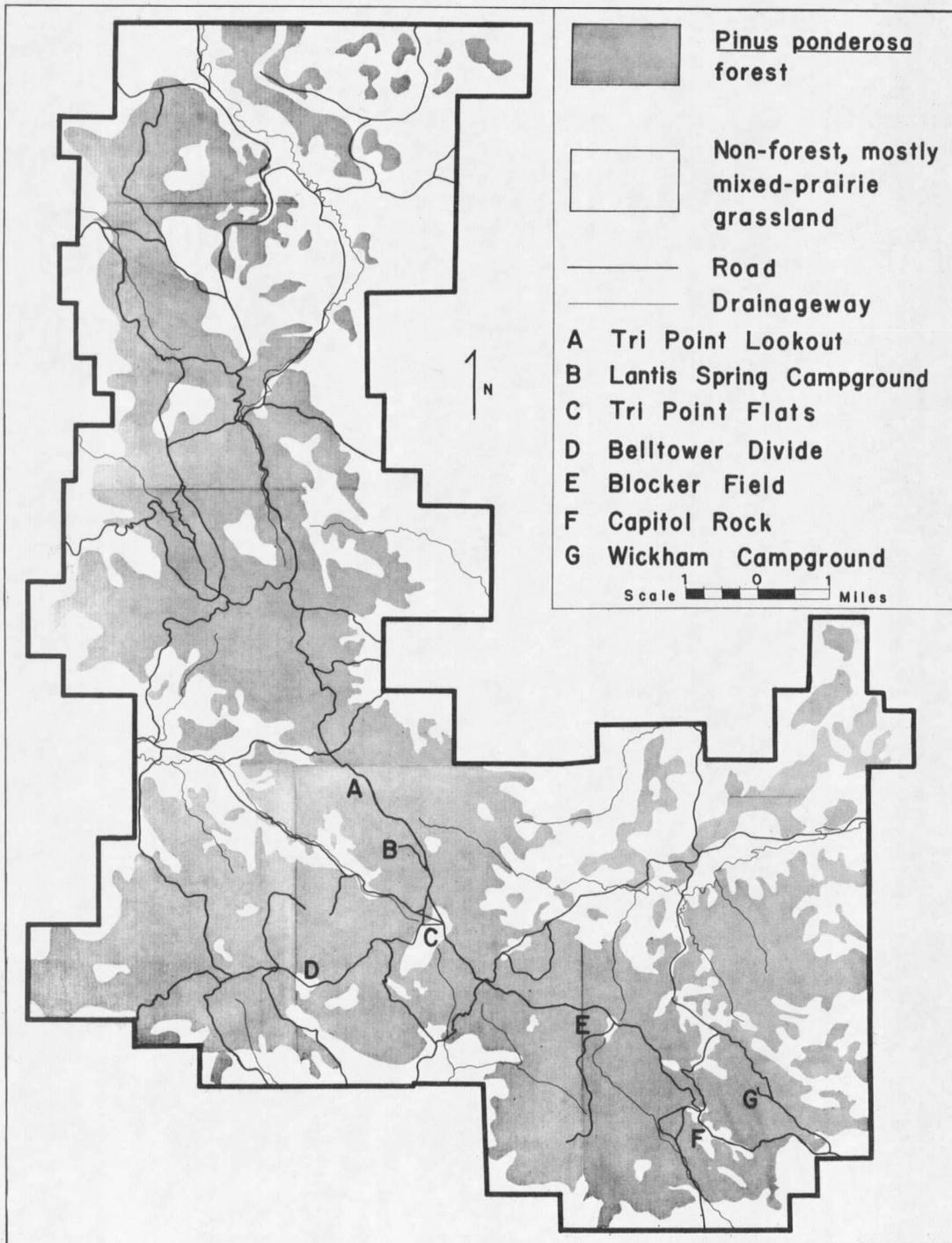


Figure 1. Map of the Long Pines Study Area.

mean during this study were -1.41" (1961), +7.48" (1962) and +7.70" (1963). The mean annual snowfall is 22.3 inches. (Climatic data for Ekalaka, Montana from the Climatic Summary of the U.S.--Supplement for 1931 through 1952 and Climatological Data, U.S. Weather Bureau.) The hills have a light snow cover most of the winter while the low slopes are generally snow free.

## VEGETATION OF THE AREA

About 40 per cent of the vegetative cover of the Long Pines Division consists of Pinus ponderosa forest which is best represented on the north and east slopes of the main ridge. Gallery forest extend as far as one mile into the prairie along some drainageways. The non-forested area is mostly a mixed prairie in scattered small parks (Figure 2) and more extensive tracts on ridge-top flats and on the slopes below the forest (Figure 3). Numerous drainageways with heterogeneous vegetation dissect the entire area. Cultivation on public land in the hills ended in the 1920's and at present grain cropping is practiced only on the lower slopes outside the forest.

### Pinus ponderosa Community

Size-class stands of Pinus ponderosa were classified following Forest Service terminology as sawlog, pole or sapling. In July 1963, five 16 x 66 foot plots were established in each of three widely separated stands for each of the three classes. For trees in the diameter class of four inches or over dbh (diameter breast height) best represented in each plot, in the sawlog and pole stands, the tree nearest the base point was increment-bored to determine its age, its dbh recorded from tape measurements and its height determined with an Abney level. In the sapling stands, these measurements were taken on trees with a height greater than































































































































































































































