

# Game Habitat and the Multiple Use of Southern Forest Ranges<sup>1</sup>

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Most southern ranges are forest ranges in the complete sense of the word. They exist chiefly on lands that were once and likely to be again covered with forests of hardwood and pine. Savannah formations can be found, but most openings are temporary and are

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maintained by fires. Records cite the use of fire by Indians to keep hunting areas open. When pastures are not mowed, when fields are abandoned, or when openings in the woods are kept free of fire, the inevitable return to forest begins. It is on these transitory ranges that the management of livestock and game is practiced in the South.

The kind and quantity of forage

is determined largely by silvicultural practice, being influenced by the kind and density of the timber stand. Read (1951), in a study in the Arkansas Ozarks, found that an average of 600 pounds (green weight) of herbage per acre was produced by the end of May under sparse stands of post oak and blackjack oak. Only 100 pounds of herbage were produced under a stand of good quality red, white, and black oaks that averaged 375 trees per acre. Gaines, Campbell and Brasington (1954) obtained similar relationships on longleaf pine lands in Alabama. They found that forage varied from 1,000 pounds (air-dry) per acre on areas with no overstory pines to 400 or 500 pounds where the pine stand had a basal area<sup>2</sup> of about 110

square feet per acre. Above 110 square feet of basal area, forage again began to increase, because mature longleaf stands open up and allow more light to reach the forest floor. At basal areas of 150 square feet, forage averaged a little over 500 pounds.

In Louisiana, Campbell and Casady (1951) found that herbage production was higher under hardwood than under pine stands, because pine litter accumulated much greater weight than did hardwood litter.

### Decline and Restoration of Forests and Wildlife

The variation of forage with timber density requires that plans for managing livestock and wildlife be closely correlated with plans for timber management. The need for close correlation did not always exist and is by no means universal today. It is developing with the rapid spread of scientific timber management.

In the past, clear-cutting left millions of acres devoid of trees and thus established temporary grassland. Free range was the rule then and, in many places, still is. Cutover timberlands, largely company-owned, were used as public domain, chiefly for cattle. Deer had not been seen in some areas for almost a century.

In southwest Louisiana, for example, the 1939 Forest Survey found 1.5 million acres of cutover land that had not reforested since the virgin timber was cut thirty to fifty years previously; another 3 million acres were relatively open cutover stands. These lands supported large herds of cattle and sheep, some goats and many hogs. Each year fire was used to reduce accumulated material from the previous year and "green up" the range, much as had been done in earlier times by the Indians.

During the past 20 years condi-

tions have been changing. Fire protection has received increased support from the people, and natural forest regeneration is re-covering many areas that had lapsed into grass. The large temporary prairies on the cutover longleaf pinelands are as a rule fairly level and have a high timber-producing potential; these are being planted or seeded to pines. As a result, former free-range lands are rapidly becoming covered with even-aged forests. The U. S. Forest Service reported that by 1954 more than 2½ million acres had been planted or seeded in the South.

Within established forests, density of stocking is increasing, timber management plans are being applied on larger holdings, and cutting is scheduled.

At the same time that the forests have been rebuilding, deer have been re-introduced and protected. Now they are increasing rapidly, and a large and active segment of the public has such an intense interest in deer that public land administrators, livestock operators, and owners of private timberlands could not ignore the problem even if desired. The management of deer forage adds another element to range management. That sufficiently large breeding herds exist to provide rapid expansion of the deer population up to or beyond the capacity of the range is evident from a comparison of estimated carrying capacity for the Southern states and their present population:

State	Potential deer Pop.*	Present deer Pop.**
Alabama	450,000	46,118
Arkansas	500,000	75,000
Florida	400,000	42,000
Georgia	(no est.)	33,000
Louisiana	165,000	78,000
Mississippi	240,000	50,000
North Carolina	155,000	160,000
South Carolina	(no est.)	50,000
Tennessee	250,000	20,000

\*Barick, F. B. 1951. Deer restoration in the Southeastern United States.

Today the range manager in the South is faced with two new and rapidly developing situations. One is the re-establishment of the forests due to the practice of timber management. The other is the rapid increase of deer over the entire region.

### Effect of All-Aged Timber Management Upon Range

Timber management practices, upon which range management must be based, fall into the two broad categories of all-aged and even-aged. In the management of all-aged stands, individual trees or small groups of trees are harvested as they mature. The general structure of the stand, and hence the amount of forage, remains somewhat constant.

Under these conditions, it is necessary for the range manager to determine the effect of the various methods of selective timber harvest, with their variations in openings, upon the forage for livestock and deer. He must determine the type of selective cutting that provides openings in the forest most beneficial to forage production. With this accomplished, the timber management plan can be adjusted to provide the greatest amount of forage commensurate with the objectives of timber production.

Moreover, the necessity for preventing undue damage to tree reproduction may make it necessary to reduce stocking below the level of forage availability.

### Effect of Even-Aged Timber Management Upon Range

In management of even-aged timber stands, all, or practically all, of the timber in a given stand is cut at the same time. Much of the existing browse remains, and a heavy growth of grass and forbs

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\*\*Hickie, P. 1954. Inventory of big-game animals of the United States. U. S. Dept. Interior Wildlife Leaflet 364. 3 pp.

<sup>2</sup>Basal area of a tree is the cross-sectional area of its stem as measured 4.5 feet from the ground.

comes in during the first growing season after the cut. The heavy growth covers the area until the young trees, which have come from seed of the previous stand or which may have been planted following the cutting, grow sufficiently to begin to shade out the grasses. As the grasses are shaded out, a heavy growth of shrubs often dominates the understory, but it too becomes thinner as the trees develop. As has been noted, these effects vary widely under the various timber types.

Under even-aged timber management, then, forage fluctuates widely both in amount and composition. In stands managed for pulpwood, the cycle may be as short as 15 years. Here again total available forage does not always indicate the stocking level. During the first seasons after cutting, when forage is most abundant, tree reproduction is becoming established and the range manager must adjust stocking rates and seasons of grazing to prevent damage. Cassady, *et al.*, in Louisiana (1955) found that, while cattle rarely graze pines when other green forage is available, losses will be excessive where cattle concentrate and over-graze. Little damage occurred when grazing was deferred until there was plenty of green forage.

The utilization of forage under even-aged stands of timber thus depends upon the recognition of the timber-growing cycle as well as the correct evaluation of the separate browse and forage cycles that accompany timber growth.

#### **Need for Combined Livestock-Game Forage Analysis**

Today stocking must be based not only upon grazing capacity for cattle but also the capacity of the forage to support deer. Formerly,

browse and forbs in the forest were either considered as a part of the cattle forage or used as a forage safety factor.

Many studies have considered livestock and timber or deer and timber but few if any southern studies have been made to determine the proper correlation of livestock and deer with timber. This must now be done under both all-aged and even-aged timber conditions. A start has been made by both game managers and land administrators.

Harlow (1955), using the forage weight method developed for southern ranges by Campbell and Cassady (1955), made a forage analysis of four forest types in Florida. Forage species for both deer and cattle were recorded as a basis for estimating combined deer and cattle pressure.

During July 1955, in a field meeting on the Ouachita National Forest in Arkansas, ranges and staff of the Forest, personnel of the State Game and Fish Commission, and range research men from the Southern Forest Experiment Station calculated combined cattle and deer carrying capacity on a 7,000-acre area containing pine, pine-hardwoods, and old fields.

In addition to grass and browse, the range manager, who now must consider game in his calculations, needs to know the deer food available in the form of acorns (for oaks are present in almost all southern forest stands). The mast crop provides an important supplement to the deer diet and may play an important role in the conditioning of deer for breeding.

#### **Fire**

Fire and its relation to timber and range management is of great importance, particularly in the

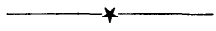
longleaf-slash pine forests of the Gulf Coast, where prescribed burns are used extensively in timber management. The range manager needs to know the effects of fire in stands producing both deer and livestock forage, as well as timber.

#### **Summary**

Most southern ranges are forest ranges. Now that forest cover is returning to large areas of cutover land, the close correlation of livestock and wildlife management with timber management plans becomes necessary. Deer, which were absent or scarce in most areas twenty years ago, are now numbered by thousands and are increasing rapidly. Range management must be based on methods of forage analysis that consider both wildlife and livestock forage. Information must be secured on the response of forage to various timber-harvesting methods, the establishment of reproduction, and the use of controlled burning.

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**Plan now to attend the 10th Annual Meeting of the American Society of Range Management in Great Falls, Montana, January 28-31, 1957.**