
NOTES ON THE RIO GRANDE WILD TURKEY IN CENTRAL TEXAS¹

WALTER P. TAYLOR, Stillwater²

The wild turkey is one of the most popular and valuable of all North American game birds.

"This great wild turkey," says Mrs. Bailey in *The Birds of New Mexico*, referring to the Merriam wild turkey, "inhabitant of the mountains of the Southwest, king of game birds in the United States, was first seen by white men in New Mexico three hundred and eighty-eight years ago, eighty-two years before the first birds were recorded from New England after the landing of the Pilgrim Fathers."

Originally found in 38 of our states (2) by the year 1920 the wild turkey has disappeared from 18 of these, and at present occupies not more than 28 per cent of its original range in the United States. In recent years the range has been re-established in some states, notably Pennsylvania.

Among the wild turkey states, Texas is favored. A survey made in 1945 by the Texas Game, Fish and Oyster Commission showed an estimated grand total of about 100,000 birds in this one state, about two-thirds of these in the Edwards Plateau region.

¹Based on studies conducted by the Texas Cooperative Wildlife Research Unit: The Texas State Game, Fish and Oyster Commission, Texas A. and M. College, the Wildlife Management Institute and the Fish and Wildlife Service, U. S. Department of the Interior, cooperating, in conjunction with Pittman-Robertson projects of the Texas Game, Fish and Oyster Commission.

²Now Leader, the Oklahoma Cooperative Wildlife Research Unit: The Oklahoma Game and Fish Department, the Oklahoma Agricultural and Mechanical College, the Wildlife Management Institute, and the Fish and Wildlife Service, United States Department of the Interior, cooperating.

Obviously, to all landowners and sportsmen interested in game, the status of the wild turkey is of outstanding importance. This is especially true in the Edwards Plateau where much of the ranchland is leased for hunting at relatively high prices under the Texas shooting preserve law. Here the wild turkey vies with the deer in popularity, both as an object of sport and a source of hunting income. It is easier to lease lands for hunting if they possess ample stocks of wild turkey as well as deer. Indeed, some sportsmen rate the wild turkey higher than the deer as a game animal.

Although the field studies here reported were conducted in Texas between 1937 and 1945, it is thought that some of the results may be of interest in Oklahoma, not alone as studies in the ecology and life history of a conspicuous member of the southwestern fauna, but also because, at the present time, the Oklahoma Game and Fish Department is working on a wild turkey restoration project centering in the 15,000-acre game preserve in McCurtain County.

Co-authors of the 450 page final manuscript covering the Edwards Plateau study include Harold L. Blakey, long-time specialist on wild turkey investigations and now with the Corps of Engineers in Washington, D. C.; Henry C. Hahn and Eugene A. Walker, both of the Texas Game, Fish and Oyster Commission, themselves resident in the Edwards Plateau; and the present writer. These workers, and assistants who worked with them, invested more than fifteen man-years on the studies here reported.

The Edwards Plateau has been and to a degree still is, one of the most productive areas in the United States for domestic cows, sheep, goats, and wild deer. Likewise as a potential habitat for wild turkeys it has few equals. It is the south end of the North American Great Plains. Its substructure is mostly Cretaceous limestone, its soils stony and rocky, its climate moderately dry, wind velocity high, temperature moderate, rainfall deficient (precipitation is always exceeded by evaporation), and its topography made up of flat-topped summits, breaks, slopes and streamways.

To a certain extent wild game in the Edwards Plateau, as in many cases elsewhere, is in competition with other farm or ranch enterprises. In the region under consideration the wild turkeys and deer compete, to a degree, with livestock (cows, sheep and goats) for food consisting of acorns and other range or forest products. In order to make it possible for the ranchman to produce game on a permanent basis, it will be necessary for the sportsman to pay him for the costs of raising the game in place of an equivalent food-consuming amount of livestock.

Satisfactory management of wildlife can only be achieved, in the opinion of wildlife specialists, through the application of ecological principles, based on knowledge of the detailed and accurate relations of the domestic and wild animals and man to their environment, including soil, climate and vegetation.

As in many other places in the western and southwestern United States, there has been a pronounced trend over the last 50 to 75 years for the original grass cover on the Edwards Plateau to be replaced by trees and brush. While present distribution of trees is correlated with geological formations, nevertheless the far-reaching changes from grass to trees and brush are caused by over-grazing by domestic livestock. It is true that dissection of the old plateau surface by normal geological erosion has tended to make the terrain rougher, thus favoring woody rather than grass growth. On the biological side the principal causes of the replacement include at least three: (1) over-grazing, which reduces the competition of grass with seedlings of woody species and so makes it possible for the latter to occupy the ground at the expense of the former; (2) protection of the ranges from fire, which likewise gives a boost to the woody species at the expense of grass; and (3) direct dissemination of the seeds of woody plants through the stomachs of livestock.

Young, Anderwald and McCully (3) suggest that wildlife which flourished in the early period of range use (birds, small rodents, cottontails, jack rabbits, coyotes) constitute another possible agent in spreading noxious plant forms. But it is believed these authors are in error, for wildlife has been spreading seeds from time immemorial until recently with no appreciable results. Over-grazing by domestic livestock seems to have pulled the ecological trigger and released a whole series of results which affect wildlife as well as domestic livestock and man.

Some of the observed changes in the environment have been beneficial to wild turkeys; others have been distinctly harmful. In order to acquire an understanding of what is going on and to be prepared to cooperate with nature it is highly desirable to give close attention to the ecological principles involved.

Methods employed in this study included general or special painstaking observations in the field, fenced plots to determine effects on wild turkeys of different degrees of grazing pressure by domestic livestock, marking of individual wild turkeys to ascertain actual extent of their movements, artificial feeding during the winter, and at other times too, stomach and dropping examinations, predator trapping and examination of predator stomachs to learn as much as possible about wild turkey enemies, and counts of wild turkeys in particular areas at different seasons of the year.

As indicated by the change in vegetation already mentioned, the occupation of the land by man and his flocks and herds has profoundly affected the wild turkey environment. Apparently the number of cattle per square mile in the central Texas region decreased from 300 head in 1867 to not more than 50 head in 1898. Since that time further deterioration has taken place. Furthermore, the habitat has been affected by a tripling of the number of goats on Texas farms from 1909 to 1943 and a six-fold increase in the number of sheep during approximately the same period. According to V. L. Cory (1) no fewer than 30 native plants have disappeared from the Edwards Plateau in the last 20 years, as a result of excessive grazing by livestock. All signs indicate a continuing further reduction in valuable grasses and palatable shrubs with a corresponding increase of weeds, pest grasses, non-palatable shrubs and trees.

Over-grazing affects wild turkeys by reducing the quality and quantity of food and by impairing the quality of the cover for nesting. In some instances it is true that the weeds that come in as a result of over-grazing are more palatable to wild turkeys than some they replace, but the net result of over-grazing is detrimental to the birds. Wild turkeys are consistently more numerous in moderately grazed or even in ungrazed pastures than in those heavily grazed.

A total of 2,905 Edwards Plateau wild turkeys were classified according to 54 vegetation types in which they were observed. The proportion of wild turkeys in types carrying livestock was highest in the fall, probably because the supply of acorns is largest then. Nearly three times as many wild turkeys were found in cedar thickets in winter as in summer, apparently confirming the importance of cedar as a winter shelter for the birds.

Available knowledge of yearly fluctuations in wild turkey numbers, which are marked, and of weather and other possibly influential factors associated therewith, is insufficient as yet to tell us what causes the ups and downs in the numbers of the birds from year to year. The critical weather factors appear to be drouth with sometimes accompanying high temperatures, flood and hail, but as yet we do not know how they work.

The role of predators in relation to wild turkey numbers is not clear. It is possible that the complete elimination from the Edwards Plateau of the wolf, coyote and mountain lion accounts in part for the successful survival of wild turkeys generally in the region. During the summer and early fall the field naturalist observes large numbers of broodless wild turkey hens, which may or

may not indicate predation by other animals (raccoons, skunks, gray foxes, snakes, horned owls, etc.) on nests and broods. At any rate it seems altogether desirable zealously to harvest the fur crop each year in wild turkey country thus helping to prevent the potential fur animal predators from becoming over-numerous.

Wild turkey roosts may serve a territory perhaps four miles in diameter, or twelve square miles, but this is exceptional. The largest concentration of wild turkeys seen during the present study was the so-called "Neunhoffer Roost" near Kerrville where, on February 10, 1942, a total of 529 birds was found.

The daily routine of the bird is substantially as follows: Off the roost before sunrise; feeding for from one to three hours; "shading up" at midday; feeding again midafternoon to evening; returning toward and going to roost shortly after sundown.

Observations on flocking were based on 662 separate flocks containing 8,741 wild turkeys. There was an obvious tendency toward greater mixing of the sexes in spring gatherings and toward their separation in winter.

Cross-country movements of the turkeys were of as much interest to us as they are to every country boy who has tried to locate the nest of a tame turkey which is prone to wander. Wild turkey movements are apparently caused primarily by decrease in quantity or nutritive value of food, decrease or absence of suitable shelter, disturbance through hunting, or perhaps a combination of these and other factors. Marked wild turkeys have been observed to move five miles from the site of release, but our studies indicated that most cross-country movements were less than two miles in extent.

The wild turkey is a versatile feeder. In the Edwards Plateau the ten principal foods on the basis of analysis of 65 crops and two gizzards, mostly taken in the fall, are acorns, ill-scented sumac, elm fruits, sorghum grains, wild oats, grasses (heads and leaves), wheat, corn, juniper berries and hackberries. At least 479 species and 46 varieties of plants native to the Edwards Plateau afford potential food resources for wild turkeys. As many as 50 separate items of plant food may appear in the diet during a single season in one locality. As competitors with the wild turkey for food, sheep and goats are more than twice as effective as cattle and horses.

What about artificial feeding? For 20 years or more, some Edwards Plateau ranchmen have been feeding wild turkeys in an attempt to hold the birds on ranges where they were especially desired during the hunting season. In connection with this study, and in cooperation with the leading ranchmen, an extended test was made to determine the practicability of artificial feeding. It was found that a consistent feeding with corn, milo maize, oats and wheat, in a suitable locality, during the period from September 1 to April 1 of the following year, will often hold wild turkeys through the winter in an area where natural foods are scarce. Obviously the chief effect is to modify local distribution. It does not appear that the total of wild turkeys in the region is increased by artificial feeding. All evidence seems to indicate that the only satisfactory solution of the wild turkey food problem is in the generous increase of natural food, to be secured through improved range management.

As a rule wild turkeys remained in winter flocks until March or April. Reliable and detailed data from 29 nests show that laying began on March 27, reached its height about May 1 or 2, and gradually decreased to June 5. Incubation started April 4, reached its peak May 26 and was completed July 3. The earliest hatching date was May 10, the latest July 4. Information on 320 broods of wild turkeys totalling 2,872 poults showed the average number of poults per hen (total number of poults divided by the number of hens with

them) to be 4.7. Average size of broods (total of poults divided by the number of broods) was 8.9. Earliest new-hatched brood was March 31 and the latest June 6.

The fact that wild turkeys concentrate in favorable habitat may indicate the possibility of effective management. Fifty-seven per cent of all wild turkeys killed on shooting preserves in 3 counties of the Edwards Plateau over a 13-year period were taken in three counties (Gillespie, Kerr and Medina). Only 13 per cent of all turkeys killed were taken in the lowest 14 Edwards Plateau counties, in which turkeys were reported killed. Under normal conditions the legal kill in the best wild turkey territory is not a limiting factor on wild turkey populations.

Any admixture of domestic turkeys with wild stock is highly undesirable, for such admixture impairs those qualities of wariness, hardhood, capacity to forage successfully, ability to nest and survive under wild natural conditions that are most prized in the game.

Where there is a stock, even a small stock, of wild turkeys established in a region, liberation of additional birds is probably unnecessary. If conditions are favorable the birds will breed and fill the area to capacity. Where, on the other hand, the birds have been extirpated, restoration is desirable if public sentiment is favorable and the habitat conditions are right. In liberating stock in such instances, groups of not less than 12 gobblers and 24 hens for each restoration site are recommended. Careful records should be kept of all details associated with the restoration efforts, together with records of inspections to determine success or failure of the project over the years. Such records would be highly useful as a guide to later activities.

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