Evaluation of two introductions of Merriams wild turkey into Montana
by Beverly J Rose

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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Merriam's wild turkeys (Meleagris gallopavo merriam), were introduced into the Judith Mountains, in central Montana, in November of 1954. A second liberation was made in the Longpines Area, in southeastern Montana, in January of 1955. Field studies were conducted on both areas from December 21, 1954, to March 25, 1956. Emphasis was placed on securing data on survival, food habits, movements, nesting and reproductive success, use of cover types, and limiting factors. Direct field observations provided most of the data, but laboratory analysis of droppings was utilized primarily for food habits evaluation. A total of 2,192 droppings collected from both study areas, during the summer of 1955, and winter of 1955-1956, were analyzed. The procedure of analysis is described. To facilitate the identification of items in the droppings, extensive insect, plant and seed reference collections were made.

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ABSTRACT

Merriam's wild turkeys (Meleagris gallopavo merriami), were introduced into the Judith Mountains, in central Montana, in November of 1954. A second liberation was made in the Longpines Area, in southeastern Montana, in January of 1955. Field studies were conducted on both areas from December 21, 1954, to March 25, 1956. Emphasis was placed on securing data on survival, food habits, movements, nesting and reproductive success, use of cover types, and limiting factors. Direct field observations provided most of the data, but laboratory analysis of droppings was utilized primarily for food habits evaluation. A total of 2,192 droppings collected from both study areas, during the summer of 1955, and winter of 1955-1956, were analyzed. The procedure of analysis is described. To facilitate the identification of items in the droppings, extensive insect, plant and seed reference collections were made.

INTRODUCTION

The ancestral range of Merriam's wild turkey (Meleagris gallopavo merriami) extended through the ponderosa pine - oak forests of central Colorado, southward through New Mexico and Arizona, with the southern limit near the United States - Mexico boundary. By 1925, the northern limit of the occupied range had contracted to the extreme southern edge of Colorado. Restocking, by the game departments of Colorado, New Mexico and Arizona, has restored this bird to portions of its ancestral range (Ligon, 1946).

At least two states, Wyoming and South Dakota, outside the ancestral range have had success with introductions of this subspecies.

In 1935, fifteen Merriam's wild turkeys, obtained from New Mexico, were introduced into Wyoming. By 1940, an estimated population of four hundred occurred in the vicinity of the release area. This population formed the nucleus for additional transplants during 1950-51. Twenty-six turkeys, also obtained from New Mexico, were released in 1951 primarily as brood stock for areas previously planted. The reproductive success of these populations continued at a high rate during the next four years. Wyoming, in 1955, declared Merriam's wild turkey a legal game bird, to be hunted on a permit basis (Anon., 1955).

South Dakota, in 1948, introduced Merriam's wild turkeys into the Black Hills. Twenty-nine, obtained from New Mexico and Colorado, were released during the years 1948-51. From these original transplants, a phenomenal increase in the population resulted. Trapping and trans-

planting from these established populations, distributed wild turkeys throughout the Black Hills. In 1954, only six and one-half years after the first birds were released, hunting on a permit basis, was legalized on Merriam's wild turkey (Anon., 1951; Gage, 1952; Nelson, 1955).

The success of these introductions into Wyoming and South Dakota suggested the possibility of a successful introduction into Montana by the Montana Fish and Game Department, despite the fact that at least three turkey plants, by sportsmen's clubs at Billings and Forsyth, had been unsuccessful (Bergeson, 1954). Two areas were selected as release sites. The first to be stocked was the southern part of the Judith Mountains approximately eight miles northeast of Lewistown, Fergus County, in the central part of the state. The second, was the Longpines Hills, approximately thirty miles southeast of Ekalaka, Carter County, in the southeast corner of Montana.

To evaluate the success of these introductions, the writer conducted field studies during the following periods: December 21 to 30, 1954; March 21 to 25, 1955; June 14 to September 21, 1955; and January 5 to March 25, 1956. Supplementary information was provided by observations of Montana Fish and Game Department employees, and landowners.

Emphasis was placed on securing data on survival, food habits, movements, nesting and reproductive success, use of cover types, and limiting factors. Direct field observations provided most of the data, but laboratory analysis of droppings was utilized primarily for food habits evaluation. To facilitate the identification of items in droppings,

extensive insect, plant, and seed reference collections were made for both study areas.

The writer is indebted to Dr. Don C. Quimby, Montana State College, for direction of the study and aid in preparing the manuscript; to Robert Eng, of the Montana Fish and Game Department, for assisting in setting up the study and for giving aid in the field; to Wesley Woodgerd, Warren Linville, and "Swede" Lindgren, also of the Montana Fish and Game Department, for field assistance; to Doctors John C. Wright and W. E. Booth, and the Montana State Seed Laboratory, Montana State College, for aid in identification of plants and food materials; to Dr. Richard Froeschner, Montana State College, for aid in identification of insect materials; and to the landowners of both study areas for their co-operation and assistance. The writer was employed by the Wildlife Restoration Division of the Montana Fish and Game Department, under Project W-74-R-1, during the investigation.

GENERAL DESCRIPTION OF MERRIAM'S WILD TURKEY

Merriam's wild turkey resembles its domestic relative, since both possess white markings on the wings and tail, but other characteristics differentiate the two. Merriam's is lighter in weight, more stream-lined in body form, and presents a less clumsy appearance than the domestic turkey (Fig. 1). The wattle of the latter is much larger and the head region possesses fewer hair-like feathers. The general appearance of the wild bird is darker and the brilliant irridescence, seen in the domestic

Fig. 1. A mature Merriam's wild turkey gobbler.

turkey, is slightly subdued (Anon., 1955).

Many wild turkeys were weighed in Wyoming during trapping and transplanting programs. "Mature" gobblers averaged sixteen pounds and one ounce, and "immature" gobblers twelve pounds and five ounces. The heaviest gobbler weighed nineteen pounds and eleven ounces, and the lightest eleven pounds and twelve ounces. The mature hens averaged nine pounds and five ounces, whereas, immature hens averaged eight pounds and six ounces. Maximum hen weight was eleven pounds and eight ounces and the minimum eight pounds (Crump and Sanderson, 1951). Two white turkeys removed from the Longpines area were weighed. A juvenile hen (Fig. 2) collected February 14, 1956, weighed six and one-half pounds. The second, a juvenile tom collected on March 20, 1956, weighed eleven and one-fourth pounds.

JUDITH MOUNTAINS RELEASE SITE

The Judith Mountains, located in central Montana, extend generally in a northeast-southwest direction for approximately twenty-five miles and have a width of about twelve miles. The relief of the area is approximately 2,500 feet and the highest point has an elevation of 6,428 feet.

The release site was Limekiln Gulch, located on the southwest edge of the mountains. This area is typical of the southern half of the Judith range. The topography is rolling to broken, with broad canyon bottoms which provide cultivated crop stringers that penetrate the

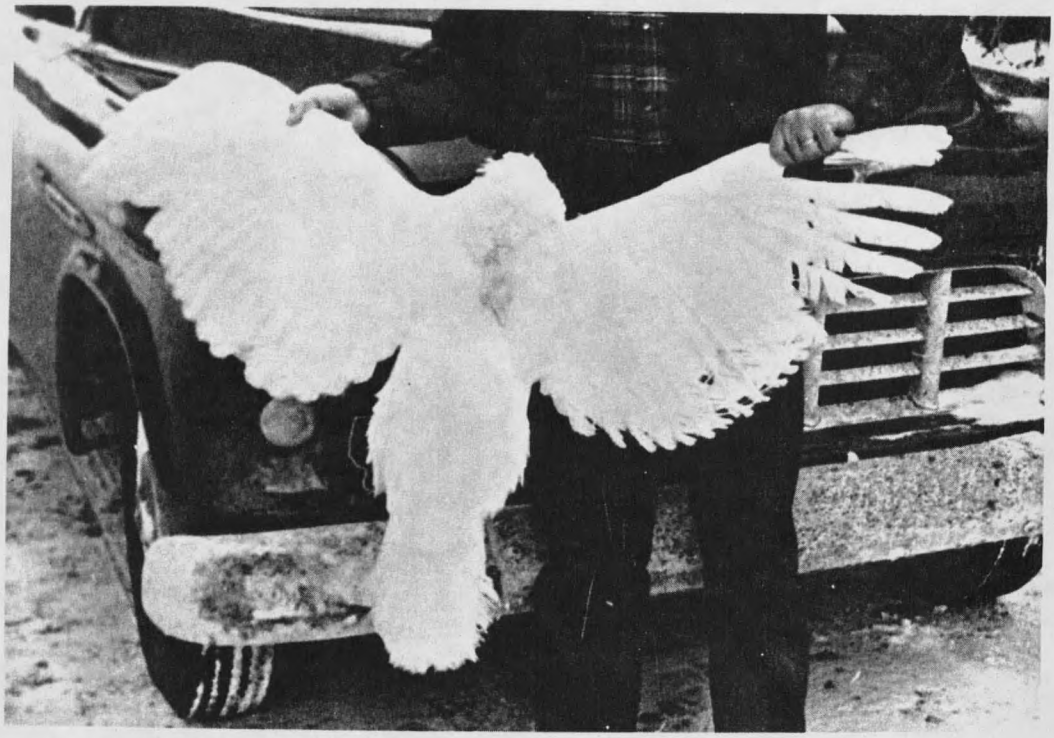

Fig. 2. The white juvenile hen which was removed from the Longpines population on February 16, 1956. The weight was six and one-half pounds.

forested areas at higher elevations. These agricultural lands are usually planted to alfalfa and cereal grains, such as oats, barley and wheat.

The cover types of the mountain slopes are mixed ponderosa pine - grassland and Douglas fir - lodgepole pine. Dense to open stands of immature ponderosa pine (Pinus ponderosa) predominate the area. Only a few stands of mature trees are found and these are on isolated ridge tops. Douglas fir (Pseudotsuga taxifolia) - lodgepole pine (Pinus contorta) is the next most abundant timber type with scattered tracts found throughout the area mostly on north and east facing slopes.

The principal understory plants of the timber types are western snowberry (Symphoricarpus occidentalis), common snowberry (Symphoricarpus albus), bearberry (Arctostaphylos uva-ursi), common juniper (Juniperus communis), and Oregon grape (Mahonia repens).

The grassland type is composed principally of Idaho fescue (Festuca idahoensis), crested wheatgrass (Agropyron desertorum), bearded bluebunch wheatgrass (Agropyron spicatum), prairie junegrass (Koelaria cristata), needle-and-thread (Stipa comata), cheatgrass brome (Bromus tectorum), smooth brome (Bromus inermis), Kentucky bluegrass (Poa pratensis), timothy (Phleum pratense), and carex (Carex spp.). Principal forbs of this type are red clover (Trifolium pratense), white clover (Trifolium repens), silvery lupine (Lupinus argenteus), lodgepole lupine (Lupinus parviflorus), Missouri milkvetch (Astragalus missouriensis), looseflower milkvetch (Astragalus tenellus), prairie milkvetch (Astraga-

lus striatus), wayside gromwell (Lithospermum ruderale), arrowleaf balsamroot (Balsamorhiza sagittata), bush cinquefoil (Potentilla fruticosa), gland cinquefoil (Potentilla glandulosa), northwest cinquefoil (Potentilla gracilis), Pennsylvania cinquefoil (Potentilla pennsylvanica), stiffleaf vetch (Vicia sparsifolia), little larkspur (Delphinium bicolor), prairie thermopsis (Thermopsis rhombifolia), black medic (Medicago lupulina), and woolly groundsel (Senecio canus).

Quaking aspen (Populus tremuloides), hawthorn (Crataegus spp.) common chokecherry (Prunus virginiana), skunkbush sumac (Rhus trilobata), rose (Rosa spp.), and mallow ninebark (Physocarpus malvaceus) are found along the edges of the forest types and the creek bottoms.

Limber pine (Pinus flexilis) is found near the tops of the higher mountains.

Creeks are generally found at two to three mile intervals throughout the area. Most are spring fed and the larger ones continue to flow during the dry season.

The mean average annual temperature for Lewistown is 42.7°F with extremes of 66.3°F (July) and 20.7°F (January). The extremes for the latter month are 66°F and -33°F, but -42°F has been recorded in February. The average annual precipitation is 16.79 inches, and the mean annual snowfall is 54.2 inches (Climatic Summary of the United States - Supplement for 1931 Through 1952 - Montana). During winters of deep snows, the canyon bottoms collect and hold the snow, but the south exposures usually remain clear during the hardest winters.

Thirteen Merriam's wild turkeys from southern Colorado were released in Limekiln Gulch on November 13, 1954. The sex and age composition was one adult male, four immature males, five adult females, and three immature females. All birds were banded with aluminum leg bands.

LONGPINES AREA RELEASE SITE

The Longpines Division of the Custer National Forest, located in southeastern Montana, is an area of approximately 60,000 acres. Although no prominent mountain ranges occur here, the area is characterized by a rolling to broken topography with all elevations over 3,000 feet and a relief of less than 1,000 feet. The release site was in the southeastern part of the Longpines, in the vicinity of Capitol Rock.

The principal cover type is mixed ponderosa pine and grasslands. There appears to be a slightly greater percentage of mature trees in this area than found in the Judiths. The understory is primarily grassland although western snowberry and bearberry are quite common in the open stands.

The grass cover is primarily Idaho fescue, crested wheatgrass, bearded bluebunch wheatgrass, needle-and-thread, junegrass, red threeawn (Aristida longiseta), and little bluestem (Andropogon scoparious). Carex is common throughout the area and Kentucky bluegrass is found in the more moist sites. Blue grama (Bouteloua gracilis) is common to the lower range areas.

Boxelder (Acer negundo), green ash (Fraxinus pennsylvanica), and

quaking aspen are found along the canyon bottoms. Currant (Ribes spp.), skunkbush sumac, common chokecherry, rose, American plum (Prunus americana), and hawthorn are the principal shrubs found along creek bottoms and edges of the forested areas. Silver buffaloberry (Shepherdia argentea), and silver sagebrush (Artemesia cana) are common to the lower canyon bottoms.

There are no cultivated canyon bottom stringers penetrating the forested areas as found in the Judith Mountains. Cultivated fields are located generally around the mountains at the lower elevations, and are usually planted to cereal grains, such as wheat and oats.

Water, in the form of seeps and springs, is found at about two to three mile intervals, and the larger springs continue flowing during the dry season.

The mean average annual temperature for Ekalaka is 44.1° F with extremes of 71.8°F (July), and 17.6°F (January). The extremes for the latter month are 57°F and -40°F, but -43°F has been recorded in February. The average annual precipitation is 12.99 inches, and the mean annual snowfall is 22.3 inches (Climatic Summary of the United States - Supplement for 1931 Through 1952 - Montana). The heaviest snowfall occurs at the higher elevation, but the south exposures remain relatively snowfree through the winter.

Eighteen turkeys, from the Black Hills of northeastern Wyoming, were released on January 27, 1955. The sex composition of the flock was five toms and thirteen hens. All birds were banded with aluminum leg bands.

NESTING

Only one nest was located. This was discovered on August 16, 1955, in the Judith Mountains. It contained ten eggs (Fig. 3). The location was on an east-facing slope in lodgepole pine timber, and was concealed in a pile of pine slash. Oregon grape was the most abundant understory plant. Mosby and Handley (1943) state that wild turkeys "show a decided preference for locating their nests near openings in the forest, usually choosing sites near trails, roads, or small abandoned fields". This location was five feet from a trail, and approximately twenty yards from a cultivated field.

The hen was still incubating, but the eggs were infertile. The smoothly worn eggs and the appearance of the egg contents, a uniformly-brownish liquid, suggested that the hen had been incubating for a considerable length of time. A search around the nesting area revealed no black caecal droppings, characteristic of nesting hens (Mosby and Handley, 1943). Approximately fifty yards from the nest, several large "clocker droppings" were found in a field, which the nesting hen was observed to use regularly.

Leopold (1933), gives reference to "clocker droppings" being used in Scotland as indicators of nesting red grouse. Patterson (1952) determined that the "clocker dropping" is a good indicator of sage grouse nesting activity and quite often can be used as an aid in locating the actual nest site.

On August 8 and 9, 1955, eight "clockers" were located on a knoll

Fig. 3. A Merriam's wild turkey nest found in the Judith Mountains. The ten eggs were infertile.

approximately three miles northeast of the located nest. A search was made on both dates for a nest, but none was found. Perhaps "the nest" was terminated by this late date.

The presence of "clocker droppings", near the nest, suggests that this type of dropping may be used as an indicator of wild turkey nesting activity.

REPRODUCTION AND SURVIVAL

The reproductive success for the Judith Mountain transplant was apparently low. One brood was observed. It contained only three young, This brood was observed in October 1955, by a landowner in Ruby Gulch, approximately two and one-half miles northeast of the release site. During the winter of 1955-56, a flock composed of one adult tom, three adult hens, and three juveniles was observed in this same general area. The location suggests that the juveniles were the same ones observed in October.

A report was received in mid-September, 1955, of a hen and six to ten young near Fort Maginnis, on the east side of the Judiths, approximately fifteen miles from the release site. A check was made with landowners of this area, but this brood was never observed. The evidence indicates a net loss of six birds (46%) for the first year.

The Longpines, in contrast to the Judith Mountains, had a high reproductive success. Sixty-one young were observed during the summer of 1955 as follows: one hen with nine young, two hens with twenty-two young, and three hens with thirty young. Apparently there were six broods with an

average of about ten young each. Two of the poults were white suggesting a domestic strain in the original stock. February and March counts gave a total of at least sixty-five young, indicating that all broods were not observed during the summer. Total counts for the area indicate eighty-two birds, an increase of 355% for the first year.

MOVEMENTS

After release, the turkeys in the Judith Mountains remained in the general vicinity for about ten days. The next sight record was in Ruby Gulch, approximately two and one-half miles northeast of the release site, on November 27. At least eleven of the original thirteen birds remained in this area until February 1, 1955. They were next observed near the release site on February 20, 1955. The number of birds in the flock was then nine. On March 24, eight birds were observed near the release site. During April, a general break-up and dispersal of the flock occurred. Three birds were reported, during April and May, approximately four miles east of the release site, two were observed on April 10, two and one-half miles east of the release site, and one was observed about May 1, three miles southeast of the release site. The birds remained dispersed after the spring break-up until late fall, when flocking occurred. A flock of eleven, was observed about December 1, 1955, in Ruby Gulch. A flock of seven, remained in this area until March 25, 1956. The summer and winter ranges for the Judith Mountains flock were essentially the same.

The Longpines flock utilized different summer and winter ranges.

The summer range was the forested areas, at the higher elevations. During the summer, most of the observations were within six miles of the release site, but one brood was observed regularly, nine miles northwest of the release site. The shift to the lower elevations occurred after October 1, 1955. On October 10, a flock of about twenty-four were observed on a ranch near Belltower Butte, on the southwest corner of the Longpines. The numbers in this flock varied between eighteen and twenty-eight until December, when the number remained near twenty-four. Eighty-two turkeys were counted in February and March, 1956, wintering near ranches around the periphery, of the forested areas, of the southern half of the Longpines. Distances from the release site were seven miles northwest, to two miles east, to nine miles west, with flocks scattered between these points. The birds left the lower ranges and returned to the forested areas between March 15 and 30, 1956.

Daily cruising ranges during the summer months were determined, by continuous observations, to be about two to three miles. By back-tracking in the snow, the winter daily cruising range was determined to be about the same, however, during periods of deep snow, this distance was decreased to about one-fourth of a mile from the roost areas.

ROOST TREES

Roost trees are easily identified by the numerous droppings beneath the trees. Small flocks of turkeys may use a single tree, however, large flocks will utilize a group of adjacent trees as the roost area.

Trees selected, generally have a trunk diameter of ten to twenty inches, and are bare of foliated branches for at least the first twenty feet (Fig. 4). The roost trees are usually located in a stand of trees at the base of a cliff or at the head of a basin (Fig. 5).

Sometimes, other types of roost areas are utilized. In November, in the Longpines area, observations were made, for several nights by a rancher, on a flock of wild turkeys which used a buffaloberry thicket as a roosting area. During a blizzard in December, another flock of over twenty birds were observed to roost on and under a fallen tree near a stock-feeding area, for three nights.

Wild turkeys usually go to roost about one-half hour before sunset. On September 2 and 5, 1955, in the Longpines, flights to the roost trees were completed at 6:35 and 6:29 P. M., respectively. At 4:25 P. M., on February 16, 1956, a roost tree was located in the Longpines. A minimum of six birds were already roosting in the tree at the time of discovery. Normally the birds leave the roost trees at daybreak. The mornings after the above roost flights, the birds were observed to leave the trees at 5:01 and 5:07 A. M., respectively. When going to roost, the birds took off from a hillside and flew upward into the roost trees. When leaving the roost trees, the point of landing was approximately the same as the take-off point.

During the summer, the birds did not appear to have regular nightly roost trees, but in some cases, the same trees were used irregularly.

In the winter, regular nightly roost trees were utilized by flocks.

Fig. 4. The trunk section of a typical winter roost tree.

Fig. 5. A turkey winter roost area. Tree in Fig. 4 is in the center background.

The birds returned to the stand of trees each evening, but seldom selected exactly the same trees in which to roost.

During periods of very severe weather, turkeys have been known to spend a day or more in the roost trees. It has also been observed that during rainy weather, wild turkeys may spend a considerable portion of the day in trees (Mosby and Handley, 1943).

FOOD HABITS

Food habits were determined by analysis of droppings. The method used was similar to the methods of Dalke, Clark and Korschgen (1942). The dried droppings were soaked in water for approximately twenty-four hours, then strained, under running tap water, through a medium-mesh household tea sieve. The dropping materials were then blotted and air-dried. Identification of items was made with the aid of a binocular microscope.

Items identified in each dropping, and the most abundant item in each dropping were recorded (Tables I and II). Insects were identified to order, and, if possible, to family. Plants were identified, in most cases, to genera, but unidentifiable grass parts were recorded as Gramineae, and grains, greens, buds, twigs, and mosses were treated as separate items.

The most abundant items identified in 933 summer droppings from the Longpines area were insects of the order Orthoptera (89.3% of droppings), the seeds of bearberry (86.0%), seeds of snowberry (54.9%), grass leaves and stems (26.4%), seeds of skunkbush sumac (23.6%), and