

GENERAL SESSION

EVEN-AGED FOREST MANAGEMENT AND WILDLIFE HABITAT

DAN W. SPEAKE¹

Managed, even-aged forest stands develop in comparatively large openings that usually have been created by clearcutting. Some form of site preparation often precedes stand establishment. Many even-aged stands also result from the planting of old fields to trees or following some natural catastrophe.

Managed, uneven-aged forests are maintained artificially by some form of selective cutting. As groups of mature trees are harvested, small trees or seedlings make up the new stand. Uneven-aged forests often exhibit great diversity because the various stages of plant succession (from openings to mature trees) are interspersed in small patches throughout a given area. However, they may be deficient in openings that contain adequate herbaceous vegetation. Such openings are essential to many forms of wildlife. Forests managed on an even-aged system are characterized by stages of plant succession occurring in blocks. The blocks can be small enough and the interspersion of them complex enough to provide excellent wildlife habitat provided we apply the knowledge we already have. At the same time forest management can easily produce large blocks of succession stages or artificial plantings that are very poor wildlife habitat.

In preparation for this talk, I wrote to the chiefs of Game and Fish Departments in 16 southern and border states during August 1970 and asked questions about current conditions and trends associated with a shift to even-aged forest management. Thirteen of them responded, and the benefit of their experience was very helpful to me. Eleven of the thirteen have noted a strong concern among wildlife biologists, sportsmen, or others about activities associated with even-aged management.

Nine of the thirteen stated that conversion of hardwood or pine-hardwood forests to pine plantations was causing a serious loss of good wildlife habitat. The other four respondents stated that there was not a serious problem because conversion was not occurring on extensive acreages.

When asked what were the several most serious wildlife problems that are developing or could develop with a shift to even-age forest management, loss of habitat variety was mentioned more than any other problem. The second most-mentioned problem was that of too much area going into short forest rotations. There was much more apprehension expressed over loss of habitat for the squirrel and turkey than that for other species.

Other specific concerns mentioned were large sizes of clear cuts, frustration and loss of interest by hunters, loss of den trees for squirrels and raccoons, loss of the mid-story in short rotations where fire and herbicides are used, possible fire exclusion from future even-aged pine forests, deer problems such as crop damage or starvation, inadequate planning and financing of a truly multiple use program, and siltation of streams adversely affecting fish after large clear-cuts with intensive site preparation.

A recent report of the Southern Forest Resources Analysis Committee entitled "The South's Third Forest — How it can meet future demands," stated that total timber cut in the South in the year 2000 will be about 2.3 times that in 1968. It was also brought out in this report that about 56 per cent of the total timber would be used as pulpwood, compared to 37 per cent in 1968. This increase in wood production must occur in spite of losses of forest land to other uses. Between 1968 and 2000 ten million acres of commercial forest are expected

¹Leader, Alabama Cooperative Wildlife Research Unit, Auburn, Alabama.

to be lost to other uses. In 1968 public forest land was estimated at 17 million acres, forest industry at 40 million, and other private forest land at 141 million acres. This report also pointed out that forest industry and national forest lands, even if intensively managed cannot begin to supply the demand for wood. They concluded, "that the greatest single need is to materially increase timber growth on about 72 million acres of nonindustrial private forests." Therefore, we can look for various programs to assist these landowners in managing their timber lands more intensively.

What do we mean by very intensive forest management? Fred W. Haeussler of Union Camp Corporation in a talk presented at the 8th Auburn Forestry Forum, Auburn University in 1969 had this to say about intensive forestry on pulp and paper industry lands. "Obviously, we must increase the growth on our lands by further intensification, through:

- (a) Intensive site preparation
- (b) Genetically superior stock
- (c) Controlled population of growing stock
- (d) Control of competition
- (e) Fertilization
- (f) Irrigation
- (g) Insect and disease control

All of these will require various machine applications."

In order to obtain additional data on current conditions and trends in the southern forest industry, in August 1970 I wrote to 37 paper companies and lumber companies that own land in Alabama. I asked them certain questions regarding their activities and plans as they affect wildlife habitat. So far, 13 paper companies owning in the aggregate 2,681,119 acres in Alabama and three lumber companies owning together 116,220 acres have answered this inquiry. Their cooperation is most appreciated.

The three lumber companies that answered do not plan any large scale changes at this time. Most of their lands will remain on long rotations and no large scale conversion of hardwoods or mixed woods to pine was contemplated.

The story was different with the paper companies, however. At this time, approximately 40 per cent of their timber land is on a short rotation, and within thirty years, they plan to have about 79 per cent on a short rotation. When asked what would be the smallest, economically acceptable clear-cut size there was a range from one acre up to a preference for "blocks of section size." Eight of the 13 gave the smallest acceptable size in the range of 100 acres or smaller, while five gave this figure as being 200 acres or larger. There seems to be some room for compromise since 10 of the 13 stated that they would be willing to adjust sizes or shapes of clearcuts for wildlife consideration. The remaining three companies said "perhaps," "maybe," and "no" in response to the above question.

When asked whether or not they planned to use controlled burning as a forest or wildlife management tool, only one of the 16 companies said no, and one didn't answer that question. Thirteen companies said they would use fire, but four of these gave qualified answers, such as, "to the extent that we can do so and comply with air emission regulations," and, "only to a very minor degree on small acreages."

All 16 of the respondents had some form of wildlife activity or program on their lands. They either furnished hunting through leases or permits or had land in management areas in cooperation with the state. Some had their own programs of wildlife management and/or research, and three large companies had wildlife biologists on their staffs.

It was not possible to get meaningful figures on the amount of hardwood or mixed forest that would be converted to pine in the next 30 years. Answers ranged from none up to 80 per cent. Several companies stated that hardwood sites would be kept in hardwoods, and some specified that bottomlands and creek bottoms would remain in hardwoods.

Problems and misunderstandings can very quickly develop between foresters and advocates of forest wildlife management because of basically different viewpoints. For instance, we know that many areas now supporting upland hardwood and mixed forests have been or will be classified as pine sites by foresters. Presumably the hardwoods of mast producing size on these areas will be lost in the next 30 years unless "key areas" are left for wildlife. From the pure timber production point of view, efficiency and economy seem to decree large blocks of even-aged stands of superior trees; also, in the production of southern pine for pulpwood, short rotations of about 30 years are the order of the day. Hardwood management has not become so intensified. However, even-aged management with clearcutting of stands is also the new look in hardwood forestry.

Wildlife managers know that the key idea in forest wildlife management is *diversity in the habitat*. An abundance of research has shown this. Forest game and most other forest wildlife thrive in situations where all their needs can be met within a short distance. This distance depends on the normal home range or annual range size of the various species. For instance, the average home range size for our southern deer is around 200 acres, and the annual range for turkeys is about 1,000 acres. Within the annual range of a turkey, openings with herbaceous vegetation are essential, a mid-story of fruit and mast producing trees and shrubs is essential, and mature hardwoods for mast production are likewise necessary. Fruit or mast production of important species will fail in some years, so other species must be present to carry the game population.

On public lands dedicated to multiple use, it would seem possible to work out plans where all needs could be met. I refer to compromises on such things as settling maximum sizes of clearcuts, considering the shapes of clearcuts, deferring the cutting of strategically located stands of mast trees, programming improvement cuts to increase browse and release fruit bearing trees and shrubs in the midstory, using fire for wildlife management purposes, and providing permanent openings or plots where supplemental food can be grown. Clearcuts should be as small as possible down to about 20 acres. Forty-acre clearcuts probably would rarely cause wildlife damage and would often be beneficial. One-hundred or even two-hundred-acre clearcuts would be acceptable in certain circumstances and for certain species if the clearcuts could be made long and narrow in shape so that more edge effect would be produced per unit area. On a given area, of course, one or two game species should be featured and it should be recognized that the others are secondary. True multiple use will demand, however, that much more money be budgeted for wildlife management.

On large private holdings, especially those devoted to short rotation pine forestry, some wildlife management is going to be difficult. If intensified, even-aged, pine forestry is carried out with regeneration occurring on large (one or two square mile) blocks, much of the wildlife is apt to be eliminated. It is true that clearcuts create quail habitat. It is also true that an abundance of deer food is produced on many clearcut areas. But these benefits are temporary. Within about ten years following planting, the canopy of young trees can be expected to close, and until thinning and/or burning, this clearcut is of little use except as cover to game. At the rate some of the all-aged forests are being converted to planted pines, it doesn't take much imagination to see that essential components of wildlife habitat could be eliminated from large blocks of land in a very short time (ten years or less). It is not uncommon to see square or rectangular clearcuts of several hundred acres being created in contiguous blocks in successive years. In such situations, hardwoods of mast producing size are being virtually eliminated over huge tracts. Under current plans for short rotations of pine stands, it is difficult to see how mast will be provided for turkeys, squirrels and deer in the future. Removal of mast trees and cover is now destroying many acres of prime squirrel and turkey habitat in the situations described above. Lack of mast will possibly reduce the carrying capacity of

such areas for deer after relatively few years. Sawlog rotations of 80-100 years are easier to handle from the wildlife standpoint because, at any one time, a much larger percentage of the forest is in older trees capable of mast production.

Once an area is converted to large, even-aged blocks of cover, intensive wildlife management then becomes a necessity. In the case of pine plantations, there should be thinning and there must be burning. Young hardwood stands must be thinned or improvement cuts must be made. There will not be nearly as much incidental game as there is now — it will have to be planned for, worked for and paid for by someone.

It is conceivable that a combination of compelling, economic circumstances in the future could cause some forest owners to attempt to greatly limit competing understory vegetation in plantations by chemical or mechanical means. If this is ever done on a large scale, "biological deserts" will certainly appear.

The environment could become artificial in appearance with trees in neat rows, and surely there would have to be more and more supplemental feeding of wildlife in the form of plantings. We may then come to the point where our game is pauperized — depending on handouts of corn to replace acorns. This degree of artificiality is repugnant to most of us.

In the management of even-aged pine woods for wildlife, controlled burning is almost the indispensable tool. Both foresters and wildlifers are apprehensive about the possibilities of restrictions on controlled burning in view of the air pollution problem. There is a good chance we may be getting way out on a limb.

The rapid clearing and conversion to pine from pine-hardwood or hardwood in areas having high deer populations sometimes results in destruction of planted pines by deer. This brings demands to "bring the deer population into balance." This is another way of saying that we have greatly reduced the carrying capacity of the range for deer, and we must reduce the deer population because they are costing us money. Perhaps some of these situations could be prevented by coordinated planning, which would include modest herd reductions before crises develop.

In the near future, we may see a type of even-aged management in the bottomland hardwoods that certainly looks bad from the wildlife standpoint. I refer here to plantations of cottonwood or sycamore. These are fast growing species which will be harvested at an early age for pulpwood.

Users of wildlife are going to have to pay the costs of managing this resource. Many wildlife management practices or modifications of forestry practices probably won't be used on industrial forest lands, unless the costs can be justified to the stockholders. Fees paid by hunters for hunting privileges can help greatly. Most hunters seem willing to pay if they get something in return. Perhaps money (both private and public) can go a long way toward solving these problems. There is also going to have to be a great deal more coordination between foresters and wildlife managers. In addition, much more research will be necessary. Wildlife managers should be concerned that tremendous tracts of upland hardwood or mixed forest may be converted to pine with loss of mast production, and then for one reason or another, fire and other wildlife management practices will not be used adequately.