While no records were kept, observations made at the managed hunt checking stations indicate that the most successful hunters used good, pointing-type bird dogs.

SUMMARY

Observations showed that there existed in western North Carolina a population of ruffed grouse comparable to that of good grouse range in central Pennsylvania. It showed further that these birds were underhunted and that an increase in hunting pressure was desirable. Reasons for light hunting were lack of knowledge of population, where and how to hunt, rough terrain, and a shortage of bird dogs. Remedies for these problems included publicizing grouse hunting through publications and television, increasing bag limits and season length, and cutting graded shooting lanes and trails in good grouse range. Plantings of clover and food-bearing trees were made to improve habitat and to concentrate birds. All wildlife management areas were opened to grouse hunting. The shooting lanes are considered to be the most important step taken. A heavy lane-cutting program was undertaken in the early spring of 1953 on the wildlife management areas. The grouse kill on these areas increased from 85 in 1952 to 241 in 1953. Until this program was instigated, the annual grouse kill on the management areas was always under 100 birds. Since then, it has been consistently above 200 birds.

It is felt that many sections of the Southern Appalachians contain a shootable surplus of grouse and that proper management can increase this sport in areas where it is neglected.

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EFFECTS OF CERTAIN PRESCRIBED FIRE TREATMENTS ON THE DISTRIBUTION OF SOME HERBACEOUS QUAIL FOOD PLANTS IN LOBLOLLY-SHORTLEAF PINE COMMUNITIES OF THE ALABAMA UPPER COASTAL PLAIN *

By WILLIAM H. MOORE

District Game Biologist, Tennessee Game and Fish Commission

In ecological succession, plant communities are never completely stable. They are undergoing constant change which tends finally to result in the climax association for the climate and soil conditions of the area. There are many factors that may alter the rate of change or even cause the community to revert to an earlier stage of ecological development, from which the community again tends to follow changes leading to the climax.

One of the most important problems confronting the wildlife manager is the control of plant succession. Numbers and species of wildlife on an area are largely determined by the type and distribution of the vegetation found on that area. Clearing, plowing, and planting may be practical on small areas but are too expensive, or even impossible, for the management of large areas. A practical and economical method of plant successional control is needed.

Apparently, fire was a factor in plant succession long before the appearance of man on this earth. According to Shantz (1947), a third of the natural

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vegetation of the earth's surface has been affected by fire. From data taken in southeastern Georgia, Eldridge (1935) showed that 85 percent of the 7,000,000 acres of land under forests of all types and 91 percent of the 6,000,000 acres occupied by the various pines showed evidence of fire history. Frequent burning extended through thousands of years in prehistoric times has resulted in a pine subclimax adapted to withstand fire (Lemon, 1949).

The use of fire as a tool in forest management came about very gradually. Forest owners and managers began to realize that certain fires resulted in little or no damage to the forest and recognized that some of these fires might be good forest management practice (Shantz, 1947).

According to Stoddard (1936), small openings created in large forested areas are likely to have a beneficial effect on the animal life for several years. Stoddard (1936) has also stated that the bobwhite quail prefers areas grown up to diversified vegetation which is open enough at their level for feeding, roosting, and nesting, and has concluded that a system of controlled winter burning every two to four years on alternating or overlapping blocks will increase this type of vegetation. Lay (1940) has stated that when hot fires occur in freshly cut slashings, these 1- to 10-year-old sites contained less quail food than unburned areas in the loblolly-shortleaf pines of East Texas. However, Stoddard (1936) thinks that burning can be carried on in established stands of slash, loblolly, and shortleaf pine, if necessary, for quail management.

The Forestry Department of the Alabama Polytechnic Institute is making a study of the effects of certain prescribed fire treatments in the management of a loblolly-shortleaf pine community of the Upper Coastal Plain.

Although areas that are managed primarily for timber can seldom produce a maximum crop of game, it was considered desirable to study the effect of these prescribed fire treatment on the distributions of herbaceous vegetation important as food to the bobwhite quail (*Colinus virginianus* L.) Since the greater portion of the important native herbaceous quail food plants of the Southeast occurs in the family *Leguminosae,* emphasis was placed on this family.

MATERIALS AND METHODS

The experimental area used in this study lies in the Fayette Experiment Forest near Fayette, Alabama. The forest is characterized by an immature 30- to 40-year-old loblolly-shortleaf pine (*Pinus taeda* L. and *Pinus echinata* Mill.) subclimax community of the oak-hickory association.

This study was set up to utilize the statistically designed experimental area used by the Department of Forestry. The forestry experiment consisted of a split plot design of six replications in which the main treatments were six factorials of two topographical positions (ridge and slope) in combination with three fire treatments (none, burned in January, and burned in August). The plots were two acres in size in each replication with two hardwood poisoning procedures (none and cull hardwood poisoned) being applied as subtreatments to square 1-acre subplots on each main plot. In the center of each acre subplot, a square area of one-half acre is the sample area for determining tree growth, the remainder of the plot serving as a buffer area. In the center of each one-half acre plot a circular plot of 0.01 acre is reserved by the Forestry Department for study of woody reproduction, herbaceous vegetation and soil conditions.

In this study, the data were obtained by sampling the area between two concentric circles of radii 20 feet and 74 feet in each unpoisoned subplot. This area lies outside that reserved by the Forestry Department and within the sample area of the buffered one-half acre. The sample unit was a single 50-foot line intercept placed at random in each subplot and placed perpendicular to the contour.

The plots were burned in August, 1951, and January, 1952, and again in August, 1954, and January, 1955. The objective was to attempt hardwood control with a hot, slow burning surface fire.

Frequency and coverage data of the herbaceous stratum were obtained by measuring the distance the canopies of various pertinent species intercepted a vertical plane determined by a calibrated chain stretched along the 50-foot line intercept. A study was made of these pertinent species or groups of species by means of analysis of variance.

RESULTS

Desmodium spp. and the *Compositae* had the greatest coverage on the August-burned plots, *Galactia volubilis* had the greatest coverage on the January-burned plots, and *Pinus* spp. reproduction had the greatest coverage on the fire protected plots. *Lespedeza* spp., *Euphorbia corollata,* and *Tragia urticifolia* had a greater coverage on the burned plots regardless of time of burning. The most vacant space in the herbaceous stratum occurred on the August-burned plots.

Analysis of variance, from the standpoint of topography, showed a significantly higher occupancy of *Andropogon* spp. and *Smilax glauca* on the slope positions while more vacant space in the herbaceous stratum occurred on the ridges. An analysis of convariance of *Andropogon* spp. with canopy indicated an ever greater difference in the coverage of *Andropogon* spp. on the fire treatments and topographical positions.

DISCUSSION

Burning increased the area occupied by quail food plants, with the slightly highest occupancy on the August-burned plots. The August burns also produced a more open type of vegetation.

It is believed that August burning will result in a greater coverage of quail food plants and produce a type of vegetation open enough at the quail's level to permit easy feeding. However, these late summer burns occur during the fruit-maturing season of many legumes and may result in the destruction of much of the quail's winter food. Nesting habits and cover requirements as well as food requirements must be taken into account. Summer fires may destroy young quail as well as some late season nests. These August-burned areas are void of vegetation and are out of production twice as long as the winter burns, as far as quail management is concerned. Continued frequent burning in the summer may also result in the destruction of the pineland habitat.

On forested areas of this type that have grown up to a dense and unproductive type of vegetation, a system of summer burning may help get the area back into quail production and then be followed by winter burning for continued quail production and vegetational control.

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PROGRESS REPORT ON BOBWHITE NESTING IN SOUTHERN ILLINOIS

By WILLARD D. KLIMSTRA
Southern Illinois University

and

THOMAS G. SCOTT
Illinois Natural History Survey

Since 1950 Southern Illinois University and the Illinois Natural History Survey have been conducting cooperative investigations of the bobwhite quail, largely in the southern 34 counties of the state. These studies have been concerned with all aspects of the biology and management of quail. Part of this