



Alabama's TREASURED Forests

An Alabama Forestry Commission Publication

Spring 2009

A MESSAGE FROM ALABAMA'S STATE FORESTER



Linda Casey,
State Forester

The Energy Independence and Security Act was passed by the US Congress in 2007 to help the nation meet the ambitious advanced biofuels mandate of 21 billion gallons by the year 2022. The Renewable Fuels Standard (RFS) was a part of this bill. Within the RFS is a definition for woody biomass. That definition of what qualifies as “renewable woody biomass” excludes almost all biofuels that would be sourced from federally owned lands and from privately owned lands, unless it comes from trees planted prior to 2007. The impact to Alabama under this definition would be a reduction in qualifying acreage from 22.5 million to 6.6 million acres.

The 2008 Farm Bill has a broader definition of what constitutes woody biomass: “material, pre-commercial thinnings, or removed exotic species that are byproducts of preventive treatments.” This definition would include federally sourced biomass and virtually all privately owned timberlands and agricultural lands. The acreage under the 2008 Farm Bill definition that would qualify as “renewable woody biomass” increases from 6.6 million to 22.5 million acres. The sustainability of Alabama’s forest is critical and to that end, all current local, state, and federal laws and regulations would apply to the harvesting of trees for biomass.

Currently, there is an ongoing national discussion by all interested parties to determine the right definition. There are many reasons for utilizing the 2008 Farm Bill definition. First and foremost, it would increase biofuels production, reduce our dependence on foreign oil, revitalize rural economies, decrease our overall carbon emissions, and allow the full realization of the promise of cellulosic biofuels by not excluding vast areas of our state. Just as importantly, it would not limit a landowner or industry’s ability to have access to potential biomass markets that may come to Alabama. Additionally, it would increase value opportunities for landowners, increase economic opportunities for the state, improve forest management in such areas as forest health, and reduce risk of catastrophic wildfires.

This issue is important not only to the state of Alabama, but to all natural resource stakeholders in the state. I encourage you to get involved. Make your wishes known to your Congressional representatives and senators.

Linda Casey

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On the Cover: This towering Durand oak (*Quercus durandii*), located in Wilcox County, is one of 11 trees in Alabama named to the 2008-2009 National Register of Big Trees. To read about the other ten "Alabama National Champions," see story on page 29. The featured Durand oak was nominated by Jason Ledbetter and is owned by the U. S. Army Corps of Engineers. *Photo by Jason Ledbetter*

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FLAT ROCK

By Terry Ezzell, Alabama Forestry Commission

In the early 1990s, Neal Taylor, an avid hunter, realized that as the white-tailed deer population grew in North Alabama, hunting leases would become harder to locate and grow increasingly expensive. With this in mind, he began searching for property close to home that he could call his own.

In 1994, he and his wife, Pamela, purchased 232 acres of land in Colbert County, only 15 minutes from their house in Russellville (Franklin County). This property was special because it was very close to where he had grown up and hunted small game as a boy. Neal knew this would not only give him and his sons their own hunting area, it would also be a great investment for his family's future. Since buying that first parcel of land, the Taylors have acquired five different adjoining parcels



Pamela and Neal Taylor enjoy managing their TREASURE Forest/Tree Farm and sharing it with family and friends.

bringing the total acreage of "Flat Rock" to 332.

As a forest ranger with the Alabama Forestry Commission, Neal's experience with forest and wildlife management helped turn this once unmanaged track of land into the showplace it is today. In fact, the Taylors were named the Northwest winners of the 2007 Helene Mosley Memorial TREASURE Forest award. Neal also credits much of his management success to his father, a TREASURE Forest landowner in the 1980s and a retired conservation employee. He says his dad started teaching him good stewardship at a very young age.

Certified as a TREASURE Forest in 2002, Neal's primary objectives are managing the property to increase the wildlife habitat and establish a healthy, productive forest using sound timber management practices.



Additional land management activities on the property included conversion of pastureland to pine stands. Today the Taylors have over 250 acres of pines ranging in age from 10-16 years old. Over the years, Neal has also carried out extensive road construction, doing all the building and maintenance himself. All of the work on the Taylor's property is conducted by him, his family, and friends.

Wildlife Management

At the time of the original purchase, the property consisted mainly of unmanaged upland hardwoods and an area where a "high-grade" harvest had taken place. While some game species were present, the density and quality were not what Neal desired. His first step was to plan a clearcut timber harvest that would produce income to help increase the diversity of the site and build a solid foundation for his wildlife management plan. Ultimately, this harvest would allow him to establish a productive forest, the basis for his investment plan.

In his pre-harvest planning, extra-wide streamside management zones (SMZs) were maintained. These areas would retain



Landowner Neal Taylor (center) discusses timber management techniques with AFC foresters Terry Ezzell (left) and Johnnie Everitt (right).



hardwoods for mast production and provide wildlife with much needed diversity in the future. Neal also marked two or three large white oaks per acre to be left unharvested. Although this would take up growing space in the pine plantation he would later establish, he felt the mast produced by these trees would be important to his wildlife management. He continues to fertilize selected trees each year to increase productivity.

Neal also worked with the loggers to pre-plan loading sites in areas that were well suited for food plots. These first plots were the basis for his wildlife plantings program, which now includes 14 plots totaling 20 acres. While some of these areas are planted in the spring with soybeans and corn, others are planted in the fall with wheat, oats, and chicory. He also manages year-round for white ladino clover. Neal noted that for the last couple years, he has planted with “Roundup Ready” corn on about 10 acres, an experiment that has proven very successful.

Along the edges of these plots and in a few of the “orchard” type settings, Neal has planted sawtooth oaks, crab apples, and domesticated fruit trees such as Yates apples, golden delicious apples, and yellow harvest pears. He protected most of these with plastic tree shelters that were removed as the seedlings grew. Now that they are producing fruit, Neal has been so pleased with their success that he has continued such plantings.

Included in the last land purchase was a small amount of abandoned pasture land. Neal has employed six acres on the site to maintain in early successional stages, promoting the growth of some persimmon trees and bushhogging.

Understanding that burning would greatly enhance wildlife habitat, Neal conducted his first prescribed burn on the property in the winter of 2007. This understory burn was applied to 250 acres of pine plantation.

Neal has taken great care in managing his whitetail deer herd through selective harvesting, even participating in the Deer Management Assistance Program with the Alabama Department of Conservation and Natural Resources from 1994-97. Today, precise numbers of deer are harvested to keep the balance between habitat and carrying capacity. He encourages those hunting his land to harvest numerous does, but only mature bucks, determined by age and body size.

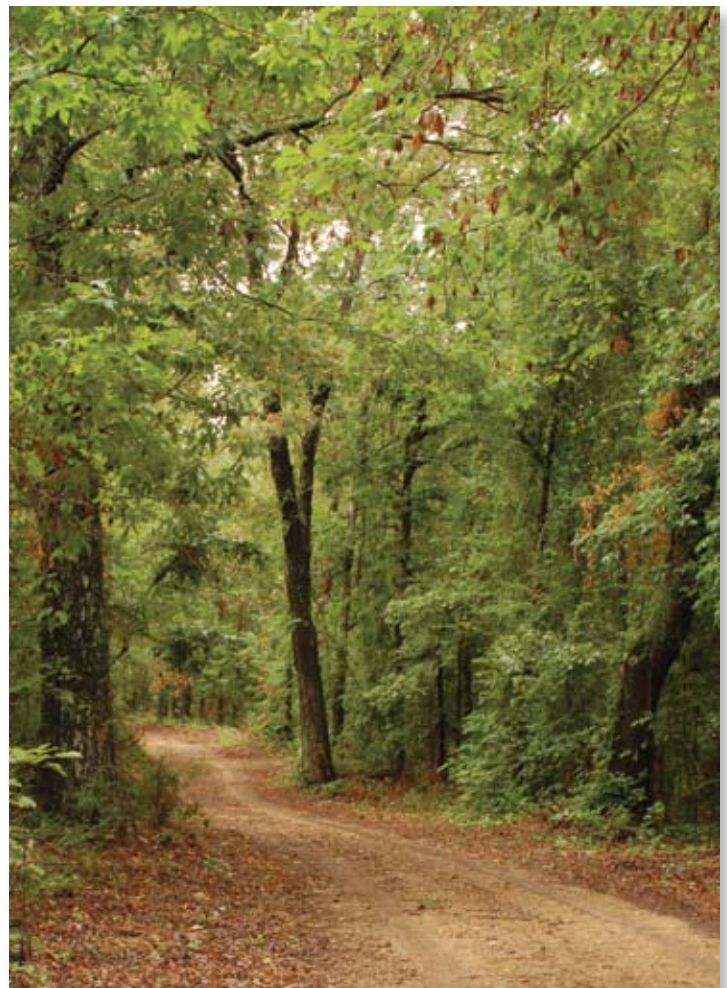
Timber Production

Even though wildlife remains his top priority, Neal knows owning the land is a good financial investment. The original
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clear-cut provided them the opportunity to replace unproductive upland hardwoods with a vigorously growing forest. After the harvest was conducted, loblolly seedlings were planted. Herbicide was applied by hand and skidder-mounted sprayer to the seedlings' competition to aid stand establishment. Great care was taken during this application to avoid the unharvested white oak trees. The planting was successful, resulting in a fully stocked stand of productive timber now occupying the site. The understory prescribed burn mentioned earlier did a good job in reducing the wildfire fuel load that had accumulated in this young stand. Later this year, Neal is looking forward to the first thinning of the pines. In the year 2010, he plans to do the next prescribed burn.

It's readily apparent that Neal endorses the outdoor lifestyle, a fact supported by the Taylors generously sharing their property with others. In addition to hosting church groups, Boy Scouts, and others at Flat Rock, he invites individual landowners who are interested in learning from his ongoing natural resource management practices.

His aggressive wildlife management program and sound timber management plans have paid off. Although rarely seen when he first purchased the property, the deer population has increased 15-fold over the last several years. Turkey, other small game, and even non-game species have also benefited and are abundant today. While taking his grandsons ATV riding, he loves to introduce them to the great outdoors, showing them various tree species and wildlife signs. Several young hunters, including one of his grandsons, have harvested their first deer under his guidance. According to Neal, these are the true rewards. Enjoying the land with close friends and family is what it's all about. 🌲



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Statewide Assessment and Strategy for Forest Resources

By Bill Baisden, Assistant State Forester, Alabama Forestry Commission

The Alabama Forestry Commission is engaging in an assessment and planning process to prioritize forestry efforts statewide. This effort reflects new requirements outlined in the Forestry Title of the 2008 Farm Bill. It will ensure that federal and state resources are being focused on important landscape areas with the greatest opportunity to address shared management priorities and achieve measurable outcomes.

The proposed plan will serve two primary functions: (1) provide an analysis of forest conditions and trends to delineate priority rural and urban landscape-level areas, and (2) provide long-term strategies for investing resources to manage priority landscapes identified in the assessment. The AFC will utilize this plan to identify projects and submit them to the USDA Forest Service for funding.

This effort should and must necessarily be a collaborative effort of natural resources professionals from across all disciplines such that the finished product will have broad support and a high degree of credibility. Although being led and facilitated by the Alabama Forestry Commission – as Congress requires state forestry agencies to take the lead in the assessment process – it further requires coordination with the State Forest Stewardship Committee, state technical committee, the state wildlife agency, landowner groups, and other partners and stakeholders. To that end, a State Natural Resources Stakeholder Brainstorming Meeting was held on December 17, 2008, at the AFC State Office in Montgomery to identify and prioritize the critical natural resource issues of Alabama.

This group will develop a forest resource strategy to provide a long-term, comprehensive, coordinated approach for investing state, federal, and leveraged partner resources to address the management and landscape priorities identified in the assessment. This strategy should:

- conserve and manage working forest landscapes for multiple values and uses.
- protect trees and forests from harm, including catastrophic storms, flooding, insect or disease outbreaks, and invasive species, as well as reduce wildfire impacts.
- enhance public benefits including air and water quality, soil conservation, biological diversity, carbon storage, forest products, production of renewable energy, and wildlife.

The forest resource strategy will serve as a living document for our agency's long-term planning. ♣

What the New Farm Bill Means for Wildlife

By Jim Schrenkel, Certified Wildlife Biologist,

Division of Wildlife and Freshwater Fisheries, Alabama Department of Conservation and Natural Resources

Many wildlife-friendly programs have been reauthorized in the Farm Security and Rural Investment Act of 2008 (Farm Bill). These programs enhance, create and protect critical and essential wildlife habitat. The programs include, but are not limited to the following:

- WHIP – Wildlife Habitat Incentives Program
- WRP – Wetland Reserve Program
- CRP – Conservation Reserve Program
- EQIP – Environmental Quality Incentives Program

Farm Bill programs are voluntary. Privately owned and Tribal Lands are eligible to participate in the programs. Landowners receive technical and financial assistance to develop upland, wetland, riparian and aquatic habitat on their property. These areas provide valuable habitat for threatened and endangered species, declining wildlife, migratory birds and waterfowl, and many local wildlife species.

Many practices are available to improve wildlife habitat. Some practices are unique to a specific program, but there is some overlap. Several types of financial incentives are available to landowners to provide or enhance valuable wildlife habitats on their property. These incentives include practice payments, rental rates, and even easement payments. Practice payments provide a one-time reimbursement (usually 50-75 percent of cost) to implement certain conservation practices. Rental rates are paid yearly to retire marginal pasture or cropland for a certain period. Easement payments provide substantial financial incentives to protect and enhance critical habitat for 30 years to perpetuity.

A variety of beneficial practices are available to landowners. Certain practices such as longleaf tree planting, hardwood tree planting, and native warm season grass planting restore entire ecosystems. These ecosystems provide essential habitat to a whole host of wildlife species, many of which are threatened or endangered. Cost assistance is available for site preparation, planting, and maintenance of these specific plant communities.

Practices such as wildlife opening construction, legume planting, strip disking, field borders, and hedgerow establishment are

very beneficial to maintain quality wildlife habitat. Prescribed burning, firebreak construction, herbicide release applications, low density loblolly pine planting, and timber thinning are other eligible cost-share practices that benefit wildlife and promote healthy forests.

Wetland enhancement, creation, and restoration are additional practices that landowners may choose to implement on their properties. These practices may include dike construction, ditch plugs, shallow water management, and hardwood tree planting. Wetlands are most noted for the essential habitat they provide for migratory waterfowl, migratory birds, and threatened and endangered species. One third of all threatened and endangered species live only in wetlands, while one-half use wetlands for at least one of their life requirements. In addition to benefitting wildlife, wetlands benefit people by storing floodwater, recharging ground water, filtering pollutants, and providing recreation.

Because wetlands provide a multitude of benefits for wildlife and people, the Farm Bill has strong incentives for wetland restoration. Alabama has been allocated 2,600 acres and millions of dollars for wetland restoration alone for fiscal year 2009. Several more million will be available for restoration of other declining habitats. Contact your local Natural Resources Conservation Service office for more information on wildlife and conservation practices available through the Farm Bill. ♣



What the 2008 Farm Bill Means for Forestry

By Arthur Hitt, Landowner Assistance Coordinator, Alabama Forestry Commission

A new farm bill is enacted every five to seven years which authorizes programs that shape the direction for the nation's agricultural industry. Congress enacted the first farm bill in the wake of the Great Depression. Forestry programs gained a place in farm bill legislation in the 1970s and '80s as agricultural production expanded and took an increasing toll on the land and water resources. Conservation programs were enacted which targeted retention of soil and water loss brought on by aggressive farming practices.

Today the 2008 Farm Bill provides new provisions and reauthorizes existing forestry programs that were created to restore, protect, and enhance forest stands and forest ecosystems. These traditional forestry practices not only help improve timber production and growth, but they provide benefits for wildlife as well. While traditional forestry practices still exist in Farm Bill programs for soil and water conservation efforts, there are changes that might affect your being able to qualify for certain forestry and wildlife practices.

First, let's look at the familiar forestry provisions. Tree planting, along with site preparation methods, prescribed burning, and fire-break establishment are the primary components of forestry and wildlife cost-share programs. However, the emphasis of these programs is no longer just soil and water conservation. It has been expanded to include habitat restoration for threatened and endangered (T&E) plants and animals, as well as entire ecosystems that might be declining. Realizing this can help you qualify for 2008 Farm Bill programs.

An example is the longleaf pine forest. It is the largest and most widespread of these threatened ecosystems in the South. Longleaf pine forests once dominated the upland landscape of the southeast from Texas to Virginia and provided habitat to many plant and animal species that are declining. In an effort to restore this ecosystem to some of its former range, funding is available through virtually all of the forestry cost-share programs. Landowners applying for longleaf restoration practices often get priority ranking. Another example at the other end of the spectrum is wetlands restoration. The Wetlands Reserve Program (WRP) was also given extra emphasis through the 2008 Farm Bill. It provides restoration cost-share payments, as well as both short- and long-term easements to restore wet cropland to bottomland hardwoods.

What Farm Bill programs are available to forest landowners? The Conservation Reserve Program (CRP), administered by the Farm Service Agency (FSA), is available to owners of agricultural and farm land. The Natural Resources Conservation Service (NRCS) also administers several programs that were authorized through the 2008 Farm Bill to continue through 2012. Specifically, these are the Environmental Quality Incentives Program (EQIP), The EQIP Forest Health Initiative, the EQIP Invasive Plants Management Project, the Wildlife Habitat Incentives Program (WHIP), and the Wetlands Reserve Program (WRP).

What forestry practices are available through CRP, EQIP, WHIP and WRP? The following list contains practices that are cost shared (reimbursed at 50-75 percent of costs) under these FSA and NRCS programs. To determine your eligibility, visit your local Farm Service Agency or Natural Resources Conservation office.

- Prescribed burning
- Herbicide treatments
- Silvopasture establishment
- Firebreak and fuel break establishment
- Riparian forest buffers
- Site preparation practices for tree planting
- Hardwood tree establishment
- Softwood tree establishment (longleaf, loblolly, and shortleaf pines)
- Restoration and management of habitats for rare and declining species
- Upland wildlife habitat management
- Early successional habitat management
- Tree pruning
- Forest stand improvement
- Pine thinning
- Pre-commercial thinning
- Wildlife habitat improvement
- Wildlife openings
- Wetland re-establishment
- Invasive plant control
- Native grass establishment
- Stream restoration
- Easement programs

Other forestry and wildlife cost-share programs are also available to forest landowners that are not funded by Farm Bill programs. You can see a list of them by visiting the Alabama Forestry Commission website at www.forestry.alabama.gov. Click on the "Manage Your Forest and Wildlife," then click "Cost Share" to see a description of the programs. Contact your local county forester to schedule a visit to your property. 📍



Photo by Stephanie Gapud

Many Alabama landowners are aware that cogongrass (*Imperata cylindrical*) is a serious threat to the natural ecosystem. Cogongrass is considered one of the world's most invasive weeds, adversely affecting millions of acres worldwide. In Alabama, this aggressive weed has steadily spread from its original point of infestation in Mobile and is pushing rapidly north and east across the South. A new tool to help inform the public as to where this threat exists can now be found on the Alabama Forestry Commission's website at www.forestry.alabama.gov; select "Invasive Species" listed under the "Insect, Disease & Invasive Species" menu.

The State Task Force on Cogongrass, a group of 30 agencies, organizations, and businesses continues to work diligently on the cogongrass threat. With encouragement from the State Task Force and funding provided by a US Forest Service grant, the Alabama Forestry Commission has developed a process to precisely locate and map infestations across the state. According to Assistant State Forester Bill Baisden, "The only way we can begin the process of effectively stopping cogongrass is by knowing exactly where infestations are located. The new webpage

gives viewers a real perspective of the full extent of the situation. While the detection and mapping phase has really just begun, the reality of the threat of cogongrass is graphically illustrated. We encourage all landowners to use the webpage as a tool to become more knowledgeable about cogongrass and see if current infestations represent a threat to their property." Baisden also advises that as detection and mapping continue in the future, landowners should reference the AFC webpage often to get updated information. Baisden further stated, "There are so many spots in the Southwest part of Alabama that it will take hundreds of man-hours to get a true assessment of the infestation in that part of the state."

An additional effort of the State Task Force on Cogongrass is to educate the public on recognizing and controlling this weed. In 2009, several workshops across the state will be held that are open to the public. For a list of workshops, please visit the Commission website at www.forestry.alabama.gov and select "Workshops" listed under the "Information & Educational Resources" menu or contact your local Alabama Forestry Commission Office. ☎

COGONGRASS

Flowering and Spring Control Options

Prepared by Nancy J. Loewenstein, Research Fellow III, School of Forestry and Wildlife Sciences, Auburn University and Stephen F. Enloe, Extension Weed Specialist, Department of Agronomy, Auburn University

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Cogongrass, one of the most significant invasive weeds in Alabama, will soon be flowering. This is important for two reasons. First, cogongrass is most noticeable when in bloom due to the fluffy white flowers and seed heads. With as many as 200 flower heads per square meter in a dense infestation, it can put on quite a display and is easy to spot – especially along roads, forest edges and in pastures. Second, to prevent seed production and dispersal, cogongrass should be treated after green-up but before flowering is completed.

What does cogongrass look like in the spring just before and during green-up?

Undisturbed patches have dense, dead swards of brown-to-tan colored leaves, with some still upright and others fallen over. The leaf width (up to 1 inch) and length (typically from 2-4 feet) combined with the stemless appearance and distinctive tan color make it stand out among other dormant grasses. Upon green-up, newly emerging green leaves will be mixed in with the dead leaves. The offset whitish midvein characteristic of mature leaves may not be as readily apparent in the young leaves, but the leaf margins are finely serrated.

Additionally, dense patches of new growth are often lime green in color. If you are unsure, dig up the roots to check for the presence of the stiff, sharply pointed rhizomes. An excellent identification guide with many pictures created by the *Bugwood Network* and USDA Forest Service is available online at www.cogongrass.org/cogongrassid.pdf. (The pdf file is 1.85 megabytes.)



What do the flowers look like and how long do they last?

Cogongrass flower heads are cylindrical in shape, from 2 to 8 inches long and 0.5 to 1 inch wide. The flower head is made up of several hundred tiny florets, each with the potential to produce a seed. When first opened, the flower is light purple or tan in color but within a week or two becomes bright white and fluffy. This is because – similar to dandelion seeds – cogongrass seeds are equipped with silky white hairs that aid in wind dispersal. When mature, the seeds are easily blown from the stalk. From start to finish, the period of flowering to seed production generally lasts from 4 to 6 weeks. Bloom time varies in the state with southern populations blooming as early as February or March and northern populations blooming as late as June. Plants will occasionally bloom at other times of the year as well, after mowing, fire, herbicide applications, or other disturbances.



How far do seeds disperse?

Studies have found seeds typically wind disperse less than 100 feet, although dispersal may be further during storm events. Movement with animals, humans, soil, and equipment are probably responsible for much more long-distance dispersal. Any type of physical disturbance during and just after flowering may greatly increase spread.

What are my spring herbicide control options?

There are two herbicides that are useful for preventing seed production: glyphosate and imazapyr. For spring foliar spot treatments, apply glyphosate (use a formulation with a minimum of 41% active ingredient) at 2.5% v/v just after green-up or during early bloom. The broadcast rate equivalent is 2 quarts per acre in enough water to wet all foliage. It can be difficult to reach the foliage when heavy dead thatch is present so take measures to ensure contact. This treatment will control new top growth and prevent seed produc-

(Continued on page 28)

Managing the Hardwood Understory

By Tim Albritton, State Staff Forester, Natural Resources Conservation Service,
and E. A. "Bud" Truett, Consultant Forester

All forests require a certain level of management to fully utilize the site potential. Things happen that increase the level of management required: hurricanes, tornados, wildfires, encroachment of invasive species, and more. Events such as these require some level of involvement by the land manager to get things back on a productive track.

This is especially true with hardwood management. It is common, however, for land managers, landowners, and even foresters to shy away from making a decision. They may rationalize their indecision by saying things such as, "it's difficult to manage hardwoods," or "it's best to let nature take its course."

I recently received a call from a forester that does not hold to these beliefs. E.A. "Bud" Truett of Livingston, Alabama, is a Registered Forester and a member of the Association of Consulting Foresters. Bud wanted me to see some of the understory release treatments he was applying in Greene County, and I was eager to see what he was doing.

Through the Environmental Quality Incentives Program (EQIP), the Natural Resources Conservation Service (NRCS) has provided assistance for understory treatment in mid-rotation pine stands for some time. This is fairly common practice and has multiple benefits; however, I had not heard of many people conducting this type of practice in hardwoods. So Bud and I set a date to get together and spend a day in the woods reviewing his treatment areas.

I asked Bud some questions that I felt many landowners would ask if they received a similar visit.

1) What type of hardwood stands (species, age, density, etc.) could benefit from such a treatment?

Many types of hardwood stands – varying in species composition, age, and density – could benefit from a reduction



Photo by Tim Albritton

of non-desirable vegetation (less than 10 feet in height) in the understory via direct spray of leaf surfaces with non-soil active herbicides. Perhaps the stand type offering the biggest bang for the buck is a 50- to 80-year-old bottomland hardwood stand of dominant full-crowned mixed-oak species left after an improvement, shelterwood, or storm-damaged salvage cut completed two or three years earlier.

A stand of 40 to 60 square feet of basal area per acre (or about 20 to 35 trees per acre) should let a sufficient amount of sunlight reach the forest floor. This would accomplish the primary objective of establishing advanced oak regeneration prior to final harvest of the high-grade "leave" trees providing the seed source. A trained crew using backpack sprayers offers the advantage of selective stem treatment, preserving a lot of the oak regeneration that may already be in place. If more than three years have passed since the improvement cut, the rough may be too thick for adequate access of ground crews.

2) What are the forestry-related benefits of this treatment?

a. Reduced competition promotes sunlight, moisture, and nutrient avail-

ability for acorn germination and growth of oak seedlings.

- b. Reduction of sweetgum sprouts through application should help accomplish "a" above, but the sweetgum should return to the oak stand later via wind-blown seed to help develop the form and grade of the oak saplings.
- c. Improved access within the stand should facilitate removal of the overstory within three or four years if oak regeneration is sufficient. Further deferral of final harvest may require retreatment.
- d. This treatment may be the cheapest way to establish advanced oak regeneration. Low stand establishment cost is critical in growing grade hardwood long-term profitability.
- e. Any undesirable stems greater than 10 feet in height, but non-merchantable for pulpwood and not removed in the improvement cut, could and probably *should* be injected either at the time direct spray is applied or later in a separate pass, as access improves (but probably at greater expense). Soil-active herbicides should probably not be used for injection in

this case due to the risk of damage to non-target leave trees.

3) What are other non-forestry-related benefits from this treatment?

- Reduction of invasive or other undesirable plants (privet, cherry laurel, switch cane, sea myrtle, etc.) promotes growth of more desirable herbaceous plants beginning the season following treatment, thus improving wildlife habitat to include nesting and brood habitat for turkeys and deer browse volume.
- Improved access in open stands increases “huntability” of the area, especially for turkeys.
- Aesthetics of the stand is enhanced in the year following treatment as annual weeds, grasses, herbs, and forbs replace undesirable woody vegetation.

4) What is the cost?

Although the cost of a directed spray understory treatment with ground crew varies with the chemicals used, the cost per gallon, gallon per acre applied (water and chemical), size of area, and accessibility should range from \$60-\$80 per acre.

For example, I used 6 quarts per acre of 4# generic glyphosate (a 15% rate), at \$12 per gallon in 2007 before the price increase, at a 10 gallon per acre rate on a small test plot of 20 acres. Chemical cost per acre was \$19, plus \$51 per acre labor, for a total of \$70 per acre.

In 2008, due to the cost increase of glyphosate and the presence of waxy leaf species such as cherry laurel, I used 10 gallons per acre with 4% Accord XRT (5.4# glyphosate), or 1.6 quarts per acre plus 2.5% 4# generic triclopyr, or 1 quart per acre on 176 acres. Both chemicals cost \$38 per gallon for a total chemical cost of \$25 per acre. Labor was discounted to \$35 per acre due to the larger size of the parcel. Total cost for this treatment was then \$60 per acre.

5) Could both bottomland sites and upland sites benefit, or is there a difference?

Both upland and bottomland sites should benefit from this treatment. Because of generally greater fertility and available moisture in the bottoms leading to a denser understory, the expense is probably more easily justified on this site.

6) What does the treatment involve (hand crews with backpacks, skidders with boom-sprayers, aerial, or other)?

- Aerial applications are not feasible, of course, because of a desire to protect the overstory. Mist-blown applications via skidder mounts might work for dense roughs with minimal desirable oak reproduction in place and an overstory with excellent crown heights. A boom type sprayer might be tough to keep in one piece while moving through an existing stand. Therefore, ground crews with backpacks and adjustable spray tips are probably the best fit here, because you can put the chemical where you want it, in the volume that you need it.

7) What time of year is this practice applied?

According to the licensed herbicide applicators I've talked to (I am not one), glyphosate and triclopyr uptake in plants is most efficient from May through July. This time period in the second or third growing season following an improvement cut usually provides a large amount of leaf surface on target stems. Vegetation density may well restrict access to a ground crew if application is later than July of the third growing season after the cut.

8) Do you have any additional comments you would like to share with landowners?

Due to the long rotation periods required to grow 20" + DBH, #2+ oak for grade lumber and flooring (55-80 years), minimizing stand establishment costs and management costs during the rotation is paramount to producing grade hardwood at a profit. Therefore, establishing advanced oak reproduction prior to final harvest avoids expensive artificial regeneration attempts. Site prep and planting of bare-root hardwood seedlings is likely not even economically feasible without cost-share dollars. However, if an understory treatment is approved for cost share, natural regeneration is promoted at an absolute minimum cost. In fact, based on a recent tax tip article by the USDA Forest Service, the cost-share payment may not even be taxed as ordinary income if certain conditions are met.

I recently read an article describing mechanical scarification with a root rake to encourage germination of acorns in existing hardwood stands. This method may be a plausible alternative to selective direct spray of competition with non-soil active herbicides, but I foresee the following negatives: 1) cost: current one pass operations with a root rake run \$125-\$150 per acre; 2) risk of feeder root damage in the residual stand of dominant oaks; and 3) root systems of non-desirable species are still living and will resprout.

Following my visit with Bud, the understory release in mid-rotation hardwood stands was added to the EQIP program. Below is the description of the practice as it appears in the EQIP Handbook.

Bud has provided some very insightful answers to my questions and I hope this article will spark some interest in one of the many timber stand improvement practices available to landowners. Many of these practices have merit with or without cost share. I hope you will take advantage of this advice and improve your hardwood forest. 🌲

Understory release in mid-rotation hardwood stands:

Removal of invasive hardwood midstory and/or understory in mature hardwood stands using the herbicide glyphosate, in combination with other non-soil active herbicides, to release highly desirable vegetation benefits wildlife and improves species composition for natural regeneration.

While herbicides are by far the most effective and economical method, mechanical means can also be utilized as long as the landowner understands they will only receive payment that is set up in the contract.

This practice should only be recommended in stands with a thick, low-quality hardwood midstory and understory. The program payment rate for this practice is \$60 per acre.

For more information about getting assistance for this practice, visit your local USDA NRCS Office. 🌲

Hardwoods & Soil pH

By Jim Jeter, Statewide Hardwood Specialist, Alabama Forestry Commission

As I write this article, it is still January. Did the rains come? Yes, they did. At this time, as far as I know, there are no drought areas left in Alabama. The north-west quadrant of the state has received about six inches of rain in the last couple of weeks. The Sipsey River has been out of its banks twice in the last five weeks, with the last flood being as high as most folks can remember in the past six-to seven-year span. This is exactly what this swamp needed. The Warrior and Tombigbee Rivers are now alive and well again. Smith Lake is at full pool as well as Lake Tuscaloosa.

It is also the time of year to plant seedlings for afforestation or reforestation. Contrary to popular belief, there are a lot of things to think about before you plant hardwood seedlings for any objective. For pine seedlings the old saying, 'Just put the green side up,' was sufficient to achieve satisfactory seedling survival when all other factors were adequate. This might be true for loblolly seedlings but, boy, did we learn a lesson about longleaf seedlings.

When I first began this section in the magazine, my intent was to try to address questions I have encountered in the recent past dealing with hardwood silviculture. With this in mind, I want to focus on one reason why we have a higher degree of hardwood seedling mortality in some soil types, especially in and around the Black Belt area of the state.

Soil pH is one of many properties governing the suitability of a site for planting or managing tree species. Most foresters are familiar with the belief that pines like acid sites while hardwoods prefer alkaline soils. This belief is, of course, a gross oversimplification. Actually, most forest trees grow well over a wide range of pH values and the majority of hardwoods do best on slightly acid soils (see adjoining table). When you look at the table you must remember that the values are presented on a logarithmic scale, thus the differences between them are not simply one arithmetic unit, such as a rise from 6 to 7. The change between whole units of pH is tenfold. A value of 6.0 is ten times more acidic than 7.0, and 8.0 is a hundred times more alkaline than 6.0.

Soil pH influences nutrient uptake and tree growth in two general ways: 1) through the direct effect of the hydrogen ion and 2) the influence on nutrient availability and presence of

toxic ions. Bottom line, pH does matter. An excess of nutrients can be toxic, and oversupply of one nutrient may interfere with the uptake of other essential elements.

Microorganism activity is very important in the availability of various nutrients. Bacteria, including actinomycetes, function better at pH levels above 5.5 while fungi seem to flourish throughout the pH spectrum. The work of microorganisms is especially important in the conversion of nitrogen compounds into forms usable by plants.

In and around many "Black Belt" prairie soils, you can have many micro-sites where pH varies greatly. If you do not plant hardwood species suitable for the corresponding pH range, mortality or stunting is very common. Be sure to use a soil survey, consult with the local Natural Resources Conservation Service (NRCS), and realize that nothing is 100% conclusive in soil type or pH determination. Bottom line: Select the correct species for the site. ☎

Reference:

Williston, H. L. and Russell LaFayette. "Species Suitability and pH of Soils in Southern Forests." Forest Management Bulletin. USDA Forest Service. 1978.

Soil pH Range for Southern Tree Species

Common Name	Scientific Name	Range in pH
Alder, European black	<i>Alnus glutinosa</i>	4.0 – 7.0
Ash, green	<i>Fraxinus pennsylvanica</i>	3.6 – 7.5
Ash, white	<i>Fraxinus americana</i>	4.6 – 7.5
Baldcypress	<i>Taxodium distichum</i>	4.6 – 7.5
Basswood, American	<i>Tilia americana</i>	4.6 – 8.0
Beech, American	<i>Fagus grandifolia</i>	6.0 – 7.0
Birch, black	<i>Betula lenta</i>	5.0 – 6.0
Birch, river	<i>B. nigra</i>	4.5 – 6.0
Birch, yellow	<i>B. alleghaniensis</i>	5.0 – 7.0
Blackgum	<i>Nyssa sylvatica</i>	4.6 – 7.0
Buckeye	<i>Aesculus species</i>	6.0 – 8.0
Catalpa	<i>Catalpa species</i>	6.0 – 8.0
Cedar, Atlantic white	<i>Chamaecyparis thyoides</i>	3.5 – 5.5
Cherry, black	<i>Prunus serotina</i>	4.6 – 6.2
Cherry, fire	<i>P. pensylvanica</i>	5.0 – 6.0
Chestnut, American	<i>Castanea dentata</i>	5.0 – 6.0
Chinkapin	<i>C. pumila</i>	5.0 – 6.0
Cottonwood, eastern	<i>Populus deltoides</i>	3.6 – 7.5
Dogwood	<i>Cornus species</i>	6.0 – 8.0
Elm	<i>Ulmus species</i>	5.2 – 8.0
Eucalyptus	<i>Eucalyptus species</i>	6.0 – 8.0
Hackberry	<i>Celtis occidentalis</i>	5.0 – 7.5
Hemlock, eastern	<i>Tsuga Canadensis</i>	5.0 – 6.0

Soil pH Range for Southern Tree Species

Common Name	Scientific Name	Range in pH
Hickory	<i>Carya species</i>	4.5 – 5.5
Holly, American	<i>Ilex opaca</i>	5.0 – 6.0
Honeylocust	<i>Gleditsia triacanthos</i>	6.0 – 8.0
Hophornbeam, eastern	<i>Ostrya virginiana</i>	6.0 – 7.0
Kentucky coffeetree	<i>Cymnocladus dioicus</i>	6.0 – 8.0
Locust, black	<i>Robinia pseudoacacia</i>	4.5 – 7.5
Magnolia, southern	<i>Magnolia grandiflora</i>	5.0 – 6.0
Maple, red	<i>Acer rubrum</i>	4.4 – 7.5
Mulberry	<i>Morus species</i>	6.0 – 8.0
Oak, bear	<i>Quercus ilicifolia</i>	4.0 – 5.0
Oak, black	<i>Q. velutina</i>	5.0 – 5.4
Oak, blackjack	<i>Q. marilandica</i>	5.0 – 6.0
Oak, bur	<i>Q. macrocarpa</i>	6.0 – 6.3
Oak, cherrybark	<i>Q. falcata var. pagodaefolia</i>	4.5 – 6.2
Oak, chestnut	<i>Q. prinus</i>	5.0 – 7.0
Oak, laurel	<i>Q. laurifolia</i>	3.6 – 5.6
Oak, live	<i>Q. virginiana</i>	6.0 – 7.5
Oak, northern red	<i>Q. rubra</i>	4.5 – 6.0
Oak, Nuttall	<i>Q. nuttallii</i>	3.6 – 6.8
Oak, overcup	<i>Q. lyrata</i>	3.6 – 5.5
Oak, pin	<i>Q. palustris</i>	6.0 – 7.0
Oak, post	<i>Q. stellata</i>	5.0 – 6.0
Oak, sawtooth	<i>Q. acutissima</i>	5.0 – 6.5
Oak, scarlet	<i>Q. coccinea</i>	6.0 – 7.0
Oak, shumard	<i>Q. shumardii</i>	4.4 – 6.2
Oak, southern red	<i>Q. falcata var. falcata</i>	5.0 – 6.0
Oak, swamp chestnut	<i>Q. michauxii</i>	3.6 – 6.2
Oak, swamp white	<i>Q. bicolor</i>	6.0 – 8.0
Oak, water	<i>Q. nigra</i>	3.6 – 6.3
Oak, white	<i>Q. alba</i>	4.5 – 6.2
Oak, willow	<i>Q. phellos</i>	3.6 – 6.3
Paulownia	<i>Paulownia tomentosa</i>	6.0 – 8.0
Pecan	<i>Carya illinoensis</i>	4.8 – 7.5
Persimmon	<i>Diospyros virginiana</i>	4.4 – 7.0
Pine, loblolly	<i>Pinus taeda</i>	4.5 – 6.0
Pine, longleaf	<i>P. palustris</i>	4.5 – 6.0
Pine, pitch	<i>P. rigida</i>	3.5 – 6.0
Pine, scotch	<i>P. sylvestris</i>	4.5 – 6.0
Pine, shortleaf	<i>P. echinata</i>	4.5 – 6.0
Pine, slash	<i>P. elliotii</i>	4.5 – 6.0
Pine, Virginia	<i>P. virginiana</i>	4.6 – 7.9
Pine, eastern white	<i>P. strobus</i>	4.5 – 6.0
Redcedar, eastern	<i>Juniperus virginiana</i>	6.0 – 7.5
Redbud, eastern	<i>Cercis canadensis</i>	6.0 – 8.0
Sassafras	<i>Sassafras albidum</i>	4.7 – 7.0
Sourwood	<i>Oxydendrum arboreum</i>	4.0 – 8.0
Spruce, red	<i>Picea rubens</i>	4.0 – 5.5
Sumac, shining	<i>Rhus copalina</i>	4.2 – 7.0
Sweet bay	<i>Magnolia virginiana</i>	4.0 – 5.0
Sweetgum	<i>Liquidambar styraciflua</i>	3.6 – 7.5
Sycamore, American	<i>Platanus occidentalis</i>	4.4 – 7.5
Tupelo, water	<i>Nyssa aquatica</i>	3.6 – 5.6
Walnut, black	<i>Juglans nigra</i>	5.0 – 7.5
Willow, black	<i>Salix nigra</i>	4.6 – 7.5
Yellow-poplar	<i>Liriodendron tulipifera</i>	4.5 – 7.0



SHADE

An Auburn University study sheds new light on just how valuable shade trees are in reducing homeowners' electricity bills during hot summer months.

Professor David Laband in the Auburn University School of Forestry and Wildlife Sciences says electricity usage and costs will be 11.4 percent less if a house has just 17.5 percent heavy shade coverage. This is compared to a house with no shade.

"The keys are heavy foliage and late afternoon shade," Laband said. "The savings can be very significant for homeowners. Over the years I had read statements that shade trees reduce electricity consumption, so we wanted to put a dollar amount to it."

His office conducted a yearlong study of 160 houses in the Auburn, Alabama area to determine the annual energy savings provided by shade trees, primarily looking at the months of May to September. He analyzed power bills, calculated shade coverage, and surveyed the homeowners about household makeup, electricity-usage habits, square footage, type of air conditioning, appliances, roofing, exterior material, and other factors.

"We looked at the amount of shade in the early morning, early afternoon, and late afternoon,"

Laband said. "If you have trees on the west side of your house, you will have a much lower power bill."

How much does tree shade save on home energy usage? Turns out there has been very little research until now. An Auburn professor has completed a study that settles once and for all the value of planting shade trees to conserve energy costs. Read on, then plant some trees!




TREES

Can Reduce Power Bills

Using local power company rates for kilowatt hours per day, Laband said the 11.4 percent savings would equal \$31 to \$33 per month. The study, which categorized types of shade into light, moderate, and heavy, also found that a house covered with 50 percent of light shade will save 10.3 percent.

Thermostat settings were important as well. “For each degree you raise your thermostat in the summer, you will save 3.3 percent on your power bill,” he said. “We also found that children under age 12 are the major power consumers in the home. They watch television, play games, and leave lights on.”

Laband hopes the study will encourage real estate developers not to cut down all the trees on new lots. “Many older houses have large trees around them because the owners did not rely as much on air conditioning then,” he said. “Houses today often do not have shade trees because it’s easier to run an air conditioner. This study shows how much can be saved when trees are used in yards.”

Auburn’s study was funded by a \$116,000 grant from the USDA Forest Service’s Urban and Community Forestry Program and a matching \$116,000 grant from Auburn’s School of Forestry and Wildlife Sciences. Laband has briefed USDA officials on the results and has presented seminars in Australia at the Tropical Forest Research Institute, the University of Melbourne, and the University of Adelaide. “It gets very hot there, too,” he said. “They are interested in doing a similar project.”

Editor’s Note: Laband, who earned his Ph.D. in economics from Virginia Tech in 1981, conducts research and teaches on topics related to economics and policy, with a focus on natural resources. He joined the Auburn University faculty in 1994 and the School of Forestry and Wildlife Sciences in 2000, where he is a member of the Center for Forest Sustainability and the Forest Policy Center.

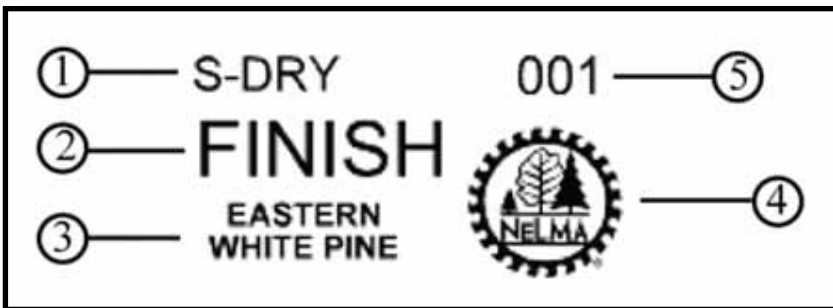
STAMPS USED TO IDENTIFY DIFFERENT GRADES OF LUMBER AND PANEL PRODUCTS

By Rebecca Wallace, Public Affairs Specialist
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 a publication of the USDA Forest Service, Forest Products Laboratory

Although it's called a grade stamp, the marking you see on lumber and panel products contains much more information than just the grade. Other elements of the marking can include the moisture content of the product, the manufacturer's mill number, the size of the product, the species of wood, or the identifying mark of the agency that certified the product.

To get a better understanding of what can be learned from grade stamps, take a look at these examples and the explanation of their main components:

1. Identified the product standard that governs the specifics of production for construction and industrial plywood.
2. Nominal thickness of the panel (subject to acceptable tolerances).
3. Panel grade designation – This indicates the minimum veneer grade used for the face and back of the panel, or it can be a grade name based on panel use.
4. Performance-rated panel standard, identifying a structural-use panel test procedure recognized by National Evaluation Service (NES).
5. NES report number from the Council of American Building Officials.
6. Exposure durability classification – Exposure 1 indicates this is an interior panel with exterior glue suitable for uses not permanently exposed to weather.
7. Span rating indicating the maximum spacing of roof and floor supports for ordinary residential construction applications.
8. This label denotes panels that have been sized to allow for spacing of panel edges during installation to reduce the possibility of buckling.



1. Moisture content/heat treatment – In this case, S-DRY indicates a moisture content of 19% or less.
2. Product grade, shown by number, name or official abbreviation.
3. Species or species grouping.
4. American Lumber Standard supervisory agency logo indicates product has been graded under the supervision of an accredited American Lumber Standard Committee agency.
5. Mill name or a unique number assigned by the grading agency. ♣

Lumber grade stamp and information courtesy of the Northeastern Lumber Manufacturers Association.

When Tornado Strikes: What to Know about Claiming a Casualty Loss

By Dr. David Mercker, Extension Forester,
The University of Tennessee

Risk is inherent to long-term investments. Perhaps no risk is more greatly feared by timberland owners than a direct tornado strike. Damage is normally so devastating that the decrease in timber value reaches 70 to 100 percent loss. Landowners are often left confused about how to proceed. The following steps are suggested to help in salvaging damaged timber and in maximizing IRS tax deductions via timber casualty loss.

Before a casualty loss can be claimed, landowners should document the tornado casualty, keeping newspaper articles and photographs as evidence. An attempt must also be made to salvage the damaged timber by contacting professional foresters and loggers. Salvage revenue is deducted off the casualty loss. Begin by salvaging the better stands of timber first. Understand that salvage logging is often difficult and unsuccessful, with logger interest very low due to a number of constraints, including: harvest dangers, slow logging production, and unseen quality defects in the wood.

The next action is to attempt to claim a *casualty loss*. The IRS recognizes a casualty loss as the “actual loss of tangible or measurable property, which is evidenced by a closed and complete transaction, fixed by identifiable events, and actually sustained during the taxable year.” The casualty must be a natural or other external force, acting in a sudden, unexpected, and unusual manner. Therefore, tornados and fires qualify; diseases and drought do not. The amount deductible as a casualty loss is the lesser of 1) the decrease in fair market value of the timber as a result of the casualty or 2) the adjusted tax basis in the timber, less any salvage revenue.

Arriving at the **decrease in fair market value (FMV)** requires an inventory and appraisal normally conducted by a professional forester. Essentially, it’s the difference between the timber value directly prior to and directly following the casualty. Foresters can estimate these two values. If salvage income was realized from the damaged timber, this must be included in the calculation. Logging tickets and receipts should be saved to aid the forester in estimating the decrease in FMV.

Arriving at the **adjusted tax basis** is normally more challenging. Essentially the tax basis is the investment value or the amount invested in a capital item. When the property is sold, or when there is a loss, or the property (timber) is used up, the basis is depleted by recovering it through deductions to gross income on tax returns. The original tax basis varies according to how the property was acquired – whether purchased,

(Continued on page 20)

(Continued from page 19)

inherited, or gifted. In cases of purchased property, the basis is the total acquisition cost of the timber. With inherited property, the basis can be stepped-up to the FMV at the time of the donor's death. When property is gifted, the recipient obtains the donor's basis. With most ownerships, the basis exists, but was never allocated at the time of land acquisition. In other words, a forester did not appraise the timber. In such cases, a forester can make a current inventory of the timber, then adjust the current volume and value back to the time of acquisition and arrive at the basis. If timber has been logged between the time of acquisition and the casualty, the basis would then be adjusted down to reflect the depleted trees.

Once the decrease in FMV and the basis are known, casualty loss can be figured. It is the lesser of these two. Normally, if the casualty is extensive, the decrease in FMV will exceed the basis and a landowner will not be able to recapture the full loss from the tornado. If the basis is zero, the casualty loss is zero. Situations where the basis might be zero (or negligently low) might include:

- timberland that was acquired many years ago that has grown considerably (i.e., timber value was insignificant at the time of acquisition);
- timber that had naturally regenerated after acquisition (for instance after a clearcut or after a field was abandoned) with no owner investment in the new trees;
- reforested land where costs were recovered through tax credits, deductions, or government cost-sharing;
- property that was gifted and the giftor's basis was low or zero;
- the basis account has already been fully depleted from prior timber sales.

Casualty losses are reported on IRS Form 4684. If a casualty loss cannot be claimed and salvage revenue was received, the income must be reported as a capital gain. Likewise, if salvage revenue exceeds the basis, this excess is a taxable capital gain.

Claiming a casualty loss is a complicated process. Unless landowners have considerable knowledge of timber inventory and appraisal, they should work with experienced foresters and tax accountants. Finally, it is good business to have timber appraised shortly after acquisition to establish a tax basis, thereby making the process described here much easier. For more information, refer to the National Timber Tax Website – www.timbertax.org. 🏠



Want More Rabbits?



By Randy Liles, Supervising Wildlife Biologist, Division of Wildlife and Freshwater Fisheries,
Alabama Department of Conservation and Natural Resources

Cottontail rabbits are found throughout most of Alabama and are considered one of the easiest mammals to manage. Two keys to successful cottontail management are habitat diversity and interspersion. Interspersion is the mixing of habitat types that are essential to successful cottontail populations.

The rabbit is primarily known as an “edge” species, preferring the area where two or more different habitat types meet. The area where a field and forest meet creates such a habitat edge. Cottontails are extremely edge-dependent animals. Because of this, several small areas or patches of food and cover are much more beneficial than one large area containing food and cover. Multiple small areas provide more edge than one large area. When sufficient amounts of quality food and cover exist, cottontail populations are very successful.

Areas that provide adequate cover may include brushy fence-rows, thickets, hayfields, wetland edges, young pine stands, thinned mature pine stands, and ditch banks. The existence (or lack) of good cover may be the greatest single factor that can affect rabbit populations. Good cover provides escape areas from predators, areas to feed and nest, and protection from severe weather, especially in the winter.

In addition to providing excellent escape cover, brush piles supply thermal protection during cold weather. Constructing brush piles is relatively simple, while the best are usually about 5 feet high, 15 feet wide, and have more than one entrance and exit. Plastic pipe (not more than 6 inches in diameter) provides an excellent entrance and exit. Large logs, stumps, or large stones can be used to construct the base. Each additional layer (up to three or four layers) is made up of brush and branches cre-

ating a tangled pile of brush on the top. Brush piles constructed according to recommendations may last up to ten years.

Just as important as proper construction is placement. Brush piles should be located close to hedgerows, windbreaks, brushy thickets, or areas where additional brushy cover is nearby. Supplemental cover can be provided by “live-topping” trees, the practice of cutting a tree trunk on a 30-degree angle about three-quarters of the way through and leaning it to the ground. Because the tree is not cut all the way through, the branches may provide green cover for several years. “Live-topping” a tree next to a brush pile is even better.

Cottontails are herbivores, which means their diet consists of vegetation. Succulent growth of leaves, stems, plant shoots, and flowers are the favorite food of rabbits. As one would expect, food supply (goldenrod, wheat, clover, legumes, soybeans, garden crops, etc.) during the spring and summer months is usually not a limiting factor to rabbit populations. However, with the approach of winter and the disappearance of the rabbit’s preferred food sources, their diets change to the bark and twigs of plant species such as poison ivy, sassafras, maple, dogwood, sumac and apple. If adequate food sources are not available, quarter-acre wildlife openings may be planted. There should be at least one opening for every 2 to 5 acres, which can be planted in clovers, alfalfa, peas, rye, wheat or a mixture of annuals.

Keep in mind that a cottontail spends its entire life within an area no larger than 10 acres. The diversity of both cover and food is the real key to having more rabbits.

For more information contact Randy Liles, Alabama Division of Wildlife and Freshwater Fisheries, 4101 Highway 21 N., Jacksonville, AL 36265. 📞

Small White Lady's-Slipper

By Alfred Schotz, Alabama Natural Heritage Program, Auburn University

To the ardent student of nature, the discovery of Alabama's native orchids can be an exhilarating and memorable experience. The splendor witnessed by the privileged few often arouses a subtle state of ecstasy, a simple delight that finds no distinction between the seasoned orchidophile and the budding novice. Such curiosity of the state's orchid flora may be easily understood, for these plants are embellished with an exquisite display of colors and forms as if intricately designed and decorated by a set of invisible hands.

Of the orchids found across the state, perhaps no group epitomizes their lavish elegance more than the lady's-slippers. Replete with a slipper-shaped pouch subtended by a series of colorful combination of sepals and petals, few Alabama wildflowers can rival their majestic poise.

Swedish botanist Carolus Linnaeus is credited with devising the botanical name *Cypripedium* (genus *Cypripedium* from Greek *Kypris*, a name for Venus + *podion*, or slipper) over 200 years ago to commemorate the legend of Venus, the Roman goddess of love. As the legend goes, Venus was out hunting with Adonis when they were overtaken by a tremendous thunderstorm. The two were forced to take shelter. Naturally enough, Venus and her beloved also took full advantage of their enforced intimacy, lending her to misplace her slipper. As the storm subsided, the slipper was spotted by a mortal who immediately went to pick it up. Before he could touch it, Venus's slipper was suddenly transformed into a flower whose central petal not only retained the shape of the slipper, but also the color in which the goddess's priceless shoes had been made.

The small white lady's-slipper (*Cypripedium candidum*) is the most delicate and rarest of the four species of slipper orchids known in the state. Known from only Dallas and Colbert counties, the species assumes its greatest abundance in the Tallgrass prairies of the upper Midwest, where it typically favors moist swales and seepage areas underlain by limestone. Such conditions are rare in Alabama, often being confined to stream banks and gentle slopes blessed with a continuous supply of ground and/or surface water. Typically, water sources have pH's greater than 6.0, higher alkalinity, and distinctly higher concentrations of mineral ions (especially calcium and magnesium) than other wetlands. Too, these habitats tend to be dominated by low-growing sedges and various grasses.

As far as wetland plant associations go, alkaline seepage areas are among the most diverse in North America. A single square meter in a Cahaba River seep may contain as many as 30 different species of mosses and vascular plants, with some larger sites potentially supporting more than 200 species. In contrast, a typical marsh, which contains no more than a few dozen species, generally supports only two to five species in an area of comparable size. Perhaps the key distinction among wetlands in terms

of species diversity is their source of water, which imparts a significant influence on hydrologic regime and water chemistry. Calcium, a key element at white lady's-slipper sites, can bind phosphorus, an essential plant nutrient, in forms most plants can not absorb. This means that fast-growing, nutrient-loving species like cattails and tall grasses fare poorly in the preferred habitat of this rare and unusual species. Growth remains relatively low, thereby favoring many small, slow-growing species such as the lady's-slipper that have evolved ways to survive with little phosphorus, or that can access phosphorus bound to calcium.

Seldom very common, recent population studies have suggested that the small white lady's-slipper may have been reduced by nearly 50 percent since the early 1900s. While the disappearance of this delicate orchid from many of its former haunts is largely attributed to habitat alterations, collectors aspiring to embellish gardens are also partially responsible. Given the importance of groundwater to maintain essential growing conditions, conservation will depend on more than land acquisition. Long-term protection may be best accomplished by managing activities in watersheds and acquiring a greater understanding of how plant diversity is influenced by groundwater chemistry and nutrient availability. Lacking a commitment to safeguard our natural heritage, the entrancing beauty of the small white lady's-slipper and a host of other species may forever disappear from the Alabama landscape. ♣

Photo by Alfred R. Schotz

Longleaf and Gopher Tortoises: *An Odd Pair Supporting a Full House*

By John S. Powers, Area Wildlife Biologist, Division of Wildlife and Freshwater Fisheries,
Alabama Department of Conservation and Natural Resources

When European explorers first reached the southeastern United States, they encountered a landscape far different from that which we are now familiar. Those early adventurers, in search of legendary riches, found little of the gold they sought. The treasure they found took a significantly different form. The world they discovered was one dominated by the longleaf pine (*Pinus palustris*). This species and its associated ecosystem would later be found valuable in their own right.

The longleaf pine ecosystem once spread over the Atlantic and Gulf Coastal Plains from southern Virginia through central Florida and all the way to eastern Texas. Estimates vary, but its extent was once somewhere between 60 and 137 million acres. Though species associations varied from location to location, the structure and appearance of these widespread stands was very similar. Open forest canopies were dominated by the towering longleaf, some more than three feet in diameter, 120 feet tall, and as much as 500 years old. A scattered but important midstory consisted, for the most part, of fire-tolerant scrub oaks. Relatively little woody understory was present, but the ground was carpeted with a host of grasses, forbes, legumes, and other herbaceous species whose growth and diversity were encouraged by the abundant sunlight reaching the forest floor. The ancient longleaf forest presented a vista of great beauty matched by few in the world.

The southeastern longleaf pine ecosystem was dependent on another constant, one which initially seems incongruous with the idyllic nature of this unique habitat. Fire, frequent fire, was a part of life in this region. Initially, fires were started by lightning strikes which most often occurred during the growing season. Later, Native Americans set fires to clear land for farming and to improve conditions for hunting. Relatively cool ground fires often burned unimpeded for days or weeks and across many miles of almost unbroken longleaf forest. Coastal Plain woodlands burned regularly, usually at intervals of two to six years. These fires kept ground-level fuel supplies low and inhibited the survival of most shade-tolerant canopy species. Were it not for fire, the shade-intolerant, but remarkably fire-adapted longleaf pines, would have been quickly choked out by these other species.

The aesthetically pleasing longleaf pine community also concealed treasures which were not readily apparent. It was and remains incredibly diverse with regard to the plant and animal species of which it is comprised. Single stands often contain more than 200 plant species, most of which occur in the herbaceous ground layer. Of the 290 reptile and amphibi-

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Gopher tortoises are one of only four tortoise species found in North America, and they are the only one found east of the Mississippi River. They are relatively large and spend their entire lives on land. Adults average 10-12 inches long but may reach more than 15 inches. Average weights for adults are typically 9-12 pounds. Females of the species reach sexual maturity when their shells are approximately 9 inches long, which may require 10 to 21 years depending on location. Males are on the average smaller than females. Gopher tortoise shells are relatively high-domed, and are not hinged. Upper portions of the shell (carapace) are usually dark brown to gray-black, while the lower shell (plastron) is lighter, often with a yellowish tint. Gular projections present on the front of the plastron tend to be longer among males. Female gopher tortoises have flattened plastrons while those of males are more strongly concave. The heads of both sexes are blocky in shape with adult males having enlarged mental glands under their chins. Gopher tortoise hind limbs are short, stubby, and elephantine in appearance, while the forelimbs are enlarged, flattened, and possessed of large nails used in digging. They are estimated to live 40 to 60 years in the wild and have been known to live more than 100 years in captivity.

Primarily grazers, gopher tortoises feed on low growing grasses, forbs, legumes, fruits, and other herbaceous plants. Young, faster growing tortoises eat insects and other invertebrates more commonly than adults, presumably because of their high protein content. Young and old gopher tortoises alike are occasionally known to feed on carrion and sometimes even excrement. Their diet includes a wide variety of plant species and while they are largely opportunistic feeders, it is believed that individuals select among available choices based on immediate and specific dietary requirements. They are believed to play an important role as seed dispersers for numerous species on which they feed. These tortoises rarely drink standing water, only having been known to do so during periods of extreme drought. The vast majority of their water requirement is obtained from the foods they eat.

The life of a gopher tortoise revolves around its burrow, dug in areas having well-drained usually sandy soil, frequently 15-30

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an species native to the Southeast, 170 (96 reptiles, 74 amphibians) are found within the range of the longleaf pine ecosystem. A host of bird and mammal species prospered among the pines as well. Moreover, many of the species associated with the longleaf pine ecosystem are endemic, found nowhere else in the world. On a large scale, the longleaf pine – through its fire tolerance and tendency to form sunny, open stands – makes this beautiful, diverse, and unique ecosystem possible. This irreplaceable role, and the fact that its removal from the system would ultimately result in the loss of numerous other species, defines it as a keystone species of the ecosystem which bears its name.

As important as longleaf pine and the fire to which it is adapted are in shaping the longleaf pine ecosystem, another species also plays a keystone role. The gopher tortoise (*Gopherous polyphemus*) is a once common and still important component of the longleaf pine ecosystem. Though their range is now fragmented, gopher tortoises were once widely distributed throughout the southeastern coastal plain, most common in areas having sandy well-drained soil. Their range closely paralleled the coastal plain distribution of the longleaf pine ecosystem, which provided the three factors necessary for the long-term survival of gopher tortoise populations: well-drained sandy soils to allow digging of burrows; plenty of low-growing plants for food; and sufficient open, sunny areas for nesting.

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Active gopher tortoise burrows can be identified by their classic flat-bottomed, high-domed appearance and the characteristic apron (area of excavated dirt and sand) in front of the opening. These burrows are the key to survival not only for the gopher tortoise, but for many other species as well, making the gopher tortoise an important component of the longleaf pine ecosystem.



feet long and up to 10 feet deep. However, burrows up to 50 feet long and up to 18 feet deep have been documented. Burrows constructed in soils having a higher clay content tend to be considerably shorter and shallower than average. The depth is limited by the depth of the water table. A gopher tortoise burrow is slightly wider than the tortoise which dug it, thus allowing the animal to turn around at any point. There is an enlarged chamber at the lowest point of the burrow.

Active burrows are readily identifiable by their classic flat-bottomed, high-domed appearance and the characteristic area of excavated dirt and sand (apron) in front of the opening. Gopher tortoises build multiple burrows scattered across their home range. This home range size in general is inversely related to the amount of herbaceous ground cover (food) present. The more food available, the smaller the home range. The home ranges of

males are larger than those of females and, hence, males tend to construct and use more burrows than females. Adults are not known to share burrows simultaneously, except for brief intervals where a threatened tortoise seeks the first available refuge and that refuge happens to be an already-occupied burrow. Yet they will sometimes use an unoccupied burrow constructed by another gopher tortoise.

Gopher tortoises are active during the day (diurnal) during which they forage for food, bask in the sun, and visit the burrows of other tortoises. Activity levels depend largely on daytime temperatures. During the winter months, they may not leave their burrows at all during extended periods of cold. They will however, bask near the mouth of their burrow on warm days even though little food may be available. As the weather warms in the

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Photo by Chris Evans, River to River CWM/A, Bugwood.org

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spring, gopher tortoise activity increases, especially from April through September. During the heat of the summer, tortoises often become largely crepuscular (most active during the early morning and late afternoon), spending the middle, hottest portion of the day in their burrows.

Though some breeding activity is known to occur among gopher tortoises from April through November, most actual copulation takes place during August and September. Breeding rituals are known to include males making low croaking noises and thumping their plastron on the apron outside the burrow of a female. Both sexes engage in head bobbing during courtship and prior to copulation. Battles sometimes occur between males for the attention of a female. Female gopher tortoises engage in sperm storage. Regardless of when actual copulation takes place, most females ovulate (with subsequent fertilization of the eggs) during April and May. Females lay 1 to 25 eggs (averaging 5 to 8) shortly after mating, usually May to June. The eggs are laid either in the apron of the female's burrow or in a nearby sunny spot. Incubation of the eggs in the warm soil requires 70 to 110 days (80 to 90 average), depending on soil temperature. Incubation at temperatures greater than 85 degrees Fahrenheit results in mostly female hatchlings, while incubation temperatures below this produce mostly males. Most hatchlings emerge during August and September. While some temporarily share the burrow of their mother, other hatchlings may use a nearby unoccupied burrow in which to overwinter. Some young gopher tortoises dig shallow burrows for themselves almost immediately.

Gopher tortoise populations, by their very nature, tend to be slow growing and hence slow to recover and/or expand into unoccupied habitat. Reaching sexual maturity alone requires 10 to 21 years after which females lay only one clutch of eggs per year. Further, loss of eggs to nest predators, especially raccoons

and fire ants, is frequently 80 percent or more. Finally, young gopher tortoises are prey to a host of reptilian, avian, and mammalian predators until their shells are fully hardened at 6 to 7 years of age. Though they have few effective predators as adults, it is estimated that as few as three of every 100 hatchlings survive to reproduce.

As previously mentioned, gopher tortoises are considered a keystone species of the longleaf pine ecosystem. As in the case of the longleaf pine itself, many species in the ecosystem depend on the gopher tortoise for survival or derive significant benefit from its presence. The value of the gopher tortoise to the ecosystem as a whole goes far beyond its role as a seed disperser for its plant food species, or the fact that the young tortoise is food for many other species. It contributes something much more important to the system, and that something is its burrow. While the digging of the burrow provides recycling of leached nutrients, the actual finished structure is a key to survival not only for the gopher tortoise, but for many other species as well. Although tortoises avoid sharing burrows with others of their own kind, they do not seem to mind sharing space with much of anything else. More than 360 species of mammals, birds, reptiles, amphibians, and invertebrates are known to spend all or a portion of their lives in either active or abandoned gopher tortoise burrows. Some species such as the gopher frog, the pine snake, the indigo snake, the scrub jay, the Florida mouse, the burrowing owl, and the gopher cricket are completely or largely dependant on these burrows for survival.

The burrows benefit the tortoises and their commensals (species who receive benefit from living in close association with another species without causing the other species harm) in numerous ways. Clearly, tortoise burrows provide safety from predators – both to species who actually reside in the burrows,

and to those who use them opportunistically (“any port in a storm,” so to speak). In the same way, they provide refuge from the regular fires which function to maintain the structural and vegetative components of the longleaf pine ecosystem. Without access to gopher tortoise burrows, many species would be hard pressed to survive long-term in this frequently hostile environment. Finally, and of at least equal importance, the burrows provide shelter from the environmental extremes of cold, heat, and drought. Because of their length and depth, gopher tortoise burrows maintain a much more constant temperature and humidity regime than that of the world outside. In the winter, they provide a more moderate environment during periods of cold. Similarly, during the summer, the burrows provide shelter from the frequently extreme heat in what has been termed by some “the southeastern desert.” Possibly more important than protection from heat, the relatively constant humidity in the depths of a gopher tortoise’s burrow provides critical protection from dehydration during periods of drought, especially for amphibians and some reptiles. It has been well documented, that as populations of gopher tortoises decline, so do the populations of species dependent on their burrows.

Times change and the world changes with human priorities. The landscape of the southern coastal plain has been no exception. As might be expected, the fortunes of the gopher tortoise have followed a path similar to that of its primeval habitat. The extent of the longleaf pine ecosystem in the southeastern United States has been reduced to less than three million acres, a small fraction of its former range, no matter whose estimate you use. Of the remaining longleaf forest, only four sites, totaling a mere few thousand acres, remain in a virgin state. The remainder are second, third, or fourth generation stands. Land clearing for the purposes of agriculture, mining, road building, and urbanization have each taken their toll. Timber harvests, many of the “cut out and get out” variety during the late nineteenth and early twentieth centuries, stripped the landscape of a treasure not recognized as such by those doing the cutting. Economic influences have dictated that most past and present reforestation in the Southeast has been to faster growing species such as loblolly or slash pine. In the past, many of these forest stands were planted using close spacings. At these planting densities, canopies quickly closed with little sunlight reaching the ground. The widespread exclusion of fire has allowed development of dense mid-story and understory forest components, while precluding the development of a diverse groundcover. The rolling savannah-like world of the southeastern coastal plain is, for the most part, gone, and it is estimated that gopher tortoise populations have declined by at least 80 percent in the last hundred years.



Photo by Chris Evans, River to River CWMA, Bugwood.org

If current trends continue, more than a beautiful landscape may be lost. At least 27 plant species associated with the longleaf pine ecosystem are federally listed as endangered, with 99 more listed as threatened or as “species of special concern.” More than 30 vertebrate species (amphibians, reptiles, birds, and mammals) historically tied to the longleaf community have declined to the point of listing as well. Currently, gopher tortoises are federally listed as threatened west of the Tombigbee and Mobile Rivers, and eastern populations are being considered for listing as well. In Alabama, they are considered a species of high conservation concern and are fully protected by law, while they are listed as threatened or endangered at the state level in South Carolina, Georgia, Florida, Mississippi, and Louisiana. Some of the other more publicized species for which concern exists include the red cockaded woodpecker, indigo snakes, red hills salamanders, gopher frogs, Florida mice, and several species of pitcher plant. Many declining species are associated with bog, seep, and ephemeral pool microhabitats embedded within the remaining longleaf stands and are found nowhere else.

Though recent trends have dealt the longleaf pine ecosystem a heavy blow, all may not be lost however. The developing Longleaf Restoration Initiative provides hope that we may not only conserve what remains of the longleaf pine ecosystem, but also see it expand. The aforementioned initiative is a joint effort

by numerous government and non-government agencies with the shared goal of seeing longleaf pine and its associated ecosystem restored on suitable sites across its historical range. The Forest Service, US Department of Agriculture, has made restoration of the mature longleaf pine ecosystem a priority on its lands in the southeastern region. In time, through reforestation of suitable sites to longleaf pine and the reestablishment of a more natural burning

regime within existing stands, considerable acreage of mature or maturing longleaf pine habitat may be restored. Also encouraging is the fact that numerous landowner cost-share programs, both state and federal, are prioritizing planting of longleaf pine on sites best suited to them. The Alabama Forestry Commission, the Alabama Department of Conservation and Natural Resources, and the USDA Natural Resources Conservation Service are leaders in this regard. Many non-government agencies such as the Longleaf Alliance are working systematically through research, education, and commercial activities, to promote retention and restoration of longleaf pine on productive sites throughout the Southeast. Together, the renewed interest in the longleaf pine and its associated ecosystem, combined with the commitment of those working toward its reestablishment, may well have turned a bleak future for many unique species – including the gopher tortoise – several shades brighter. 🌱



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tion, but regrowth is likely in late summer and retreatment will be necessary. Surfactant may or may not be required, depending on the product used, so be sure to check the label.

The second option is a tank mix of imazapyr (0.5% v/v of a 2 lb ai/gal formulation) + glyphosate (at 2% v/v). Imazapyr is primarily a forestry/noncrop herbicide that has considerable residual soil activity and cannot be safely used under desirable hardwoods. This treatment will provide good control throughout the summer but retreatment will be required, either in the fall or the following spring.

What about surfactants/additives?

Use the surfactant specified on the label of the specific product used. Non-ionic surfactants (NIS) work well with glyphosate formulations that need surfactant, while NIS or methylated seed oils (MSO) are often useful with imazapyr depending on the formulation. With regard to *Cogon-X*, our current research indicates it does not improve control with glyphosate alone with spring applications. However, you will find many people who are happy with the results when they use it.

Can I just treat in March?

No. Spring green-up and flowering appears to vary considerably in the state. Thus spring pre-flower herbicide timing may occur between March and May, depending upon the geographic location (earlier in the southern counties, later as you move northward). Additionally, burned or mowed areas may green up and flower earlier than undisturbed areas.

What about grazing and mowing for seedhead suppression and control?

Intensive grazing and repeated mowing can suppress cogongrass. However, animals grazing or mowing during the bloom period can increase seed dispersal on equipment and on animals. Additionally, cogongrass can quickly recover once grazing or mowing is reduced.

What other resources are available for more information?

Go to www.cogongrass.org for additional news, fact sheets and identification information. ☎

TREASURE Forest Re-Certification *Attention Landowners!*

Is your TREASURE Forest certification current? Check your certificate for your certification date. TREASURE Forests should be re-certified every five years. If your date is older than five years, it's time to re-certify. Contact your local AFC office and schedule a time with a Forestry Commission associate to re-certify your TREASURE Forest.

Alabama's National Champions

Eleven of Alabama's "State Champion" trees have also been declared "National Champions" for 2008-2009! Owners and nominators of national champion trees are sent certificates from *American Forests*, the nation's oldest nonprofit citizens' conservation organization who is responsible for the Champion Tree program. Additionally, the Alabama Forestry Commission places markers (modeled after the American Forests' certificate) at the base of the trees.

Below is a list of the eleven national champion trees and the county in which each tree is located.

- Florida Anise – Perry County
- Odorless (Scentless) Bayberry – Baldwin County
- Swamp Dogwood – Dallas County (co-national champion)
- Georgia Hackberry – Perry County (co-national champion)
- Southern Magnolia – Calhoun County (co-national champion)
- Durand Oak – Wilcox County
- Myrtle Oak – Baldwin County (co-national champion)
- Two-winged Silverbell – Wilcox County
- Sparkleberry – Choctaw County (co-national champion)
- Sugarberry – Barbour County
- Staghorn Sumac – Tallapoosa County

Anyone can nominate a tree for Champion Tree consideration! To learn more about the Champion Tree program contact Brian Hendricks, the AFC's Champion Tree Program Coordinator, at (334) 240-9370, or visit the AFC's website at www.forestry.alabama.gov. Access the "Champion Trees of Alabama" link under the "Educational Resources" heading, under the "Information and Educational Resources" menu. There you will find useful information about the program, and a current listing of all Alabama champion trees, and an on-line nomination form. ☺

This magnificent Southern Magnolia (Magnolia grandiflora), located in Calhoun County, is 90 feet tall with a 92-foot spread and circumference of 209 inches. It was nominated by Mary Bryant and is owned by the Variosa Ladies Club.

Photo by Steven Jones



Mason, Dixon, Ellicott, and Freeman

By Douglas A. Smith, Retired, Alabama Forestry Commission

Mason and Dixon are well-known names given to a surveyed line they established in 18th century Colonial America. This line has become a common socio-cultural divider between the northern and southern states, even though most people don't know its exact location. At the time, little could these two British experts realize either the significance of their line or how famous their names would become. Yet within a century after its creation, the boundary defined and symbolized the struggle between slave and free states, and eventually the Union and Confederate States.

The men behind the name were Mr. Charles Mason, an astronomer who once worked at the Royal Observatory in Greenwich, and Mr. Jeremiah Dixon, a renowned surveyor. It all began in 1632 when King Charles I of England gave George Calvert the colony of Maryland. Fifty years later in 1682, King Charles II gave the land that would become Pennsylvania to William Penn. A decades-spanning boundary dispute arose between the Calvert and Penn families, with the ultimate result being the survey completed by Mason and Dixon during 1763-1767. Using stone markers, the surveyors created a north-south boundary between the colonies of Delaware and Maryland, continuing to mark the east-west running line between the colonies of Pennsylvania, Maryland, and Virginia (present day West Virginia). However, both men returned to England long before there was any controversy about North and South or freedom vs. slavery, much less the American Civil War of 1861-1864.

The Mason-Dixon Line is so important to some people that it has sparked debates relating to loyalty during the Civil War. Others take "facts" and use them to validate different objectives. All of the details will never be known; therefore I believe in the philosophy of journalist David Housel: When legend and fact conflict, go with the legend . . . An interesting story not known by many Alabamians is the continuing connection of Jeremiah Dixon to South Alabama. History notes that Jeremiah Dixon died in England as an unmarried man. However, a book entitled *The Dixon Legend** describes Jeremiah Dixon II who settled near and was later buried close to present-day Andalusia. This book also



The Dixon Family Cemetery near Dixie, Alabama
Spring 2009

mentions and shows a copy of the earliest land deed that his son, Wiley B. Dixon, recorded in 1837. This is the same old home site of the late Mr. Solon Dixon that was donated as a teaching and research center to what is now Auburn University's School of Forestry and Wildlife Sciences.

Now what, you may ask, is the relationship between Mason-Dixon and Ellicott? None, except that the line connected with Ellicott is technically more important to those of us in Alabama. A long-running boundary dispute involving Spain, France, and England ultimately became an issue between Spain and the new United States of America. To settle this dispute, both countries each appointed two representatives to survey a "Line of Demarcation" between the United States' Mississippi Territory and Spanish West Florida. U.S. President George Washington commissioned Major Andrew Ellicott to lead this expedition, accompanied by Major Thomas Freeman. In 1779, after four years of arduous work in often hostile territory, the 31st Parallel was marked by placement of a large stone. Beginning in 1803, the Ellicott Stone became even more important as surveyors used it as the point of origin to lay out townships and ranges. The intersection of what is referred to today as the St. Stephens Base Line (defining the state boundary between Alabama and Florida) and the St. Stephens Meridian, it remains the basis for all U.S. Public Land Surveys in southern Alabama and southern Mississippi. Depending on the location, your prop-

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erty boundary may be described in relation to this particular point. If you are interested, do some research and discover why the Freeman Line in central Alabama affects the size and shape of sections of land.

Both the Mason-Dixon Line and the boundary lines established by Ellicott and Freeman are significant to Alabama. In summary, you owe the geographical designation of your property to Majors Ellicott and Freeman, while you may owe your cultural/social associations to Mr. Mason and Mr. Dixon. 

* Dixon, Solon, and John Burgess. *The Dixon Legend*. Huntsville, AL: Strode Publishing, 1982.



The Ellicott Stone is 3 feet high, 2 feet wide, and a half foot thick. It is marked "U.S. Lat. 31 1799" on its north side, and on the south side, "Dominos de S.M.C. CAROLUS IV. Lat. 31 1799" (Dominion of his majesty King Charles IV). This historic landmark, listed on the National Register Historic of Places, is protected by an enclosure on the west side of the Mobile River in north Mobile County.



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Sweetgum

(*Liquidambar styraciflua*)

By Fred Nation, Environmental Services, Baldwin County

Sweetgum, also known as redgum, is a large, well-formed canopy tree, frequently to 80 feet tall, with a straight trunk to 2 feet or more in diameter. The crown is conical, broadening with age. Many of the twigs and small branches develop distinctive corky ridges that give them a winged appearance. The bark on mature trees is gray, vertically furrowed, with long narrow ridges.

The leaves are alternate, star-shaped, 3 to 5 inches across, with five (occasionally seven) finely serrate, sharply pointed lobes. When bruised or crushed, the leaves and branches are aromatic, with a fragrance that most people find pleasant. Since the earliest pioneer days the sweet, aromatic resin has been collected, mostly by children, and used as “chewing gum.” The fragrant resin of a Mediterranean sweetgum species, *L. orientalis*, has been collected for centuries and sold as “storax” for use as incense, medicines, and as a fragrance in the perfume industry.

The fall foliage is among the most spectacular of any North American tree, with brilliant yellows, reds, and purples that vary from tree to tree, and year to year, depending on growing conditions. Sweetgums are often confused with maples because both share similar, palmately-lobed foliage. They can easily be distinguished, however, with a quick look

at the twigs and leaves, which are alternate on sweetgum, and opposite on maples. The leaves are a larval host for the pale green luna moth, one of our largest and most beautiful insects.

The fruits are woody capsules, fused into hard, spiny balls about 2 inches across. They are produced in great numbers and they are persistent, falling from the trees over a long period from fall into the following summer. Anyone who has stepped barefoot on one of those prickly balls will quickly become aware of one of the objections to sweetgum as a lawn or landscape tree! Another “weedy” characteristic is the production of root sprouts, which often pop-up and grow very quickly in lawns and flower beds. It will often aggressively “pioneer” cleared land, and sometimes appears as a weed species in competition with planted pine trees.

Sweetgum is the only species in the genus *Liquidambar* in North America, but it is quite successful and has a large range, from Connecticut south to central Florida, west to eastern Texas, and north to Illinois and Ohio. In Alabama it is found throughout the state in nearly every habitat, but it attains its best growth in moist, rich alluvial soils. Sweetgum is an important hardwood timber

species. It is used for cabinetry and furniture, crates, plywood, veneer, and for pulpwood. The wood is heavy, moderately hard, and takes stain quite well. On the other hand, sawed boards tend to warp as they dry, and the wood is not durable for outdoor use.

More than most of our native trees, sweetgum has defenders and detractors, with good cases to be made on both sides. But the brilliant red, yellow, purple, and crimson colors of a tall, stately sweetgum tree in its fall glory are elegant statements in favor of its use as an ornamental in the right settings in our parks and landscapes. The Alabama State Champion *Liquidambar styraciflua* is 75 feet tall, with a trunk circumference of 161 inches and a crown spread of 66 feet. This forest giant is growing in Coosa County. 🌳



Photo by Fred Nation