The Population Unit in a Wild Turkey Census*

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Purpose

One of the first steps in the development of a wildlife management program is a census or measurement of the stock on hand. If a census of the population can be taken, and at the same time other valuable information concerning the population can be gained, efficiency of effort is increased to that extent. We know that time is valuable. The wild turkey is a wary and highly mobile species. To provide a realistic census, the sampling method used to ascertain population density needs to be both practicable and effective for the purpose. With the method described here, a census may be taken, which leads to a reasonably realistic estimate of population density.

Investigational Area

This report results from an investigation being made of the social and space behavior of wild turkeys on the Wichita Mountains Wildlife Refuge in Comanche County, Oklahoma. The Wichita Refuge has an area of 59,099 acres. Many rocky hills are found here as well as wooded ravines, rolling prairies, and lake margin meadows. Post oak and blackjack oak are the dominant woodland species, while the bluestems are the most common grasses.

Methods

The information upon which this approach to the problem of census is based, was obtained through direct observation of turkeys in their natural state during the winter of 1953-54.

Three separate flocks of wild turkeys were under prolonged observation on the refuge area. Each of these flocks was marked by trapping several birds in each flock. Distinctly colored leg bands were applied to the captives, which then were released. The flocks could be further identified by the number and composition of their group. The home ranges of each of these three flocks were ascertained by plotting on a map the places where the marked birds were seen. Information concerning the location of other flocks on the refuge was obtained from refuge personnel, as well as by myself.

The data used for this approach to census are for the winter months. These months represent the time of the year when a turkey census is most practicable, because the flocks then are easy to count. They, moreover, are reflective of turkey social and spatial behavior characteristic of these months. Turkey flocks are relatively stable as to density and composition during the winter months. Moreover, where one bird of a flock is found so also is the remainder of the entire flock, with exception of the adult gobblers. The adult gobblers form a smaller, more or less independent flock. They cruise, however, over the same ground as the larger or main body of the social group. Occasionally they are found feeding with the hens and poults. A winter flock thus is seen to consist of the flock of hens and poults, in addition to a smaller flock of adult toms.

Conventional Wild Turkey Population Estimates

Conventionally a census of wild turkeys is based upon a count of either flocks or individuals in one or more selected areas. This data then is extrapolated to provide an estimate of either the number of flocks or of individuals per unit of area. Generally speaking, the unit of area is based

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upon what is presumed to be the total range for the species in the region under study.

For example, Mosby and Handley (1943, pp. 28-29) estimated the Virginia wild turkey population at a density of one flock per 6.56 square miles of occupied range. The amount of occupied range was estimated by assuming a two-mile cruising radius per flock of birds, which assumption is vaguely based so far as reality is concerned. The flocks for which they had a talley of the known number of birds in each gave an average of about eleven turkeys per flock. At the rate of eleven birds per flock, the population could be estimated at 0.6 birds per 640 acres.

Bick (1947, p. 137) showed the Louisiana wild turkey population at a density of 158 flocks on 1,320 square miles. This reduces to one flock per 5,976 acres.

According to Wheeler (1948, pp. 14, 15) Alabama turkeys varied in density from one bird per 253 acres to one bird per 1,970 acres; for a game sanctuary area, he found a density of one bird per 27 acres (p. 44).

For West Virginia, Bailey (1948, p. 8) found the greatest wild turkey density to vary from one bird per 171 acres in one region, to a low of one bird per 304 acres.

The results from these attempts to ascertain population density of wild turkeys cannot but be highly generalized, since they fail to take into account specifically that part of any region which actually is inhabited by the species. While the work reviewed above evidently was done with care, and in some cases with a plain awareness of the possible varying influence of different cover or soil types, in no case are the densities based upon the ascertainment of the area of one or more home ranges.

An Approach Highly Conformable With Reality

As already pointed out above, it is a behaviorial trait of the wild turkey to live together in flocks during winter. This is abundantly attested in the literature. Moreover, these flocks appear to be discrete social groups, perhaps each being a family clan. It is also pointed out above that each winter flock of wild turkeys lives in a particular area, its home range. For the wild turkey, this trait does not yet seem to be widely recognized. The entity of the winter flock together with its home range provides the basis for a distinctly realistic approach to the problem of estimating population density among wild turkeys.

The three turkey flocks studied on the Wichita Mountain Wildlife Refuge reached an average of 23 birds each. The averave area of the home range upon which each flock lived was 1,256 acres, a density of one bird per 55 acres of inhabited area or occupied habitat.

There are 59,099 acres in this refuge. Extended observation suggests the presence in this area of 14 discrete flocks of turkeys. On the basis of the average area of home range as here ascertained, the 14 turkey flocks occupy a total home range area of 17,584 acres (1,256 x 14). The turkeys thus reside on an estimated 30% of the total area of the refuge.

The matter of finding the total population wild turkeys on the inhabited part of the refuge is one of simple proportion. The average number of individuals per flock is multiplied by the estimate of the total area inhabited, and this product is divided by the average area of home range, thus:

$$\frac{23}{1{,}256} \times \frac{x}{17{,}584} = 322, \text{ the total estimated population.}$$

The density of population still remains at one bird per 55 acres of inhabited refuge. This estimate of the total wild turkey population is in remarkable accord with the estimated population made by refuge personnel. During recent years, their estimate of the total refuge population of turkeys has varied from 250 to 300 birds.

It is believed that the estimate of 322 turkeys representing the winter population of the species on the refuge, derived as explained above, is much nearer reality than if no cognizance at all had been taken of that part of the refuge which actually is inhabited by turkeys. If the total area of the refuge had been used to estimate the refuge wide turkey population density instead of using only that area inhabited by them, the total population density estimate would have been 322 birds to 59,099 acres, or one bird per 184 acres. This density is approximately 30% less than the one based upon inhabited range only.

It is to be expected that population density will vary, among other reasons, from one cover type to another. This requires that an independent density estimate be made of each of the cover types used by turkeys. An average of their sums will provide a reasonably true picture of actual density.

Since population is a dynamic phenomenon, receiving increment at least once a year, and suffering some attrition throughout the year, it is absurd to conceive of it as a fixed or static entity. While the evidence presently available may not yet be conclusive as to the discreteness of the winter social group of turkeys or as to the area occupied by them, it does provide results much more satisfying because of their tangible realness. This approach as applied to the wild turkey, moreover, conforms with a like approach developed earlier in connection with estimating populations of coyotes and timber wolves (Stebler, 1951, pp. 173-181).

For the purpose of estimating total population and population density of wild turkeys, the population unit can be taken as the average number of birds in a winter flock together with the average area of its home range.

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