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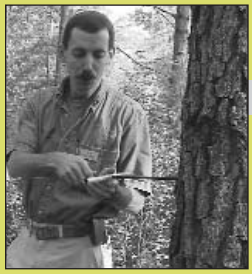
forest WISDOM

forest guild quarterly publication / winter 2008

in this issue:



Rob Kindrick
A registered forester in Georgia, Rob Kindrick is the conservation forester at Callaway Gardens. The scope of his work includes the daily management of approximately 10,000 acres of property. Rob has been involved with the Forest Guild, SAF, the Longleaf Alliance, and several other natural resource organizations.

MANAGING FOR BIODIVERSITY

The Preserve at Callaway Gardens

by Rob Kindrick, Conservation Forester

The Preserve at Callaway Gardens (the Preserve) is located in Pine Mountain, Georgia, approximately 70 miles southwest of Atlanta and 30 miles north of Columbus, Georgia. The Preserve lies in the piedmont region of the state, with the coastal plain to the south and the influence of southern Appalachians to the north. An interesting and diverse plant community exists, with species from all three regions of the state overlapping.

It was here in the early 1930s that Virginia Callaway found the plumleaf azalea (*Rhododendron prunifolium*), a native American azalea common to only a small area in west-central Georgia and east-central Alabama. Of the approximately 40,000 acres that Virginia and her husband, Cason Callaway, originally purchased, the Preserve encompasses just over 10,000 acres. The Callaways donated the acreage to the Ida Cason Callaway Foundation with the vision that the land would provide a demonstration area for wise land stewardship. Since 1995, I have been the Preserve's conservation forester.

A primary management focus has been the restoration of longleaf pine (*Pinus palustris*) and the understory plant community that once accompanied that system. The Preserve is in the range of the montane variety of longleaf pine. An interesting attribute of the Preserve is Pine Mountain Ridge running from northeast to southwest through the tract. The ridge, one of the southernmost mountains in Georgia, averages about 1,000 feet in elevation across the property and extends about 6 miles on the Preserve tract. Individual trees and small groups of remnant longleaf pine exist along the ridge, and much of our restoration efforts have been focused here.

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forest **WISDOM**
issue twelve / winter 2008

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TWO GUILD MEMBERS' VIEW

Current Trends in Southern Forestry

by Fred White and Bruce White

This brief overview presents nine socioeconomic and environmental trends developing in the South today that we believe will certainly influence forests and the practice of forestry within the region. These trends offer both opportunities and obstacles to the promotion and practice of excellent forestry.

TREND # 1 - Declining production of softwood-dimension timber from the Pacific Northwest and Canada will permit or even require an increased production from Southern forests. The Southern softwood-dimension timber industry will become stronger as the volume produced from both natural stands and plantations increases. The South is in an excellent position to compete favorably with imports from Latin America.

TREND # 2 – The Southern pulp and paper industry, long the dominant feature in Southern forestry, is undergoing a profound change. It is transferring ownership of its portion of the Southern forest to TIMOs, REITs, and other owners not tied to wood production and paper facilities. Independent Southern sawmills are much less active in this divestment movement. Many of these land sales are encumbered by a 20-year timber-supply agreement. The aging Southern pulp and paper industry, particularly in the south Atlantic states, is at a competitive disadvantage to newer mills and plantations in South America whose chip and pulp imports into Southern ports are soaring.

TREND # 3 - Population growth in the South currently leads the nation and is primarily urban and suburban sprawl. As a result, the Southern forest is becoming increasingly fragmented. The average non-industrial forest ownership tract is less than 40 acres. The typical owner is about 60 years old, and his/her potential heirs are usually living in urban areas.

TREND # 4 - The typical Southern logger is equipped to effectively perform high-speed, high-volume harvests. Changing land ownership, tract size, and high fuel costs dictate that new skills will be needed. However, increasing numbers of career logging contractors who have grown old in the profession are opting to quit instead. They are not being adequately replaced by a younger cohort equipped to take advantage of the changing conditions.

TREND # 5 - The current Southern drought is changing the public view of the value of surface waters and the forests which provide and protect them. Both state and local governments are becoming increasingly interested in the protection of all forested watersheds. These watersheds are largely hardwood forests, and most are privately owned. It is very likely that state governments will begin to create tighter controls upon forest management in general. Adding to the current drought-induced anxiety, two inland pulp mills have recently curtailed production due to a lack of process water during the summer months.

TREND # 6 - Both climate change and the increasing cost of fossil fuels have begun to accelerate the use of biomass as an alternative source of energy. The forests and farmlands of the South have a vast potential to produce woody biomass. Currently in the South, production of wood pellets is rapidly growing. Two of the six cellulosic ethanol plants funded by the U.S. Department of Energy are located in the South. Co-generation of electricity with fossil fuels and wood is also increasing annually.

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Managing for Biodiversity, from page 1

One of the first management objectives we implemented was prescribed burning, because there had been very limited burning on the property for the previous 50-60 years. The lack of burning left us with a heavy fuel load at a high risk for wildfire. The goal of the initial burning in 1997 was to reduce the fuel load so that we could extend our burn season and burn with different intensities to get improved ecological results. Our initial burning was carried out under very conservative parameters and entirely during the dormant season.

> *"We use prescribed burning to expose any existing seed bank and improve potential for natural longleaf regeneration, thin hardwoods to increase sunlight to the understory, and collect longleaf seed to plant on sites that do not regenerate naturally."*

Due to staff size, our current burns are limited in acreage per burn unit. Smaller burns are about 25 acres, larger burns as much as 300 acres, and the average is about 100-150 acres. The advantage for us in burning small acreage is that we can control the intensity by keeping ignition on a tight grid. Whenever possible if the unit meets acreage criteria, we also try to use natural breaks such as creeks and existing roads to prevent having to plow lines. We have been successful at reducing the fuel load across most of the property, and some areas have now been burned three to four times.

Due to the lack of natural wildfires for an extended period of time before 1997, hardwood species such as chestnut oak (*Quercus prinus*), hickory (*Carya spp.*), blackjack oak (*Quercus marilandica*), and post oak (*Quercus stellata*) now dominate the upland sites of the rocky slopes of Pine Mountain Ridge. We use prescribed burning to expose any existing seed bank and improve potential for natural longleaf regeneration, thin hardwoods to increase sunlight to the understory, and collect longleaf seed to plant on sites that do not regenerate naturally. On a very limited basis, we use herbicide to control hardwood re-sprouting where we are not successful with fire alone. In these ways, we hope to convert some of these areas back to predominant longleaf with a more diverse understory.

Much of the rest of the property consists of a mixture of naturally regenerated pine and hardwoods. Very little of the property (less than 10 percent) is in pine plantations. Our silvicultural practices within these plantations are used as educational opportunities for many of the landowner groups who tour the property on our weekly "Walk in the Woods" program. Within one 30-acre stand, three different row thins are in place in alternate rows, (fifth row, third row, etc.). Trees in the remaining rows are thinned based on quality. When landowners and other guests see the differences in the row thinnings, discussions arise about the reason they might choose one type or the other on their own properties depending on whether their goals are financial, ecological, or somewhere in between.

We harvest timber on an annual basis, and fortunately, our decision to carry out a harvest in a stand is based on ecology before revenue (although any revenue generated from harvest does help support our ongoing operations). We are focusing on an uneven-aged management style to keep the forest productive and sustainable and also to reduce the amount of regeneration harvest. I mark trees to be harvested based on basal area and quality, with trees from multiple product classes and species harvested on most sites. Products include pulpwood, chip-n-saw, saw timber, and veneer. An average total of 25-30 tons per acre is removed from all product classes. Photo points were installed in 40 locations across the property in 2003. A photo taken every winter and summer is archived to follow changes over time.

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Connecting a fire line in preparation for planting longleaf.

Understory burning in a young longleaf stand.

A controlled burn conducted by Rob Kindrick on the Preserve.

These two photos taken in June 2007 show the effect of the drought on the Upper Neuse River in North Carolina.
Photos by Tom Pender

RESEARCH AND OBSERVATIONS

Drought in the Southeast

by Stacy Clark, Martin Spetich, Zander Evans

"When coupled with an insect outbreak, mortality for northern red oak escalated to 10 - 15 percent, far above normal mortality levels of 1 - 2 percent."

A historic drought gripped the Southeast region in 2007. It was the second driest year on record for the region, and rainfall in some areas including Alabama and North Carolina was the lowest on record for the last century. By the end of 2007, over a third of the region was classified in "exceptional" drought (the worst drought designation used by the U.S. Drought Monitor. See the drought map on the back cover for a more detailed distribution of national drought conditions in 2007. Water levels all over the South fell. The city of Atlanta declared a water emergency because Lake Lanier, which supplies Atlanta's drinking water, was 10 feet below average. Lake Okeechobee in southern Florida was dramatically lower as well. Also during the 2007 drought, Georgia experienced its largest wildfire on record when the Georgia Bay Complex burned 441,705 acres. When added to the other 9,500 fires that year, the total burned was more than 504,000 acres.

Drought threatens many aspects of urban and rural life from municipal water supplies to agriculture to recreation, and forests are not exempt. Recently Georgia Forestry Commission staff forester, James Johnson was interviewed about the impact of drought on trees by *The Weekly*, a Macon, Georgia newspaper. According to Johnson, "The lack of rainfall is impacting shade trees, especially the red oak group in urban areas, and has also caused a decrease in timber production for the past growing season." Drought, a common disturbance in Southeastern forests, weakens trees and increases their susceptibility to secondary pest and pathogen outbreaks, causes tree mortality, and exacerbates fires. Following are selected observations and studies on various impacts of drought in the Southeast.

A long-term study conducted by the U.S. Forest Service (USFS), Southern Research Station (SRS), in a 200 – 300 year-old stand on the Cumberland Plateau in Tennessee found that a drought in the early 1980s may have been the primary factor leading to death of decadent northern red oak (*Quercus rubra*) and hickory (*Carya sp.*). SRS research forester Stacy Clark found evidence from tree-rings suggesting that drought weakened the trees. When coupled with an insect outbreak, mortality for northern red oak escalated to 10 –15 percent, far above normal mortality levels of 1 – 2 percent. Clark is continuing to study the stand dynamics following the exceptional 100-year drought of 2007.

The 2007 drought has had detrimental effects not only on old trees, but on newly established trees that Clark planted in the winter of that year. Drought hits seedlings even harder than established trees because their limited root networks cannot access moisture deeper in the soil, and they do not have the reserves to sustain themselves in dry times. For example, nearly half of the American chestnut (*Castanea dentata*) seedlings Clark planted as part of a restoration effort in the Bankhead National Forest died due to the drought. The trees were planted in former loblolly pine (*Pinus taeda*) plantations that the USFS is trying to restore to native hardwoods. The chestnuts did survive better when planted under thinned stands with a residual basal area of 50 percent, compared to stands with no basal area. While forest openings may have provided more sunlight for the

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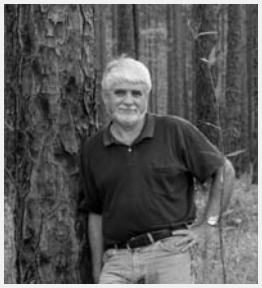
At longleaf plantation near Newton, Georgia on a misty morning.
Photo courtesy of Rhett Johnson.

LONGLEAF PINE

Recovering a Southern Forest Treasure

By Rhett Johnson



Rhett Johnson
is co-founder and co-director of the Longleaf Alliance. He was director of Auburn University's Solon Dixon Forestry Education Center for 28 years until he retired in 2007. He has degrees in both forestry and wildlife biology and is a faculty member of Auburn University's School of Forestry and Wildlife Sciences.

Visit
www.longleafalliance.org for more detailed information and links to their many partners.

The longleaf pine (*Pinus palustris*) forests of the southeastern United States once occupied more than 90 million acres and were dominant on an estimated 60 million acres. In the centuries before significant settlement, these forestlands were described by visitors in a variety of ways, ranging from gloomy, monotonous barrens to vast expanses of sunlit parklands sparsely timbered and awash in grasses, wildflowers, and wildlife. More detailed observers recorded the range of conditions in the longleaf forest mosaic, including densely stocked stands of massive stems as well as open savannas that resembled grasslands more than forests.

When European settlers began to occupy the region, the value of these longleaf forests became immediately apparent. Rich grazing for free-ranging cattle was maintained either by the frequent low-intensity fires that occurred naturally as a result of lightning strikes or by fires set deliberately by settlers who emulated the native cultures that preceded them. The wood was strong and rot resistant; the tall straight boles were ready-made for masts and ship timbers; and the resin–much sought after in the wooden ship era–fueled the development of naval stores, the South's first real industry.

As the South was progressively settled, occupied, and cleared for extensive agriculture, the longleaf forests were forfeited, their demise hastened by the advent of steam-powered equipment and modern logging practices. Longleaf forests that had been self-sustaining for centuries were unable to withstand the onslaught. Reforestation was not yet a consideration, and exploitation was the rule of the day. The great cities of the region (Williamsburg, Charleston, Savannah, Mobile, Pensacola, and New Orleans) were built using high-quality longleaf pine lumber. In fact, much of that lumber exists today either in its original or recycled use. Re-sawn old-growth longleaf occupies a high-end niche market and is much sought after by contractors and craftsmen around the world.

Longleaf acreage declined steadily through the 19th and 20th centuries until, in 1995, there were estimated to be only three million acres left, approximately three percent of the original total. The advent of the pulp and paper industry in the longleaf region in the mid-20th century shifted attention to the culture of loblolly and slash pines, species better suited to supply that industry. Longleaf pine, and much of the knowledge the profession had gained about its biology and culture, was relegated to the sidelines. It essentially became a "hobby" tree, grown on quail plantations, national parks, and a few specialty ownerships.

It might seem that the longleaf forest, having once dominated so large an area, is a climax forest type. However, we know today that it is a sub-climax forest, maintained at that successional level by fire. Historically, natural or anthropogenic fires are thought to have occurred on average in a two- to four-year return interval. This regime was (and is) not so much good for longleaf as it is bad for many other species. It is essentially management by subtraction. Longleaf is fire tolerant virtually throughout its lifespan, which allows it to survive fires that eliminate many woody competitors and encourage a rich herbaceous understory. Grasses and forbs flourish in this regime, resulting in a monotypic overstory, sparse mid-

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On-the-ground management in Southeast forests like the one at right may suffer as a consequence of changing forest ownerships.

CHANGING LAND OWNERSHIP

The Rise of Forestland Investors in the Southeast and How it Affects Excellent Forestry

by Paul Trianosky

Paul Trianosky
is a Forest Guild member and the director of forest conservation for the Southern U.S. Region of The Nature Conservancy, with over 25 years of forestry experience ranging from state and federal agencies to private industry and the non-profit sector. He has a B.S. in forestry from Virginia Tech, and a Masters degree in environmental management from Duke University.

If you've been anywhere near the business of forestry over the last ten years, you've no doubt noticed that the forest is changing... ownership, that is.

For most of the past century, the forest-products industry in the United States was dominated by integrated companies that owned and managed forestland in addition to wood processing facilities. This worked very well for a long time, until pressure from Wall Street and a greater recognition of land and timber values shifted the collective thinking of the forest-products industry. The result has been the wholesale sell-off of forest industry lands and the rise of new players in the arena of land and timber investment.

The buyers of these lands have primarily been Timber Investment Management Organizations (TIMOs) and Real Estate Investment Trusts (REITS). Only minor players as recently as 15 years ago, these entities represent the new dominant class of industrial ownership. As I write this, the transition of ownership is nearly complete, with only a couple major integrated-forest-products companies retaining any significant forest base or resisting the urge to transition themselves to REIT structures. Unfortunately, the selloff has been less like "wholesale", and more like "mall-priced retail"... and the forest resource may ultimately pay the price.

With the newly opened eyes of Wall Street now on this asset class, there is tremendous competition for the purchase of well-managed forestlands. Gone are the days of volume (i.e., large acreage) discounts and undervaluation of both timber resources and raw land. Investment buyers are extremely savvy about actual current value, potential future value, growth, risk, and probable future trends. Recent sales of large corporate forestlands have taken the form of a competitive bidding process, further driving competition and pushing purchase prices upward.

Some of the numbers illustrating these soaring timberland values are astounding. According to a recent article in the *Arkansas Democrat Gazette* ("Money Grows on Land, Not on Trees," by Nancy Cole, May 18, 2008), one 900,000-acre timberland ownership in Arkansas,

Louisiana, and Texas increased in sale price from $1.19 billion to $1.71 billion in transactions just 17 months apart, representing a 44 percent increase in that short investment period. Since timber values have certainly not increased at this rate, one wonders how sustainable forest practices can possibly render sufficient profits to pay the bills at this pace.

Rising prices are among the pressures that have resulted from fundamental differences in management perspective between REITS/TIMOS and historical forest-products companies. In fairness, some of these same pressures made land ownership less attractive to the forest-products industry in the first place and now

Open stands of longleaf pine may be difficult to attain under intensive investment-style forest management.
Photo by Alison McGee/The Nature Conservancy

make it more difficult for these new owners to manage according to the tenets of excellent forestry.

Most forestland investment entities have an obligation to maximize value, which quite often results in parcelization on resale. Higher prices create additional pressure for carving off "highest and best use" lands for development purposes. This, in turn, limits the potential for future forest management and raises operability costs in the fragmented landscape. The need to cut costs to maintain profit in this very competitive environment has meant the virtual elimination of forest management research by these new owners and drastic reductions in numbers of professional forestry staff compared to their industry predecessors. The tenet of excellent forestry that it must "always [be] guided by science, place-based experience, and continuous learning and discovery" has suffered tremendously in this new environment.

As a professional forester, it's easy for me to understand how greater pressure for profitability and higher purchase prices can reduce the options that a manager can effectively consider. This is where the impact is felt on the forest resource itself. Excellent forestry is defined by the Forest Guild as "forestry that is ecologically, economically, and socially responsible. It goes beyond meeting minimum best management practices and places the long-term viability of the forest above all other considerations." As profit margins narrow and sale prices of land and timber outstrip the value growth of either, management options decrease and excellent forestry suffers. This is simply not a scenario that encourages sustainability or the assurance of a broad range of forest values above profitability.

An article in SAF's *Forestry Source* in August of 2006 said it well. In offering advice to young foresters in the employ of forestry investors, Richard N. Smith opined, "REITs and TIMOs are not forestry-driven organizations. They are investment- and financially-driven entities... [whose investors] value people who make and save them money." This management philosophy can lead to decisions of financial expediency at the expense of other considerations.

Complicating matters is the new trend toward foreign investment in American forestlands, stimulated by the weakening dollar. The historic purchase of International Paper's timberlands in 2006 was led by the Dutch company Resources Management Services, LLC. According to an article in the *Birmingham Business Journal* (August 18, 2008), Alabama is part of the trend of foreign investment, now ranking third among states in foreign-owned land, with 1.7 million acres. The same article reports that the U.S. Department of

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> *"As profit margins narrow and sale prices of land and timber outstrip the value growth of either, management options decrease and excellent forestry suffers."*

Markets for woody biomass may create higher-value use for low-grade wood.

Alyx Perry
is a Forest Guild member. The Director of the Southern Forests Network, she provides support to landowners, businesses, and rural communities working to cultivate farm and forest enterprises that protect ecosystems, enhance local economies, and preserve the South's land-based heritage. www.southernforestsnetwork.org

A CONTINUING CHALLENGE

Creating Local Markets for Southern Forest Products

by Alyx Perry

In the South, we are experiencing a dramatic transformation in the cultural, economic, and physical landscape as a result of changes in the forest products industry. Southern forests produce more timber than any other region of the United States or any other country in the world.[1] Forest-based recreation and tourism are thriving industries in the region, and we also produce various non-timber forest products.

It is important to note that the forests of the South are owned primarily by working class family forest owners in small tracts (75 percent in tracts under 500 acres) and managed as working forests. The production of forest products and services has provided the economic foundation for sustaining our region's forest landscape for generations. While the level of timber harvesting has steadily increased in the South, forest-associated economic benefits to local landowners, forestry professionals, and businesses have declined due to a number of failures including:

- External ownership and concentration: forestland and forest-based industries are increasingly owned by investors from outside the region in more concentrated ownerships.
- Inadequate landowner education and empowerment: Landowners lack sufficient education about forest management options, and fewer than four percent have forest management plans. This frequently results in less-than-optimal forest management and a high level of influence by timber buyers.
- Pricing: fierce competition in the industry has always resulted in pressure to drive down costs, resulting in "externalizing" costs such as negative impacts on forests and workers. Globalization has worsened this trend, resulting in diminishing economic benefits to landowners and forestry professionals in particular.
- Demand-driven forestry: forests tend to be managed to produce products and services demanded by industries or consumers, resulting in unsustainable demands on forest resources.

The most dramatic impact of these trends is that the South has the highest rate of forest loss in the country. It is estimated that as much as one million acres of our forests will be developed each year, largely because most landowners and locally-based businesses do not have the means to make forest ownership and forest-based livelihoods economically feasible.

Today in the South we need to cultivate markets that support sustainable forest management. Innovators throughout our region are working to harness the potential of new markets and restore traditions of local ownership and cooperation. The goals are self evident: make it pay, and keep the benefits local. Following are some potential markets for highest-value use of products and services obtained through sustainable forest management.

"Green" products

The socially conscious consumer and "green" building market is growing quickly and increasing the demand for products with associated values like forest conservation and local job creation. Certification, branding, and labeling of sustainable and local forest products has grown in popularity and effectiveness as a

means to appeal to consumer preferences and harness price premiums that can cover the true costs of sustainable forest management. Forest Stewardship Council (FSC) certification is growing in popularity in the South, and there is a growing demand for FSC-certified wood in the region. While barriers to FSC certification are high, we are slowly beginning to see it become more accessible to landowners and businesses in the South. In addition, there is a lot of interest in the region in creating local and regional branding to take advantage of consumer preferences for local, high-quality products.

New markets are being explored for under-utilized woods like American Sycamore.
Photo by Richard Webb,
Self-employed horticulturalist, Bugwood.org

In Virginia, the Blue Ridge Forest Cooperative was organized by landowners who came together to accomplish excellent forestry, collectively manufacture and market value-added products, and increase the long-term financial feasibility of forest ownership. The co-op produces FSC-certified building materials and specialty products and is finding a ready market among local green builders and urban consumers. The co-op has also partnered with the Southern Forests Network (SFN) to pioneer another innovative market strategy–the region's first nonprofit group-FSC-certification program. Due to their small size, many landowners and forest-based businesses in the South lack access to affordable certification. SFN's group certification program provides affordable FSC certification for family forestlands and local chain-of-custody facilities.

In South Carolina, Forest Guild member Don Handley is a consulting forester who is promoting the management of pine-dominated forests to produce high-quality sawtimber. Most landowners in the region currently practice intensive, short-rotation forestry to produce low-grade fiber for the paper market and low- to moderate-quality sawtimber. Buyers in the region (homebuilders in particular) are expressing a strong desire for higher-quality pine lumber, which is in short supply and is easily produced through sustainable management. Don and others hope to cultivate this market for landowners who want to practice more sustainable management.

In North Carolina, the Wood Products Extension Program at North Carolina State University (NC State) is working to create markets for alternative/less-demanded species and products. You know the story: design trends result in high demands for some species and no demand for others, and producers have trouble selling what they need to sell to keep good forest management moving forward. Harry Watt, NC State business improvement specialist, is exploring new strategies for cultivating demand for alternative species and character woods. He sees real potential for increasing manufacturer demand for alternative species such as American Sycamore (*Platinus occidentalis*), sweetgum (*Liquidambar styraciflua*), hackberry (*Celtis occidentalis*), and beech (*Fagus grandifolia*) in the design and manufacture of locally made furniture.

Non-timber forest products

Forests in our region are also home to a variety of marketable non-timber forest products (NTFPs) including medicinal plants, culinary herbs and mushrooms, maple syrup, and decorative plants. The opportunity to produce these for income can be a real incentive for more sustainable forestry and a focus on restoring understory resources. The non-timber forest products website at Virginia Tech gathers

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Managing for Biodiversity, from page 3

Longleaf seedling ready for planting.

A "Walk in the Woods" tour at he Preserve at Callaway Gardens.

The most exciting aspect of the Preserve for me is the 2,507 acres that were placed under conservation easement through the Forest Legacy Program in 2004, which means there can be no development on that portion of the property for perpetuity. However, we can continue to manage the forest and wildlife and provide educational and recreational programming. In addition, about 2,000 acres are currently in the approval process to go under easement through the Georgia land conservation program. When this easement is finalized, it will tie together the 6 miles of ridge on the Preserve to the 10,000-acre F.D. Roosevelt, the largest state park in Georgia, which is to our northeast.

Connecting people with nature is our philosophy here at the Preserve, and we are continually offering programming and seeking new opportunities to allow people to experience the natural world. While the property is currently gated and posted, it is available for guided programs. In the past few years, we have had 1,000-1,500 people annually participate in our programs. We look forward to an increase in that number while always being sensitive and careful of the impact of increased programming on the land.

I invite any Forest Guild members who are going to be in our area to contact us and come out and visit the Preserve. It is the best way for us to gain new insight and ideas on how to continue to steward this unique property.

Current Trends, from page 2

- **TREND # 7** - Southern forest owners will increasingly benefit from carbon sequestration payments via the voluntary carbon market. Following the inevitable implementation of a nationwide cap and trade program, the continuation of this trend will depend largely upon the rules that are set in place.

- **TREND # 8** - As climate changes, it is expected that the health, vigor, and even composition of the Southern forest will be compromised. Whether rapid or gradual, severe or slight, there will be change–probably unwelcome change. Forest management must respond to what may be poorly understood alterations of the norm. Successful responses will lie at or between two extreme poles. At one pole, the response will be to create as diverse a forest condition as possible that lets nature take its course in selecting successful components over time. At the other pole, the response will be to create a much simpler forest of a species expected to respond positively to the change at hand.

- **TREND # 9** – Between 1990 and 2001, the number of conservation easements established in Southern states almost tripled. This is a clear trend, although we don't know how many of these were working forest conservation easements.

Southern Forest Treasure, from page 5

story, and rich, diverse understory. Forest ecologists agree that fire-maintained, functioning longleaf forests are among the most biodiverse in the world. Aggressive fire-suppression policies and anti-fire campaigns in the first half of the 20th century (such as Dixie Crusaders, Bambi, and Smokey) may have done as much to seal the fate of the longleaf forest as unchecked logging and lack of reforestation.

A plantation of young, thriving longleaf pine in Georgia.

Based on the realization that longleaf forests and the foresters who understood them were being lost, the Longleaf Alliance was founded in 1995 and assumed a leadership role in the effort to halt and reverse that trend. A firm conviction that any meaningful restoration effort would necessarily incorporate private landowners (fully 90 percent of the forestland in the region is privately owned) led to a focus on that segment, with public partners supporting the effort on their own lands. The Alliance's goals concentrate on restoring longleaf forests by demonstrating their ecological and economic merit. The conservation value is self-evident: game and non-game animals, threatened and endangered endemics, and an amazingly diverse plant community all flourish in functioning longleaf forests.

The economic argument is less well understood. Longleaf pine produces quality lumber that attracts premium prices in many markets, meets export standards, and regularly produces high proportions of utility poles (the South's highest-valued pine product). Expected pole yields from loblolly and slash pine stands are typically less than 15 percent, while longleaf forests regularly produce pole yields of 50 to 75 percent. Pole stumpage values have historically exceeded saw timber values by 50 percent or more.

In addition, the market for longleaf pine straw is booming, with many landowners literally "raking in" $100-$200 per acre per year for that "byproduct" starting as early as age ten. Longleaf is inherently tolerant of or resistant to many threats to other southern species. It is tolerant of fire, more wind firm than other pines (important in the hurricane belt), and highly resistant to attack by southern pine beetles, fusiform rust, and other prevalent tree diseases.

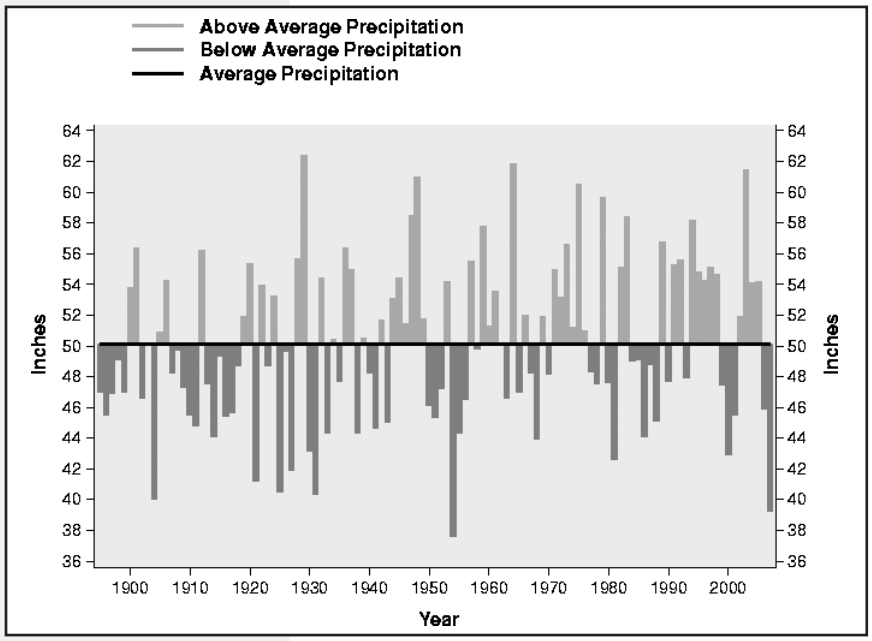
Advances in seedling quality and planting methods, along with development of dependable natural regeneration techniques, have made regeneration of the species certain. Its growth rates rival that of other southern pine species once height growth is initiated. Longleaf can be managed in even-aged or uneven-aged systems and yields high-quality products, aesthetically pleasing views, species-rich communities, and quality recreational experiences.

Perhaps the greatest threat to the continued restoration effort is the increasing difficulty in keeping prescribed fire in the manager's toolbox. Air-quality concerns, wildland-urban interface problems, liability, and a shortage of trained practitioners all present challenges to the longleaf restoration effort. It has been noted that taking the fire out of the longleaf forest is akin to taking the rain out of the rainforest.

Last year saw the first-ever increase in longleaf acreage, reversing a long decline. There will never be 90 million acres of longleaf forests again, but restoring that once-great forest to significance in the Southeastern landscape is now a real possibility.

"Taking the fire out of the longleaf forest is akin to taking the rain out of the rainforest."

South's Exceptional Drought, from page 4



This graph shows the patterns of above-average and below-average precipitation in the Southeast from 1895 to 2007.

chestnuts, the openings were more water-limiting than the thinned stands. Other questions Clark is asking related to American chestnut regeneration include: Does chestnut need to be established before disturbance? Can it be introduced after? How does it respond to competition? Through her research, Clark is learning more about how to use silviculture to help restore the American chestnut to the forests of the Southeast.

According to Tennessee-based forester and Forest Guild member Nate Wilson, the 2007 drought was compounded by an early leafout followed by a late frost in the spring. In some locations in the South, there was complete defoliation of several species. Particularly hard hit on the plateau were hickory (*Carya sp.*) and yellow or tulip poplar (*Liriodendron tulipifera*). They lost their first flush of leaves completely and then were immediately sent into the worst drought in 100 years. Wilson also observed an increase in mature tree mortality, "It seemed that the red oaks (*Quercus rubra*) suffered most severely, and would in many cases 'brown out' from a complete foliation in a matter of days. I assume that this was cavitation in the xylem (essentially a collapse of the tree's hydraulic system), but have no way to verify it."

Forest pests and pathogens take advantage of drought conditions. For example, the southern pine beetle (*Dendroctonus frontalis*) reproduces more rapidly in prolonged hot and dry weather. Moreover, beetles are better able to attack and kill trees during a drought because the trees produce less resin, a cornerstone of their defense against the pest. Small, light yellow to white pitch tubes about the color and shape of popcorn usually form where the beetles enter the tree along the entire trunk length. Trees that are especially weak may only show reddish boring dust in bark crevices or cobwebs at the tree base.

Martin Spetich, SRS research forester, has been evaluating impacts of a major 1998-2000, Ozark-region drought on upland hardwood forests over the succeeding years. Drought-induced stress appears to trigger or contribute to oak decline syndrome. Spetich found that the density of standing dead trees increased from 21 to 28 trees per acre, and he attributed the mortality to drought-induced oak decline. Potential timber quality of surviving trees was also impacted by oak decline, as the number of northern red oak trees exhibiting epicormic branching increased from four trees per acre in 2000 to 22 trees per acre in 2001.

Fire in mature sand pine forest in Florida.
Photo by George Custer.

Spetich has also found that drought may lead to increased occurrence of fire, a phenomenon often associated with forests in the western United States during the past century. A tree-ring study by Spetich and University of Missouri professor Richard Guyette examined the relationship between drought and historic fire in the Boston Mountains of Arkansas. They examined fire history back to the early 1600s,

continued on page 13

South's Exceptional Drought, from page 12

and identified trends in historic fire frequencies associated with long-term climate variability and human population fluctuations. They postulate that the last century of fire suppression and resultant lack of fires in the region may partially explain the decline of oak in the Ozarks and other areas of Arkansas.

Drought can also alter species composition and reduce diversity particularly in wet areas such as marshes. Research from the Coweeta Long Term Ecological Research site, North Carolina suggests that the normally wet climate in the southern Appalachians helps foster high levels of species diversity. According to Steve McNulty, leader of the USFS Southern Global Change Team, an El Niño pattern of higher sea-surface temperatures in the Pacific Ocean is predicted for 2009 and 2010, which normally means more precipitation but also higher temperatures and faster evaporation. Increased precipitation and warmer temperatures encourage plant growth early in the spring. Later in the summer, higher temperatures can dry out plants quickly, creating fuel for wildfires. Their research suggests that drought in the Southeast and its related adverse impacts on the region's forests may become even more common in the twenty-first century.

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TIMOS, from page 7

Agriculture has noted a record pace of foreign purchase of land, including the rapid expansion of holdings belonging to the ironically named John Hancock Company of Canada.

As responsible land managers, we might ask what motivations these foreign investors have in advancing goals of sustainability, energy independence, or the rescuing of legacy values through restorative management of longleaf pine or bottomland hardwood. Will this new class of owners sense the same responsibility toward excellent forestry that might be felt by owners and investors who value social and cultural consequences beyond profits? Perhaps not, yet our responsibility and commitment to practice excellent forestry continues.

So what can we, as forestry professionals, do to ensure responsible resource management, indeed excellent forestry, in these new and difficult circumstances? After all, the sources of the change emanate from global market pressures that are beyond our reach and control.

The answer to this difficult conundrum may lie in the current public sympathy toward all things "environmental". Investors in TIMOs and REITs are, after all, people–with all the sensitivities and concerns for future generations that are currently so evident in public discourse. Could these same investors be motivated to rein in the exuberant purchasing of current TIMOs and REITs and focus some of that energy on assurances toward sustainable management and (dare I say it) excellent forestry?

Unloading logs at a Georgia mill in the 1990s. Photo by David J. Moorhead, University of Georgia, Bugwood.org

TIMOs and REITs have done an excellent job of diversifying to more effectively carve out niche markets and cater to various facets of the investor community. Many have explored or completed deals that monetize conservation easement values and ecosystem services. The next logical step may be to guarantee practices of excellent forestry in order to satisfy increasingly sophisticated investors. We may be able to influence this by continuing to expand the ranks of responsible professionals and by helping to make excellent forestry a mainstream expectation by landowners, investors, and the public.

"Will this new class of owners sense the same responsibility toward excellent forestry that might be felt by owners and investors who value social and cultural consequences beyond profits?"

Creating Local Markets, from page 9

Recreation is a growing ecosystem services market in the Southeast.

information on products and local management issues and markets to assist NTFP harvesters and growers, marketers, processors, and end users.

Ecosystem services

Innovators are working to ensure that more landowners and communities harness all of the potential value streams produced by forests, especially underutilized opportunities such as recreation, hunting and fishing leases, facilities for events and overnight guests, and educational programs. These can be excellent strategies for producing income without compromising conservation goals.

Watershed protection programs may be the next big ecosystem service income opportunity, and there is a high level of interest in opportunities to protect municipal water supplies through forest conservation. For example, the Raleigh, North Carolina, watershed encompasses a 770-square mile area in the Upper Neuse River Basin. Approximately 60 percent of the Upper Neuse Basin is still forested, but rapid development is placing many of these lands at risk for conversion and development. A group of conservation organizations, landowners, government agencies, and watershed protection groups are working together through the Upper Neuse Clean Water Initiative to protect forested lands and headwater streams. Raleigh Mayor Charles Meeker is convinced that it is the most cost-effective way to protect drinking water supplies, saying, "Preserving forestland around waterways protects public health and is more cost effective than building new water treatment facilities." In addition, watershed markets, due to the direct connection between conserving local forests and increasing local water security, will likely avoid many of the policy and logistical obstacles faced in the carbon market (discussed below).

Climate change and alternative energy

The emerging carbon market may provide significant economic benefits associated with sustainable forest management. However, it is unclear whether the market will result in incentives that benefit the average owner of a smaller property who is practicing sustainable forestry or create disproportionate incentives for unsustainable forestry and concentrated land ownership.

Markets for woody biomass may also present an opportunity for higher-value use of low-grade wood. The need throughout the South to facilitate removal of low-grade materials is mirrored in other regions of the country. Today, we are witnessing the development of two biomass industries in the South: a large-scale industry that plans to produce ethanol, wood pellets, and energy fueled by supplies from intensively managed forests and genetically modified trees; and a second, small-scale industry that produces power and heat for single facilities. A large-scale biomass industry has the potential to perpetuate short-sighted management and corporate control of forests in our region. A small-scale industry is far more likely to create markets that may support restoration-oriented forestry.[2]

In the South, overcoming economic barriers to the conservation, restoration, and sustainable long-term management of our forests will require reform in our forest-product markets. All of the market-based strategies discussed are critical for achieving ecological, economic, and social sustainability in our region's forests and forest-based communities.

[1] National Woodland Owners Survey, 2004, U.S. Forest Service.

[2] The Fall 2008 Issue #11 of *Forest Wisdom* (http://www.forestguild.org/publications/forest_wisdom/Wisdom11.pdf) focuses exclusively on issues related to biomass utilization.



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The Forest Guild promotes ecologically, economically, and socially responsible forestry–"excellent forestry"–as a means of sustaining the integrity of forest ecosystems and the welfare of human communities dependent upon them. The Guild provides training, policy analysis, and research to foster excellence in stewardship, to support practicing foresters and allied professionals, and to engage a broader community in the challenges of forest conservation and management.

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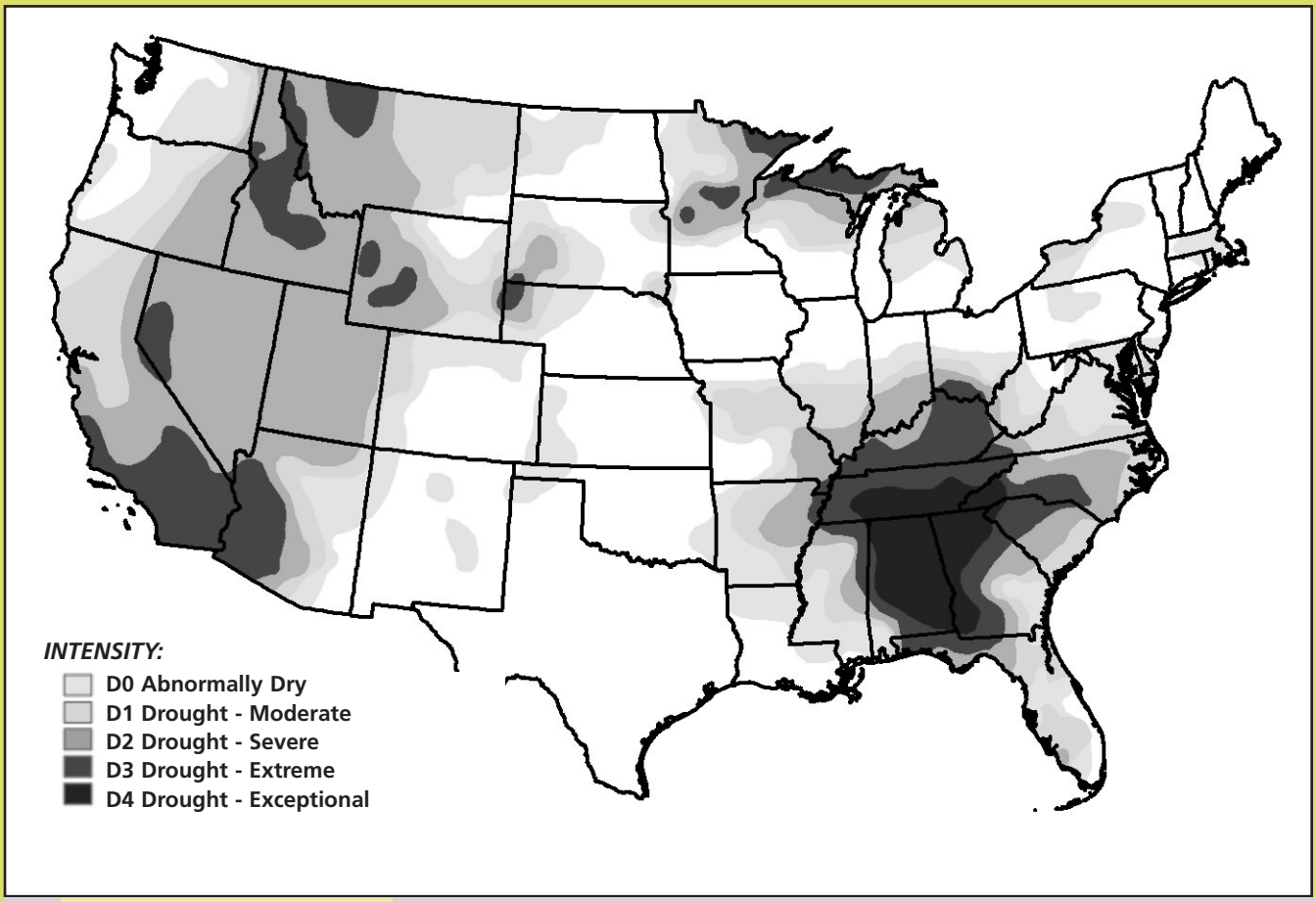

This map published by the US Drought Monitor illustrates the severity of the 2007 drought that gripped the Southeast. http://www.drought.unl.edu/DM/MONITOR.HTML