Shedding Light on Southern Timber Management

By Derek Dougherty

If you own land in the Southern U.S., you probably have pine trees on your property. Many landowners have planted pine plantations on their land. Based on many factors — stocking rate, type of site preparation, pine species planted, the growth stage of the plantation — the habitat quality of these plantations as deer habitat could range from poor to great.

If you own timberland that includes pine plantations, you should take a look at these areas and evaluate their value as deer habitat. Some pine plantations are planted at high densities and intensely managed to provide maximum timber volumes. These plantations reach canopy closure at an early age and block the sunlight needed for forest floor plants to grow. These are the plants that provide food and cover for most wildlife species. Timber management that places a strong emphasis on maximum timber production may not be the most suitable for the landowner that places a high value on wildlife habitat quality.

There are timber management options that will maximize timber income while providing high-quality habitat to your deer herd. By embracing technological improvements in timber management and changing your focus from maximum timber volumes to maximum timber value, both wildlife and timber objectives can be achieved.

The principles involved in growing valuable pine trees are similar to those used to grow quality deer because both trees and deer density are dependent and responsive to improvements in nutrition levels. To grow quality deer, we use established QDM principles. We selectively manage the deer herd and manipulate the habitat to maximize available nutrition. Through planned harvesting, the buck-to-doe ratio and population size are kept in balance with the carrying capacity of the land. Through fertilization and planting of supplemental, high-protein food plots, body size and antler development are maximized. We accomplish these tasks using mechanical tools, herbicides, fertilizer, seed, and prescribed fire to promote the preferred deer habitat and forage.

To grow high-value pine plantations, we use progressive timberland management practices to manipulate the environment to favor the final harvest trees or “crop” trees. We plant the best seedlings available and add fertilizer to maximize growth. We designate the “crop” trees as “leave” trees for further growth and cull all crooked, diseased, suppressed, and/or inferior trees. We use many of the same tools and management practices listed above for QDM.

The decisions a timberland manager makes at the time of planting and thinning determine the possible uses and value of the trees produced. The length of the rotation — the time between planting and final harvest — also has a major impact on the products produced. Planting high numbers of seedlings per acre, thinning the stands lightly, and not fertilizing — typical management decisions throughout the South — will produce a mixture of lesser-valued pulpwod, super pulpwod and chip-n-saw trees. To grow higher-value trees under these conditions, you must use a long rotation, 35 years or longer before final harvest. Long rotations of high-density trees means extended periods of closed crowns and poor wildlife habitat.

However, if we use good genetics to establish low-density plantations, aggressively thin to lower residual densities, fertilize frequently, and prune the crop trees to insure quality products, we can produce valuable timber in short rotations, around 22-25 years. Due to the lower number of seedlings
planted and the low residual densities left after thinning, the time of complete crown closure is limited. An abundant amount of sunlight is allowed to reach the forest floor and wildlife forage levels will increase. Now that we have given an overview of the basic principles of wildlife-friendly timber production, let’s elaborate on eight principles for simultaneously producing quality timber and quality whitetail habitat.

Use the best genetics available.

Pine tree volumes and quality are greatly affected by genetics. Fortunately, controlling the genetics of your pine plantation is much easier and cheaper than controlling the genetics of your deer herd. To grow high volumes of quality sawtimber, start by selecting seedlings from the best genetics available. Most federal, state, and industrial forestry organizations have cooperated over the years in helping select the best pine trees to serve as the “parent trees” for future growing stock. Since the jargon of forest genetics can easily become complicated, the simplest recommendation is to buy the best seedlings available. If you can’t evaluate or acquire them, hire a professional forester to assist you.

Lower your initial planting density.

After choosing the best quality seedling, you must decide how many seedlings to plant per acre and how to distribute them. This is where it’s easy to draw parallels between deer management and timber management. To maximize the number of adult bucks a property can produce, we need to establish the number of deer by sex and age the property can sustain without negatively impacting herd or habitat quality. If the number of deer exceeds this desirable level, herd reductions should result in increased body and antler size. Likewise, if we want to grow larger-diameter, higher-valued trees, we need to grow fewer trees per acre.

Consider starting with an initial planting density of 300 to 450 seedlings per acre, as opposed to 600 to 800 trees per acre. This lower-density helps accomplish part of your objective by growing larger-diameter trees in a shorter time period. Does it help improve the deer habitat? You bet it does. To grow better deer, we need more quality forage. The only forage available to deer is the forage they can reach, from ground level to about five feet. The only way to get vegetation within this zone is with adequate sunlight. By lowering planting densities (i.e., 300-450 seedlings per acre), a much larger window is created for early stand forage production before canopy closure.

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Fertilize.

Beginning at initial crown closure, start a fertilizer regime. Apply a larger rate, 180 pounds per acre of nitrogen and 18 pounds per acre of phosphorus every four to five years, or a lower rate, perhaps 120 pounds per acre of nitrogen and 12 pounds per acre of phosphorus, every two to three years. These applications may add an additional cubic foot per acre of timber volume. The fertilizer will help the deer in two ways. First, it may decrease the amount of crown closure time by allowing the landowner to thin earlier. Second, the treatment will increase the nutrients in the available forage before thinning, after the first thinning, and throughout the remainder of the rotation. The improved protein and nutrient levels in the available forage, in concert with other components of a QDM program, will increase deer body weights and improve overall condition.

Prune the “crop” trees.

Low-density plantations will grow larger limbs, producing lumber products with larger

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Whitetails aren’t the only species that benefit from a timber management program which balances timber production with wildlife.
knots. We can overcome this problem by pruning the “crop” trees to minimize the portion of the bole containing knots. The pruning operation can be completed in two separate “lifts,” beginning when the trees grow to 25 to 28 feet in total height. In the first lift, select trees should be pruned to eight or nine feet. This will leave a knotty core of around four to seven inches. It will take two to three additional years for pruning scars to heal. The remaining wood added to that core will be “clearwood” with no knots. Only prune the best third or best half of the trees. The remaining non-pruned trees will be removed during the first thinning.

**Thin early and hard.**

Thin the pine plantation to lower the stand density and improve tree diameter growth for the remainder of the rotation. Remove the diseased, crooked, and/or suppressed trees, and leave the crop trees to continue growing. Conventional thinnings in high-density plantations generally occur at 16 to 20 years, leaving a residual basal area — a term foresters use to describe the amount of timber in a stand — of 70 to 90 square feet per acre. To grow larger diameter trees, thin the plantations earlier, around nine to 13 years. Remove more timber volume, leaving a residual 50 to 70 square feet of basal area per acre. The benefits from this early and heavier thinning will be substantial for your deer herd. It basically leaves one huge, fertilized food plot. On the forestry side of the ledger the result is equally attractive. Individual trees in the plantations will maintain optimum crown ratios (33 to 40 percent) and will be capable of fully utilizing the increased nutrition provided through the fertilization treatments.

The thinning process is critical for optimizing stand value. The thinning should be completed by a quality thinning contractor. The leave trees or crop trees should be marked by a party representing you — your consulting forester — as opposed to the timber harvester.

**Prune and fertilize again after thinning.**

In this pruning lift, prune up to 18 feet. This will leave a large-diameter clearwood log in every crop tree. Fertilizing again after the thinning will ensure that the added nutrients are available to the crop trees, and the sprouting wildlife forage. To enhance legume growth at this time, you may want to consider increasing the amount of phosphorus fertilizer that is applied. Phosphorus fertilization has been shown to promote native legume growth and should be beneficial when applied to a thinned stand.

**Manipulate the forage quality.**

Once sunlight penetrates the forest floor after the thinning, legumes, annual grasses, vines, and hardwood sprouts will grow. You can further maximize the wildlife value from the...
new forage by using prescribed fire and/or herbicides. Applications of herbicides such as Arsenal® will kill the low value sweetgums and promote the growth of valuable forage species like blackberry, greenbrier, and honeysuckle. The prescribed fire will impact the species frequency and composition. The impact will vary, depending on the season in which the burn is conducted. Perhaps more importantly, the burning will keep the vegetation within the deer’s reach.

Harvest all remaining timber and establish a new low-density plantation. This final harvest may occur around age 22 to 25 years. By then, you will have produced a stand of 14- to 20-inch diameter trees with a log of clear-wood on each tree and more sawtimber and pulpwood above the clear-wood log. Timber harvest values may be in the $3,000 to $6,000 per acre range. By now the crowns will have closed for the last several years and you will need to allow more light to the forest floor for the wildlife plant production. Clear-cutting the timber will allow the maximum exposure of light to the forest floor and will leave the site in good condition to establish the next low-density plantation.

By implementing this timber management regime, you can significantly improve the wildlife habitat; quality of pine plantations when compared to management regimes that stress total volume production. An added benefit is the aesthetic value of these managed plantations. The large-diameter, pruned pine plantations with frequently burned understories are beautiful.

“I manage several large tracts of land in middle Georgia where my client’s primary management objectives are wildlife and timber combined,” said Todd Hunt of Timber Management Inc., a central-Georgia company that uses these progressive timberland management techniques. “They are sold on the thinning, fertilizing, and burning concepts. My clients see more deer in these areas and are harvesting more quality bucks. The results are equally dynamic for timber production. We have lowered our initial planting density from 726 seedlings per acre to 454 seedlings per acre. Simply put, we are growing bigger deer and bigger trees and my clients love it.”

Give these techniques a try on your existing pine plantations, or simply establish a new low-density plantation in your next cutover or even in an abandoned field. You will be pleased with the results.

The approach above represents a management regime utilizing many of the new approaches being used in the management of pine plantations. The best management regime for your land will depend on your individual needs, desires, the inherent quality of the land, condition of the pine stands on your land, and timber markets in your local area. As such, we recommend that you solicit the advice of a forestry professional in the development of timber management plans for your property. Furthermore, to help assist landowners in managing timber on their property, we will be developing a series of articles in coming journals that cover timber management in the Southern U.S. —Editor

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QUALITY WHITETAILS