HARDWOOD CORNER

By James P. Jeter, BMP Forester/Hardwood Specialist, Alabama Forestry Commission

In a continuing effort to promote upland and bottomland hardwood management, the spirit of cooperation lives on. May 5, 2015, marked another opportunity for staff from several state and federal agencies, as well as some private landowners, to meet, discuss, and learn more about upland hardwood management. Landowner Steve Rice hosted the event on his property located in Marshall County in north Alabama.

One of a series of trainings that takes place every two years or so, the original workshop was the brainchild of Natural Resources Conservation Service (NRCS) State Staff Forester, Tim Albritton. With his guidance and suggestions, a group of us has held together over the years to keep this course alive, demonstrating the true spirit of cooperation between agencies. Those involved through the years, and presently, are:

- Dr. Callie Schweitzer / USDA Forest Service
- Jim Schrenkel / Wildlife Biologist / Alabama Department of Conservation and Natural Resources
- Dr. David Mercker / University of Tennessee Extension Service
- Tim Albritton / USDA Natural Resources Conservation Service
- Jeff Thurman / USDA Natural Resources Conservation Service
- Lynn Washington / Alabama Forestry Commission
- Jim Jeter / Alabama Forestry Commission

This year's training, as in the past, was primarily targeted to help agency personnel who work with private landowners. The goal was to provide management recommendations as well as a better understanding of how to direct the landowner through the process of cost-share assistance while meeting their specific management objectives.

Is Your Hardwood Stand Ready to Thin?

An Example of Calculating Basal Area

Dr. David Mercker, University of Tennessee Extension Forester

As forest stands develop, they become overstocked. Overstocking leads to reduced growth rate, mortality, susceptibility to diseases and insects and lowers the return on investment. Thinning is a forest management practice that removes some trees while redistributing growth and maintaining proper stocking.

Stocking = amount of anything relative to what is considered optimum; in forestry, it is an indication of growing space.

Basal Area (BA) = one measure of stocking, it is the surface area of a tree stump measured in square feet at 4.5' above the ground
= can be measured as an individual tree or as a group of trees

Ex.	Diameter	BA (sq. ft.)
	8"	0.35
	14"	1.07
	20"	2.18
	28"	4.28

For simplicity, think of basal area this way. Pretend that an acre of land is delineated and every tree located on that acre is cut off at 4.5 feet above the ground level. Then the stump surfaces are measured to determine their area (as in the area of a circle).

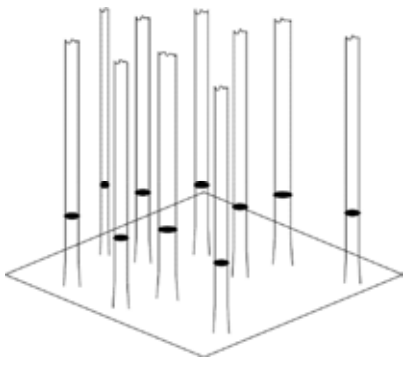


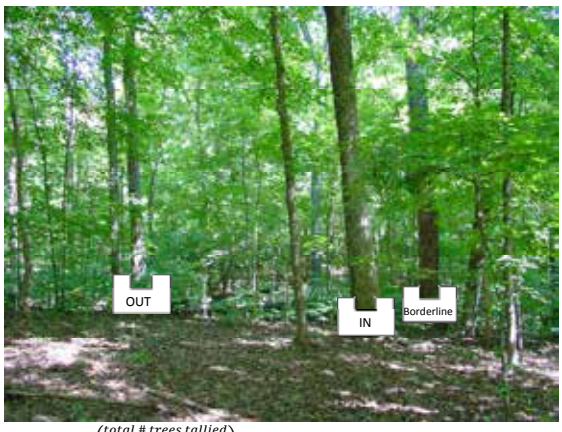
Figure 1

Figure 2

Measuring Basal Area

Angle Gauge = a tool used by foresters to determine which trees are to be included in a forest inventory; prisms are also commonly used

Procedure = in a circle plot, all trees that are larger than the width of the angle gauge are counted in the inventory. Trees are measured at a height of 4.5 feet. This In today's example, the width of the gauge is .75" (or 19mm) and is held 25" from the eye. This is equivalent to a 10 factor prism, meaning that each tree tallied is equivalent to 10 square feet of basal area per acre. The eye must remain over the plot center. Trees are either out, in, or borderline. For a cursory inventory, count every other "borderline tree" as in.



Stand Basal Area = $\left(\frac{total\ \#\ trees\ tallied}{\#\ Plots\ taken}\right) x\ 10$

So when using a 10 factor gauge, 8 trees tallied is 80 sq. feet of basal area; 12 trees tallied is 120 sq. feet of basal area, and so forth.

Take Home Message - When the average number of trees tallied is 11 or more (110 sq. ft. of basal area), it is near time to thin. So see a Forester.

Relation of basal area, number of trees, and average tree diameter to stocking percent for upland central hardwoods. Tree-diameter range 7-15 (left), 3-7 (right). The area between curves A and B indicates the range of stocking where

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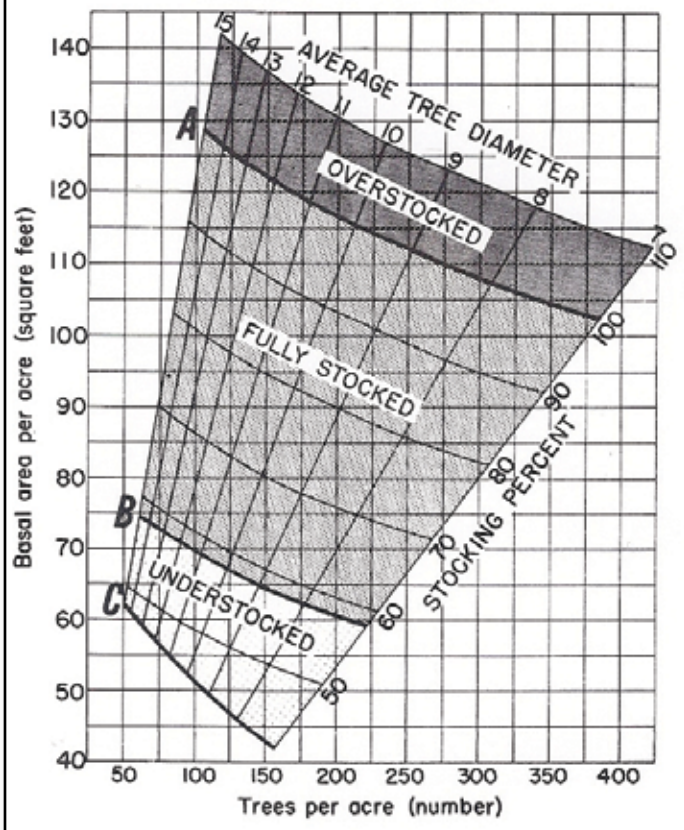

USDA, Forest Service Ag. handbook 355

Figure 3

Located in a very nice 23-year-old, multi-species, hardwood plantation established by the landowner and family, the first tour stop topic was titled, "Is Your Hardwood Stand Ready to Thin?" Dr. David Mercker conducted a lively discussion about seedling survival, stocking rates, form class, grade, landowner objectives, and what to consider in making the management decisions to move forward. He presented us with four very good, simplistic handouts [figures 1-4] that should help the average landowner make decisions by providing methods to figure stocking rates and determine growth.

Taking place in a much older natural stand of hardwood located on the transitional slope of the Cumberland Plateau, the second tour stop was led by Dr. Callie Schweitzer. Again, the discussion was lively and very informative. She asked us many questions regarding how to regenerate this particular stand. Did it need regenerating, or should it be left alone to grow? We talked about how to look at the growing stock and the terms used [figure 5], and she explained how naturally regenerated red oak seedlings react/survive when under a shaded canopy vs. being in a disturbed (thinned) stand [figure 6]. Last but not least, we discussed the process of decision making [figure 7].

At this same station, Jim Schrenkel talked about wildlife needs and how this particular stand varied from the earlier stand. He also

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Figure 4

RATE OF GROWTH
(GROWTH FACTOR TABLE)

DBH	Rings Per Inch											
	4	5	6	7	8	9	10	11	12	13	14	15
4"	.282	.225	.188	.161	.141	.125	.113	.102	.094	.087	.080	.075
5"	.220	.177	.147	.126	.110	.098	.088	.080	.073	.068	.063	.059
6"	.181	.145	.121	.103	.091	.080	.072	.065	.060	.056	.052	.048
7"	.153	.123	.103	.088	.077	.068	.061	.056	.051	.047	.044	.041
8"	.133	.106	.089	.076	.067	.059	.053	.048	.044	.041	.038	.035
9"	.116	.093	.078	.067	.058	.052	.047	.042	.039	.036	.033	.031
10"	.105	.084	.070	.060	.053	.047	.042	.038	.035	.032	.030	.028
11"	.095	.076	.063	.054	.047	.042	.038	.034	.032	.029	.027	.025
12"	.087	.070	.058	.050	.044	.039	.035	.032	.029	.027	.025	.023
13"	.080	.064	.053	.046	.040	.035	.032	.029	.027	.025	.023	.021
14"	.074	.059	.049	.042	.037	.033	.030	.027	.025	.024	.021	.020
15"	.069	.055	.046	.039	.034	.031	.028	.025	.023	.021	.020	.018
16"	.064	.052	.043	.037	.032	.029	.026	.023	.021	.020	.018	.017
17"	.061	.048	.040	.035	.030	.027	.024	.022	.020	.019	.017	.016
18"	.057	.046	.038	.033	.029	.025	.023	.021	.019	.018	.016	.015
19"	.054	.043	.036	.031	.027	.024	.022	.020	.018	.017	.015	.014
20"	.051	.041	.034	.029	.025	.023	.020	.019	.017	.016	.015	.014
21"	.049	.039	.033	.028	.024	.022	.020	.018	.016	.015	.014	.013
22"	.046	.037	.031	.027	.023	.021	.019	.017	.015	.014	.013	.012

Procedure

1. Determine GROWTH FACTOR by applying average d.b.h. and average rings per inch to above table.
2. Compute annual rate of growth of BASAL AREA, CORDS, TONS, BOARD FEET (International), or CUBIC FEET by multiplying amount of good growing stock in each category by the GROWTH FACTOR.

Hardwood Corner

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discussed managing for target wildlife species based on specific landowner objectives, the differences of hard-mast species and soft-mast species, and their benefits to different animal species.

As always, the topic of burning in hardwood stands came up. I am biased, but I think we all agreed that if a landowner is growing hardwood for timber production, fire has no place in timber stand improvement (TSI) activities of a hardwood stand. On the other hand, if the total objective is for wildlife management and there is no desire to grow quality sawtimber – burn away! Jim has completed many acres of prescribed burns in upland hardwoods and will be happy to talk to anyone about the results.

After lunch, Tim Albritton led a discussion about NRCS cost/share programs that deal with hardwood establishment or wetland restoration. [To get further details about these programs, please visit or call your local NRCS field office.]

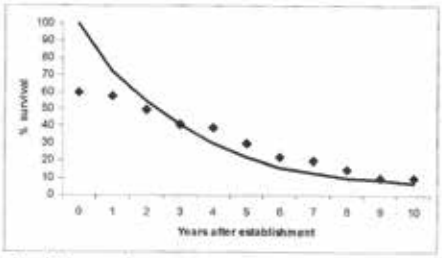
As always, it was a pleasure to be a part of this group, and I think all 35 participants should have been able to take home some new thoughts about hardwood management. As with any event, it takes many people working behind the scenes to make it successful. Thanks to consulting forester Brian Bradley and all the folks that helped him, and thanks to Lynn Washington and his staff of Alabama Forestry Commission folks as well. Without the knowledge of how to make workshops such as this happen, they would not take place.

It's always interesting to see who will show up at these training events. One landowner who resides in Autauga County, Alabama, and also owns land in Kentucky, attended in preparation for a meeting with a forestry consultant in Kentucky. You just never know how far reaching these events will be!

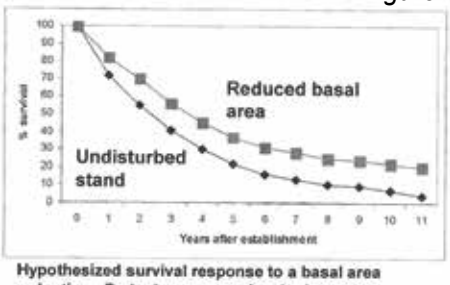
Figure 5

Preferred Growing Stock	
1	Trees in good condition
2	Trees of desirable species for the site and for management objectives
3	Trees with dominant or codominant crowns
4	Tree which can be left indefinitely as long as in good condition
5	Trees of a minimum grade or potential grade for site goals
Reserve Growing Stock	
1	Trees in good condition, do not qualify for preferred GS
2	To leave one for one or more cutting cycles would not risk merchantability or survival
Cutting Stock	
1	Poor condition, risk of mortality or degrade in merchantability
2	Species unsuitable for site
Cull Stock	
1	Sound cull stock-never sawlogs, have usable fiber
2	Unsound cull stock-no merchantable fiber

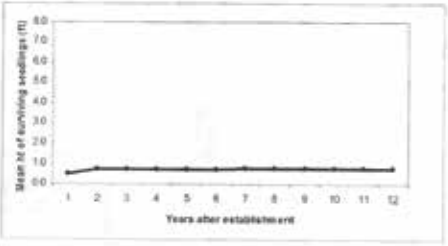
Figure 6



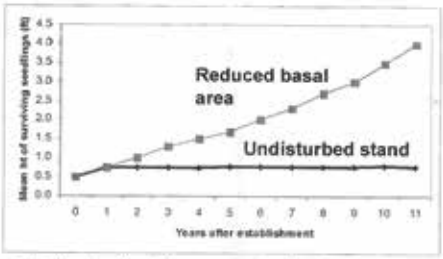
Survival curve for a cohort of red oak seedlings growing under undisturbed conditions. Oak seedlings arrive in waves (a cohort) but expire steadily beneath dense canopies.



Hypothesized survival response to a basal area reduction. Reducing canopy density increases seedling survival.



Mean height obtained over time by a cohort of red oak seedlings growing under undisturbed conditions. These seedlings generally do not grow taller than one foot.



Hypothesized height response to a basal area reduction; allows oak seedlings to grow in height, but also allows the competition to respond.

Figure 7