



FIG. 1. Higher income products, such as long poles, can be realized from long rotation forest management which is compatible with good quail management.

FIG. 2. The quail shooting preserve forest, as illustrated here, was early recognized by Herbert L. Stoddard, Sr. as a type which provided optimum conditions for quail. Later, his forest management plan also provided opportunity for the production of quality timber and at the same time preserving a forest of high aesthetic value. Such a forest also meets the requirements of a recreational forest set forth by H. H. Chapman.



Wildlife Forestry and Fire

LEON NEEL

Consulting Forester

Thomasville, Georgia

IN CONSIDERING the management of any tract of land for a multiple purpose, it is desirable, and perhaps even necessary, to limit remarks to that particular tract of land from which certain successful management results have been achieved, and certain conclusions can be drawn. Whether the results of land management research can be applied successfully to other and broader areas will depend largely on the competence of the responsible individuals on adapting the principles to their own particular problems.

The history of the game preserve area centered in the Thomasville-Tallahassee region is well documented. There has been continuous land management research in this region since 1924. In fact, Tall Timbers Research Station is a healthy offspring of the land ownership objectives of this region.

While the primary objective of land ownership in our area was originally for quail, a changing world has forced us to manage land for the production of income as well. If this is not true entirely for the present, it is definitely desirable for the future. In anticipation of this situation, Stoddard (1931) discusses timber management in his book *The Bobwhite Quail* as follows:

It is obvious that nothing like a *maximum* lumber crop and *maximum* quail crop can be produced on the same ground, for

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occasional burning, "open stands," and other game preserve matters are *not* conducive to maximum lumber production. Trees are believed to be a good crop for the quail preserve, however, under present economic conditions.

While maximum quail production has been reached in conjunction with agriculture, it was evident early that good quail shooting could be experienced in the open pine woods of our area. Hence, it developed that the game preserves as we know them, combine agriculture and forest management to give the best possible quail shooting. Compromises in every case are necessary, and depend on the stress of importance from quail to timber to agriculture.

The earliest evidence of forest management as an integral part of a game preserve was the fact that in most cases the owners of this land refused to allow the cutting of any trees, as they preferred the stands of original growth and second growth timber to remain for aesthetic reasons, rather than sell them for the small income the forests would have brought at that time. This fact dates from the beginning of the acquisition of this land for game preserves and accounts to a large degree for the magnificent stands of timber in our area today.

A gradual increase in the value of timber, the development of the pulp industry in the South, and finally World War II combined to make game preserve owners manage their properties wisely for the production of timber, as well as game.

In the Southeast, Stoddard in 1941 began a consulting forestry service for the game preserve owners, unique in the fact that he was representing only the land owners in the management of their timber. This proved immediately successful, for prior to this, the only representation was either directly or indirectly controlled by the wood-using industries at the expense of the landowners, and the "selective cutting" practiced under this system was simply "selecting" what the mills wanted to cut and leaving the rest. Needless to say, the areas cut on the game lands prior to 1941, or prior to management solely representing the owner, were severely high graded, and some of our greatest problem areas today are lands that were cut under sawmill supervision at an earlier date.

In 1941 began the real research into timber management on game lands, and this is still continuing. Stoddard had already realized the basic principles involved, and now came the opportunity to apply them to the land. The problem was simply to increase timber production to its maximum, while maintaining the highest possible quail population and hunting success.

In adapting applied ecology to the current economic situation in the wood-using industries, it became apparent that two principles would guide our approach to forest management. These are:

1. Selective cutting (for the harvesting and maintenance of the timber stands)
2. Long rotation

In effect we are managing a "Recreation Forest"—Stoddard recognized this in the early quail work and in his publications frequently discusses the possible conflicts between quail and timber management. H. H. Chapman also was aware of problems involved in "Recreational Forest" and in 1931, the same year of Stoddard's book, he published a work entitled *Forest Management*. His views as a forester are interesting in comparison, and he states,

The average person in the woods wishes to move through them without too much discomfort in going from place to place, and takes his pleasure in looking at the trees. For greatest satisfaction the ground should be free from brush and reproduction, the trees tall and fairly clean of branches.

The average forest presents no such conditions. Only a small portion of it may be mature or old and this may be decadent, filled with blow down or dead trees grown up with dense underbrush of shade-enduring species, and difficult to traverse. Open areas may be promptly occupied by briars, giving place to thickets of reproduction, which in turn become pole stands filled with unsightly dying lower branches. Only here and there may one proceed with comparative ease through a natural forest, except where, as in so much of the southern pineries, repeated fires have exterminated reproduction and threaten the life of the forest. The desire to see under the trees and to move freely is not compatible with the average conditions necessary in a healthy forest.

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In this statement, Chapman grasped the problems of his time, problems created by man himself by destructive logging and fire exclusion, which in turn led to destructive wildfires. Consequently, his observations on the southern pineries proved to be incorrect, and he later understood this. But his remarks do show us the conditions of much of our forest land at that time, and the problems involved in managing these lands as "Recreational Forests."

Selective cutting furnishes us with absolute control of the stand of timber for its entire cycle. By controlling the trees, i.e., which are to be left and which are to be removed, we can control some of the ecological factors related directly to the timber, such as, stand density, composition, and appearance, growth, quality, and related wild-life habitat. We can also control the value of the timber stand within its own limitations related to the current timber market. Which factors to stress in managing timber this way depends on the objectives set up for any individual tract or property.

Long rotation is necessary because as Chapman recognized it is only as a timber stand approaches maturity is it most valuable from a recreational standpoint.

While good quail shooting can be experienced on cut over timber land, the best results are always achieved on land that carries an adequate stand of timber towards the latter half of the cycle.

In relation to stand density, there is a point where any increase in volume would be detrimental to the desired quail population. This balance is determined by many factors, but principally depends on soils, site and desired quail density. As this figure is never stable due to the removal of timber and to growth, as well as variable environmental factors, a certain art is required in making this judgment. Cutting cycles of from 5 to 10 years have fitted our program best, both in the removal of the timber and by this, the manipulation of the ground cover in conjunction with fire. That is to say, the physical act of logging creates a certain amount of soil disturbance, and the removal of some trees opens the canopy so that succession is altered and plant growth changed, all to the benefit of quail. In every case, an increase in the quail population of an area should be experienced a year or two following a selective cut on land managed



FIG. 3. A natural stand of loblolly pine saplings showing the lack of adequate ground cover for quail. A selective thinning now would open the canopy and allow herbaceous vegetation to develop.

for quail and where no detrimental environmental factors occur.

To illustrate the principle discussed above, we have some land that can carry 20,000 board feet per acre as a producing forest and still have adequate ground cover to support quail, where other stands lose the ground cover at about 5,000 board feet or less.

To attain maximum usage of the land for quail shooting we are dependent on small and diversified age classes in attaining reproduction, so that in effect we have an all age forest in even age groups. By this method, extensive areas of open land have been broken up and timber value increased by strip-planting or group-planting pines. In 1930, Mr. Marvin Sasser, then and now manager of Norias Plantation, made the first artificial pine planting on a game preserve in our area for the specific purpose of introducing pines to an open area *and* furnishing cover and diversity for quail. This system was applied to its fullest in the Albany, Georgia, section where extensive open areas were broken up by planted pines. These stands are now yielding small poles and sawtimber and have all the appearances of some of our best quail woods.

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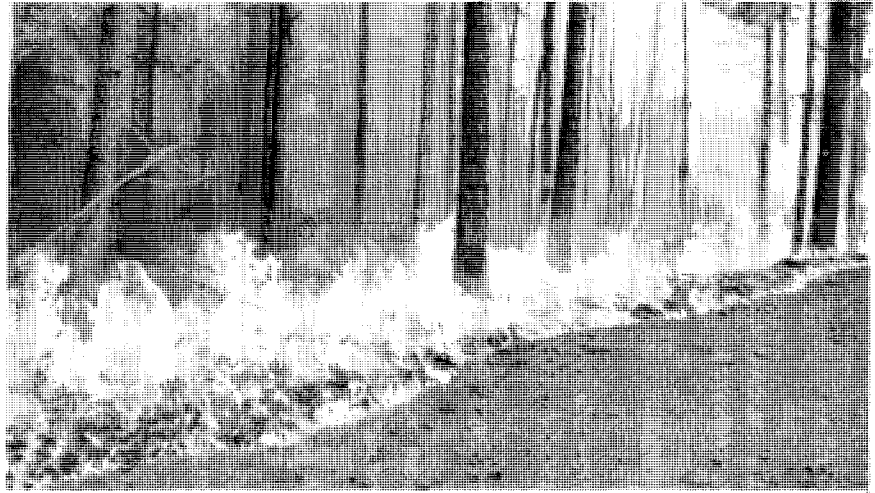


FIG. 4. Controlled burning, illustrated by this headfire, provides the only economical method of maintaining the essential open character of the southern pine recreational forest.

We are also using small, diversified age groups of natural and artificial reproduction to increase timber volume within the quail woods. This is accomplished by simply allowing the establishment of reproduction in the woods as small openings occur either naturally or after cutting operations. In some cases bird feed patches are created by the removal of undesirable species or some timber, and after a use period as feed patches they are seeded to pines. In this method the establishment of reproduction in the forest or on extensive open ground serves the additional purpose of furnishing escape cover for quail for a few years. Escape cover should never be limited to pines alone, however.

The species of pine to establish is again dependent on the individual objectives of the ownership. We prefer a mixture of the four major species of southern pines on our upland, as each has different seeding habits and each is important as a quail food source.

Where extensive blocks of woodlands occur we have brought in agriculture as a method of increasing the quail population. This is spectacularly illustrated by a project on one property in Thomas County with a block of about 1200 acres of even age longleaf of

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small pole size. On one afternoon hunt in the 1965-66 season two covies were found in these woods. In the spring of 1966 fifteen well dispersed fields totalling 75 acres were cleared within this woodland and planted to corn and soybeans. On one afternoon hunt in the 1966-67 season over the same ground 18 covies were found, mostly around the fields. While other factors might have been involved in the increase, the major factor certainly was the introduction of small corn and soybean fields into the large woodland block.

This, and the other principles outlined above, are the basis of our manipulation of the ground for multiple purposes. Needless to say, every acre every day presents us with problems that seem to be working against our goals. Even though all of our land has been affected and modified by man, we insist on applying natural principles to solve these problems and to carry out principles of our wildlife-forestry management.

LITERATURE CITED

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