

to flood several hundred acres of public hunting grounds in that area. Neither request gave consideration to conflicting interests or to the important fact that inflow into the reservoir at that particular time was totally insufficient to meet either request. We do not receive many such requests from Arkansas or Missouri. Mutual understanding of mutual problems, which can best be attained by close and continuous coordination at field level, will eliminate these situations.

As for the criticism—some of it has been deserved. But, you will find, if you will take time to learn the details, that much of it has been unfair and unwarranted. There is little that can be done to correct this situation as long as it is standard operating procedure on the part of some of our experts to use a microscope to search for possible fish and wildlife losses which may be caused by Corps projects, and at the same time to ignore or minimize benefits until these benefits finally bowl them over like a steam roller.

Act 732—the Coordination Act—requires coordination between the Corps and the Fish and Wildlife Service, and with the head of the agency exercising administration over the wildlife resources of the State. Coordination with the Fish and Wildlife Service is necessary and desirable. However, for the most part, recommendations made by the Service, other than those involving migratory waterfowl, are concerned with State-owned resources. Therefore, it is evident that a close relationship between the Corps of Engineers and the states concerned is most necessary and most important. For this reason I have repeatedly emphasized state relationship in this paper.

In conclusion, let me say again to the field men as well as to the State Directors—Study our projects—Tell us your views and problems. We'll listen.

NATIONAL FOREST GAME AND TIMBER

By C. OTTO LINDH

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When one thinks of the many species of wildlife and especially big game, he also thinks of the woods or forests. It is also quite natural to think of the related items of forest habitat, cover, and food supplies. In the South, the thought mostly involves hardwoods—whether they are small shrubs or massive oaks. The overall hardwood situation in the South¹ is rather interesting.

THE HARDWOOD SITUATION IN THE SOUTH

There are 178 million acres of commercial forest land in the South or 59% of the land area. 91.5% is private, 5.1% is national forest, and 3.4% is other public.

On the commercial forest land of all ownerships hardwoods predominate on 47%, the mixed oak-pine type on 11%, and softwoods (mostly pine) predominate on 42%.

During the last Forest Survey period of about 20 years the hardwood type increased 13 million acres, mostly at the expense of pine and mixed pine types. In Georgia alone the hardwood type increased by 2.9 million acres from 1935 to 1951. Another example—in east Texas during the last 20 years the number of pine trees increased 19% while hardwood trees increased 64%.

There is 154 billion board feet of hardwood sawtimber in the South or 47% of the total sawtimber. In addition, there is over 51 billion board feet of hardwood cull trees—they have no commercial sawtimber value. Cull hardwood trees of all sizes cover the equivalent of one-fourth of the total forest land area of the South. That condition significantly affects the economy of all the people.

There are 802 million cords of hardwood growing stock or 55% of the total growing stock. There is more hardwood than pine growing stock. There are 315 million cords of oak and 224 million cords of gum.

¹ As used herein the South includes Oklahoma, Arkansas, Tennessee, North Carolina, South Carolina, Florida, Georgia, Alabama, Mississippi, Louisiana, Texas.

During the last Forest Survey remeasurement period the hardwood sawtimber volume increased about 21%.

The net annual growth of hardwoods after allowances for timber harvesting and all losses is 42 million cords; the net for sawtimber alone is 8.3 billion board feet. Considering sawtimber only, growth exceeds the cut by 16%

About 45% of the nation's hardwood land is in the South. The acreage of hardwood is increasing. The net volume of hardwood is increasing rapidly. The Timber Resources Review indicates that for the east as a whole we need to grow one-half more good hardwoods and three times more softwoods to meet future demands. We have more hardwoods but better quality species are diminishing. We need more good hardwoods and less culls.

THE HARDWOOD SITUATION ON THE NATIONAL FORESTS

Compared with the commercial forest lands in all of the South, the national forests have 5.1% of the area, 6% of the hardwood type, and 7% of the hardwood volume.

Much of the timber on the national forest lands of the South when acquired had been heavily cut, high-graded, and burned. Considerable acreage had been farmed and was badly eroded. Management by the Forest Service has been directed to protection, increasing the growing stock, and raising better trees. Even today in the understocked hardwood stands only about one-half of the growth is being removed during a periodic harvesting operation. The poorer quality commercial trees are thinned or removed. The better species and quality trees are favored for increasing a future higher value stand on a rotation of around 100 years. Hardwood stands on hardwood sites are not being converted to pine—they are managed to produce more and better hardwood trees.

Hardwood trees are increasing on the national forests. They will increase in volume under protection and intensive management.

TIMBER STAND IMPROVEMENT ON THE NATIONAL FORESTS

Timber is harvested annually from a little over 7% of the national-forest lands of the South. Of this area one-third or about 2½% of the total national-forest commercial timberlands are given some form of treatment annually in order to improve the stands. Many different improvement practices are involved. Seed beds are prepared. Pines are thinned. Competitive woody plants of no value or in surplus supply are controlled. Overstory cull hardwoods are weeded or deadened. Pines are favored on pine sites and hardwoods on hardwood sites. The objective in the treatment of hardwoods is control and not eradication. It is recognized that there will continue to be conflicts in treatment practices and some compromises will have to be made in relation to the several values and uses.

The primary interest in improving timber stands from a wildlife-management standpoint is the weeding and control of hardwoods.

When timber-stand improvement instructions were first issued by the Forest Service over 22 years ago recognition was given to wildlife to the extent of knowledge then available. The instructions have been revised as research facts and experience have dictated. One of our projects for 1956 has been the re-analysis and revision of our timber-stand improvement instructions. They have been reviewed to date on the ground in four states with wildlife groups and agencies. They are receiving further review with interested groups before issuance.

In addition to our general Regional policy instructions, the forest supervisors of each national forest prepares detailed instructions for specific units. His instructions, plans, programs, and treatment measures are tailored to fit each set of conditions on the ground.

Several general principles are involved in the treatment of hardwoods. Areas treated at one time are relatively small with intervening areas undisturbed. A required minimum number of den trees are left if available. A required minimum number of different kinds of locally important food species are left—often there are more than the minimum left even in mixed types. Sprouting usually

provides more stems than there were to start with—for instance, on one research plot, 250 hardwood stems per acre were still sprouting four years after treatment.

It is understood that there is to be a panel discussion on your program on timber stand improvement so it would be inappropriate for me to go into details of various practices or treatment measures at this time.

WILDLIFE DEVELOPMENTS ON THE NATIONAL FORESTS

There has been considerable activity on the national forests to improve wildlife management. Following the establishment of the national forests, the Forest Service transplanted deer to a number of units where the population was extinct. Several states have continued to transplant deer and turkey from one national forest to another.

By cooperative agreements with the states, 73 wildlife management areas have been established. These areas now include $2\frac{1}{4}$ million acres of national-forest land. Wildlife management has been intensified on these areas.

A good start has been made in developments to improve the habitat or management for wildlife. For example, during the last decade the Forest Service, the states or both, on a cooperative basis, have done the following on the national forests of the South:

1,366 food plots have been established for deer or birds or both.

256 miles of roadsides, temporary roads, skid trails, etc., have been vegetated primarily for the benefit of wildlife. Such work is increasing.

Almost 25,000 acres of deer browse has been cut.

50 ponds or lakes have been constructed to benefit wildlife.

Over 90,000 acres have been prescribed burned for wildlife, particularly birds.

Over 250 miles of ways or trails have been specifically constructed for hunters or fishermen access. These access ways are maintained.

While a good start has been made in increasing wildlife numbers and in developments for wildlife much more needs to be done. The limitation at this time is development funds, technical personnel, and research.

FACTS ON WILDLIFE-FOREST RELATIONSHIPS

There have been a number of research studies on the relationship between wildlife and forest habitat and food supplies. A few studies are being conducted at this time. More are needed. In the long run the effective correlation of wildlife management and timber management must be based on sound facts. Facts in turn must come from technically sound research.

In the South there are several hundred woody plant species. There are several major timber types. There are many soil types and several climatic and topographic zones. There are several silvicultural methods being used. There are several important wildlife species with different requirements for habitat and food. It will be extremely difficult to wisely harmonize these differences even if all the facts were known. Some management practices for both wildlife and timber are bound to involve compromises.

There is need now for a few large scale studies on wildlife-forest relationships. For example, much more on-the-ground information is needed on—what does a deer eat, how much, and when? Related is how much does the forest produce of the different palatable foods under various management practices? Also related is the intensity of various management practices on an acre basis versus a varied area basis. It is our intention to see if one or more such large-scale studies can be made on the national forests. Each study would, as a minimum, involve the State, the U. S. Fish and Wildlife Service and the Forest Service. Each would require the services of several scientists such as a biologist, an ecologist, and a silviculturist. By such cooperative projects, facts should become available to serve as more reliable guides for management of the forest and wildlife resources.

THE FUTURE

The Nation's population is increasing rapidly. The pressure on the land and forests and all resources will continue to increase. We will need more wood, more water, more wildlife, and more recreation. There will be much more

interest in hunting and fishing as a sport or for relaxation. The national forests of the South will continue to have a relatively small but important part in furnishing such relaxation for sportsmen.

On many national forest units there is now food and habitat for more wildlife. The deer population and harvest could be increased now as much as four to ten times in many places.² The turkey population could be increased many fold. All national-forest land should fully contribute to wildlife management to the extent of its ability and compatibility with other values and uses. The goal should be more research, a well-informed public, a desire for and strict law enforcement, and intensive wildlife management on each and every unit.

The goal can be reached by all of us continuing to work together. There are many more opportunities to coordinate our efforts—obtaining of facts, arriving at a mutual understanding, and carrying forward sound programs on the ground. It is good to get around the table, write to each other, or talk to each other; but there is no substitute for working together on programs and management practices on the ground or in the woods. We in the Forest Service solicit your continuing sound advice and counsel. We need more research and facts. We need your technical help. We have joint objectives and interests. We must cooperatively and harmoniously work together on an enlarged scale in the woods on each and every unit. By so doing we can make sound and worthwhile progress that will make the best use of all forest land resources and satisfy man's need to the extent of those available resources.

FISH AND WILDLIFE CONSERVATION AND THE SOIL BANK ACT

By LESTER BAGLEY

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Mr. Chairman, I appreciate very much this opportunity to appear before the Southeastern Conference. I presume you are aware that I am pinch hitting for Dr. Meehan who was originally scheduled to give this talk. Dr. Meehan asked me to express his regrets that he is unable to be with you today. I assure you it is a genuine pleasure to take his place and represent the Washington Office of the Fish and Wildlife Service at this meeting. Inasmuch as the assignment was given to me on short notice with little time for detailed preparation, my talk will deal chiefly with broad aspects of the assigned topic.

The Agricultural Act of 1956 was passed on May 28, this year. Title I of this Act is the Soil Bank Act which authorizes the Soil Bank program. I can assure you that during this time, and even before passage of the Act, the Fish and Wildlife Service has been very busy helping to lay the groundwork for inclusion of a strong wildlife program, and assisting in the preparation of regulations to cover wildlife practices on reserved lands. Right now, our Service is in the midst of finalizing a Memorandum of Understanding between Interior and Agriculture, which we hope will spell out the details of who does what in the wildlife phase of the program in a manner satisfactory to all concerned.

From a personal point of view, I believe this Soil Bank Act is very important legislation from a wildlife standpoint, perhaps the most important since the Federal Aid to Wildlife Act became law. Let me say further that if—and this is a big if—if the State fish and game departments are given the opportunity to participate actively in the program, the wildlife work permitted under the Soil Bank program can easily result in habitat improvements on a scale never before known in our time. But at the same time let me caution you not to expect miracles from the program. We must remember that wildlife improvements are permitted only on lands placed in the "bank," and that such lands must have been in agricultural production during the year immediately preceding

² From 2 papers (and other sources): Barick, F. B. 1951—Paper presented 5th Annual meeting Southeastern Game and Fish Commissioners; Hickie, P. 1954—U. S. Dept. of Interior Wildlife Leaflet No. 364.