GEORGIA FORESTRY
COMMISSION

Sustainable Forest Management in Georgia

Prepared by the Georgia Forestry Commission
for the Georgia General Assembly July 1, 2008

Executive Summary

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Georgia's forests are being sustainably managed to meet the numerous needs of our state today. To ensure our forests will continue to meet the ever increasing demands of future generations, many challenges must be met. Success will depend on proactive decisions by our state leaders and the entire forestry community addressing a myriad of forestry-related issues.

Georgia boasts about 24 million acres of forest land. The forestry industry contributes $27.7 billion to Georgia's economy and tree inventory volumes are at an all time high. We have 78% more cubic feet of wood growing in Georgia than we did 50 years ago. However, the state's population is increasing at a record rate, and 106 acres of forest land are lost to development daily. These and other trends threaten forest sustainability and the numerous economic, environmental, and social benefits that our thriving forests provide.

Georgia's forest area has remained stable over the past 50 years at about 24 million acres. Approximately 92% of this acreage is privately owned. However, ownership patterns have been changing and average parcel sizes are shrinking. This is due to a number of factors, including the effects of urbanization and the tremendous divestiture of forest industry-owned lands. Several issues, such as state and local tax structures and the strength of forest product markets, affect the economic viability of owning and managing forest land.

Fifty-five Georgia counties are dependent on forestry activity, and while the number of mills has declined, total productivity remains high. Strong markets for forest products are crucial to the future of traditional pulp and paper, lumber, and pole supplies. Forest growth well exceeds removals and is available to supply global and local markets. The development of a forest resource-based bioenergy industry is poised to contribute significantly to Georgia's economy and reduce our dependence on nonrenewable fossil fuels.

Georgia's forests provide valuable ecological services that help supply our state with clean water, clean air, wildlife habitat, and recreation opportunities. With two out of every three falling raindrops in Georgia landing on forest lands, the sustainable management of our forests is one of the most significant factors affecting our water quality and quantity. The General Assembly's recent adoption of the Statewide Water Management Plan recognizes Forestry's Best Management Practices as a model program that other land use practitioners should emulate. Carbon sequestration is an emerging ecological market opportunity that will soon provide additional incentives for landowners to keep their property forested.

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Forestry professionals ensure public safety by providing fire prevention services in the form of prescribed fire as well as wildfire suppression. The health and sustainability of Georgia's forests are dependent on attention to both. Urbanization places more lives and property at risk from wildfire and greatly complicates the management of wildfires and prescribed fires.

Urban sprawl and fragmentation impact natural habitat and the nature services forestry provides. Forest recreation contributes $1.8 billion annually to Georgia. A system of public and private conservation strategies is needed to support forest and wildlife sustainability. The professional use of prescribed fire and the eradication of invasive plants and animals are needed to maintain the full suite of habitats required by native species. Expansion of the Georgia Land Conservation Program supports this goal, as does the State Wildlife Action Plan.

Forest land valuations for tax purposes are inconsistent across Georgia and "highest and best use" land valuation threatens forest sustainability. The General Assembly's overwhelming support and passage of the 2008 Forest Land Protection Act is an excellent first step. However, additional legislation is needed to support the fair and equitable treatment of forest land to help ensure Georgia's forest resources for future generations.

The cooperative efforts of a diverse group of natural resource professionals developing this report have confirmed the need for a comprehensive statewide assessment of Georgia's forest resources. The Georgia Forestry Commission has initiated a comprehensive assessment and action plan that will be completed in April, 2010.

With the wise use of knowledge and resources, Georgians can keep our forests sustainable for present and future generations.

Introduction

Introduction

Georgia's population is increasing at record rates. Within 25 years, the number of people calling our state "home" is expected to jump from 9 million to 12 million. As we monitor the impacts of that growth, it is prudent to pay special attention to its effect on vital natural resources, including the state's water, air, and wildlife. The one critical link that impacts the health of each of these other resources is Georgia's 24.8 million acres of thriving forest land.

In 2007, the Georgia General Assembly enacted into law Senate Bill 176. It requires the Georgia Forestry Commission (GFC) to submit a report every five years which summarizes the sustainability of our state's forests.

Specifically, the bill requests verification of "*the ability of forest resources in this state to meet the needs of the present without compromising the ability to meet the needs of future generations.*"

This initial report, submitted to the General Assembly on July 1, 2008, highlights the current conditions of our forest resources, along with the challenges and opportunities being faced by Georgia's forest managers and owners. It concludes that while Georgia's forests are being sustainably managed for the numerous needs of our state today, their future viability will be determined by specific actions of state leaders and the forestry community.

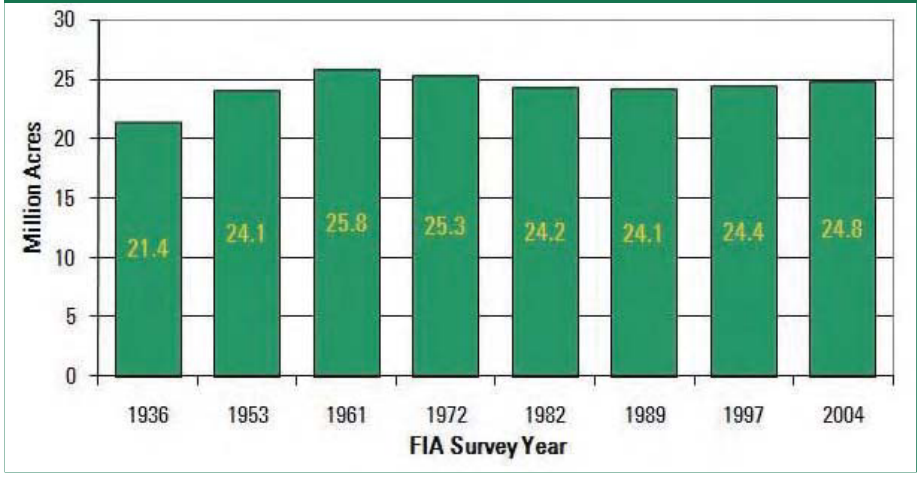
It is the GFC's goal to help educate Georgians about their role in guaranteeing the sustainability of our precious forest resources - for the benefit of each of us today, and for every future generation.

I. Georgia's Forests Today

An Overview

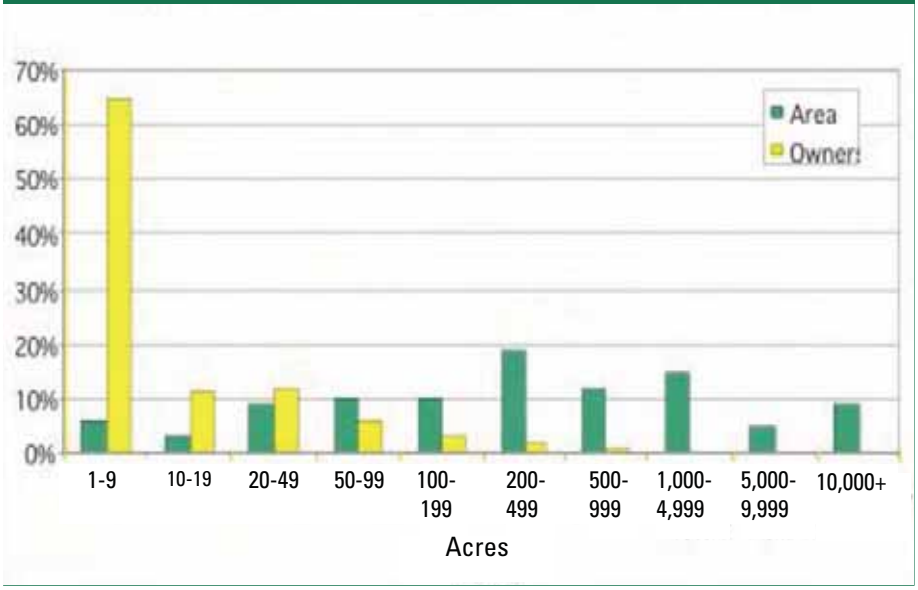
Since the beginning of recorded history, Georgia has been distinguished by its forest land bounty.

Fig. 1 Area of Forest Land - Georgia



Source: USDA Forest Service, FIA and Georgia Forestry Commission, 2006.

Fig. 2. Family Forests by Size of Forest Landholdings and Owners



Source: USDA Forest Service National Woodland Owner Survey, 2006.

William Bartram, one of the first naturalist-botanists, roamed this region in the mid-1770's. He found forests of different ages interspersed with expansive savannahs, swamps, and river bottomlands filled with a rich diversity of broad-leaved species.

It was not until the 1880's that large scale commercial logging practices began to alter the appearance of Georgia's landscape. By the late 1920s, most of the virgin stands in Georgia had been cut over. By 1930, heavy removals forced increased taxes on the remaining timber, which in turn caused its rapid liquidation.[1]

Georgia's forest land acreage has remained relatively stable since that time, and perhaps more importantly, timber volumes have also remained stable. Georgia's timber volumes are at an all time high since the forest inventory of Georgia began in the 1930's.

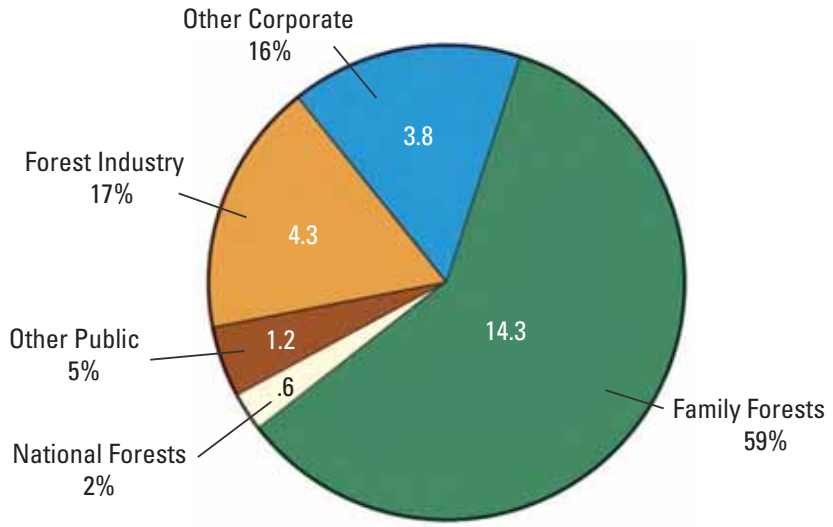
The number of forest land acres in Georgia has stabilized at approximately 24 million acres, or 67% of our total land area, as demonstrated by the Forest Inventory and Analysis reports compiled since 1936 (Figure 1).

However, it is the current trend toward shrinking parcel size (Figure 2) that can be expected to impact the quality, quantity and availability of our forest resources into the future.

Ownership of Georgia's Forests

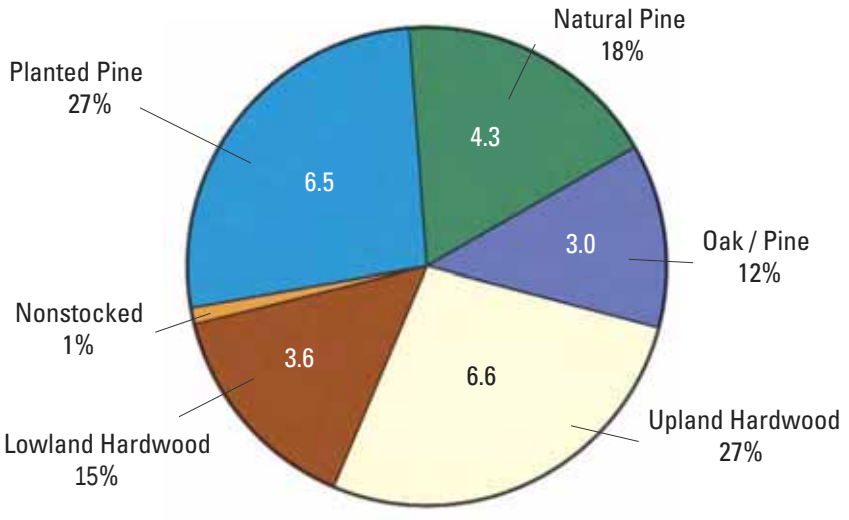
The majority of Georgia's forests are privately owned. Only eight percent are public lands, including state and national forests, parks, and other federal, state and local government lands (Figure 3). Therefore, the continued sustainability of Georgia's forests falls largely on individuals and corporations. These landowner groups are facing new challenges that will determine the future of Georgia's forests. State and local tax structures, along with the inconsistent valuation of forest land and struggling forest product markets, will have a major impact on these landowner decision makers.

Fig. 3 Ownership of Timber Land (Million Acres)



Source: USDA Forest Service, FIA and Georgia Forestry Commission, 2006.

Fig. 4 Area of Forest Land by Type (Million Acres)



Source: USDA Forest Service, FIA and Georgia Forestry Commission, 2006.

Shrinking Parcel Sizes and Their Impacts

The shrinking size of forest land parcels is of concern. When owners of large tracts die, their heirs may be left with enormous tax bills, often leading to the sale of some or all of the land in order to pay taxes. Such land is more prone to be subdivided. Much of the more productive timber land is being purchased by timber investment management organizations (TIMO's). One result of greater TIMO involvement is a more rapid turnover in forest ownership and an increased potential for subsequent parcelization into smaller-sized properties.[2]

As landholdings get smaller, the implementation of sound forest management may decrease. One impact of this change is the disruption of wildlife corridors and migration patterns. Other impacts include adverse changes in water quality and quantity. As more private forest lands are split up into smaller acreages, this land becomes less likely to ever provide forest products. Although the trees may still be present, good land management practices will be harder to implement, especially if this trend continues and the pressure of taxes is not addressed.

Composition of Georgia's Forests

As of the 2004 survey, there are 24.8 million acres of forest land in Georgia. Hardwood timber comprises 42%, softwood (mostly pine) 45%, and mixed oak/pine, 12%. One percent of the forested area is nonstocked, i.e. recently harvested land that has not yet seeded or been planted with seedlings (Figure 4).

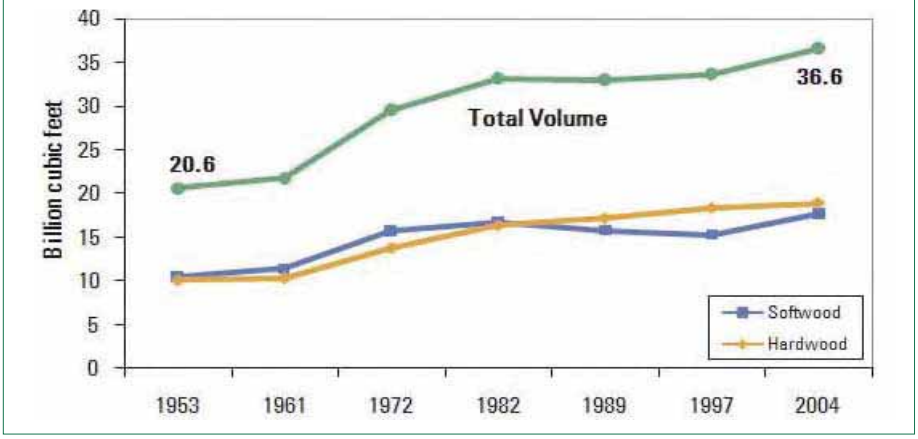
Historical Growth, Harvesting and Reforestation

Georgia's forests are currently growing more wood than is being harvested on an annual basis. Timber volumes have been increasing since 1953, which means that today we have 78% more cubic feet of wood growing in Georgia than we did 50 years ago (Figure 5).

Tree planting has declined recently, likely due to decreased prices (Figure 6) paid to landowners for timber. If prices increase, tree planting should also increase. If reduced tree planting begins to impact timber volumes, then tree planting incentive programs may be warranted. The high peaks in tree planting coincide with federal tree planting cost-share programs.

Forest landowners are facing several challenges to their ability to retain ownership of their working forests. Highest use tax valuations are unfavorable to forest ownership. It is not economical to grow trees on land that has been valued at residential, commercial, or industrial rates. Often, it takes many years before income is generated from forest land, but property taxes must be paid annually.

Fig.5 Volume of Live Trees on Timber Land by Species

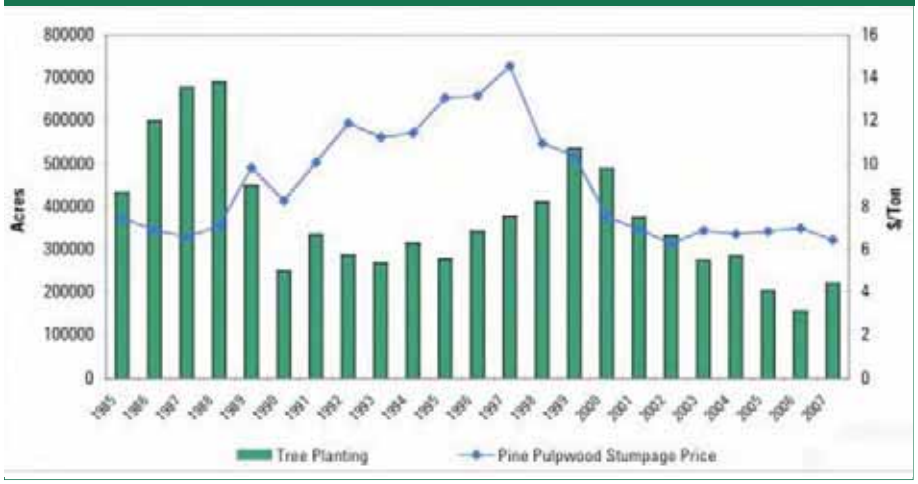


Source: USDA Forest Service, FIA and Georgia Forestry Commission, 2006.

Ownership Changes Impact Forest Sustainability

The changing ownership patterns from traditional, rural-oriented landowners to new, younger owners migrating from cities has brought about a loss in the basic understanding of forest management. Many landowners are unaware of the importance of management of the resource to achieve specific goals, such as sustainability. Productivity of the forest is critical to ensuring that sustainability.

Fig.6 Tree Planting Levels and Pine Pulpwood Prices



Source: Georgia Forestry Commission and Timber Mart-South, 2007.

An increasing amount of forest land is being left idle. This is partly due to low or poor markets that are too weak to drive the investment in reforestation after a timber harvest.

Tree seedling costs are reasonable at this time, but the loss of industry nurseries will impact the availability of seedlings, leading to higher prices for those seedlings. Genetic research is also diminishing. Such research is critical to the improved productivity of commercially important tree species. Genetic research is also vital for combating diseases and insects, especially in light of the non-native invasive pests that are finding their way into Georgia.

Retaining and Maintaining Forest Land

Land conservation programs create opportunities for forest landowners to place restrictions on their properties that limit or prohibit development. Such restrictions will help eliminate any highest use designation other than forest land for tax valuation. The state is now positioned to enter into conservation easements with forest landowners, as are a number of land trusts and non-governmental organizations.

Funding sources are quite limited, and it will take support from the General Assembly if conservation easements are to contribute significantly to forest sustainability.

Some forest lands are unique due to species diversity, location, recreational opportunities, historic significance, or other important characteristic. State acquisition of these properties should be considered. Funding sources are quite limited and support from the General Assembly is needed to preserve these areas.

Strong markets for forest products are necessary to ensure forest landowners are able to maintain forest land. The traditional pulp and paper, lumber, and pole markets need to be encouraged to expand, along with the new markets for bioenergy and ecosystem services. Forest landowners can form cooperatives to facilitate management activities over larger land areas, letting economies of scale improve their opportunities in the open market.

Forest land valuations for tax purposes are inconsistent across the state. The General Assembly should address these inconsistencies through a legislative mandate beyond the Conservation Use Valuation Act. Fair valuations will limit the need for forest land owners to divest themselves of that resource, helping to ensure sustainability.

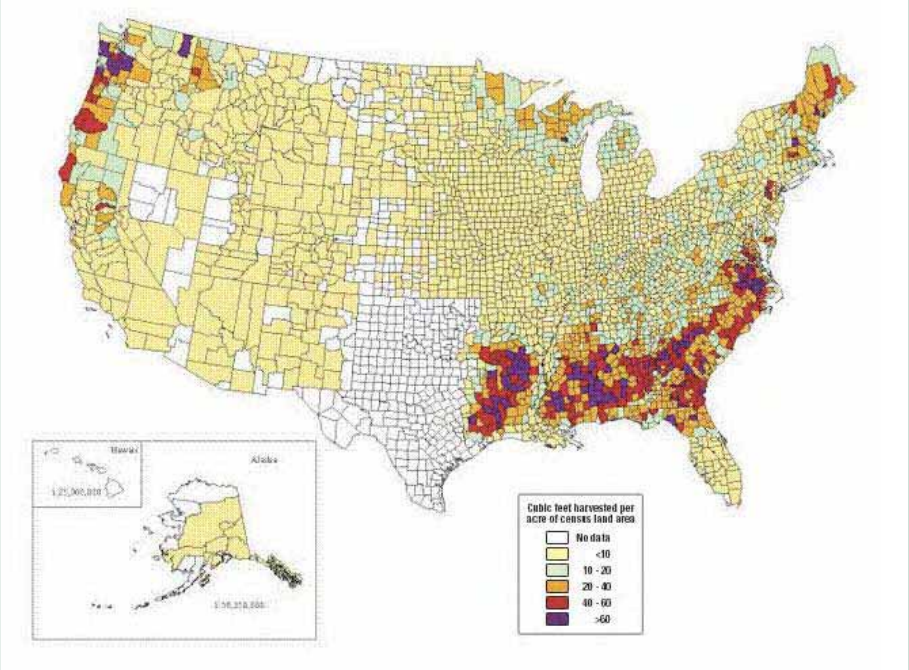
Technical assistance to landowners is critical for good management of the forest land. Professional Consulting Foresters alone cannot meet the needs of the 526,000 forest landowners across the state.

The Georgia Forestry Commission can provide technical assistance through personal contact, landowner workshops, conferences, educational forests, publications and other media, and public meetings.

II. Benefits of Georgia's Forests

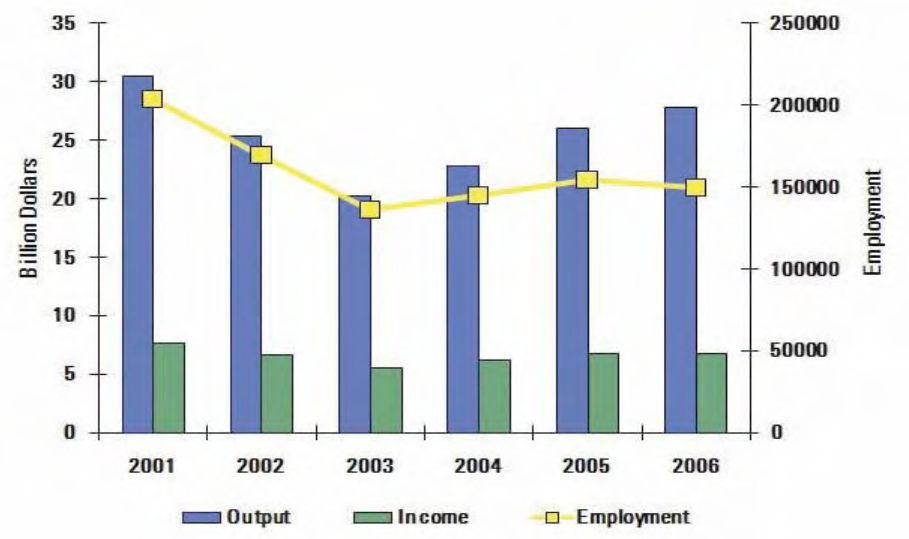
Georgia is in the middle of one of the primary wood producing regions of the world.

Fig.7 Intensity of Harvest for All Products in the United States by County



Source: USDA, United States Timber Industry - An Assessment of Timber Product Output and Use, 1996.

Fig.8 Forest Products Manufacturing Trends in Georgia



Source: Riall, B William, Economic Benefits of the Forestry Industry in Georgia: 2006, Georgia Tech Research Corporation, 2007.

Of total world production, the forests of the 13 southern states provide 18% of all wood products (Figure 7). One fourth of the world's pulp is produced in the South's forests. *In 2003, Georgia led the 13 southern states in total production of pulpwood and other forest products.*[3]

Georgia's 24.8 million acres of forest land, containing vast supplies of renewable raw materials, sustains an important economic engine for the state. In 2006, total economic activity supported by Georgia's forest industry was $27.7 billion in output, including 149,347 jobs and $6.8 billion in payroll and compensation and $580 million in taxes to Georgia's state budget (Figure 8).[4]

Based upon employment, 55 Georgia counties are either 'critically,' 'very,' or 'moderately' dependent on forestry activity; 50 additional counties were found to be 'somewhat' dependent on forest-related industries (Figure 9).

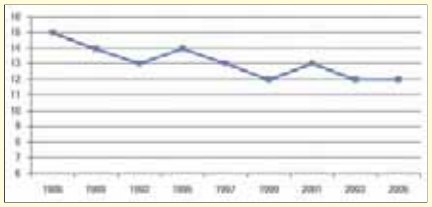
Fig.9 Forestry Dependency Based on Employment 2006

Source: Riall, B William, Economic Benefits of the Forestry Industry in Georgia: 2006, Georgia Tech Research Corporation, 2007.

Georgia has 185 primary forest products manufacturers: 12 pulp mills, 15 chip mills, 9 engineered-wood mills and 140 sawmills and pole mills; approximately 1,500 secondary manufacturers provide further processing to Georgia's wood products.[5] From 1986 to 2005, Georgia lost 137 primary forest products manufacturers. (Figure 10).[6]

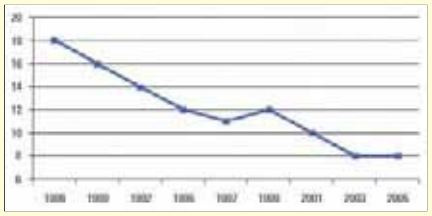
Fig.10 Number of Forest Products Manufacturing Mills in Georgia

Number of Pulp Mills



Number of Sawmills

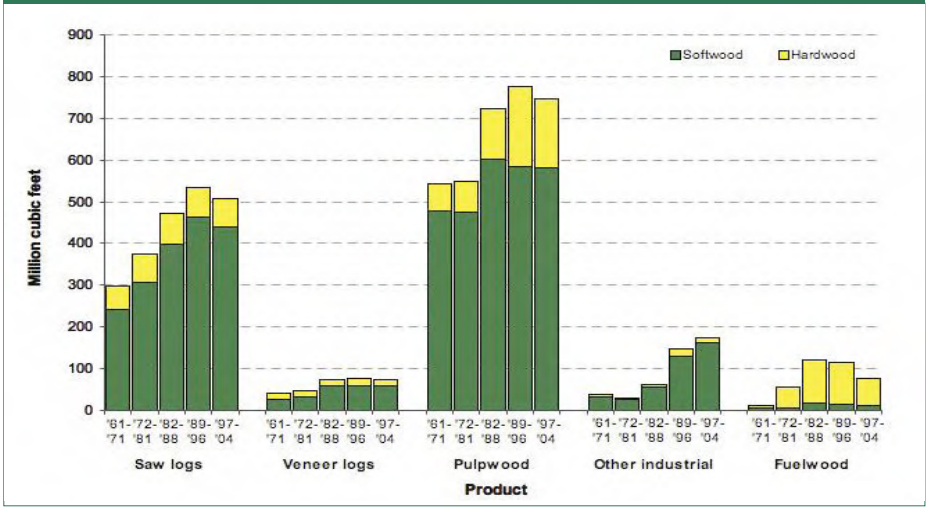
Number of Veneer Mills



Source: GFC Timber Product Output Survey, 2005.

Although the number of mills has declined in the last 20 years, mill productivity remains at historically high levels (Figure 11).[7]

Fig.11 Average Annual Output of Timber Products by Product & Species Group



Source: Harper, Richard, Southern Research Station, USDA Forest Service, 2007.

The depressed housing and construction market of 2007-2008 has caused several dimensional lumber mills and engineered wood products mills to reduce output or shut down operations altogether. These mill shutdowns have a domino effect on each region's economy, including the loss of logging jobs and fewer markets for timber growers.

Georgia's Forests are Capable of More

Georgia's abundant forest lands are capable of providing economic benefits above current levels. As previously mentioned, according to the most recent Forest Inventory Analysis data for 2006, Georgia's forest growth exceeds removals for all species, softwoods, and hardwoods, by 30%, 26% and 46%, respectively. This excess growth could support additional capacity at existing mills or new mills could be established to utilize the excess.

Consider this softwood example: Excess growth for softwoods equals 9.7 million tons of wood per year. In perspective, 9.7 million tons of excess wood could support 21 new sawmills, each receiving 450,000 tons of wood per year, with each mill creating approximately 125 jobs; alternately, the excess softwood growth could support six new oriented strand board mills with each mill creating 200 jobs.

Consider this hardwood example: Excess growth for hardwoods equals 6.2 million tons of wood per year. Again, in perspective, 6.2 million tons of excess wood could support 21 new sawmills, each receiving 300,000 tons of wood per year, with each mill creating approximately 150 jobs.

Since only about one dozen mills approach these production levels, it is not unreasonable to project that dozens of smaller mills, at smaller production levels, could be located across the state to utilize the excess softwood and hardwood growth. These scenarios are plausible if markets and economic conditions existed to warrant mill expansions or the addition of new mills.

Growing global competition and the availability of markets for wood and wood fiber are two factors that will influence the future of the forest industry in Georgia. Forest products continue to be an important export commodity to world markets. In 2006, exports from Georgia to world markets from the paper and wood products sectors accounted for 10% of the total export valuation from Georgia, or $2 billion.[8]

Meeting the Challenges

Recent economic swings in forest products markets have created challenges for firms and landowners alike. Although the economic impact report on Georgia's forest industry shows improvement for 2006, the recent decline in housing starts and construction have created a challenge for the building products industry, resulting in declined production and delayed startups of new projects.

However, continued population migration to the South and internal growth in the region should create solid demand for building products over the long term.

Another challenge for the forest industry in Georgia is increased market competitiveness on a global scale. For example, southern lumber markets have been negatively impacted by subsidized lumber from Canada and other countries, and low-cost finished wood products are flooding U.S. markets because of lower production costs in overseas factories.

The current abundance of Georgia's forest resources has attracted national and world-wide attention and created opportunities to attract new forest industry firms. However, we must address the challenge of maintaining reforestation levels that will result in a long future of high economic returns from forests to our communities and environment.

A Future in Bioenergy

Georgia companies are seeking opportunities in the commercialization of bioenergy, or the conversion of forest biomass into energy, which will benefit both forest landowners and forest industries.

The development of a bioenergy industry will foster new products from the forest, a sustained demand for forest resources, and the opportunity to manage forests differently. Landowners will begin to see more waste material utilized from their lands. This may not mean additional income at first, but it will certainly result in a savings in reforestation costs. As the value of biomass for energy uses becomes more defined, the market for small diameter trees, or pulpwood, can be expected to improve.

Loggers will begin to find new ways to efficiently harvest biomass. Landowners will have an additional incentive to plant trees. The actions of both landowners and loggers will certainly be influenced by local bioenergy markets, just as they have been by other forest products manufacturing facilities.

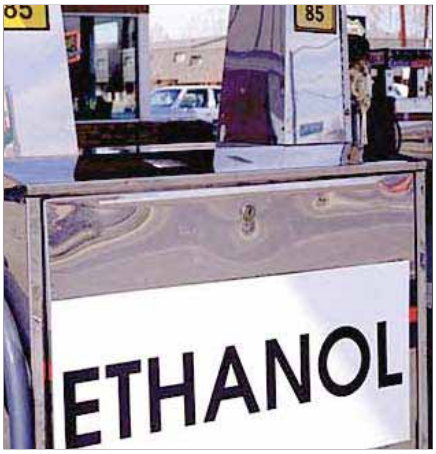
Forest biomass is organic material that comes from the forest and includes logging residues, sawdust and other byproducts of wood manufacturing facilities, waste wood from construction and demolition activities, land-clearing debris, and trees.

Georgia's sustainable forests produce an abundance of forest biomass that could be converted to energy. A huge potential exists to capture a portion of biomass resources that are currently not utilized.

In 2004, a harvest and utilization study was conducted which found that 14% of total softwood volume and 26% of total hardwood volume were left in the woods after harvest.[9]

Residues from timber harvesting (tops and branches) exceed five million dry tons (no moisture content) annually, another 13 million dry tons of unmerchantable timber is potentially available annually, and 1.4 million dry tons of urban waste wood must be disposed of annually.[10]

It is estimated that Georgia's unmerchantable timber and waste wood streams could supply 22% of Georgia's current energy needs if converted to energy.[11] These "new" forest products will be a major component of Georgia's future forest industry and will be important renewable feedstocks for industries that produce electricity, heat and liquid transportation fuels.



Recent announcements of new bioenergy facilities are evidence of a growing opportunity for new markets for previously unutilized and low value forest biomass.

The development of a forest resource based bioenergy industry will add to the economic impacts of Georgia's $27.7 billion forest industry. New industries will create jobs and investment for rural Georgia families and communities while providing tax revenue for the state. Georgia imports 100% of its oil, gasoline, diesel fuel, natural gas, and coal from foreign countries and other states.

The development of a forest bioenergy industry would allow Georgia's energy dollars to stay in our local economy.

According to Georgia Power Company, renewable electricity from Georgia's biomass is growing rapidly for a variety of reasons. In 2006, the Georgia legislature passed House Bill 1018 which exempts biomass from fuel sales and use taxes, thereby making it more cost competitive with traditional fuels.

Yellow Pine Energy Company, LLC, will build a 110 megawatt plant in Clay County, near Fort Gaines, Georgia, utilizing 1,100,000 green tons (approximately 50% moisture content) per year of wood biomass.[12] Greenway Renewable Power LLC, an affiliate of Rollcast Energy, Inc. will build a 50 megawatt plant in Heard County, near Franklin, Georgia, utilizing 550,000 green tons per year of wood biomass.[13]

Production of wood pellets is gaining momentum in Georgia.

Additionally, in a series of resource studies for individual companies, the GFC was able to clearly demonstrate the energy potential from wood biomass in Georgia. Two bioelectricity plants have recently been announced by Georgia Power and are expected to be in operation in 2010.

The export of compressed wood pellets to Europe for "carbon neutral" electricity and heat production is another market that is gaining momentum in Georgia. Fram Renewable Fuels, a new forest bioenergy plant in southeast Georgia's Appling County, began production of wood pellets in December, 2007. The wood pellets, made from sawdust, will be exported to several European countries, where mandates exist to decrease carbon emissions from fossil fuels.

Biomass Fuels Energy Independence

Biomass is a renewable source of energy that can provide liquid transportation fuels, and potentially could replace 30% of U.S. petroleum use.[14]

One of the most significant events in the history of Georgia's forest industry occurred in November, 2007, when Range Fuels broke ground in Treutlen County, near Soperton, Georgia, for the world's first commercial scale cellulosic ethanol factory, converting non-merchantable trees and harvesting residues to ethanol.

The plant's first phase will produce 20 million gallons of ethanol per year utilizing 400,000 green tons per year of wood biomass. The final stage of the facility is expected to produce 100 million gallons of ethanol per year, utilizing 1.5 million green tons of wood biomass.

Forests Provide Valuable Nature Services

Georgia's forests provide ecological services such as mitigating the "heat island" effect in urban areas, water recharge and filtration, erosion control, wildlife habitat, and clean air. Furthermore, forests remove carbon dioxide from the atmosphere and store or sequester the carbon in wood fiber. These often-overlooked services are becoming recognized and given value.

Emerging Opportunities

Carbon sequestration is an emerging ecological market opportunity for forest owners. The sale of "carbon credits" could provide new income to Georgia landowners.

The GFC and the Warnell School of Forestry and Natural Resources of the University of Georgia have defined a Carbon Registry protocol for Georgia and developed an online carbon sequestration registry to list and track forestry projects that are managed to sequester carbon.

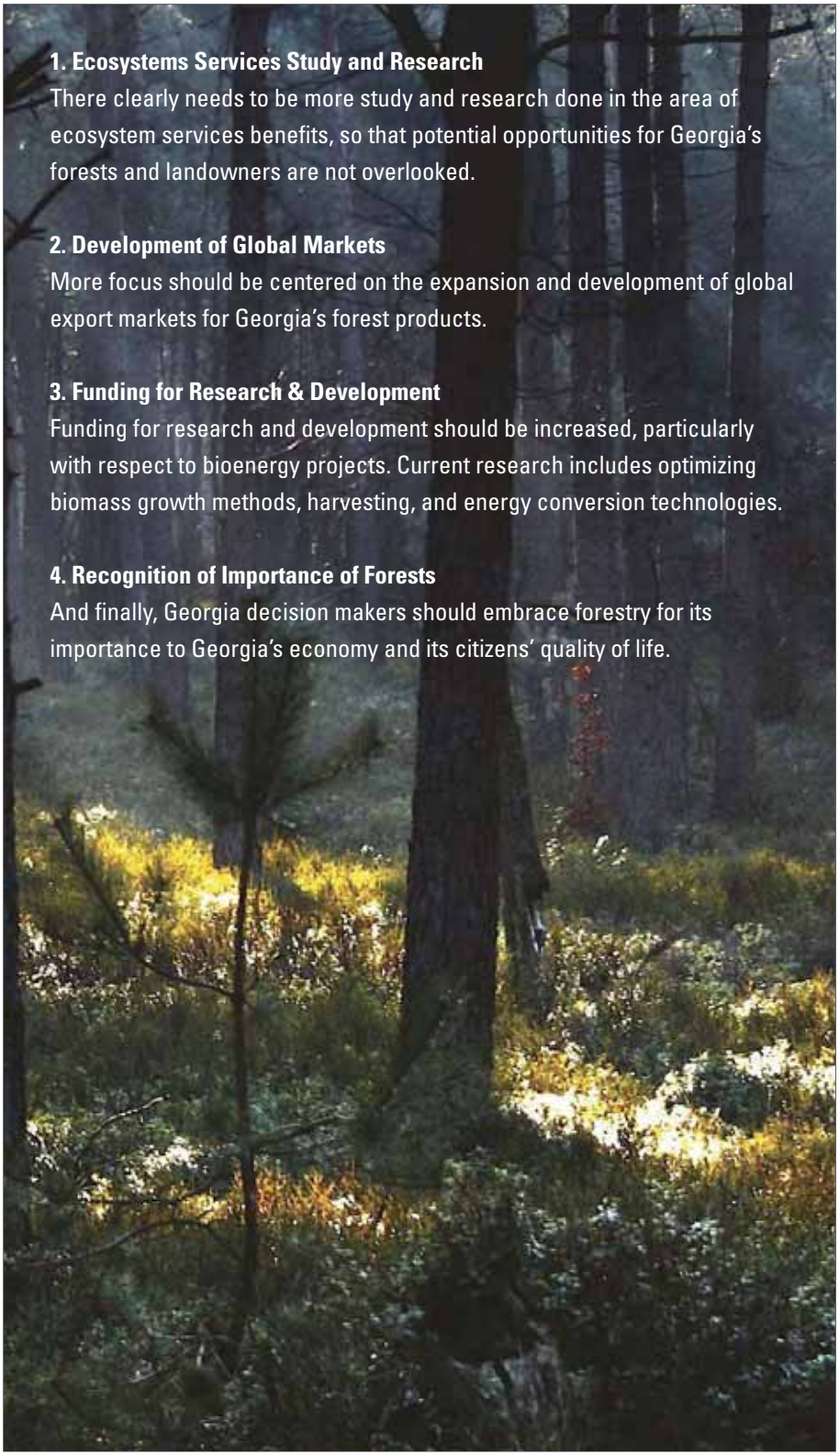
The Registry gives Georgia landowners the opportunity to certify that their forests meet specific standards required by those companies wishing to purchase carbon credits.

Those landowners who wish to develop projects may use the Registry as a marketing tool, and Registry staff members actively pursue market opportunities for registered projects. Trading Development Rights (TDR) is a new opportunity for maintaining forests within or near dense development areas.

In a TDR transaction, the landowner is paid by a developer to give up development rights and, in return, the developer is allowed to create higher density developments in areas already zoned for development.

Another nature service being investigated is enhancing riparian buffers to protect water quality. This can be accomplished by a landowner receiving payment for giving up some or all timber harvesting rights within or near a riparian area.

What is needed from the Georgia General Assembly to help achieve the greatest sustainability results and economic impacts from Georgia's forests?



1. Ecosystems Services Study and Research
There clearly needs to be more study and research done in the area of ecosystem services benefits, so that potential opportunities for Georgia's forests and landowners are not overlooked.

2. Development of Global Markets
More focus should be centered on the expansion and development of global export markets for Georgia's forest products.

3. Funding for Research & Development
Funding for research and development should be increased, particularly with respect to bioenergy projects. Current research includes optimizing biomass growth methods, harvesting, and energy conversion technologies.

4. Recognition of Importance of Forests
And finally, Georgia decision makers should embrace forestry for its importance to Georgia's economy and its citizens' quality of life.

Many of Georgia's 44,056 miles of perennial streams, 23,906 miles of intermittent streams, and 603 miles of ditches and canals begin or flow through forest lands.

Because seven to ten thousand forestry operations are conducted on some 790,000 acres per year statewide, it is important for forest landowners to follow Best Management Practices in order to protect these water resources.

Maintaining Georgia's Water Quality

As a result of the 1972 Federal Clean Water Act, the Georgia Environmental Protection Division (EPD) has been responsible for managing and protecting the state's waters from point and nonpoint sources of pollution. The Georgia Water Quality Control Act (O.C.G.A 12-5-20) lists standards for water quality such as sediment or temperature that, if violated, can result in fines or penalties up to $50,000 per day.

Best Management Practices

Since 1977, the EPD has designated the GFC as the lead agency to develop, educate, implement, and monitor the use of Best Management Practices (BMPs) for forestry operations, that when used properly, minimize or prevent nonpoint source pollution (primarily erosion and sedimentation) contributions.

The BMPs were first developed in 1981 and are continuously updated. Upon passage of the Clean Water Act (CWA) Amendments of 1987, the EPA issued guidance on the relationship of nonpoint source controls and water quality standards as part of the Water Quality Standards Handbook.

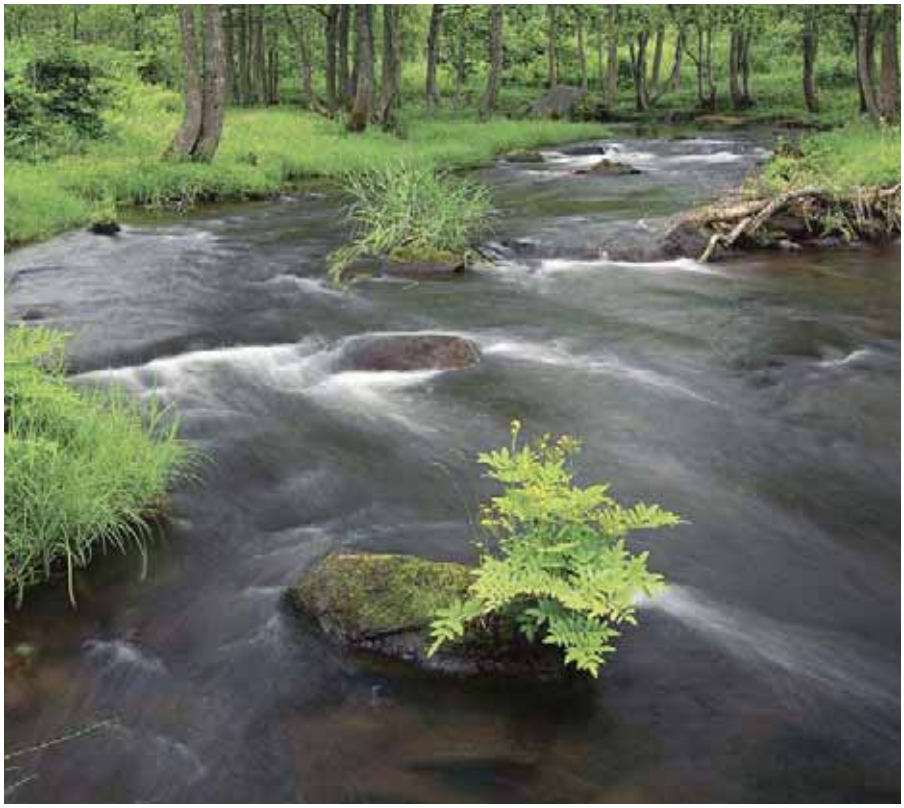
The guidance states: "It is recognized that Best Management Practices, designed in accordance with a state approved process, are the primary mechanisms to enable the achievement of water quality standards." It goes on to state: "It is intended that proper installation of state approved BMPs will achieve water quality standards and will normally constitute compliance with the CWA."

Forestry is the only land use practice in the state that monitors BMP implementation through random stratified surveys. The Statewide Water Management Plan recognizes GFC's Water Quality Program as a model for other land-use organizations.

BMP Implementation

Because the GFC cannot monitor every forestry operation, implementation of BMPs is determined through monitoring surveys. The protocol and scoring methodology for these surveys is consistent with the Southern Group of State Foresters (SGSF) BMP Monitoring Task Force's revised recommendations, developed and adopted in June 2002, titled, *Silvicultural Best Management Practices Implementation Monitoring, a Framework for State Forestry Agencies.*

The SGSF Task Force is composed of hydrologists and water specialists from state forestry agencies, the US Forest Service, the forest industry, and the National Council for Air and Stream Improvement (NCASI) in consultation with EPA Region IV nonpoint source specialists. The GFC conducts these BMP Implementation and Compliance Surveys on approximately 400 sites randomly selected through county tax records.



Surveys were conducted in 1991, 1992, 1998, 2002, 2004, and most recently in 2007. The objectives of Statewide Forestry BMP Surveys are to determine:

- The rates of BMP implementation;
- Acres in BMP compliance;
- Effectiveness of BMPs for any needed modifications;
- Actual miles of streams that may have forestry water quality impairments; and
- Ownerships and regions to target for future training.

BMP Implementation is determined by dividing the total number of individual BMPs that are applicable and fully implemented on the evaluated sites by the total number of applicable BMPs. The result is then summarized for each practice or category by overall site, by region, and statewide. The overall statewide percentage of implementation was 64.9% in 1991, 67.0% in 1992, 78.7% in 1998, 85.9% in 2002, 89.8% in 2004 and 91.8% in 2007.

BMP Compliance

BMP Compliance is determined by calculating the units of measure specific to the forest practice (number of acres, number of stream crossings, miles of road) that were in compliance with BMPs and dividing by the total number of units measured for that particular practice.

The statewide percentage of acres in compliance averaged 86% in 1991, 92% in 1992, 98% in 1998, 99.1% in 2002, 99.4% in 2004, and 99.7% in 2007.

Results from these surveys indicate excellent compliance with BMPs. However there is room for improvement. Regions, landowner groups, and specific practices can be identified for more education in order to improve the implementation results. In the case of stream crossings, compliance is far from desired and denotes an enforcement and training priority.

The use of skidder fords or debris crossings accounted for 39% of the non-compliance. Because of this, the GFC is working with the EPD and the Pine Country Resource Conservation and Development Council to secure a grant to subsidize portable bridges, allowing timber buyers to purchase them at a reduced cost.

This should decrease the occurrence of improper stream crossings and improve compliance. The data from these surveys can be queried by river basin and for specific 12-digit Hydrologic Unit Codes, which will become very useful in the preparation of regional water development and conservation plans as prescribed under the Georgia Comprehensive Statewide Water Management Plan.

Ensuring Sustainability

Most forest industries in Georgia are members of the Sustainable Forestry Initiative (SFI) and require that loggers who deliver forest products to their facilities are Master Timber Harvester (MTH)-trained.

MTH training is an intensive educational process which includes instruction in water quality protection and BMPs. There is a biennial educational requirement to maintain MTH status.

Loggers who do not follow BMPs can be reported to regulatory authorities and the SFI State Implementation Committee. Individual member companies can refuse to allow deliveries from these loggers. This self-regulation approach has been very effective in encouraging implementation of BMPs and, as a result, ensuring the future sustainability of water quality and quantity from Georgia's forest land.

Challenges

Some smaller companies are not participants in the SFI process and, consequently, do not place high BMP demands on their suppliers. This creates an uneven playing field. Also, other land disturbing activities follow different BMP recommendations, especially with regard to stream buffers, which sometimes create confusion among forestry operators. For example, developers must maintain only a 25-foot buffer along streams, while forestry operators recognize a 40-foot minimum zone.

Conversion of forest land to urban use is the greatest threat to sustainability of water quantity and quality. Georgia is experiencing unprecedented population growth, resulting in increased urbanization and suburbanization. The addition of impervious surfaces in landscapes that were formerly forested or used for agriculture results in increased stormwater runoff as well as changes to drainage patterns.

Opportunities

Conscientious conservation and natural resource management will need to be an integral part of community planning for improving water quality and quantity. Inclusion of green space in developments and requirements for minimum tree cover density will help mitigate the effects of stormwater runoff.

Conservation easements and other tax incentives should be considered to protect environmentally sensitive riparian areas from development.

Additionally, state or local governments may consider purchasing sensitive tracts in areas expected to develop in the future.

Consistent rules and regulations on land disturbing activities should be adopted and enforcement capabilities should be provided.

Funding is needed for technical assistance and educational programs to the forestry community while working with other organizations (federal, state, local agencies and non-governmental organizations).

Forestry must be represented on regional water planning councils.

Georgia boasts a tremendously diverse natural heritage across its five physiographic provinces, ranking sixth among all states in overall biological diversity.[15]

Most of these native plants and animals depend upon forest habitats for survival. Over time, some species have successfully adapted to extensive landscape changes resulting from residential and commercial development, agriculture, intensive forestry, stream impoundment, pollution, and other factors that have accompanied human population growth and a high rate of natural resource consumption.

However, other species are less adaptable and are in need of careful management to prevent further declines in the face of extensive habitat loss. Georgia ranks eighth among all states in the number of species at risk and fifth in the number of extinctions.[16]

Wildlife Species' Ups and Downs

In general, populations of many species of wildlife that utilize forest habitats are doing well on public and private lands, following shifts away from agriculture in the early 20th century that increased forest land acreage.

White-tailed deer, wild turkey, and bald eagle populations are thriving following reintroductions and careful management. However, other species that are more specialized and depend on specific forest types are declining. For example, populations of the northern bobwhite, Bachman's sparrow, red-cockaded woodpecker, prairie warbler, and many others that once occupied the extensive and highly diverse longleaf pine savannahs of the coastal plain have all decreased as their habitats have dwindled.

Other forest habitats in decline include mature bottomland hardwoods and cypress-gum wetlands. Imbedded within forests are small patches of special habitats such as bogs, rock outcrops, caves, and prairie remnants that are essential for numerous localized and rare species.

Many aquatic organisms have declined as a result of impoundments, siltation, pollution, and competition from exotic species. Careful stewardship of our rivers and streams, as well as a conservative approach to resource utilization, will be essential to sustain and restore aquatic systems while supplying a sufficient water supply to our citizens. Forested watersheds play an important role in protecting water quality.

Strategies for Sustainability

Probably the greatest tool available for guiding efforts to sustain overall forest wildlife in Georgia is the "State Wildlife Action Plan" (SWAP).[17] This document, entitled *A Comprehensive Wildlife Conservation Strategy for Georgia*, was completed by the Wildlife Resources Division of DNR in 2005, with the help of many private and public stakeholders.

The strategy focuses on those species and habitats believed to be most in need of conservation attention because of population declines and continuing threats. It lists 296 high priority animal species and 323 plants, along with a number of forest and non-forest habitat types.

The plan addresses the extent and condition of essential habitat types, as well as habitat problems and conservation opportunities. It also addresses research, surveys, monitoring, and habitat restoration needs, and provides an evaluation of existing conservation policies and programs. In addition, the strategy outlines partnership opportunities and prioritizes the implementation of specific conservation actions.

Of a list of 25 "problem categories" for high priority species and habitats, developed within the strategy and used in an overall assessment, four have direct ties to forest management activities: altered fire regimes, conversion of natural forests to agricultural and silvicultural uses, forestry practices not meeting the standards of Best Management Practices, and invasive/alien species. There are opportunities to address these problems and enhance sustainability.

Development and Conversion Lead to Habitat Loss

High quality forest habitat is being lost through development and conversion to other uses in conjunction with our growing population and changing society.

Contributing factors include urban sprawl, tax laws and economic factors that encourage subdivision and development, global competition for forest

products, intensifying forest management practices, and widespread corporate divestiture of timber lands. Conservation of forest habitat through a system of public and private conservation lands, and through policies that encourage private landowners to keep their lands in forests, will be necessary to sustain Georgia's wildlife.

Prescribed Fire Nourishes Wildlife

Fire is a natural and necessary part of our landscape and will continue to occur in our forests. Prescribed burning can be used as a tool to benefit forestry and wildlife habitat, as well as a means of protecting humans from the impacts of catastrophic fires.

A sustainable approach to forest and wildlife management must promote the responsible use of prescribed fire through landowner education and training, public relations, and support from state and federal agencies.

Looking Forward

The greatest challenge we face in sustaining forest wildlife populations in Georgia is to maintain the full suite of habitats required by native species, including those with very specialized requirements, in the face of ever expanding urban and suburban growth.

Expanding urban areas impact our ability to use prescribed fire by increasing the extent of smoke-sensitive areas and by generating air pollution that leads to smoke restrictions. Also, the growing urban/wildland interface compounds other problems, including conflicts between wildlife and humans, pets, and/or livestock.

The State Wildlife Action Plan presents a strategy for working toward sustainable wildlife populations and stresses a comprehensive land conservation program as an essential element.

In the absence of prescribed fire, some habitat types will degrade and some species will dwindle and disappear. Also, fuel will accumulate and contribute to dangerous wildfire situations.

Prescribed burning is becoming increasingly difficult to implement in the face of land fragmentation, air quality regulations, and smoke management challenges.

Conservation and Preservation

One of our greatest opportunities for sustaining forest wildlife populations is to continue building the Georgia Land Conservation Program (GLCP) into a larger and longer-term statewide program consisting of more public lands and more private lands under permanent conservation easements. This will require significant on-going funding, and the longer such a program is delayed, the fewer opportunities there will be for success.

Other cooperative programs on private land are also beneficial. Recognition and technical guidance efforts such as the Sustainable Forestry Initiative and the Forestry for Wildlife Program need to be expanded and promoted. Landowner access to and involvement in assistance programs, such as the Bobwhite Quail Initiative and those available through the Farm Bill, should be maximized.

Additionally, national conservation plans can be dovetailed with the SWAP and may be used to direct conservation efforts and leverage state and federal funding to achieve greater ecological benefits for landowners and society at large. Examples of these include the *Northern Bobwhite Conservation Initiative, Partners In Flight North American Landbird Conservation Plan,* and *Partners In Amphibian and Reptile Conservation - Habitat Management Guidelines for Amphibians and Reptiles of the Southeastern United States.*

How can the Georgia General Assembly Help?

The General Assembly can support sustainability by ensuring funding of essential forestry and wildlife conservation programs, including implementation of the State Wildlife Action Plan and increased funding for land conservation through both easements and fee acquisition. It can also provide support for programs to fight invasive exotic species and to facilitate prescribed burning.

Georgia's increasing urbanization affects forest recreation just as it affects other forest benefits.

Prioritizing Needs for Forest Land

Federal, state, county and local governments as well as public-private partnerships will be needed in the rapidly growing areas of Georgia to preserve and maintain forest land so that public access to diverse recreational opportunities near people's homes and jobs can be ensured.

Forest conservation should be a special priority north of the fall line, along the coast, and in counties with the highest growth projections. Key lands for acquisition should be identified and prioritized in these rapidly growing areas. According to a telephone survey conducted by The Statewide Comprehensive Outdoor Recreation Plan (SCORP), 88% of Georgians support public funding for investment in outdoor recreation.

As Georgia becomes more urbanized, it will become more challenging to sustain a connection between urban populations and our natural resources. Our forest land, parks and nature-based recreation will provide critically important connections to the environment and promote a conservation ethic.

Additionally, our schools should have access to natural areas for education. Schools must provide balanced interpretation, education and outdoor recreation programs to promote healthy lifestyles and knowledge of our natural resources.

Recreation Impacts Georgia's Economy
Forest-based recreation provides continued opportunities for economic growth and tourism in Georgia.

As an example, Georgia leads the nation in the number of non-resident hunters with 136,000 annually. Georgia sportsmen spend more than $1.8 billion annually that contributes to 31,000 jobs. Investment in public outdoor recreation, public-private partnerships and promotion of private recreational opportunities will continue to provide strong economic benefits to Georgia in the future.

Anglers currently spend approximately $569 million each year on fishing in Georgia. The total economic effect of angling is approximately $1.5 billion. There are 10,649 jobs related to sport fishing which generate $15 million in state income taxes and $19 million in state sales taxes.

The new Go Fish Georgia program is a $30 million initiative that will boost economic development in many small towns and establish Georgia as a national fishing destination. The success of this program and maintaining this viable industry will depend on the clean fresh water that flows through the sustainable forest lands in the state.

Georgia's rich forest resource provides recreation opportunities that provide immeasurable value to our state's residents and visitors. Decisions that support sustainability by balancing growth with conservation should be prudently considered now to ensure these opportunities remain available to future generations.

III. Threats to Forest Sustainability in Georgia

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There are many challenges at hand for Georgia's currently thriving forest system and the people who manage it.

Unprecedented population growth and the urbanization of our state lead a list of forces that could undermine forest sustainability in decades to come. Other threats include ownership changes, forest pests, invasive plants, wildfire, and limitations on the use of prescribed fire.

Urbanization

Urbanization is a major threat to forest sustainability. GFC-funded studies by the University of Georgia's Natural Resources Spatial Analysis Laboratory (NARSAL) determined that approximately 54 acres of canopy cover were lost in the Atlanta region each day from 1991-2001, while approximately 28 acres of impervious surfaces (e.g. roads, buildings, etc.) were added daily.

Updating this information to 2005 showed a slight decrease in canopy loss but impervious surface additions increased to approximately 55 acres daily.

In a similar statewide analysis, NARSAL determined that from 2001-2005, Georgia's canopy cover declined by about 398,330 acres, or 273 acres per day. Although canopy loss in rural areas often reflects ongoing forestry activities, in urban areas it often indicates development. Accordingly, impervious surfaces increased by about 154,134 acres, or 106 acres per day.

These changes effectively and permanently remove this acreage from forest cover, thereby increasing storm runoff. This results in water quality issues and flooding. It also has negative impacts on air quality and local climate.

Another impact of the change in land use is the previously mentioned issue of forest fragmentation. Fragmentation results in less efficient management units, which contribute to cost increases and resource management difficulties. Though fragmentation may not result in forest canopy loss, in many cases the resources on the tract become unavailable to markets.

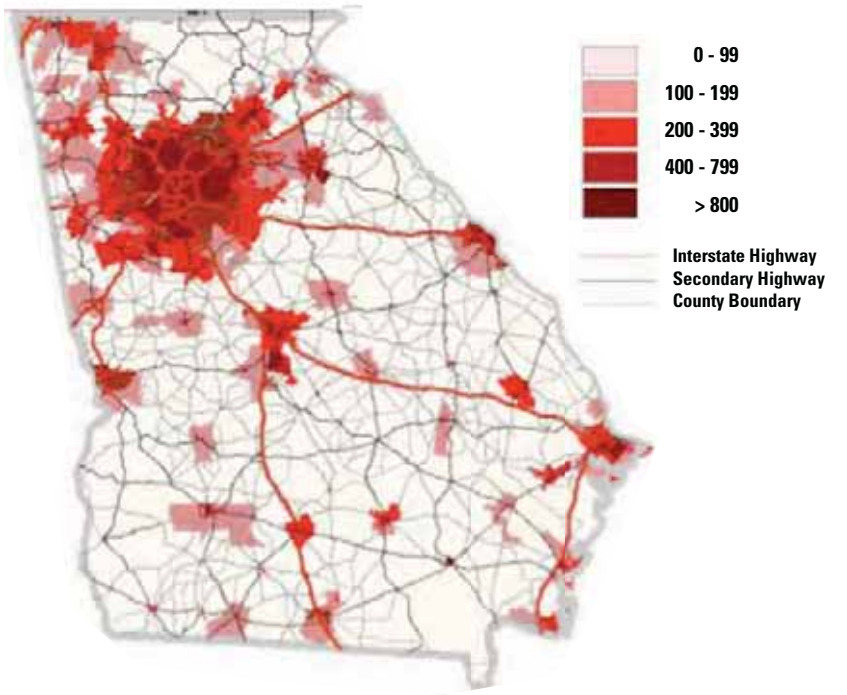
This fragmentation also impedes the management of fire and insect, disease or invasive plant eradication efforts. It disrupts wildlife corridors and migration routes of many wildlife species.

Forestry Practice

At approximately 45 people per square mile, there is a 50:50 chance of practicing forestry. At 150 people per square mile, forestry approaches zero (Figure 12).[18]

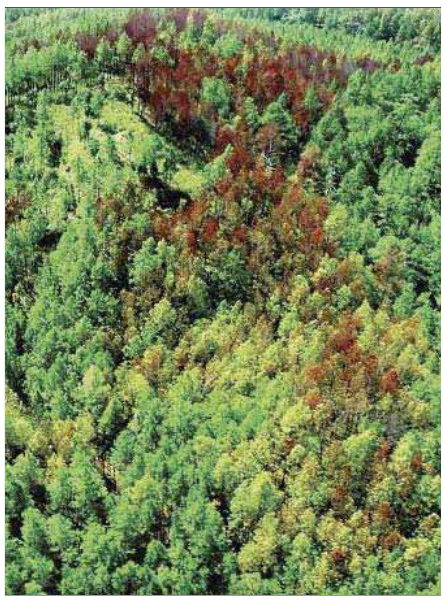
Maintaining incentives and smart public policy to allow lands to remain in forest cover will provide both environmental and economic benefits for Georgians in the future.

Fig.12 Number of People per Square Mile in Georgia (2000 Census)



Source: Harper, Richard, Southern Research Station, USDA Forest Service, 2007.

The challenge is to provide landowners with incentives to retain manageable tracts of forest land that can compete with the financial returns of converting or selling forest land for other purposes. Some of these incentives could be in tax relief and in the development and support of markets to increase the financial investment value of forest resources.



Forest Pests & Invasive Species

Healthy forests are essential for air and water quality, habitat, environmental cooling, recreation, and the multitude of forest products from which Georgians benefit. History shows us that a decimating agent such as the Chestnut Blight in the early 1900's can drastically alter the forest ecosystem and eliminate important resources.

The southern pine beetle (SPB) and other pine bark beetles continue to represent the biggest threat to pine timber in Georgia and the South. The GFC monitors SBP activity annually and takes measures to thwart its spread.

In today's global market, the potential is very real for insects and disease organisms to find their way into Georgia and cause widespread damage. For example, the hemlock woolly adelgid, imported from Japan, was detected in Georgia in 2002, and has now spread throughout most of our native hemlock range. It has the potential to all but eliminate hemlocks in north Georgia and drastically alter the ecosystems in the area.

The redbay ambrosia beetle was first detected near Savannah in 2002, and is associated with a laurel wilt disease that is killing redbay and sassafras trees across almost six million acres of forest in the coastal plain region.

Invasive Plants

Invasive plants such as cogongrass are finding their way into the state. Cogongrass, which destroys wildlife habitat, spreads aggressively and overcomes native grasses and herbaceous browse. It burns extremely hot, increasing the threat of wildfires.

The challenges are to continue to monitor native forest health issues AND to aggressively monitor for new insects and disease in the forest, urban landscapes, and at points of entry so that control can be undertaken while problems are small and the chances of eradication or control are greatest.

Cogongrass threatens Georgia's forests.

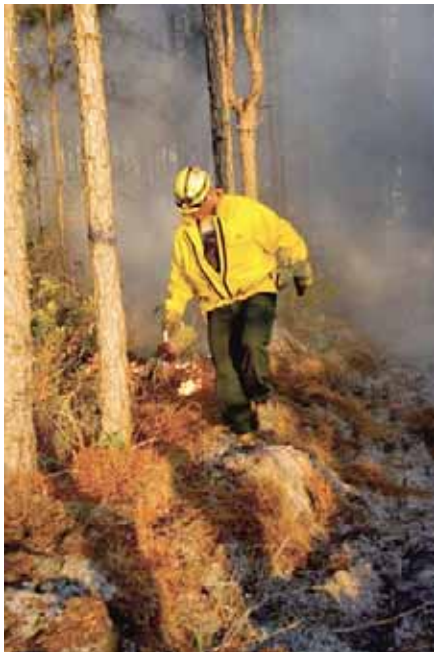
Other established invasive plants such as kudzu, Chinese privet, autumn and Russian olive, and multiflora rose continue to displace native plants.

Legislative support and regulation to prevent the introduction and spread of non-native exotic plants, animals, and pathogens is needed. In addition, interagency cooperation on invasive species management can be improved through the development and implementation of a statewide invasive species management plan and establishment of a state invasive species council.

Wildfire & Prescribed Fire Restrictions

Fire is a natural part of Georgia's landscape and must be managed for a positive influence on forest sustainability. Wildfire suppression has been Georgia's management strategy for nearly eight decades and is essential for public safety and the protection of property. Wildfires can destroy millions of acres of forest land and threaten lives and property if left unchecked.

Prescribed fire is a safe way to apply a natural process, ensure ecosystem health and reduce wildfire risk. It is an integral part of sustainability and is supported and promoted by natural resource managers. Prescribed fire offers a proactive approach; providing many benefits for healthy forests in addition to reducing damage from wildfire. Most forest ecosystems, flora and fauna, benefit from prescribed fire.



Wildfire Concerns

Urbanization increases apprehension about fire. Air quality has become a major concern in Georgia, and prescribed fire has been targeted as one of many sources of harmful emissions. Drift smoke from prescribed fire and wildfires concerns urban dwellers. An important challenge is to help Georgians understand the life sustaining properties of healthy forests, and the natural role that fire plays in ecosystems.

Urbanization places lives and property at risk from wildfire and reduces options for proper fire management. The greatest fire management challenge for forestry professionals is to ensure public safety by providing fire prevention services in the form of prescribed fire as well as wildfire suppression. The sustainability of Georgia's forest is dependent on attention to both prescribed fire and wildfire suppression.

Property Taxes

Several taxation issues affect forest land ownership and the forest industry in Georgia. However, none is more critical to the future of Georgia's forests than property taxes.

Ad Valorem System Changes

Georgia's ad valorem tax system was created during a time when the wealth and profits of the state came out of the production of the land – when cotton was still king in the 1800s. As times have changed and Georgia has become increasingly urban, the tax structure has remained the same.

Landowners throughout Georgia are reporting dramatic increases in local property taxes, many hit with a doubling, tripling, or more of ad valorem tax liability just in the past few years. In this environment, a growing number of landowners simply cannot grow trees fast enough or sell them at a price high enough to pay the current property taxes levied on the land.

In addition, landowners must pay severance taxes on the timber when it is sold at 100% fair market value. For many, owning forests and timber land has become a poor business decision. Studies show that for every $1.00 in ad valorem tax generated by Georgia's timber lands, those same lands receive less than $0.50 return in services.

Addressing the Problems

Some relief is at hand. In November, 2008, Georgians will have an opportunity to vote on a Constitutional Amendment that provides for property taxation of Georgia's forests based more on their actual use than on their potential use as developed lands.

Currently, a similar, though more limited, tax program is available for forests not exceeding 2,000 acres. In the existing conservation use tax system, available only to private individuals who own forest land, landowners are required to place their property in ten year covenants, severely restricting the use of the property. If a covenant is breached, stiff penalties must be paid.

In the proposed program for larger forests, which allows corporate landowners to participate, the required covenant is 15 years, and the penalty for violating the covenant is severe. This is an excellent first step in helping forest landowners keep their land intact and in forests.

However, there is still much more that needs to be done to address the inequity that exists across Georgia in the application of ad valorem taxes.

Georgia's forests are a valuable natural resource and economic engine for our state. Forest land owners should be given every reason to hold their property for the benefits of forest sustainability and the security and enjoyment of future generations.

Conclusion

Threats to forest sustainability in Georgia come in many forms. Their common thread is the human factor. Issues of urbanization, ownership, and effective forest management can ultimately be solved, however, by that same thread: humans - equipped with knowledge and tools, both applied judiciously for a sustainable forest landscape in Georgia.

Source References and Acknowledgements

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