



FWF Update Newsletter

Department of Forestry, Wildlife and Fisheries

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Website: <http://fwf.ag.utk.edu>

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Symposium Announcement: Biomass and Forestry in Tennessee

Adam Taylor, Assistant Professor, Forest Products

There will a half-day meeting in Nashville on October 1st to discuss the possible impact of biomass utilization on the forests and forest industry in Tennessee. This gathering will start at 9am at the Sheraton Music City (Edgewood room) and will finish with a panel-discussion with various stakeholders in the forestry community. This event is being held in conjunction with the Tennessee Forestry Association annual meeting but it is open to anyone and is free. Please call Dana at 615-883-8382 to register.

Time to Order Seedlings for Spring Planting

Wayne Clatterbuck, Professor, Forest Management and Silviculture

Although fall and winter is well on the way, now is the time to begin planning for reforestation, i.e., planting trees in the spring. Site preparation for planting should be accomplished in the late fall to control herbaceous and woody weeds before spring planting. Bare root tree seedlings (both hardwoods and pines) should be planted before April 1 when seedlings break dormancy and begin to grow. Reserve seedlings now from the Tennessee Division of Forestry (TDF) nursery located near Delano, TN in Polk County.

Contact your local Division of Forestry office or the nursery at 423-263-1626 (web address: <http://state.tn.us/agriculture/forestry/landowners/catalog.pdf>) for a seedling catalog containing order forms, price, and species available for sale. Do not procrastinate. The demand for seedlings of some species may exceed supply.

Autumn Leaf Color: Can We Predict When the Best Leaf Color Will Occur?

Wayne Clatterbuck, Professor, Forest Management and Silviculture

The weather conditions, primarily temperature and moisture influence, the leaf color in any particular area. Since the forecast of weather conditions can be highly variable weeks to months in advance, the prediction of when the leaves will turn and how brilliant it will be cannot be determined very early with any degree of accuracy.

Autumn color begins first at the northerly latitudes and higher elevations in response to cooler temperatures and shorter days. The color progresses to the lower elevations and more southerly areas. Thus, leaf color will peak at different times depending on location allowing color to occur for several weeks. A few factors are listed below that influence leaf color.

- Cool nights are essential. The cycle of warm days and cool nights stimulate brilliant leaf color
- Cold and rainy weather with less sunlight results in less red color. Sunlight is needed for the red hues.
- If the temperatures are too warm, chlorophyll stays active longer keeping leaves green. Trees require cooler temperatures to degrade the chlorophyll to reveal the orange and red colors.
- Freezing temperatures and early frosts kills the leaves causing them to turn brown instead of the typical autumn colors.
- Late summer droughts can delay the onset of fall color by a few weeks.

Temperature, sunlight and moisture are highly variable each year assuring that no two autumns are alike. Generally in Tennessee, leaf color is most brilliant during the last week of October and the first week of November. Leaf color in the mountains is earlier.

Wood Identification Resources

Adam Taylor, Assistant Professor, Forest Products

Frequently I am asked to identify the species of various wood samples. I am happy to do these identifications and there is no charge (for a sample or two). Samples (at least as big as my thumb, please) can be mailed to me at:

Adam Taylor
2506 Jacob Dr.
Knoxville TN 37996

However, if you would like information so that you can do the identification on your own, please be aware that there are many resources available. There is a slide show introduction to wood identification available at <http://web.utk.edu/~mtaylo29/pages/Downloads.htm>. It is focused on the 4-H wood identification contest but will be useful for any wood id exercise. There is an introductory publication that can be downloaded at <http://www.utextension.utk.edu/publications/pbfiles/PB1692.pdf> or you can write to me for a copy. If you are interested in microscopic examinations (and this is the only way to identify many species), there is a photo gallery of species at <http://wood.tennessee.edu/NR/exeres/E91D1B26-4829-4926-9D11-3FBD4FB54C26,frameless.htm?NRMODE=Published>. Finally, if you have a group that would like to learn more about how to identify wood, I would be happy to visit and provide hands-on instruction. For more information, contact Adam Taylor at AdamTaylor@utk.edu or 865-946-1125

WILDLIFE MANAGEMENT CALENDAR FOR SEPTEMBER

by Craig Harper, Professor, Wildlife Management

HABITAT MANAGEMENT

Spray perennial cool-season grasses (such as tall fescue and orchardgrass)

- October through mid-November is the optimum time to kill these grasses!
- spray in preparation to plant native warm-season grasses next spring and/or to release the seedbank
- use 1.5 – 2 quarts per acre of a glyphosate herbicide (such as Roundup)
- refer to [*A Landowner's Guide to Native Warm-Season Grasses in the Mid-South*](#), PB 1746, or [*Chapter 5 in Native Warm-Season Grasses: Identification, Establishment, and Management for Wildlife and Forage Production in the Mid-South*](#), PB 1752 for additional information on eradicating perennial cool-season grasses.

Burn and disk old-fields and other early successional habitat

- will stimulate forb growth next spring, which will provide brooding cover for wild turkeys and bobwhite, and will improve forage availability for white-tailed deer
- will reduce grass dominance where nwsgr have become too dense
- will reduce woody encroachment by sweetgum, elms, and other undesirable woody saplings in the field
- don't be afraid to burn; prepare adequate firebreaks by disking around the perimeter of the field and burn against the wind
- Smokey Bear actually likes burning – it provides him with more food!
- refer to [*Chapter 6 in Native Warm-Season Grasses: Identification, Establishment, and Management for Wildlife and Forage Production in the Mid-South*](#), PB 1752 for additional information on managing early successional habitat for wildlife

Prepare firebreaks this fall/winter if you plan to burn old-fields next March/April

- disking now will stimulate forbs next spring
- firebreaks can be planted to cool-season food plots if desired

Plant firebreaks and other disked strips not left for natural vegetation

- annual cool-season grains (especially wheat) along with annual legumes (crimson and arrowleaf clover and Austrian winter peas) are excellent choices
- refer to [*A Guide to Successful Wildlife Food Plots*](#), PB 1769 for additional information

Establish hedgerows across fields with soft-mast bearing trees and shrubs

- also plant in blocks at end of fields or in “odd” areas
- wild plum, crabapple, elderberry, persimmon, and others are good choices

Finish planting cool-season food plots

- refer to [*A Guide to Successful Wildlife Food Plots*](#), PB 1769 for additional information on seeding rates and management recommendations

Spray perennial forage food plots for weed control if necessary

- refer to [*A Guide to Successful Wildlife Food Plots*](#), PB 1769 for specific information

Continue to strip-mow or silage-chop dove fields to provide seed and hunting opportunities

- strips can be disked and top-sown with winter wheat (2 bushels per acre) to provide additional forage opportunities

Timber stand improvement

- stimulate growth among oaks, beech, cherry, persimmon, and other mast producers by killing surrounding competitors
- girdle unwanted trees and spray wound with a mixture of Garlon 3A and Arsenal AC
- use 2 quarts Garlon 3A and 25 ounces Arsenal AC filled to 1 gallon of water

Build brushpiles from thinned trees and pruned limbs

- put large limbs on bottom and small limbs on top for crevice space and overhead protection
- effect is greatest along edges of fields of native grasses and forbs

Sow winter wheat along edges of flooded fields to provide important forage for migrating

- Canada geese and American wigeon later this winter

Clean out bluebird boxes to allow more room for roosting bluebirds when cool weather arrives

- 10 or more bluebirds may roost in a single box on cold nights

Clean out wood duck boxes and replace old wood shavings with fresh shavings

- screech owls and squirrels may use the boxes through fall and winter
- repair/install predator shields if necessary

Put up bird feeders - it's not too early

- refer to *Improving Your Backyard Wildlife Habitat*, PB 1633, for information on specific feeders and seed for birds

WILDLIFE DAMAGE/POPULATION MANAGEMENT

Close crawl spaces under the house and check for openings in the attic

- helps keep snakes, skunks, and squirrels from getting into places where they are not welcome
- rodents are beginning to cache food for the coming winter; take action now to keep them out of your house

Bats are leaving summer hang outs for winter hibernacula

- allow bats to leave attics before closing crevices, then make sure all openings are closed so they can't get back in next spring/summer

Blackbirds and starlings are gathering into large winter flocks

- don't allow them to roost in your trees; if they start, they'll form a habit
- repel them with noise makers (shotguns, firecrackers, banging metal pans together)
- be persistent

Deer hunting season is underway

- allow hunters access to your land if you have a problem with too many deer
- shoot the females (does); concentrating on bucks does little to control overpopulation
- in many overpopulated areas, it is necessary to kill 1 doe per 10 acres (sometimes more) before the population is reduced to acceptable levels
- where Quality Deer Management is desirable, reduce the population so plenty of forage is available, shoot does to even the sex ratio, and allow bucks to reach 3 ½ years of age before shooting them (refer to [*Quality Deer Management: Guidelines for Implementation*](#), PB 1643, for additional information)

Refer to *Managing Nuisance Animals and Associated Damage Around the Home*, PB 1624 for additional information on wildlife damage management.

Conflicting Approaches to Forest Management Continues

Wayne Clatterbuck, Professor, Forest Management and Silviculture

Dr. Chad Oliver, professor of silviculture at Yale University maintains that the current state of many forests is the result of well-meaning, but misguided, assumptions and actions. According to Oliver, the idea that forests thrive if left alone has already produced catastrophic results in the form of diseased trees, overcrowded forests, threatened species and wildfire. Oliver states that today's wildfires are hotter, bigger and more destructive than they have been since we began controlling fire almost 100 years ago. This fire exclusion policy has allowed trees to fill in stands that were once characterized by widely spaced, fire-resistant trees. Forest floors have become dense with debris, providing fuel for fires that now reach up to the crowns of trees. The low-intensity, more frequent fires that once cleaned and revitalized some forests are largely a thing of the past. At the same time, the open forest environment that once harbored birds, butterflies and plants has dramatically diminished.

The solution is to prescribe a wide range of forest management practices such as thinning, planting, natural regeneration, harvesting, pruning, prescribed burning and other strategies to improve the overall balance of the forest. The goal should be to return forests to a balanced mixture of age and size classes from young to old or small to large. Forest harvesting should be balanced with intermediate forest treatments and old growth. In the process, timber is removed and used, dangerous fire conditions are prevented, homes are provided for fish and wildlife and high-quality wood is grown for future generations.

Tree Responses to Disturbances

David Mercker, Extension Specialist, Forest Management

Trees are regularly exposed to disturbances. Some disturbances are minor, where recovery is rapid and often without lasting affect. Other disturbances are much more severe, leaving scars as evidence, and sometimes resulting in mortality. The response to disturbances varies according to characteristics of the species, vigor at the time of the disturbance, and treatment following the disturbance. Oliver and Larson, in *Forest Stand Dynamics* (1996), outline a number of disturbances and the typical response to those disturbances. Some are summarized here:

Scars – Scars occur when trunk and stem cambium is killed from various sources such as fire, equipment, falling trees, mammals, and insects. Scars often lead to partial rot. Healthy trees will compartmentalize (or surround and grow over) the rot. Such spots can become weak and are later susceptible to stem breakage.

Burying Roots – In some cases, only a few inches of additional topsoil added over existing roots will suffocate trees and kill them. This is a common problem in construction settings. Some species (poplars and willows) can survive by developing adventitious roots (roots that develop unusually).

Sun Scald – trees previously in shade, then suddenly exposed to direct sunlight, can experience sun scald on the bark. This phenomena occurs because the temperature on the bark surface is hotter than the surrounding air, thus killing living cambium cells. Scald causes scars on the sunny-side of the tree. A tree responds to scald as it would to scars formed by other means.

Freezing Damage – also called “frost cracks,” – these are seams that are caused in the winter when, after several days of moderate weather, a sharp drop in temperature occurs. The outer layer of wood contracts much more quickly than the inner layer, causing a crack to form, normally from the base and extending several feet upward. The cracks are often audible with a loud “pop” and although the cracks quickly reseal, they are subject to future reopening. Pathogens may enter through the wound causing stain.

Crown Breakage – wind and ice often burst tree tops. Survivability following this disturbance is a function of four things: tree age/health/vigor, the extent of crown loss (40% or more is critical), season of breakage (damage during the growing season is worse because carbohydrate consumption is high while carbohydrate production has been significantly reduced due to crown loss – resulting in carbohydrate drain), and post-damage care.

In forest settings, proper management will keep trees healthy, making them more likely to endure the damage that results from disturbances. Proper management includes managing for hardy, native species, and maintaining healthy growth through periodic thinning. A final word regarding trees in yard settings: normally it is not recommended to apply wound dressing. In most cases, doing so hinders the natural healing process of compartmentalizing the wound. Instead, the best prescription is stimulating new growth by watering, fertilizing, and aerating.

Economic Impacts of Forestry in Tennessee

Larry Tankersley, Extension Forester

Overview

In 2003, Tennessee’s forest products (paper products, wood products, plus furniture and related products) exported outside the US, including forestry and logging, totaled \$453.3 million. Paper products had the highest export value at \$332.4 million, followed by wood products (\$73.9 million), furniture and related products (\$ 37.8 million), and forestry and logging (\$9.1 million) (US Department of Commerce, 2003b).

Tennessee is one of the top hardwood lumber producing states in the US. In 2003, approximately 964 million board feet of hardwood lumber and 95 million board feet of softwood were produced (Tennessee Agricultural Statistics Service, 2004). The majority of the forest cover in the state was hardwoods. White oak, red oak, hickory, yellow-poplar, and maple were some of the predominant hardwood species. For softwoods, loblolly pine, shortleaf and Virginia pine and redcedar were major species.

Forestry manufacturing industries for the state included wood products, paper, and furniture and related products. These industries shipped approximately \$9.2 billion of goods. That’s 1.8 percent of the national market share for value of shipments wood products, 2.3 percent of national paper manufacturing and 1.5 percent of furniture and related products.

In terms of employment, the forest products group (wood product manufacturing, paper manufacturing, and furniture and related products) employed over 51,500.

Economic Impacts at the State & In-State Region Levels

Direct economic activity for forestry related industries contributed a total of \$13.1 billion or 3.4% of the State's economy. Employment in forestry related industries was 58.9 thousand persons or 1.7 percent of the workforce. Total value-added was over \$4 billion with \$2.8 billion in labor income.

76.4 percent of the forestry workforce was employed in secondary industries (wood products manufacturing) and 23.6 percent in primary (logging; pulp, paper, and sawmills; and nursery/timber tracts).

For both primary and secondary forestry, the Memphis Region had the largest value of total industry output (32%) followed by the Nashville Region(22.5%). The Chattanooga Region(24.9%) followed the Memphis Region(41.1%) in economic activity for primary forestry followed by the Nashville(15.6%), Tri-Cities(12.8%), and Knoxville(5.6%) Regions. However, the Nashville Region had more jobs in primary forestry compared to the Chattanooga Region. For secondary forestry, the Knoxville Region(12,260) had more jobs followed by the Nashville(12,154) and Memphis(9,975) Regions. Yet, total industry output was larger for the Nashville(\$2.1billion) Region followed by the Memphis(\$2.0 billion) and Knoxville(\$1.8 billion) Regions.

Primary Forest Products:

The largest output value for primary forest products was from paper and paperboard mills(\$3.35 billion), followed by sawmills(\$833 million); logging(\$703 million); pulp mills(\$316 million); and forest nurseries, forest products, and timber tracts(\$36million) (i.e., growing trees for reforestation; gathering forest products, such as gums, barks, balsam needles, rhizomes, fibers, and ginseng; and timber tracts for selling timber).

The Memphis and Chattanooga Regions had the largest output values for paper and paperboard mills at 39% and 36.%, respectively. For employment, paper and paperboard mills had the largest number of individuals with the Memphis and Chattanooga Regions employing the largest numbers. The Nashville Region had the largest output value for sawmills. For logging, the Memphis and Nashville Regions had the largest output values. For pulp mills, 94.6 percent of the economic activity originates from the Memphis Region. For forest nurseries, forest products, and timber tracts, the Tri-Cities Region had the largest output values.

Secondary Forest Products

The largest output value for secondary forest products was paper manufacturing, followed by furniture and related product manufacturing; millwork; manufactured home manufacturing; other wood product manufacturing; and veneer, plywood, and engineered wood product manufacturing. Furniture and related product manufacturing for this analysis was comprised of household and institutional, office, and other (mattress, blind and shades) furniture categories. The other wood product manufacturing category was comprised of wood preservation, wood containers and pallets, miscellaneous wood products, and kitchen cabinets. The Memphis Region had the largest values for output, employment, labor income, and value added for paper manufacturing. The Knoxville Region had the largest output values for furniture and manufactured home manufacturing, with the latter category being an important industry for the state. Economic activity was the largest for the Memphis and Nashville Regions for millwork and other wood product manufacturing. For the veneer, plywood, and engineered wood product manufacturing category, the Memphis Region had the largest output value, followed by the Knoxville, Nashville, Tri-Cities, and Chattanooga Regions.

Estimated Total Economic Impacts of Forestry

The estimated total economic impacts of forestry included not only the direct impacts from the industry, but also the impacts the industry had on input supplying industries (indirect impacts) and on expenditures by households and other institutions (induced impacts). The total economic impacts from forestry included direct, indirect, and induced impacts. Forestry contributed an estimated \$22.8 billion to Tennessee's \$388.2 billion economy annually; roughly 5.9%. Employment from forestry totaled over 148 thousand from primary and secondary forest products production.

Primary Forest Products Total Impacts

Pulp and paperboard mills contributed the largest values for all the categories analyzed compared to the other four primary forest products sectors combined. The Memphis Region dominated all value categories for this sector, with the Chattanooga Region having the largest values next followed by the Tri-Cities Region. The Memphis Region also had the largest values for logging and pulp mills. The Nashville Region had the largest output values for sawmills. The Tri-Cities Region had the largest output values for forest nurseries, forest products, and timber tracts.

Secondary Forest Products Total Impacts:

Paper manufacturing and furniture and related product manufacturing were the largest contributors for all categories. Although paper manufacturing had the largest value for output, labor income, and value added, the furniture sector had the largest number of employed individuals. The Memphis and Nashville Regions had the largest output value for the paper manufacturing sector (for Memphis, primarily from paperboard containers manufacturing and sanitary paper products; for Nashville, from paperboard containers, all other converted paper products, and coated, laminated paper, and packaging materials). For furniture, the Knoxville (primarily from upholstered household furniture, institutional furniture, and showcases, partitions, shelving, and lockers), Chattanooga (upholstered household furniture), and Nashville (institutional furniture and showcases, partitions, shelving, and lockers) Regions were the leaders. The Knoxville Region also had the largest output values for manufactured home manufacturing. For millwork, both the Memphis and Nashville Regions had the largest values followed by the Knoxville Region. The Nashville (primarily from wood kitchen cabinets and countertops, wood containers and pallets, and all other miscellaneous wood products—NAICS 321999) and Memphis Regions (wood containers and pallets and wood kitchen cabinets and countertops) were the leaders in all categories for other wood product manufacturing. Veneer, plywood, and engineered wood product manufacturing economic activity were the largest in the Memphis Region.

Conclusion

Forestry included the management and logging of trees; sawmills (primary forestry products), including pulp and paper mills, plus forestry products manufacturing (secondary forestry products). Forestry accounted for 5.9 percent of the state's economy, employed close to 149,000 Tennesseans, and generated \$22.8 billion in output.

(This information was compiled from a report generated by the Department of Agricultural Economics, University of Tennessee, December, 2006. Special thanks to Burt English, Kim Jensen and Jamey Menard for their efforts.)

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