

## WILD TURKEY RANGES IN ALABAMA MOUNTAIN HABITAT

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*Abstract:* Annual and seasonal ranges of 76 resident and 13 restocked wild turkeys (*Meleagris gallopavo*) from the Alabama Lower Coastal Plain were studied over a 3-year period in a north Alabama mountain habitat. Turkeys were tracked by radio telemetry. After exploratory movements of up to 9.2 km, restocked turkeys adjusted to the habitat within about 6 weeks and included the release site in their annual ranges which were almost identical in size to those of resident birds. Resident turkeys released at their capture-site used it as part of their annual range and when released as far away as 4.0 km returned to the capture-site. Mean annual ranges of 1,544 ha for 33 resident and 1,559 ha for 9 restocked turkeys were measured and were over 3 times larger than those reported for the Piedmont and Coastal Plain.

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Proc. Ann. Conf. S.E. Assoc. Fish & Wildl. Agencies 33: 233-238

The Alabama Department of Conservation and Natural Resources began restocking wild turkeys in 1945 in mountainous northern Alabama ranges with stock from the Fred T. Stimpson Sanctuary in southwestern Alabama. After initial stocking success, harvest rates declined on state wildlife management areas in the region. Populations have persisted but at much lower densities than in the Lower Coastal Plain.

Mosby and Handley (1943) stated that in Virginia the average cruising radius of the wild turkey was about 3.2 km in the eastern part of the state and somewhat greater in the mountains. Habitat improvement was said to reduce turkey range size appreciably. Stoddard (1963) stated that to maintain a dense stocking of wild turkeys and to prevent wandering, an abundance of preferred foods must be available at all seasons. Speake et al. (1975) found that wild turkey hens on areas containing few openings made longer seasonal movements than did hens on ranges with well distributed openings. They also found that turkeys tolerate a wide range of habitat conditions and patterns of land use but the majority of them select seasonal ranges that have a good mixture of habitat types.

We are indebted to D. Nelson, Area Manager of Thomas Wildlife Management Area, W.J. Hamrick of the Alabama Department of Conservation and Natural Resources, and J.A. McGlincy, Wildlife Technician for their support and assistance. This study was partially funded by Federal Aid to Wildlife Restoration, Alabama Pittman-Robertson Project W-44.

### STUDY AREA

The study area consisted of lands on and adjacent to the Thomas Wildlife Management Area in northwestern Alabama in the westward extension of the Appalachian Plateau. Most of the area was high, winding, narrow ridges and deep valleys (Hodgkins et al. 1976). The major habitat types are mature upland hardwoods, creekbottom hardwoods, pine stands established by Timber Stand Improvement (TSI) methods, pine plantations, pastures, and croplands. The primary plant species on the upland forest are oaks (*Quercus* spp.) and hickories (*Carya* spp.). American beech (*Fagus grandifolia*), sweetgum (*Liquidambar styraciflua*), white oak (*Q. alba*) and scarlet oak (*Q. coccinea*) are the dominant species in the creekbottoms. Long winding pastures on private land are vegetated primarily with fescue (*Festuca arundinacea*) and the croplands are in corn (*Zea mays*) and soybeans (*Glycine max*). Pastures and fields are well

distributed on 3 sides of the management area turkey range. The portion of the management area used by wild turkeys had about 2% of its area in openings maintained as game food plots. The mature hardwood forest on the area has not been cut since 1945.

The total range used by the turkey population under investigation was about 14,170 ha in the following habitat types: 75% upland hardwoods, 10% creekbottom hardwoods, 5% pine plantations less than 9 years since planting, 4% pastures, 3% agricultural fields, 2% pine stands 19 years old established by TSI methods, 0.6% in powerline and gas pipeline rights-of-way, and 0.3% in openings created on the management area. The wild turkey population was estimated 1 May 1976 as 1 per 142 ha and 30 September 1978 as 1 per 58 ha.

Turkey hunting was initiated on the study area in 1961 after stocking in 1945. Harvest rates decreased from 28 gobblers in 1962 to 2 in 1970, after which the season was closed until April 1978 when a 10-day hunt was held and 27 gobblers were harvested.

## METHODS

Between January 1976 and April 1978, 76 wild turkeys (42 hens and 34 gobblers) were captured on the study area. Additionally, 9 adult hens and 4 adult gobblers were captured on the Fred T. Stimpson Sanctuary in the Lower Coastal Plain and released on the Thomas Wildlife Management Area between January and March 1976. Turkeys were captured with rocket-projected netting (Dill 1969) and chemically treated baits (Alpha chloralose), as described by Williams et al. (1973), and were instrumented with radio transmitters. The receivers, antennas, solar powered activity-location-mortality transmitters, and the techniques employed in their use are described in detail by Everett et al. (1978). The use of solar powered transmitters allowed us to monitor the movements of certain individuals for 3 years.

Instrumented birds were tracked 2 or more times each week throughout the year and their locations plotted by triangulation (Cochran and Lord 1963). Daily locations were taken for all turkeys immediately before and after public hunts and for incubating hens. When an instrumented bird could not be found from the ground, we made an aerial search.

The minimum home range method as described by Mohr (1947) was used to delineate annual and seasonal ranges. Annual ranges of 42 radio-instrumented wild turkeys were based on fixes taken twice each week throughout 1 year. Spring ranges were based on radio locations taken from 15 March to 31 May. Summer ranges were from 1 June to 30 September. The fall season was included in our winter data since the instrumented turkeys primarily used the mature hardwood forest throughout the period 1 October to 14 March.

The wild turkey population on the study area was estimated each May 1 and October 1 in 1976, 1977, and 1978 by the Schnabel method (Schnabel 1938). The estimation was based on the number of instrumented turkeys with functional radios and uninstrumented birds sighted during each April and September and the number of instrumented turkeys with functional radios which were tracked during the same time period.

## RESULTS

### Post-release Movements

Movement data were obtained for 65 birds resident on the Thomas study area. Fifty-three birds were released at the capture-site. Fifty remained within 0.8 km of the capture-site until seasonal range changes occurred. All of them later used the capture-site as part of their annual range. Three birds that did not remain near the capture-site did not use the vicinity of the capture-site thereafter. Twelve resident turkeys were released at locations up to 4.0 km away from their capture sites. Eleven of these returned to the vicinity of capture within 7 days; a distance of at least 3.2 km for 8 of the birds. One hen remained

near the release site and made no movements toward her capture-site, 4.0 km away. She later included the release site as part of her annual range.

Post-release movements were also measured for the 9 hens and 4 gobblers restocked from the Lower Coastal Plain. The gobblers were released 22 January 1976. One gobbler moved 3.6 km the first day but returned to the release site after 4 days. The gobbler's range thereafter included the release site; his movements were within 1.8 km of it. The other 3 gobblers remained within 0.8 km of the release site for 7, 8, and 9 days and then moved 2.4 km, 3.2 km, and 4.8 km away but returned. Afterward their ranges included the release site. These 3 gobblers moved as individuals until the late summer when they flocked with 2 unmarked gobblers.

Seven hens were released 3 February 1976. One remained near the release site and died 1 week after release. The other 6 remained within 0.8 km of the release site for periods of 3 to 24 days and then individually moved away. Their movements were from 3.3 km to 9.2 km away from the release site. The hen that moved 9.2 km established her range around a large pasture and did not return. One hen moved 3.7 km and returned the following day. She then moved away from the release site and established a range 1.6 km from the release site. The other 4 hens set up ranges which included the release site on 1 edge.

Two hens from south Alabama were released 3 March 1976. They remained within 0.8 km of the release site for 20 and 24 days. One hen established an annual range which had the release site on one edge and the other hen moved 5.2 km away for 17 days during which time she was believed to be laying eggs. She returned to the release vicinity in 1 day and was killed by a bobcat (*Lynx rufus*).

#### Annual Ranges

Minimum annual ranges of 18 resident gobblers for which we had radio locations for 1 full year averaged 1,631 ha (Table 1). The 4 gobblers restocked from the Coastal Plain had an average annual range of 1,691 ha. Two of the restocked birds were radio-tracked for over 1 year and 1 was tracked for 3 years. An average annual range of 1,439 ha was obtained for 15 resident hens. Annual ranges of 5 restocked hens averaged 1,455 ha (1,165 ha to 2,219 ha). No significant difference ( $P > 0.05$ ) was found between the annual ranges of resident and restocked gobblers or the 2 groups of hens.

#### Seasonal Ranges

Thirty-six spring ranges of resident and restocked gobblers averaged 503 ha and 43 hen spring ranges had a mean of 348 ha. Twenty-seven resident and 9 restocked gobbler ranges were measured as were 32 resident and 11 restocked hen ranges (Table 1). No significant difference ( $P > 0.05$ ) was found between the ranges of the 2 groups of gobblers or hens.

Thirty-three resident and restocked gobbler summer ranges had a mean of 665 ha, whereas the average of 33 hen summer ranges was 714 ha. Twenty-six ranges of resident and 7 ranges of restocked gobblers were measured; twenty-seven resident hen and 6 restocked hen summer ranges were measured. No significant difference ( $P > 0.05$ ) was found between the ranges of the 2 groups of gobblers or hens.

Twenty-three winter ranges of resident and restocked gobblers averaged 973 ha. Twenty-eight hen winter ranges had a mean of 783 ha. Nineteen resident and 4 restocked gobbler ranges were recorded as were 22 resident and 6 restocked hen ranges (Table 1). No significant difference ( $P > 0.05$ ) was found between winter ranges of the resident and restocked gobblers or the ranges of the resident and restocked hens.

## DISCUSSION

Release of the resident birds at their site of capture did not cause marked changes in their movements. Almost all used the vicinity of the capture site until range changes were noted which corresponded with changing seasons. Resident turkeys released away from

TABLE 1. Average wild turkey range size (ha) found by various authors in the Southeast.

Author	Region	Hen Gobbler	Annual	Spring	Summer	Fall	Winter
Wheeler (1948)	Coastal Plain	H	405				
		G	405				
Ellis & Lewis (1967)	Ozark Highlands	H	552				
		G	445				
Davis (1973)	Coastal Plain	H	140				
		G	224				
Barwick & Speake (1973)	Piedmont	H					
		G	398	204	133	172	270
Hillestad (1973)	Piedmont	H		150			
		G					
Fleming & Webb (1974)	Piedmont	H					
		G		95			
Speake et al. (1975)	Coastal Plain	H		Combined			
		G		644			
Choctaw Bluff	Coastal Plain	H		476			
		G		474			
Sanctuary	Coastal Plain	H					
		G					
Saco	Coastal Plain	H		318			
		G					
SRA	Piedmont	H				Combined	
		G				430	
Present Study	Appalachian Plateau	H					
		G					247
Resident	Appalachian Plateau	H	1,439	327	684	730	
		G	1,631	488	687	994	
Restocked	Appalachian Plateau	H	1,455	410	853	982	
		G	1,691	545	586	881	

capture-sites usually returned to the capture-site vicinity and remained until seasonal range changes were noted.

Movements after release of turkeys from the Lower Coastal Plain into the mountain habitat had the following general sequence of events: The birds remained near the release site for several days, began exploratory movements, and usually returned to the vicinity of the release site; only 2 of the 12 birds established ranges that did not include the release site; each turkey settled into a pattern of regular movements similar to those of the resident birds within about 6 weeks after release; with seasonal changes, the turkeys moved into new areas and again their movements were similar to the resident turkeys.

Speake et al. (1969) who studied a turkey population in the Alabama Piedmont, found that movement patterns of turkeys stocked on the study area and those raised on the area were similar in every respect. Most stocked turkeys quickly selected ranges centering around the more familiar area of the release site. Eichholz and Marchinton (1975) noted somewhat similar movement, in that after the period of initial exploration ended, the turkeys settled into movement patterns similar to resident birds. They hypothesized that the turkeys would orient around the release site if it was in good quality habitat. We found that 4 of the transplanted birds used the release site for 2.5 years and 2 used the area for over 3 years after release.

Annual ranges of wild turkeys reported in the Alabama Coastal Plain are less than one-third the size of the ranges we found in mountainous habitat (Table 1). Wheeler (1948) considered the Fred T. Stimpson Sanctuary to be optimum turkey range and believed that the average area used by various flocks seldom exceeded 405 ha. Davis (1973) reported that wing marked gobblers and hens in the Alabama Coastal Plain had

average annual ranges of 243 ha and 140 ha respectively. Barwick and Speake (1973), using radio telemetry, reported that annual ranges of 12 gobblers in the Alabama Piedmont average 398 ha.

When the birds from the Lower Coastal Plain were stocked into the mountainous region, where the movements of resident turkeys averaged over 1,544 ha, the ranges of the restocked birds increased in size, approximating those of the resident birds. This increase in range size is believed to be a response to the habitat into which the birds were released.

Spring and summer ranges of wild turkeys in our study are much larger than found in other Southeastern studies. Barwick and Speake (1973) reported mean spring ranges of 204 ha for 5 gobblers in the Alabama Piedmont. Fleming and Webb (1974) found that during the breeding season, 8 gobblers from the South Carolina Piedmont had average ranges of 94.6 ha. Eichholz and Marchinton (1975) found that 3 subadult gobblers released into unfamiliar habitat in spring had ranges averaging 419.6 ha for a 100-day period. They also found in the same study that an adult gobbler had a range of 280 ha. Hillestad (1973) reported average ranges of 5 non-nesting hens to be 78.5 ha and 149.8 ha for 8 nesting hens in the Alabama Piedmont. Summer ranges of 133 ha were reported by Barwick and Speake (1973) for gobblers in the Piedmont. Other data for comparison with our summer ranges were available as combined spring and summer ranges (Speake et al. 1975) (Table 1). The summer ranges for our study were larger than the combined spring and summer ranges of wild turkeys on 3 different Coastal Plain study areas and were approached in size by the Choctaw Bluff study area; an area with few interspersed openings. If our spring and summer ranges were combined and measured, this combination would still be much larger than the combined spring-summer ranges reported for the three Coastal Plain studies. Direct addition of spring range figures to summer range figures are not possible due to some overlap of spring and summer ranges. Speake et al. (1975) found that spring and summer habitat should include 12 to 25% well dispersed openings, in order to reduce the distance of spring dispersal to nesting and brood rearing habitat. The Thomas Wildlife Management Area provided winter range for turkeys, but the lack of suitable openings limited its value as spring and summer habitat. Therefore the turkeys made long seasonal movements to reach openings which met their spring and summer requirements.

Winter habitat selected by the wild turkeys on the study area was the mature hardwood forest. This habitat type has long been thought to be ideal winter habitat for wild turkeys. Abundant acorn crops of both black and white oak groups were noted during both the winters of 1976-77 and 1977-78. With abundant mast for food, it would seem that the movements of turkeys would be localized and winter ranges would be small, but the range sizes we found were much larger than those reported from the Lower Coastal Plain and Piedmont with their mixed pine-hardwood forest.

## CONCLUSIONS

The sizes of annual and seasonal ranges of wild turkeys are primarily a function of habitat quality. Wild turkeys on less productive ranges must move farther to meet their needs than those on better habitat with good interspersed types and openings. The turkeys resident to the mountain study area had larger annual ranges than those of the Coastal Plain and Piedmont habitats. This is believed to reflect the poorer quality of the mountain habitat. Wild turkeys restocked from the Lower Coastal Plain into the mountain habitat responded by increasing their range sizes and movements, conforming almost exactly to those of the resident turkeys.

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