

---

## THE RANGE-TYPE PATTERN REQUIREMENTS OF BOBWHITE QUAIL IN PAYNE COUNTY, OKLAHOMA\*

RICHARD DeARMENT, Oklahoma A&M College, Stillwater

**INTRODUCTION.** The management of bobwhite quail by habitat improvement is coming to the front in Oklahoma. Obviously, successful habitat improvement depends on knowledge of quail requirements. With this in mind, in February 1948, the Oklahoma Cooperative Wildlife Research Unit, at the request of the Oklahoma Game and Fish Department, started a 5-year bobwhite quail investigation project in the northcentral part of the State. This project is under the direct supervision of F. M. Baumgartner and W. P. Taylor of the Unit.

The initial phase of this project has been a study of the sub-types of vegetation and the pattern of these sub-types found in ranges now occupied by coveys of bobwhite. This paper analyzes the sub-types of vegetation used by 19 coveys of quail. It is based on 204 covey flushes made by the writer

---

\*Contribution from 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, U. S. Department of the Interior, cooperating.

with the assistance of a bird dog from October 1, 1948, to October 1, 1949.

**METHODS.** According to Duck and Fletcher (1) Payne County has three major vegetative types: (1) Tallgrass Prairie, (2) Post Oak-Blackjack Forest, and (3) Bottomland Timber. For purposes of the present investigation, 10 study areas of 160 acres each were located in the first two types. None was located in the Bottomland Timber.

Daily field maps of each area, traced from aerial photographs, were used to record the quail flushes and the vegetation on the study areas. Flush data sheets were used to record all pertinent information.

**THE SUB-TYPES OF VEGETATION.** The vegetation on the study areas was arbitrarily classified into 9 sub-types as follows: (1) Oak Woodland, (2) Timbered Ravine, (3) Hedges and Thickets, (4) Tallgrass Grazed, (5) Tallgrass Ungrazed, (6) Shortgrass Grazed, (7) Shortgrass Ungrazed, (8) Forbs, and (9) Cultivation. A brief description of each sub-type, giving some of the dominant plants in each, is given below.

1. *Oak Woodland.* This sub-type consists of woodlands dominated by post oak (*Quercus stellata*) and blackjack (*Quercus marilandica*).
2. *Timbered Ravine.* Any seepage area or creek bottom revealing one or more of the following tree species was included in this sub-type: Elm (*Ulmus americana*), hackberry (*Celtis spp.*) cottonwood (*Populus deltoides*); buckthorn (*Bumelia lanuginosa*), willow (*Salix spp.*), and coffee tree (*Gymnocladus dioica*).
3. *Hedges and Thickets.* Consists of woody vegetation along fencerows, field borders, roadsides, and in upland fields. It is represented by the rough leaf dogwood (*Cornus drummondii*), Chickasaw plum (*Prunus angustifolia*), redbud (*Cercis canadensis*), persimmon (*Diospyros virginiana*), sumac (*Rhus spp.*), blackberry (*Rubus spp.*), and coral-berry (*Symphoricarpos spp.*).
4. *Tallgrass Grazed.* Includes steadily grazed pastures having over 50 percent of their vegetation in tallgrass. This sub-type is dominated by the bluestems (*Andropogon spp.*), Indian grass (*Sorghastrum nutans*), purpletop (*Triodia flava*), and switchgrass (*Panicum virgatum*).
5. *Tallgrass Ungrazed.* This includes all tallgrass meadows that are ungrazed. The plant species are the same as grazed tallgrass, except for the cultivated species like the weeping love grass (*Eragrostis curvula*) and other species used for seed and hay.
6. *Shortgrass Grazed.* All pastured short grasses, annuals or perennials, whether true short grass or not, were put into this category. An area having over 50 percent coverage of any or all of the following was placed in this group: The three-awn (*Aristida spp.*), Bermuda grass (*Cynodon dactylon*), bluegrass (*Poa annua*), buffalo grass (*Buchloa dactyloides*), and grama grasses (*Bouteloua spp.*).
7. *Shortgrass Ungrazed.* Similar to grazed shortgrass, except that there is no grazing.
8. *Forbs.* The so-called weeds or non-graminaceous herbs belong here. Korean lespedeza (*Lespedeza stipulacea*) was put in this category because it was not sufficiently common on the study areas to be placed in a separate group. The more common species making up this type are sunflower (*Helianthus spp.*), ragweed (*Ambrosia spp.*), golden-weed (*Aplopappus ciliatus*), lamb's quarters (*Chenopodium spp.*), pigweed (*Amaranthus spp.*), snow-on-the-mountain (*Euphorbia marginata*), trailing wild bean (*Strophostyles spp.*), and partridge pea (*Cassia chamaecrista*).
9. *Cultivation.* In this category were placed all domestic species of plants under cultivation, other than those used for hay or meadow crops. The more common groups include fruit trees, grains, soil building plants, and others.

**FLUSHING DATA.** When a covey was flushed the exact site was recorded on a field map and tabulated under one of the 9 vegetative sub-types. Only covey and brood flushes were compiled: those by breeding and nesting pairs were purposely omitted.

The flushes were tabulated according to the months of the year. The months were grouped into three seasons: Winter (January, February, March, and April), summer (May, June, July, and August), and fall (September, October, November, and December).

The relative importance of each vegetative sub-type to the bobwhite quail was determined by the number of flushes in each. The seasonal importance of each sub-type was determined also.

**RESULTS.** The relative and seasonal importance of the 9 vegetative sub-types in Payne County, Oklahoma, to bobwhite quail during the study period (see Figure 1), was as follows:

1. *Oak Woodland.* Only 9 per cent of the flushes were located in this sub-type. Almost three-quarters of the flushes were made in the winter season.
2. *Timbered Ravine.* Thirty-one per cent of the flushes were found in this category, which was identified as the most important sub-type. The flushes were distributed seasonally as follows: Winter: 37 per cent; summer: 22 per cent; fall: 41 per cent. The importance of this sub-type for quail can be explained, in part, by the fact that there is a greater amount of edge per total area, more fertile soil, and better moisture conditions than found in the other types. Another important feature is the physical protection afforded the bobwhite by timbered ravine in critical periods.
3. *Hedges and Thickets.* Sixteen per cent of the total flushes occurred in this sub-type. Seventy per cent of these were in the winter, 18 per cent in the summer, and 12 per cent in the fall. Quail need the protection this sub-type affords more acutely in the winter than at any other season. They also use it for travelways, escape and resting cover, and for emergency feeding.
4. *Tallgrass Grazed.* This type was represented in only 3 per cent of the flushes. The seasonal break-down is as follows: Winter, 57 per cent; summer, 43 per cent; fall, none. This area provided little in the way of food or cover.
5. *Tallgrass Ungrazed.* Ten per cent of the flushes were made in this sub-type. They were distributed rather equally among the three seasons, with 38 per cent in the winter, 33 per cent in the summer, and 29 per cent in the fall.
6. *Shortgrass Grazed.* Seven per cent of the flushes were recorded here. The seasonal breakdown of the flushes was as follows: Winter, 36 per cent; summer, 43 per cent; fall, 21 per cent.
7. *Shortgrass Ungrazed.* Six per cent of the contacts were made in this sub-type. Most occurred in the winter—69 per cent. Twenty-three per cent of the flushes were made in the summer, and only 8 per cent in the fall.
8. *Forbs.* Thirteen per cent of the total flushes were made in this sub-type. The winter season was the most important with 54 per cent of the flushes. Fall produced 38 per cent and summer 8 per cent of the flushes. The birds are attracted to these areas during the fall and winter because of the abundance of food and the favorable feeding conditions in the absence of other ground vegetation. In summer they provide little

in the way of food or shelter. Korean lespedeza was an important food for quail during the critical winter periods.

9. *Cultivation*. This sub-type was found in 5 per cent of the total flushes. Thirty-three per cent of these occurred in the winter, 22 per cent in the summer, and 44 per cent in the fall.

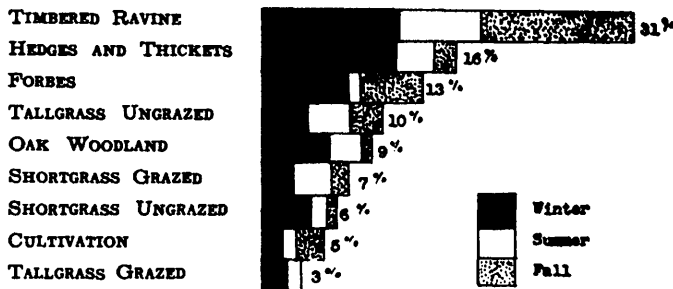


FIGURE 1. Relative and Seasonal Importance of Nine Vegetative Sub-types to Bobwhite Quail in Payne Co., Oklahoma. October 1, 1948 to October 1, 1949. Based on 204 Flushes of 19 Coveys Located on 10 Areas.

#### SUMMARY

- Two hundred four bobwhite quail flushes, representing 19 coveys located on 10 areas in Payne County, Oklahoma, were recorded from October 1, 1948, to October 1, 1949.
- The Timbered Ravine was the most important vegetative sub-type used by bobwhite quail. This sub-type was frequented most during the winter and fall. During the summer it was used to a lesser extent because the birds were found in the more open areas.
- The Hedges and Thickets were used almost as much as the Timbered Ravines during the winter, but to a far lesser extent in the summer and fall.
- It is interesting to note that the flushes occurring in Forbs were negligible during the summer season. Korean lespedeza, where present, was found to be a vital factor in sustaining coveys during the critical winter weather.
- The remaining vegetative types are ranked according to their relative frequency of use by quail: Tallgrass Ungrazed, Oak Woodland, Shortgrass Grazed, Shortgrass Ungrazed, Cultivation, and Tallgrass Grazed.

#### LITERATURE CITED

- DUCK, L. G. AND JACK B. FLETCHER. 1943. A game type map of Oklahoma. Oklahoma City: Oklahoma Game and Fish Department.