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# HUNTING PRESSURE AND ITS EFFECT ON BOBWHITE QUAIL POPULATIONS IN EAST-CENTRAL TEXAS

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Errington and Hamerstrom (1935), in summarizing their data on winter survival of bobwhites (*Colinus virginianus*) on experimentally shot and unshot areas in Iowa, concluded that reasonable shooting is biologically sound. Hunting would be most advantageous in early fall in order that the kill might comprise birds from the doomed seasonal surplus. Comparison between bobwhite populations on hunted *vs.* protected areas in Oklahoma over a five-year period (Baumgartner, 1944) showed that reduction of the autumn population by hunting to approximately the normal breeding density did not result in a decline in numbers of birds from year to year.

Lehmann (1937) considers man as the worst "predator" of quail in Texas and points out that quail cannot be expected to increase in old ranges and spread to new areas as long as hunters endeavor to hunt out coveys to the last bird. Lay (1949) is of the opinion that hunting is not a serious problem because bobwhites shift around and restock over-shot areas each spring. Hunting success becomes so low that hunting stops before breeding stock is seriously hurt on any large acreage. Evidence acquired during 1950 and 1951 in the Post Oak Region tends to indicate that hunting pressure does not lower the breeding stock below the normal carrying capacity of the land.

The dominant species in the upland

Post Oak Region, which includes a portion or all of approximately 36 counties in east-central Texas, are post oak (*Quercus stellata*) and blackjack oak (*Quercus marilandica*). Others found growing in association with these are water oak (*Quercus nigra*), hackberry (*Celtis occidentalis*), hickory (*Hicoria* spp.), and elm (*Ulmus* spp.). Thickets of yaupon (*Ilex* spp.), wild plum (*Prunus mexicana*), sumac (*Rhus copallina*), and stretchberry (*Smilax bona-nox*), coupled with weedy pastures containing goat-weed (*Croton* spp.) and other weed species, provide excellent quail habitat in much of the Post Oak Region.

During 1950 and 1951, an ecological study was carried out in this region in an effort to determine the cause or causes of occasional extreme fluctuations in population numbers. Hunting pressure was thought to be a possible cause. Through the cooperation of quail hunters, and examination of climatological data for the region, the following information was obtained.

Cooperating were the Texas Game and Fish Commission, the Texas Cooperative Wildlife Unit, the Wildlife Management Institute, and the U.S. Fish and Wildlife Service.

## EFFECTS OF CLIMATE ON HUNTING SUCCESS

Early reports (October-November) from landowners and hunters working their dogs in preparation for the

1951-1952 season (December 1-January 16) indicated large numbers of quail present, more in some cases than were noted in 1950. The fact was evident, however, that there was less protective cover in which the birds could hide. Reports from hunters made during the quail season indicated that about the same number of coveys were present as in the previous year, but with fewer birds in each. The adult-juvenile ratio in the winter of 1951-1952 was 1:1, the adults representing a large holdover of birds from the high population in 1950. The adult-juvenile ratio in the winter of 1950-1951 was 1:6, the large number of young resulting from a successful nesting season.

Most bird hunters considered the 1950-1951 and 1951-1952 quail seasons as average or even poor on the basis of the number of birds killed as compared with the number seen. The 1950-1951 season was characterized by very little rainfall with only 4.04 inches falling from August 1950 through January 1951. Evidently the ability of dogs to scent quail was seriously affected, and many coveys were overlooked or flushed before being detected. The number of birds killed during this season was low as compared with the number present.

The 1951-1952 hunting season followed a period of extreme drought (24.36 inches of rain in 1951), although rains in September and occasionally during the season dampened the soil, thereby increasing the dogs' ability to scent quail. The drought in the summer of 1950 had reduced grass and other ground cover but not to the point of almost complete bareness observed in many localities by late summer and fall of 1951. Coveys of quail located

and pointed by dogs ran or flushed before hunters could approach within gunshot range.

It became almost impossible to locate single birds after the covey had flushed and scattered. Hunters reported quail making extremely long flights, some estimating distances between 300 and 500 yards. This long time-interval between flushing and alighting may have enabled the quail to run further or to hide. The birds' apparent uneasiness when found in open situations, resulting in quick flights and running, proved to be a compensatory factor for losses suffered indirectly from the drought. Probably a larger number of quail would have been harvested during the 1951-1952 season had it not been for the birds' habit of running from dogs and flushing without holding to a point.

#### DATA SUPPLIED BY HUNTERS

Approximately 30 hunters were contacted during the 1950-1951 and 1951-1952 quail seasons. They were asked to record the following information concerning each hunt: Hunter's name, date of hunt, county hunted, kill per hunter, total number of quail seen, total number of acres covered, number of hunters, number of hours of hunting, and cripples lost (Table 1).

This information, correlated with field observations and discussions with hunters, allows several conclusions to be drawn regarding hunting pressure in this region. Bobwhites nesting in the spring and summer of 1950 produced a high fall population as contrasted with a low population in 1951. Approximately one more bird was killed per hunt by each hunter in the 1950-1951 season than in that of 1951-1952, even though

TABLE 1.—COMPARATIVE DATA SUBMITTED BY HUNTERS DURING THE 1950-1951 AND 1951-1952 QUAIL SEASONS

Averages	1950-51	1951-52
Quail killed per hunter during each hunt.....	6.9	5.4
Number of hunts per hunter per season.....	6.6	7.6
Number of hunters in a party.....	2.0	2.0
Length of hunt (hours)...	3.8	3.9
Acreage covered per hunt	269.8	485.3
Number of birds killed per hunter each season.	36.6	33.5
Number of acres per quail (population density)...	5.54	12.2
Number of cripples lost per hunter on each hunt	—	.9

the hunter covered fewer acres per hunt in the former season.

A noticeable change was evident in the average number of acres per quail. In the fall of 1950, the population density of one quail per 5.5 acres was the highest recorded during the course of this study. The quail density (acres per quail) on the main research areas in Robertson County, based on October, 1950 census, was 8.2 acres per quail.<sup>1</sup> Possibly as a result of high mortality of young quail in the summer of 1951, the fall population density was about one bird per 12.2 acres, approximately half the density recorded for 1950.

#### HUNTERS AND HUNTING PRACTICES

Hunting pressure may be effective locally in reducing the number of birds below that which the area can support

<sup>1</sup> No hunting was permitted on the two 640-acre research areas during the 1950-1952 season. However, 16 bobwhites (20.5 per cent of the population on one area) were removed, evidently by natural causes, between October, 1950 and February, 1951.

over the critical winter period. Most of the hunters who were contacted lived in Bryan and College Station and hunted in Brazos, Robertson, Madison, or Grimes County. In the majority of cases these men hunted the same areas each year. Usually the hunter's own discretion governs the number of birds he removes from a certain area during the hunting season.

Many of the hunters who assisted in the quail project were employed in positions that often allowed them several hours in the field each day. Most hunters averaged seven hunts a season with each man killing about 35 birds,<sup>2</sup> although two outstanding exceptions (not included in the averages) were noted. One of the two killed 237 quail in the 1950-1951 season, and the other killed 293 in the 1951-1952 season.

#### BAG LIMIT

Present hunting regulations permit a hunter to kill 12 quail per day but not more than 36 per week; 12 quail represent the number of birds in an average covey. Few hunters kill their limit of quail on each hunt. Another factor to be considered is the number of birds crippled or killed but never recovered. The number of birds recovered and those lost on 34 hunts during the 1951-1952 season were tabulated. Of 307 quail shot down during these hunts, 243 were recovered, the remaining 64 (20.8 per cent) being left in the field, crippled or dead. Probably many additional "feathered" birds and those not immediately affected by shot eventually suc-

<sup>2</sup> These figures are low since hunts in which no birds were killed or in which they were given to someone else were not recorded.

cumb to their wounds. This factor of birds lost should be taken into consideration when determining the number of quail that can be removed from an area and still leave a sufficient number of birds for the following breeding season.

It is believed the majority of sportsmen kill no more than the law allows. Several hunters reported having shot an occasional bird over their dogs during training periods before the season opened. This procedure may not be entirely without justification, but a practice of this type forms another "mortality factor" reducing bobwhite numbers.

F. M. Cowert<sup>3</sup> reported 20 hunters arrested in 1950 for killing quail in closed season; reports for 1951 included 8 arrests for killing quail in closed season and 14 for exceeding the bag limit. These probably represent only a few of the violations that actually occur during and between seasons.

The majority of local hunters can drive to their favorite hunting areas in one or two hours. Many profess to enjoy "getting out" and watching good dog-work and place these criteria above the actual killing of birds for meat. A reduction in the bag limit would not affect these individuals or those who rarely kill their limit, and it might help reduce the hunting pressure in certain local areas.

Despite illegal trapping and pot-shooting, exceeding the bag limit, and theoretically shooting each season all the birds allowed by law, a certain percentage of the wintering population during good and even average years

evidently are able to withstand the hunting pressure and increase their numbers the following spring. However, the law makes no allowance for those years which are considered poor and when quail populations are at a minimum. Reduction of the bag limit in years of low quail populations may prevent overshooting in local areas.

#### THE HUNTING SEASON

Another factor of equal or greater significance is that of establishing a hunting season during the most favorable period of the year, both to the hunter and to quail. The quail season now runs from December 1 to January 16, inclusive. Special seasons and county variations exist, but they differ little from the designated general season.

Errington and Hamerstrom (1936) have expressed their belief, based on studies of hunting pressure and its effect on quail populations in Iowa and Wisconsin, that it would be most advantageous to have the hunting season early in the fall before the quail populations are reduced by natural causes. A similar opinion is expressed by Lay (1949) while presenting his ideas concerning the possibility of advancing the quail season in Texas.

Quail populations are at their peak following the summer breeding season, after which there is a constant decline in number until the breeding season commences the following spring. An early fall season will therefore provide a greater number of mature quail to hunters. Since the surplus fall populations will be reduced by one means or another to fit the late winter carrying capacity of the land, hunters could remove this early fall surplus before it is

<sup>3</sup> Director of Law Enforcement, Texas Game and Fish Commission.

lost to natural causes. It appears that the principal fault with a late season in Texas is that the fall surplus of quail has been partially removed before the season begins. With added hunting pressure, not only the remaining surplus but also the seed stock may suffer too great a loss in local areas during years of low populations.

Those opposing an early season claim that dry or warm weather and too dense ground cover seriously hinder hunting success. Grass and other cover may be heavier during the early fall, but a larger number of birds at that time certainly compensates for this slight disadvantage. Another factor favoring an earlier season is that the present hunting pressure on quail would then be distributed among those game species (deer, dove, and waterfowl) now having earlier seasons. Although a few hunters restrict their hunting activities to one species of game only, the majority hunt the several different game birds and mammals as they come into season.

#### SUMMARY

1. Through the cooperation of quail hunters, and by considering the effects of climate on hunting success, an effort was made to evaluate the effects of hunting pressure on quail populations in east-central Texas during 1950 and 1951.

2. For the Post Oak Region as a whole, hunting pressure apparently did not seriously reduce quail numbers during 1950 and 1951. The 1950-1951 and 1951-1952 hunting seasons were char-

acterized by drought, and hunting success in many instances was poor, even though many birds were seen. Quail found in open pastures or fields appeared uneasy and would readily flush or run from dogs.

3. On the average, hunters killed only approximately one-half of the allotted 12 quail per day. Records kept on 34 hunts during the 1951-1952 season showed that 20.8 per cent of the quail shot down were never recovered.

4. The present quail season, December 1 to January 16, is considered unsatisfactory since much of the fall surplus has already been eliminated before the season commences. An earlier season—for example, from October 15 to November 30—would be more likely to provide better hunting and still retain a larger number of quail as seed stock.

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