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**THE EFFECTS OF A SPRING "GOBBLERS-ONLY"
HUNTING SEASON ON WILD TURKEY
REPRODUCTION AND POPULATION SIZE**

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ABSTRACT

A wild turkey (*Meleagris gallopavo silvestris*) population was established near Auburn, Alabama by releasing 26 wild-captured birds during 1965 and early 1966. From March 1965 through June 1972 dynamics of the population were studied. Continued observation on the population, most individual of which were marked, was the primary method of study. A total of 2,362 positive identifications of individually marked turkeys was made.

Direct count estimates of spring-breeding populations and late-summer populations were made each year from 1965 through 1971, excluding 1969, on the 7,293 acre study area. Late summer counts gave hen-poult ratios and estimates of total reproductive success.

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Hunting was not allowed during the first 5 years after the original release. Harvest data collected from hunter permit questionnaires and personal interviews showed that 1.8 and 1.2 legal turkeys were harvested per square mile on the study area during the springs of 1971 and 1972, respectively. A comparison of population estimates and estimates of total reproductive success for the years when no hunting was allowed (1965-1970) with those of 1971 and 1972, when hunting was allowed, indicated that a spring "gobblers-only" hunting season had little effect on reproduction and population size.

INTRODUCTION

Recently, remarkable success has been achieved in re-establishing wild turkeys by transplanting small numbers of wild-trapped birds (Hardy, 1959; Preston, 1959; Powell, 1967). The Saugahatchee Wildlife Research Area wild turkey population is the result of one such transplant (Speake, *et al.* 1969).

The Saugahatchee Wildlife Research Area was established in 1965 through an agreement between the Alabama Cooperative Wildlife Research Unit and the 21 landowners of a 9,083 acre tract near Auburn, Lee County, Alabama. The primary purpose for establishment of the area was to obtain suitable habitat to establish a study population of eastern wild turkeys. Only 7,293 acres of the tract was used for this study.

Between March 1965 and February 1966, twenty-six wild-trapped turkeys of Alabama stock were released in three groups on the Saugahatchee Area. As part of a comprehensive investigation of the population dynamics of the newly introduced population, the effects of a spring "gobblers-only" hunting season on reproduction and population size were studied. This paper presents results obtained during that study. Obviously, such information would be of importance to the game manager.

STUDY AREA

The study area is located in the Alabama Piedmont in Lee County (Fig. 1). The major habitat types on the area are pine woods (5%), mixed pine and hardwood (73%), upland hardwoods (5%), bottom land hardwoods (7%), and permanent pasture and other openings (10%). Predominant plant species are loblolly pine (*Pinus taeda*), shortleaf pine (*Pinus echinata*), sweet gum (*Liquidambar styraciflua*), post oak (*Quercus stellata*), water oak (*Quercus nigra*), white oak (*Quercus alba*), hickory (*Carya* spp.), and flowering dogwood (*Cornus florida*). Broomsedge (*Andropogon* spp.) grows in abandoned fields, and carpet grass (*Axonopus* spp.), lespedezas (*Lespedeza* spp.), Bermuda grasses (*Cynodon dactylon*), Dallas grass (*Paspalum dilatatum*) and Bahia grass (*Paspalum notatum*) in pastures.

Agricultural land use is primarily cattle grazing of improved and woodland pastures. Roughly one-third of the area is grazed by cattle. Most of the forested area is cut over at irregular intervals for sawlogs and pulpwood.

Surveys in 1940 and 1941 (Barkalow, 1949) showed that wild turkeys had been exterminated from the area and that other portions of Lee County contained very few wild turkeys. Davis (1962) reported there were no known wild turkeys in the county. The present population is the result of the 1965 transplant mentioned above.

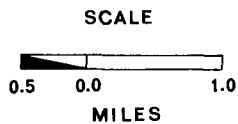
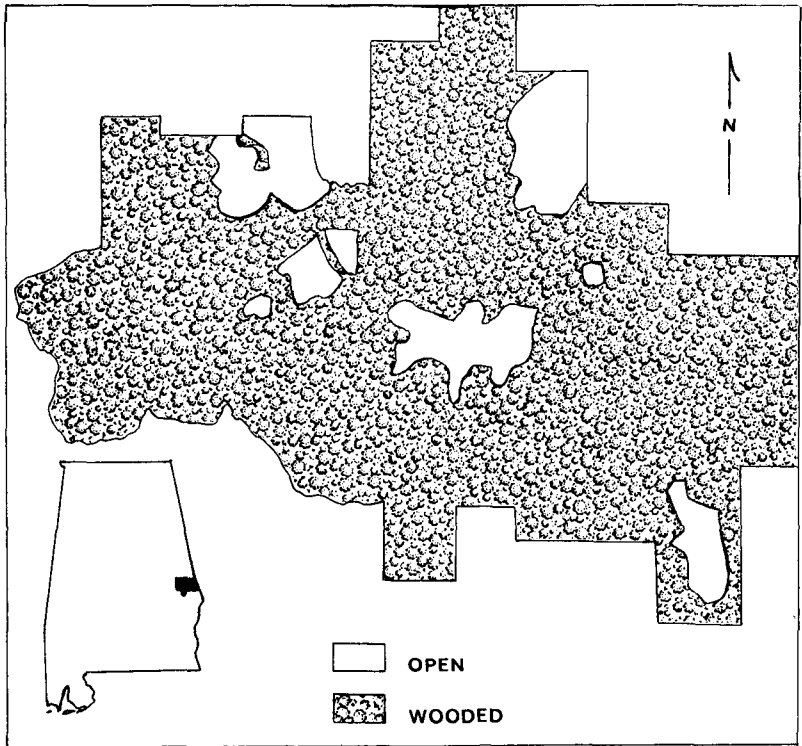


Figure 1. The Saughatchee Wildlife Research Area, Lee County, Alabama. The dark area on the inset map is Lee County.

METHOD

Capturing and Marking

Turkey flocks were located by making visual observations or scouting for turkey sign. After flocks were located, birds were captured using one of two trapping techniques: (1) chemically treated baits (alpha-chloralose and tribromoethanol) and (2) projected netting. These techniques are described by Williams *et al.* (1970), Austin (1965) and Dill (1969). After capture, all birds were patagially tagged as described by Knowlton *et al.* (1964).

Obtaining Observations

Observations of turkeys were made mainly during trips through the research area to systematically search for turkeys or turkey sign. Some observations were made during trips to the research area to prepare for capture attempts and while patrolling the area to prevent poaching and trespassing.

During spring, summer and fall, an average of over five trips per week was made to the study area. Due to unfavorable weather conditions and poor accessibility to much of the area, only several trips per month were made during the winter.

The use of 10 X 50 binoculars when in the field facilitated observations of turkey.s A spotting scope was occasionally useful.

Estimating Turkey Populations

Population estimates were made at six-month intervals beginning October 31, 1965, and, with the exception of 1969, for each succeeding May 1 and October 31 through 1971. The May 1 estimate represented the breeding population after fall, winter and early spring losses, while the October 31 estimate represented the maximum population after reproduction and early poult mortality had occurred.

The direct count method, described by Speake *et al.* (1969), was used to estimate the population

The October 31 estimate of poult production was based on summer and fall brood counts. Since more than half (at times as high as 80%) of the hens were individually marked and most were seen numerous times in open pastures with or without poults, it seems likely that a reliable count of hens and poults was obtained each year (Fig. 2).

The last reliable count of the summer for each poult group (usually in October) was used as the number alive on October 31. The total poult production for the year was then calculated.



Figure 2. Marked poults in open pasture in September. (Photography by William L. Cooper)

Estimating Reproductive Success

Each summer the number of hens observed with and without poults was recorded. Also, the number of poults surviving per hen at the end of the summer was determined from field observations.

Estimating Extent of Harvest

The estimated number of birds harvested was obtained from questionnaires issued with daily hunting permits. Each hunter was required to obtain a permit from the landowner before hunting and return it to the landowner before he left the area. Hunters were required to contact the Alabama Cooperative Wildlife Research Unit after killing a turkey. Arrangements were then made to have a Unit staff member examine the bird. Personal interviews were also held with many hunters in an effort to assure that all harvested turkeys were recorded.

A staff member of the Alabama Cooperative Wildlife Research Unit usually patrolled the area during legal shooting hours. This aided in preventing hunting without permits.

RESULTS AND DISCUSSION

Capture and Release of Turkeys

No effort was made to capture turkeys on the study area during the first year after the original release. Beginning in 1967, as many unbanded turkeys as time and circumstances permitted were captured and marked. From September 1967 through October 1971, 233 unbanded descendents of the original release were captured, leg- and wing-banded, and released at capture points. Fifty-four recaptures were made.

Population Estimates

From October 1965 through June 1972 there were 2,362 observations made of 259 turkeys whose marks were identified. There were many additional sightings of unidentified marked and unmarked turkeys.

During the period that no hunting was allowed on the area (1965-1970), the original stocked population increased more than fivefold (Fig. 3). The estimated population size increased from 27 on May 1, 1966, to a high of 143 on October 31, 1970. After five breeding seasons (1970), the fall population estimate was 12.5 per square mile on the study area.

Spring to fall increases were 93% in 1966, 64% in 1967, 81% in 1968, 116% in 1970 and 171% in 1971. Population estimates were not made in 1969 because the major investigator at that time had been immobilized by injuries received in an automobile accident. The higher than normally expected increase in 1970 and 1971 can be attributed to exceptionally good reproductive seasons these years (Table 1). Also, the removal of 23 turkeys (21 gobblers and 2 hens) during the first hunting season (1971) made the May 1, 1971, population estimate lower than normal, thus yielding a higher spring to fall percentage increase for that year.

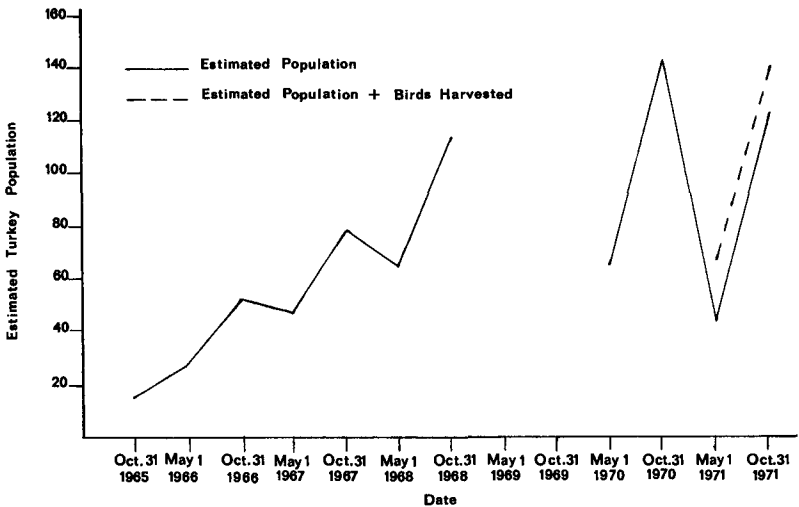


Figure 3. Direct count estimates of the wild turkey population on the Saugahatchee Wildlife Research Area (1965-1971).

TABLE 1. Reproductive success of wild turkey hens on the Saugahatchee Wildlife Research Area. (1965-1971).

Year	Observed Number of Hens with Poults	Hens without Poults	Total Number of Hens Observed	Average Number Poults Per Successful Hen	Total Number of Poults Produced
1965a	2	1	3	2.5	5
1966	8	5	13	3.2	25
1967	7	16	23	4.6	32
1968	13	12	25	4.8	62
1969			(No Data Available)		
1970	18	4	22	4.9	88
1971	14	9	23	5.9	83

aOnly three hens had been stocked by the breeding season of 1965.

Data presented in Figure 3 indicate that the population has stabilized. May 1 population estimates for 1968 and 1970 differ only slightly (65 vs. 66, respectively). The May 1, 1971 estimate of 45 is somewhat lower, however. But, if the 23 birds that were harvested just prior to May 1, 1971, are included in the May 1, 1971, population, the estimate would be 68. These data indicate, then, that the spring breeding population in 1968, 1970, and 1971 would have differed only slightly if no harvest had been allowed in 1971.

As the population grew, the percentage increase in the breeding population (May 1 estimate) decreased. There was a 77% increase in the breeding population from 1966 to 1967, 35% from 1967 to 1968, and 1.5% from 1968 to 1970. If no birds had been harvested in 1971, the estimated percentage increase in the breeding population from 1970 to 1971 would have been 3%. These figures also indicate that the population has stabilized.

Reproductive Success

The number of hens observed with poults, the number of hens observed without poults, and the number of poults raised per successful hen were recorded for each year from 1965 through 1971, excluding 1969 (Table 1). The percentage of hens observed to have successfully raised one or more poults was 62 in 1966, 30 in 1967, 52 in 1968, 82 in 1970, and 61 in 1971; the average for the five years was 57. Wheeler (1948) found that only about half of the hens observed on his south Alabama study area in August 1944, had poults. He also reported that the average brood size in July for 1941, 1944, and 1945 was 5.0, 4.9, and 4.5, respectively. These estimates are close to those of the Saugahatchee population from 1966 through 1971 (Table 1).

HARVEST

The first hunting season for wild turkeys on the Saugahatchee Area was held March 20, 1971, through April 26, 1971. Only gobblers were legal to harvest.

The known legal harvest was 21 birds, which was 51% of the estimated gobbler population and 15% of the fall 1970 population estimate. Fifteen adult gobblers and six subadult gobblers were taken. An additional two hens were known to be illegally killed.

The second hunting season on the area was held March 20, 1972 through April 30, 1972. The known legal harvest during this season was 14, or 11% of the fall 1971 population estimate. Three adult and eight sub-adult gobblers were harvested. Two unknown-aged gobblers and one bearded hen were also harvested. The percentage of the gobbler population harvested in 1972 is unknown.

Mosby (1959) believed that hunting mortality under a "gobblers-only" season was around 10% of the total fall population in most areas in the range of the eastern wild turkey. Harvests on West Virginia study areas ranged from 10 to 23 annually over a seven-year period (Bailey and Rinell, 1965). The percentage harvest of the fall population in 1970 and 1971 on the Saugahatchee Area is close to these estimates.

Bailey and Rinell (1965) suggested that a legal kill of one turkey per square mile constituted reasonably good hunting. Our harvest data show that 1.8 and 1.2 birds were killed per square mile on the study area in 1971 and 1972, respectively. Reasonably good or better hunting was, therefore, achieved just five years after the original stocking was made.

Reproduction and Population Size After Harvest

Several writers have discussed the effects of hunting on the overall population. Powell (1967) believed that it is virtually impossible to eliminate a turkey population in good turkey range of adequate size in Florida by hunting

under present regulations. Latham (1958) assumed that whenever hunting kill and crippling loss exceeds 40% of the population, additional protection is probably needed. Mosby and Handley (1943) reported that hunters in a six-day season in 1940 harvested 30% of the estimated fall population (150 birds) on the Cumberland State Forest in Virginia. Twenty years later on the same area, 46% of the estimated fall population of 250 turkeys was harvested. Bailey and Rinell (1965) reported that results from their study in West Virginia do not show any correlation between population size and the percent removed by hunting. Allen (1956) believed that spring turkey seasons do not "retard the turkey population."

Our data suggest that a spring "gobblers-only" harvest does not adversely affect reproduction and population size. Reproductive success of hens on the Saugahatchee Area in 1971, after the first spring "gobblers-only" hunting season was held, was as good or better than that of 4 of the 5 years (1966-1970) when no hunting was allowed (Table 1). Only in 1970, which was the best reproductive year before hunting was allowed, were more poults produced than were in 1971 after a spring "gobblers-only" harvest. In 1970, 18 hens raised 88 poults whereas 14 hens raised 83 poults in 1971. Therefore, total poult production differed little for the 2 years.

Incomplete data collected after the 1972 hunting season suggest that the 1972 breeding population and reproductive success will be as good as or better than most previous years. By August 1, 1972 we had observed 63 individual poults and indications were that the May 1, 1972 population estimate will be over 60 birds.

The fall, 1971, population estimate of 123 is only 21 birds (which is the number of birds harvest the previous spring) lower than the fall 1970 estimate (Fig. 3). Assuming the fall population does not significantly decrease from the present level (1971) of 120-125 birds (approximately 10.5 per square mile), there will remain an adequate population to support an annual spring harvest. If only 10% of the fall population is harvested there will still be over 1 turkey per square mile killed, which, as previously mentioned, is considered good hunting.

Harvest data from this study, together with the increase rate of the population detected since 1966, supports the conclusion of Speake *et al.* (1969) that the practice of prohibiting hunting until 5 years from the time of restocking is sound. Our data indicates that even when reproduction is poor for 1 or 2 years, protected turkeys of wild-trapped stock in reasonably good habitat should reach a substantial population size before being subjected to hunting.

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A TELEMETRIC STUDY OF ADULT MALE ALLIGATORS ON ROCKEFELLER REFUGE, LOUISIANA

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ABSTRACT

A telemetric study was conducted on adult male alligators [*Alligator mississippiensis* (Daudin)] on Rockefeller Refuge from April 14, 1971 through March 18, 1972. Fourteen alligators were captured, tagged, marked for identification purposes, outfitted with color coded neck-collar radio transmitters, and released at their respective capture sites. A directional receiving unit was used to follow their daily movements. The size of the animals ranged from 8'3" to 10'5.5".

Minimum home range sizes and habitat preferences were determined for eleven of the alligators under investigation. Radio signals were not detected during the majority of the winter dormancy period which extended from the end of December through mid-February. The longest movement recorded was 33 air-line miles from the capture site.

INTRODUCTION

This paper describes movements and activities of adult male alligators and attempts to evaluate this data in order to formulate management practices for the species.

Due largely to excessive hunting pressure as a result of the high market value placed on their hides, Louisiana's coastal alligator population reached its low point in the mid-1950's and early 1960's. A steady decline in population has been documented by naturalists, beginning as early as the 1900's. The drastic decline over the past two decades was primarily an indirect result of the systematic exploration of the oil and gas resources in the coastal marshes of the state. Canals