

A WILD TURKEY POPULATION ON AN AREA TREATED WITH HEPTACHLOR AND DIELDRIN*

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Studies were begun early in 1958 on a 3,600-acre area in Wilcox County, Alabama, to determine the effects of aerial applications of granular formulations of the insecticides heptachlor and dieldrin on certain species of wildlife. These studies by biologists from the Alabama Cooperative Wildlife Research Unit of the Alabama Polytechnic Institute are still in progress.

The insecticides were applied by a team representing the Plant Pest Control Division, United States Department of Agriculture and the Alabama Department of Agriculture and Industries. The application was a part of the fire-ant eradication program in which these latter two agencies are cooperating.

The wild turkey was not included in the planned studies on wildlife, but the presence of a resident wild turkey population on the area allowed ample opportunity for observations. While not conclusive, as to cause and degree, the observations made thus far indicate a drastic change in the turkey population during the year following the application of 2 pounds per acre of dieldrin or heptachlor.

Approximately 2,000 acres of the research area is a part of the Lower Coastal Plains Substation, a research unit of the Agricultural Experiment Station of the Alabama Polytechnic Institute. The remaining 1,600 acres making up the test area is owned partly by Presley Bryant and Clarence Smith. The entire area has been known to support a good wild turkey population. Much of the land in Wilcox County is similar in this respect.

Information as to the abundance of the species on the area prior to the treatment in March of 1958 has been obtained chiefly by interviewing landowners and members of the Substation residing on the area. Only summer and fall observations were considered in these interviews, since it is at these times of the year that wild turkeys are most concentrated, and in flocks that can be most accurately counted. A population estimate

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was obtained for the year 1957, which was the latest reproductive season preceding the treatment of the area.

The Substation superintendent, Lavern Brown, stated that he knew of at least four distinct flocks of wild turkeys residing on the Substation during the summer and fall of 1957. These were frequently seen by Mr. Brown and other station personnel, especially in the pastures and old-fields to which turkeys are prone to come at these seasons to feed on abundant insects and grass seed. Mr. Brown estimated that together these four flocks totaled 50 to 65 turkeys.

Mr. Bryant, who takes particular interest in his turkeys and takes every opportunity to observe them and their sign, knew of an additional three flocks using his land during that period. He estimated at least 30 individuals in these groups. Mr. Smith and his laborers also encountered turkeys on his land at that time, but, since his property extends between Mr. Bryant's and that of the Substation in one part and along Mr. Bryant's in another, it was difficult to determine if those they reported were additional flocks. For that reason they are not included here.

It was concluded from the above that there were at least seven flocks of wild turkeys residing on the 3,600 acre test area in summer and fall of 1957. A minimum of 80 individuals is believed to have made up these flocks. Hunting was reportedly good on the area during the 1957-58 season, with at least eight gobblers bagged. Poaching was kept at a minimum and hunting was strictly regulated through a long-standing agreement between landowners and the Substation.

By the time the writer and other researchers arrived on the area in February of 1958, the flocks had begun their customary breaking up (prior to the breeding season), and had in general deserted the pastures and open areas. They were still very much in evidence, however, and the author frequently encountered turkeys and their sign along logging roads and ravines in the woods. During February and early March, 1958, two different flocks were seen as well as assemblage of smaller groups and individuals. Together these personal sightings numbered 25. Other researchers and residents also encountered turkeys during this period of late winter and they were frequently asked for such information. Over this 1½ month period,

sightings averaged about five turkeys per week. All such encounters could be considered accidental as they occurred during the performance of other duties and without an organized effort to locate turkeys.

The area was treated in portions, as weather permitted, with either 2 pounds of heptachlor or dieldrin per acre between March 17 and April 1, 1958. Shortly after this treatment an unusual scarcity of turkeys or their sign prevailed over the whole area. Sightings during April and May averaged only about one turkey every week even though some effort was being made to locate them. Sign, in the form of tracks and droppings, became almost impossible to find. It was the opinion of most of those on the area that some drastic alteration of the wild turkey population had occurred. As the summer of 1958 approached, the appearance of broods (normally prominent at that time in the pastures and fields) was awaited as a means of judging the permanence of this change. Evidence collected during this summer of 1958 indicated that, though some hatching did take place on the test area, the young did not survive beyond the age of about three weeks. On the Substation portion the evidence of hatching was in the form of a dead turkey poult about two weeks of age found by research personnel. However, live turkey broods were not seen by anyone on the substation throughout the summer of 1958. Live broods were seen during this period on parts of the test area other than the Substation.

Two such broods, containing 21 poults about 2 weeks of age, were seen at close range by Mr. Bryant on his land. After the first encounter in early summer, these two broods suddenly disappeared and neither they nor their sign were seen again. About the same time a helper working on the land of Mr. Smith reported seeing a young brood in a pasture. These too were never seen again. The sign of this or another brood was located by researchers, but the source was never found, and the sign itself soon disappeared. As the fall of 1958 arrived, it appeared that none of these broods or any others hatched on the test area had survived to produce fall and winter family flocks. Survival of young of the year appeared to be 0%.

The apparent seriousness of the situation prompted the writer during the fall of 1958 to make a concentrated effort to find the composition of the population. Beginning in October of 1958 a series of blinds

and baited areas were used in an attempt to concentrate the population for viewing. Frequent visits during October, November, and part of December to check sign at the baits, combined with approximately 50 hours of blind work during this period, substantiated the low reproduction for the year. A total of five adult gobblers, 6 mature hens and one young of the year were actually viewed from these positions. How many of these had been on the area at the time of treatment is not known. The distribution of bait might have caused infrequent visitors from non-treated land to spend more time on the test area during the period of baiting. Nevertheless, the turkeys seen represented a ratio of one young to eleven adults. Concurrently with the above observations Lovett E. Williams from the Wildlife Research Unit at Auburn was conducting a separate study on a wild turkey population in another part of the same county. Mr. Williams concluded that young of the year represented 50 to 60 per cent of the fall population on that area. This is considered normal for wild turkey populations. The test area, however, contrasted greatly with this as it also contrasted with itself in former years. Indications of this poor reproduction on the treated area have continued up to March, 1959.

That the changes in the turkey population on the test area were due to the application of the insecticides is not definitely known. But, several things point to it as the cause. First, there were no similar conditions in evidence in the turkey populations over the remainder of the same county. Second, the changes on the test area followed very closely the insecticide application. Third, it is known definitely that other wild animals, including quail, suffered heavy mortality on the test area as a result of the poisons. Fourth, it is known that applications of the same insecticides in other areas have resulted in the death of domestic turkeys and chickens in farmyards.

On the test area itself, there was a complete failure of reproduction in a domestic turkey flock owned by Mr. Smith. Three hens laid a total of 50 eggs of which only seven hatched. All seven of these poults died soon after birth. In addition, most of the chickens on Mr. Smith's land died. The reproductive failure in both domestic and wild turkeys on the Wilcox County area was not a complete surprise to biologists concerned. Results from laboratory experiments have shown

that penned quail and chickens fed sublethal doses of these insecticides in their diets suffered high reproductive failure. Both hatchability and survival of young were low as a result of the insecticides being transferred through the egg and to the young birds. The presence of large numbers of dead and dying insects on the treated area also presented an opportunity for turkeys to obtain the poison in a secondary manner. Both young and old wild turkeys feed heavily upon insects during the spring and summer. Conceivably they could have eaten enough of these contaminated insects to have produced secondary poisoning.

Though there is evidence that some adult turkeys survived the period of the insecticide treatment, the scarcity of turkeys of all ages following the treatment indicates that some adults succumbed also. Recently (March, 1959), skeletons of some mature birds have been found on the area. It is believed, however, that a reproductive failure of almost 100% did occur in the wild turkey population of the test area in the spring and summer following the treatments.

Though this report is not intended as final or conclusive, it is hoped that it will aid in suggesting possible avenues of approach in research on similar areas.

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DISPERSION OF LITTLE BLUE HERONS FROM A POND IN MACON COUNTY, ALABAMA

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The Little Blue Heron, *Florida caerulea*, nests in a number of colonies in Alabama. One located about three miles south of Tuskegee, in Macon County, has been of interest to the writer since the summer of 1952.

The colony located its nests in the alder and willow trees growing in the upper end of one of two adjacent ponds known locally as the "Hog Wallow Ponds." The adults dispersed quite widely each day hunting food, so the effects of the colony were widespread.

It was almost a pure colony of Little Blue Herons. A few Great Blue Herons, Common Egrets, and Wood Ibises were occasionally seen, but did not nest there. A few Green Herons did nest there and a Black-crowned Night Heron nested nearby. Besides the herons, Red-winged Blackbirds were abundant; Mourning Doves and Orchard Orioles nested in the trees among the herons.

Nests of the Little Blue Herons varied greatly in number during the period of study and their position changed as ecological succession took place in the community. At the beginning of the study a long peninsula of alder bushes extended into the pond for several hundred feet. As the study progressed, the alders in the water died and became undesirable nesting sites. At the base of the peninsula the alders spread out along the shore and became merged with larger willow trees. The shore trees and bushes gradually became the more choice nesting places. As ecological succession removed the alders from the more choice nesting position, the population of herons became reduced. No nesting was done in the spring of 1958 because a so-called sporting club got the idea that they were damaging the fishing and shot and scared away the birds.

One of the outstanding parts of the study of this community was the dispersion of young. In order to study dispersion, it was necessary to band the young birds so that they could be identified when later recovered. Number six bands, obtained from the USDI, Fish and Wildlife Service, were used. They were placed on the legs of the nestlings varying from the age of about three weeks until after they had just left the nest.