

GEORGIA FORESTRY  
COMMISSION



# Sustainability Report for Georgia's Forests: January 2019





# Executive Summary





**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 needs of present generations and the projected demands for future generations, many challenges must be addressed. Forest sustainability is dependent on both environmental and economic sustainability. A challenge to either element is a challenge to both elements. Success will depend on proactive decisions by our state leaders and the entire forestry and conservation communities addressing a myriad of forestry-related issues.

**Georgia boasts more than 24 million acres of forestland.** Georgia's forest inventory volumes are at an all-time high. We have 49 percent more cubic feet of wood growing in Georgia than we did 40 years ago. However, the state's population is increasing at a record rate. Urbanization continues to be a threat to forest sustainability. Further, recent increases in population and changing land-use patterns have made ongoing forest management more difficult in some areas of the state. These and other trends threaten forest sustainability and the numerous economic, environmental, and social benefits that our forests provide. This report describes both forestland (all forests including those not available for commercial harvest – 24.6 million acres) and timberland (all forests that are available for commercial harvest – 23.9 million acres). (*GFC 2016*)

**Georgia's forest area has remained stable over the past 50 years** at about 24 million acres. Approximately 91 percent of this acreage is privately owned, giving Georgia more privately-owned acres of timberland than any other state in the nation. Forest growth exceeds removals by 41 percent annually and is available to supply global and local markets. However, ownership patterns are changing and average parcel sizes are shrinking. This trend is due to a number of factors, including urbanization and the tremendous divestiture of forest industry-owned lands. Several issues, such as federal, state, and local tax structures and the strength of forest product markets, affect the economic viability of owning and managing forestland.

**Eighty-three of Georgia's 159 counties have at least one primary wood-using mill.** Strong markets for forest products are crucial to the future of traditional pulp and paper, lumber, and pole supplies. In 2017, the economic impact of forestry was \$35.9 billion and over 147,000 jobs. (*Georgia Institute of Technology, 2018*) The development of a forest resource-based bioenergy industry is poised to contribute significantly to Georgia's economy and reduce our dependence on non-renewable fossil fuels.

**Georgia's forests provide valuable ecological services** that help supply our state with clean water, clean air, wildlife habitat, and recreation opportunities that benefit all Georgians. A University of Georgia (Warnell School) study valued these ecological services at \$37 billion annually, with clean water noted as one of the most important services that benefit society (*Moore 2011*). Because two out of every three raindrops in Georgia land on forestlands, the sustainable management of our forests is one of the most significant factors affecting the state's water quality and quantity. The General Assembly's adoption of the Statewide Water Management Plan recognizes Forestry Best Management Practices as a model program that other land-use practitioners should emulate. A GFC internal analysis (unpublished) of watersheds used for drinking water indicates that 60.5 percent of these areas are forested, so these forests cleanse the water utilized by the majority of Georgians. Wildlife-associated recreation, which is greatly supported by healthy forest ecosystems, generates \$5.5 billion annually and supports 40,000 jobs.



## Executive Summary (cont.)

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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 as growth expands into rural environments and greatly complicates the management of wildfires and prescribed fires.

**Urbanization and fragmentation impact natural habitat and ecological services forests provide.** The loss of forestland to urbanization continues to be the greatest single factor for conversion to other (non-forest) uses, even though we are still emerging from one of the greatest recessions in our country's history. A system of public and private conservation strategies is needed to support forest and wildlife sustainability. Sustaining healthy forests, including the professional use of prescribed fire, is critical to maintaining the full suite of ecosystem services, traditional forest outputs, and habitats required by native species. Expansion of the Georgia Land Conservation Program supports this goal, as do the State Wildlife Action Plan and the Forest Action Plan.

**Timber security is an important component** of forest sustainability. Forests are a valuable commodity and deserve sufficient protection under Georgia law. House Bill 790, passed in 2014, strengthened Georgia's timber security law and made great strides in protecting Georgia's forests. GFC law enforcement officers have investigated 484 timber complaints since July 1, 2014, when HB790 clarified GFC authority. These 483 complaints represent almost 18,000 acres of forestland with more than \$2.5 million of estimated losses. GFC has assisted landowners in recovering \$413,434 in damages, with many additional cases still pending judgement.

**Forestland valuations for tax purposes have been inconsistent across Georgia** and "highest and best use" land valuation threatens forest sustainability. Despite the implementation of conservation use tax programs – Conservation Use Valuation Assessment in 1991 (CUVA) and the Forest Land Protection Act in 2008 (FLPA), property tax burdens on Georgia's timberland owners continue to exceed those in most other states. During the 2018 election, Georgia voters approved "Amendment 3," which creates more uniformity in the valuation process for timberland across the state's 159 counties. Legislation can still be developed to support the fair and equitable treatment of forestland to help ensure Georgia's forest resources for future generations.

**With the wise use of scientific knowledge and resources,** Georgia can keep its forests sustainable for present and future generations, providing tangible benefits to landowners, local economies, and forest industry, while continuing to provide vital environmental and ecosystem services from which all Georgians benefit.

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# Introduction

Introduction



## Introduction

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."*

working will be market prices that generate enough revenue to allow for an acceptable rate of return of the landowners' investment.

Georgia's population is increasing at record rates. Within 25 years, the number of people calling our state "home" is expected to jump from 10 million to almost 15 million. As we monitor the impacts of that growth, it is prudent to pay special attention to



Forest sustainability is dependent on both environmental and economic sustainability. A challenge to one is a challenge to the other. While we are maintaining acres of forests at a stable rate and growth is surpassing removals, it is increasingly important to maintain traditional markets and develop new markets for forest products so landowners have incentives to keep forests in forests, rather than choose alternative uses for the land. A key component of helping landowners keep their working forests

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 resources is Georgia's 24.6 million acres of forestland.

It is 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.

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# I. Georgia's Forest Today

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Forest Today

# Georgia's Forests Today



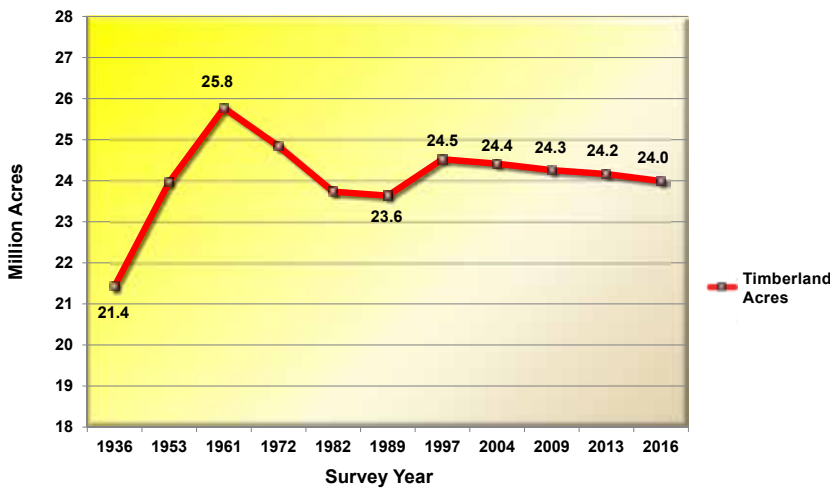
## An Overview

Georgia's timberland acreage has remained relatively stable for more than 60 years and perhaps more importantly, timber volumes have increased. Georgia's timber volumes are at an all-time high since the forest inventory of Georgia began in the 1930s. (Figure 1)

in place since the 1930's. All metrics pertaining to our forests and charts and diagrams are derived from this data. (GFC 2016)

Georgia timberland remains relatively constant with 24 million acres, according to 2016 Forest Inventory and Analysis data. This accounts for 67 percent of Georgia's total land area.

**Figure 1 - Georgia Timberland Acreage Trend**



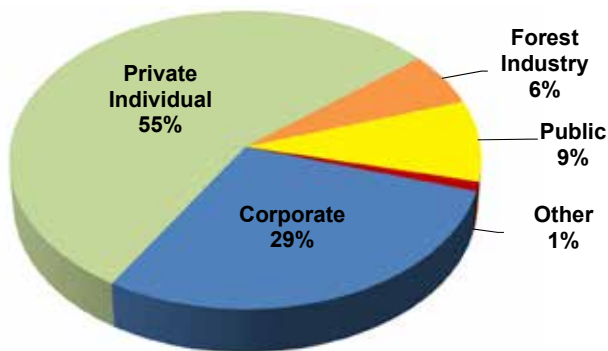
Source: US Forest Service 2016 Data and The Georgia Forestry Commission

However, sawtimber supply remains high in relation to demand. This presents a challenge for timberland owners considering final harvest due to low prices. Weak markets could pressure landowners to convert to non-timberland, subdivide large timber tracts in land sales, or delay reforestation and future timber sale revenue.

## Ownership of Georgia's Forests

The majority of Georgia's forests are privately owned, and we lead the nation in privately-owned timberland acres. Only nine percent of our forests are public lands, including state and national forests, parks, and other federal, state, and local government lands. State and local tax structures, inconsistent valuation of forestland and struggling forest product markets, and land-use changes will have a major impact on these landowner decision-makers.

**Figure 2 - Georgia's Forestland Ownership**



Source: US Forest Service FIA Data 2016, 2017, 2018 (depending on state) and The Georgia Forestry Commission

## Shrinking Parcel Sizes and Their Impacts

The shrinking size of forestland parcels is of concern. As forestland is passed to a new generation, it is often in jeopardy of being subdivided for a variety of reasons. Although large blocks of productive timberland are being purchased by timber investment management organizations (TIMO's) and real estate investment trusts (REITS), many acres of forestland

NOTE: The Forest Inventory & Analysis (FIA) program of the U.S. Forest Service is the system of ongoing measurements of our forests in the U.S., and has been





are being subdivided and converted to non-timberland uses and split into small timber parcels, which are inherently more difficult to manage.

As landholdings get smaller, the implementation of sound forest management often decreases and the land is less likely to produce traditional forest products. Not only does it cost more for wood buyers and loggers to move in equipment needed to harvest small tracts, efficient reforestation

of these small woodlots is difficult as well. These logistical challenges, coupled with the diverse management goals characteristic of small forest landowners, have contributed to recent declines in replanted acres. Smaller tracts also present challenges to wildfire suppression, a priority for GFC. Reduced management (e.g. thinning) contributes to higher wildfire risks, and protection of homes becomes more difficult within a network of small woodlots.

### Composition of Georgia's Forests

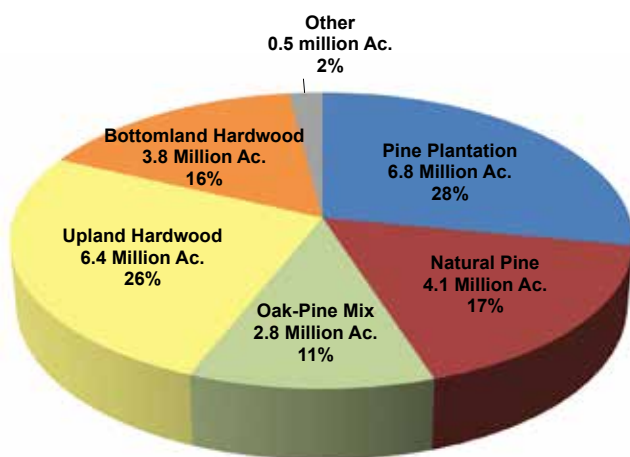
Georgia's forest composition is diverse, with hardwood timber comprising 42 percent, softwood (mostly pine) 45 percent, and mixed oak/pine, 11 percent. Two percent of the timberland area is non-stocked; i.e. recently harvested land that has not yet seeded or been planted with seedlings.

### Historical Growth, Harvesting and Reforestation

Georgia's forests are currently growing more wood than is being harvested on an annual basis. While acreage has remained stable for decades, timber volume shows a continued increase. *Figure 4* shows softwood net growth and harvest removals for survey periods from 2004 through 2016. The increased growth to removals ratio reveals the impact of improved genetics and silviculture on forest productivity, particularly for pine plantations. Although these plantations only comprise 28 percent of our forests, they are essential to the production of raw materials needed to sustain our forest products industry.

Georgia hardwood growth continues to exceed removals at a higher rate, resulting in a net change of 39 percent from the 2004 to 2016 survey period, as shown in *Figure 5*. However, this is due to removal decline (-40 percent) exceeding growth decline (-13 percent). Reasons for growth decline may include changes to age class distributions, with more volume moving into older, slower-growing stands, land-use changes, mortality due to disease and insects, or reforestation in pine plantations. Perhaps one of the greatest contributions to hardwood removals declining is a loss of demand for hardwood pulpwood, as digital options continue to replace writing and printing paper.

**Figure 3 - Georgia Forestland Acreage by Forest Type Group**



Source: US Forest Service FIA Data 2016 and The Georgia Forestry Commission

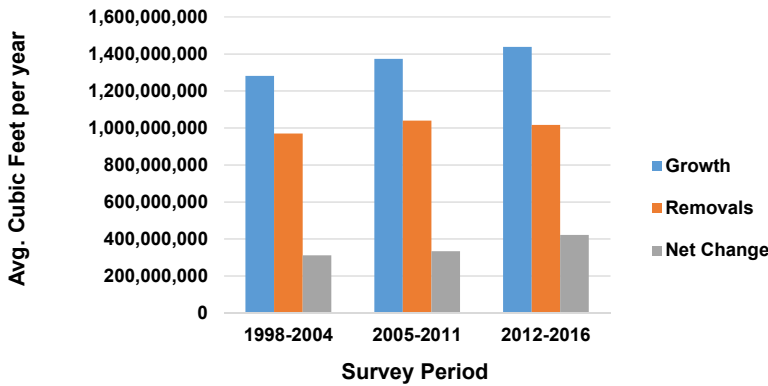
**Figure 4 - Georgia's Softwood Net Growth vs. Removals**



Source: Forest Inventory and Analysis Program, US Forest Service, 2016 Data

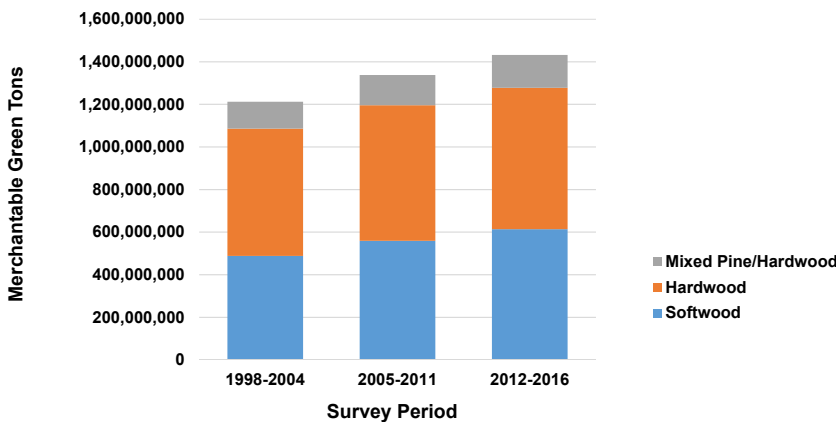


**Figure 5 - Georgia Hardwood Net Growth vs. Removals**



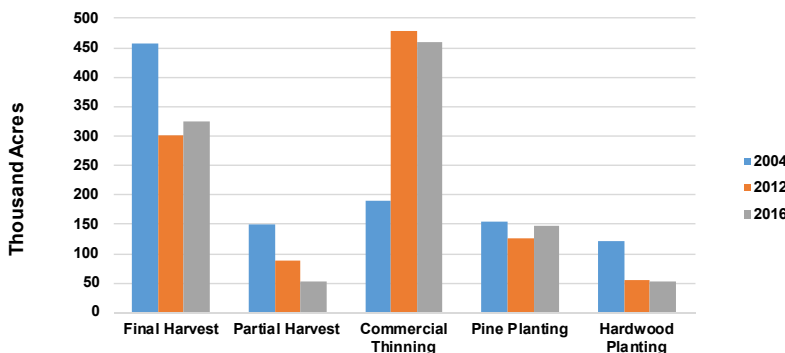
Source: Forest Inventory and Analysis Program, US Forest Service, 2016 Data

**Figure 6 - Volume by Forest Type Group and Survey Period**



Source: Forest Inventory and Analysis Program, US Forest Service, 2016 Data

**Figure 7 - Annual Harvest and Reforestation**



Source: Forest Inventory and Analysis Data, US Forest Service, 2016 Data

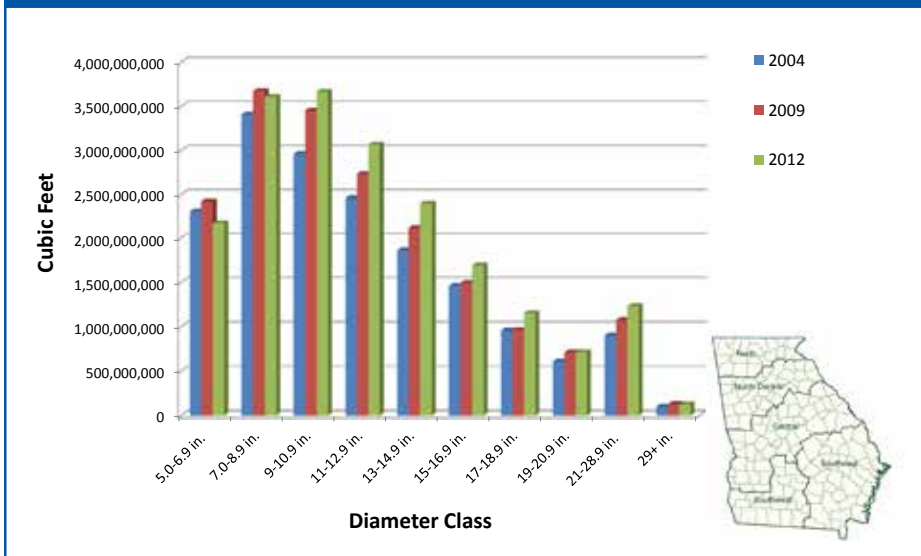
As seen in *Figure 6*, overall timber volume has increased by 18 percent from the 2004 to 2016 survey period. This includes an increase by 26 percent for pine, 11 percent for hardwood, and 22 percent for mixed pine/hardwood, respectively.

*Figure 7* shows significant changes to timber harvests from 2004 to 2016. The lumber market is strongly linked to construction activity. Therefore, while residential construction was near an all-time high in 2004, high demand existed for sawtimber, resulting in substantial clearcutting and replanting. Following the recession, the 2012 timber market saw a significant decrease in final harvests as many landowners in need of cash flow opted to thin timber, hoping sawtimber prices would increase for their final harvest. This delay in clearcutting also reduced tree planting in 2012. The abundance of sawtimber continues to suppress prices in 2016. However, Georgia experienced an increase in final harvests and pine planting, and a decrease in thinning.

Although Georgia's timber volumes are still increasing, continued replanting is necessary to ensure volume growth meets harvesting demands. Our long-term trend has shown we are growing 63 percent more pine volume per acre when compared to 1972 figures. Ownership changes could result in less intensive objectives for wood production, and this trend could stabilize or reduce per-acre pine volume averages. (*GFC 2016*) More funding for tree planting or tax incentive programs would make replanting after harvest more economically feasible for private forest landowners, thereby increasing future wood supply. Some states in



**Figure 8 - Trend in Pine Total Volume Statewide by Diameter Class & Survey Year**



the Southeast offer one or both of these options to encourage forest investments (*Figure 8*). This figure shows states that have either a mill tax (where money is collected at the first point of round-wood scaling), state appropriations, or a combination of both. A portion of these funds are then used to finance forest management activities (such as tree planting) on timberlands to help sustain the resource. This does not include any reforestation cost-share programs funded by the federal government. A few states have income tax incentives specific to reforestation investments. (Unpublished survey, fall 2013 – management chiefs in the Southern Group of State Foresters.)

In the past, peaks in tree planting have coincided with federal tree planting cost-share programs, illustrating that cost-share programs can directly contribute to increases in future wood supply. However, many current federal programs are offering lower incentives along with more specific requirements, which limits the ability of the programs to

broadly affect reforestation across the landscape. Incentivizing tree planting with tax incentives or direct cost-share payments from a variety of sources should be considered.

As a result of reduced tree planting, we are starting to see slightly lower volumes in the smaller diameter classes of southern yellow pine. This trend is likely to continue unless the reduced tree planting trend is reversed. The good news is that volumes have increased across most of the other diameter classes in most regions of the state. This decline is fully depicted in the appendix by FIA Survey Unit data, and the statewide trend is shown in *Figure 8*.

### **Ownership Changes Impact Forest Sustainability**

The changing ownership patterns from traditional, rural-oriented landowners to landowners disconnected from agriculture has contributed to a reduced understanding of basic forest management and the options available. There has also been a shift in ownership from forest industry to privately-held

companies and small private owners. With an estimated 200,000 landowners who own 10 acres or more of timberland, the delivery of technical information is a tremendous obstacle. Outreach to these private forest landowners is a priority for GFC. State, federal, and private resource professionals should adapt and leverage all opportunities to provide technical assistance to this diverse sector. Proper management of the forest by every type of owner is critical to ensuring that our state has a sustainable wood supply.

Professional consulting foresters alone cannot meet the needs of the 200,000 forest landowners (owning at least 10 acres) across the state. The Georgia Forestry Commission can provide limited technical assistance through personal contact, landowner workshops, conferences, public meetings publications, and other media. Private foresters also play a role in technical assistance, but tend to serve larger landowners. Reaching a fraction of these owners is a daunting task, and is perhaps a function in which the state should consider investing, since the ecosystem services our forests collectively provide benefit every Georgian. There is a huge demand for private foresters to manage larger land bases and provide the full suite of services some landowners need. State foresters are needed to assist in the critical functions of a government agency, such as protecting water quality and the health of our forests. GFC foresters also help implement cost-share programs to landowners, which collectively provide direct payments of approximately \$7.5 million annually (*GFC 2016*). These cost-share payments directly benefit the forests of Georgia and aid in keeping them healthy and sustainable.



## Retaining and Maintaining Forestland

The ad valorem tax structure for timberlands is critical for forest owners to retain and manage our working forests. Taxes commensurate with this use are allowable in both CUVA and FLPA and should be embraced by counties to keep these working forests working. A UGA study (*Dorfman 2006*) concluded that lands enrolled in these programs still contribute more to the counties than they utilize in county services. Moreover, these working forests provide the ecosystem services (that benefit society) and forest products (which directly relate to jobs) critical to our state. Georgia Department of Revenue figures show that almost half of our state's land base (47 percent) was enrolled in these programs from 2009-2012.

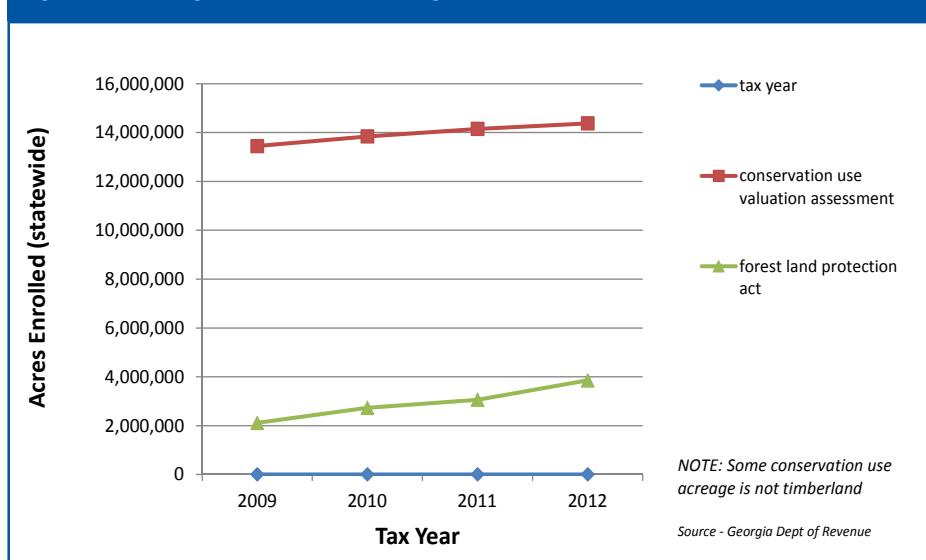
forestry throughout our state. Policy makers should carefully assess the impacts of state and local rules on the ability of private owners to invest and maintain our forest resources.

Land conservation programs create opportunities for owners to reduce their tax burden by forgoing certain development and land-use rights. The state is positioned to enter into conservation easements with forest landowners, as are a number of private land trusts and non-governmental organizations. While CUVA and FLPA provide short-term land restrictions on development, conservation easements provide a means to permanently protect forestland from conversion, thus serving as a valuable conservation tool.

are unique due to species diversity, location, recreational opportunities, historic significance, or other important characteristics. State acquisition of specific keystone properties requiring state funding should continue to be considered by the Georgia Land Conservation Council. Funding from the general assembly is needed to conserve significant properties statewide.

Strong markets for forest products are necessary to ensure forest landowners are able to maintain forestland. A key component of helping landowners keep their working forests working will be market prices that generate enough revenue to allow for an acceptable rate of return of the landowners' investment. Traditional pulp and paper, lumber, and pole markets have been the mainstay in Georgia for decades and provide stable markets in most locations. Expansion of these markets, along with new markets for bioenergy, pellets for export, mass timber construction, and ecosystem services, would benefit the economy and encourage forest investment. No other single characteristic for sustaining our forests is stronger than an active and viable forest products market. By expanding existing markets and encouraging new market development, Georgia can continue to prosper and grow.

Figure 9 - Acreage Enrolled in Tax Programs



Forestland valuations for tax purposes and local ordinances are inconsistent across the state. Fair valuations will limit the need for forestland owners to divest themselves of this resource, helping to ensure an equal opportunity to manage and invest in

Funding sources are quite limited, and it will require the collaborative support of the state, non-governmental organizations, and forest landowners if conservation easements are to contribute significantly to forest sustainability. Some forestlands

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## II. Benefits of Georgia's Forests



## Forest Productivity and Sustainability

Georgia has 24,564,762 acres of forestland. Of this total, 23,990,826 acres is classified as timberland (i.e. forest land that is commercially-available with no timber harvesting restrictions), ranking Georgia number one in timberland in the U.S. Ninety-one percent of this timberland (21,893,835 acres) is privately-owned – more than any other state in the nation.

Forest sustainability can be viewed, measured, and documented in many ways. Reports such as this one, which summarize metrics from sources including the U.S. Forest Service Forest Inventory and Analysis, will be useful in communicating the ability of the state's forests to supply sustainable wood products for present and future generations.

One measure of quantifying forest sustainability is comparing the amount of timber volume to the amount of timber utilized for products and other uses. According to the U.S. Forest Service, Georgia's commercial timberlands grow 626 million cubic feet more wood per year, on average, than is harvested, resulting in growth exceeding removals by 46 percent for all species combined. Softwood (pine) and hardwood growth exceeds removals by 35 percent and 92

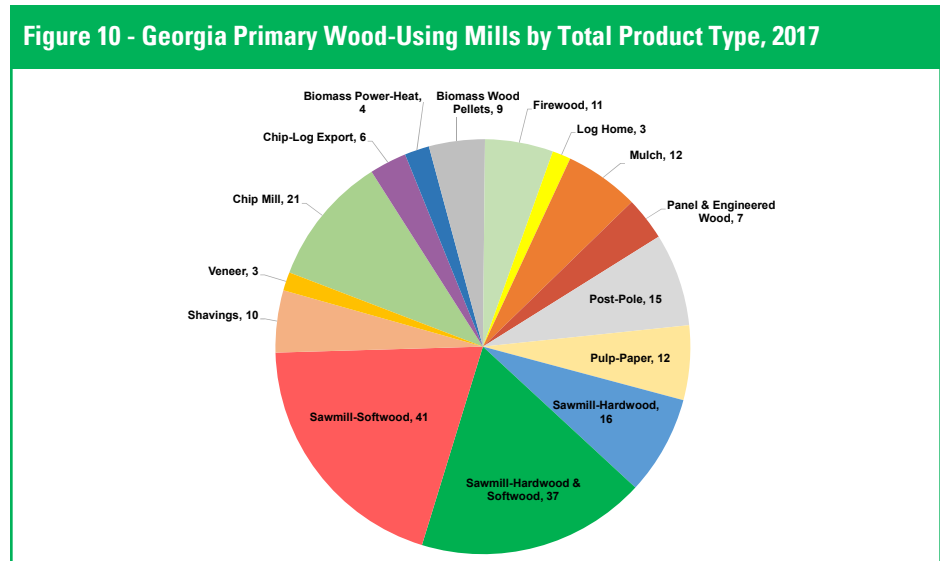
percent, respectively, per year. Trees on Georgia's timberlands are adding volume at an incredible rate –growing 64 cubic feet per second!

Forest certification systems including the Sustainable Forestry Initiative® (SFI), Forest Stewardship Council (FSC), and American Tree Farm System (ATFS), provide established mechanisms for third-party verification of sustainable forest management. Of Georgia's nearly 25 million forested acres, only 3,523,599 acres, or 14 percent of the state's forests, are enrolled in any of the three major forest certification systems: SFI – 2,320,719 acres; FSC – 81,601 acres; ATFS – 1,121,279 acres.

Georgia's abundant, productive, and sustainable forests are an integral part of the state's economy, as shown in the following sections, *Wood-Using Industries & Mill Productivity and Forest Industry Economic Impacts*.

## Wood-Using Industries & Mill Productivity

Georgia's forests support a forest products industry with 207 primary wood-using mills that convert logs into primary wood products, including lumber, veneer or sheathing, poles and posts, wood pulp, and energy products, such as wood pellets. There are more than 1,100 secondary wood-





using mills that convert primary wood products into value-added products, including manufactured homes and buildings, furniture, molding, paper products, trusses, containers, cabinetry, and more.

In 2015, Georgia’s primary wood-using mills processed 47,268,311 green tons of logs: 86 percent softwood and 14 percent hardwood; equating to 1.9 million truckloads of logs from forests to factories.

Since 2009, the number of primary wood-using industries operating in Georgia has fluctuated with the economy, averaging 190 mills for the period: 2009 – 180 mills; 2011 – 172 mills; 2013 – 179 mills; 2015 – 211 mills; and 2017 – 207 mills.

An important economic success story has been the growth of the state’s forest biomass energy industrial sector. Since 2007, more than one dozen bioenergy plants have been built. These companies convert renewable forest biomass into energy. Forest biomass includes wood and other organic materials, such as small diameter trees from timber harvests, logging residues, sawdust, and other by-products of wood manufacturing facilities and land-clearing debris. Bioenergy



companies currently operating in Georgia include nine wood pellet mills and four biomass electricity plants, while several other companies are perfecting biomass conversion technologies to produce liquid transportation fuels and other high-value products.

Georgia is home to many forest industry leaders:

- The largest hardwood sawmill in the U.S. – Battle Lumber Company – Wadley, GA.
- The largest wood rosin plant in the world – Pinova (DRT) – Brunswick, GA.
- The largest recycled paper mill in North America – WestRock – Dublin, GA.
- The largest wood pellet plant in the world – Georgia Biomass – Waycross, GA.
- The largest crude tall oil bio-refinery in the world – Arizona Chemical – Savannah, GA.

### Forest Industry Economic Impacts

Georgia’s forests support a forest products industry that contributes more than \$35.9 billion annually to the state’s economy.

A recent study (*Georgia Institute of Technology, 2018*) reported on the economic benefits of Georgia’s forest industry, including output (revenue), employment, and compensation:

- \$21.3 billion in total revenue output was generated by all forestry sectors combined.
- Georgia’s forest industry provided 53,933 jobs; the seventh consecutive year of positive job growth.
- Compensation (defined as wages and salaries including benefits) of forest industry workers equaled \$3.84 billion.
- The forest industry generated \$970 million in gross tax revenue for the state; net tax revenue totaled \$97 million.

Pulp and paper products was the dominant forest industry sector, generating 62 percent of total revenue output, 36 percent of employment, and 49 percent of compensation.

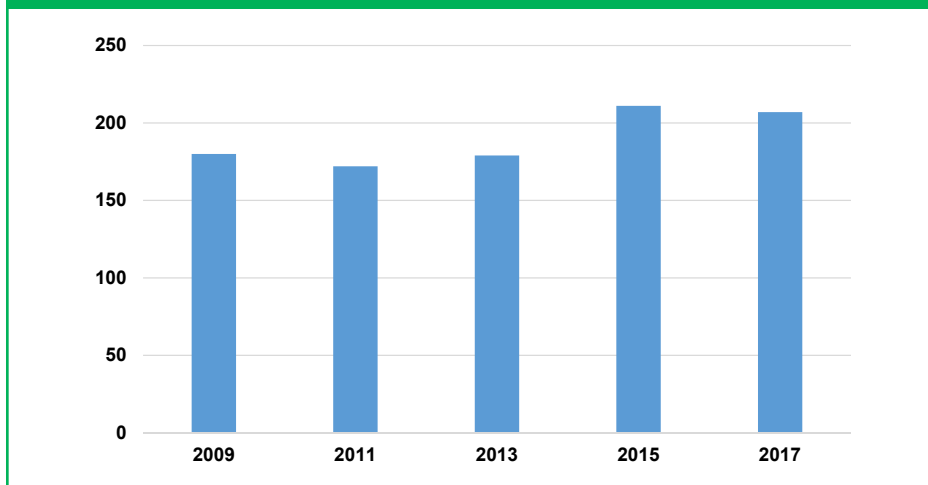
Total economic impacts of the forest industry\* include:

- Total output - \$35.9 billion.
- Total employment – 147,380 jobs.
- Total compensation - \$8.7 billion in wages and salaries.
- All metrics realized gains for seven consecutive years.

\* Total economic impact of the forest industry includes dollars brought into the state, which recirculate through all major industry sectors (multiplier effect).

In addition to the above data, urban and community forestry provides significant benefits to communities around the state. Overall, urban and community forestry companies in 2017 created and supported 46,209 jobs,

**Figure 11 - Number of Primary Mills**



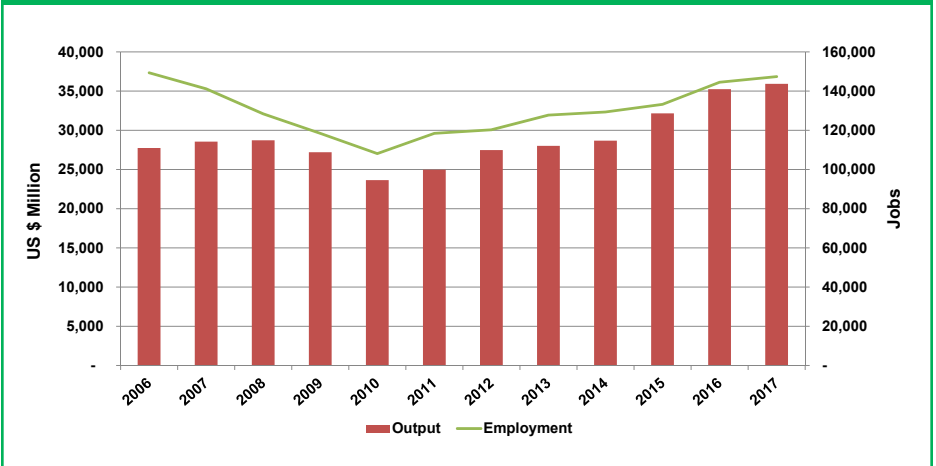


with wages and salaries of \$1.7 billion and generated \$4 billion of economic activity.

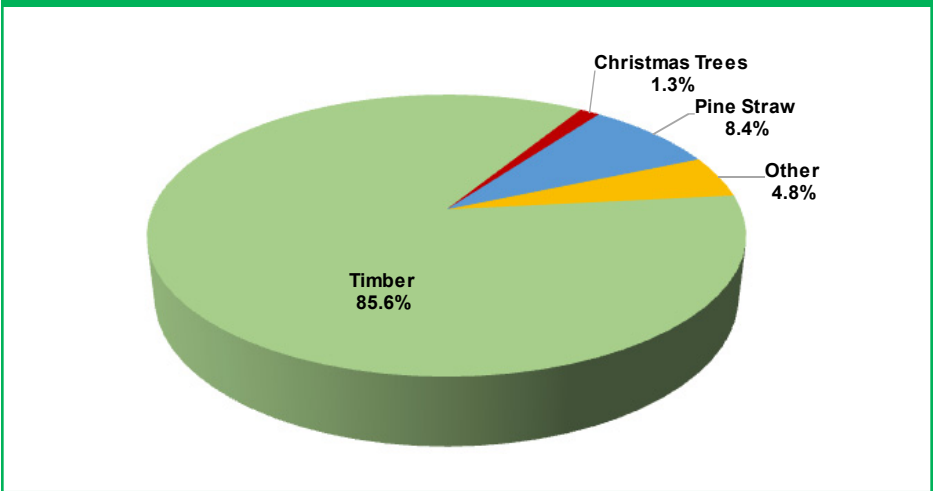
Figure 12 shows the total economic activity represented by output (revenue) and employment supported by the forest industry from 2006 – 2017.

Values from ecological services such as carbon offset credits, trading development rights, and ecosystem services payments provided by Georgia’s forests may develop in the future and provide potential income streams for forest owners.

**Figure 12 - Total Economic Impacts, Output & Employment, 2006-2017**



**Figure 13 - Forest Products Farm Gate Value, 2016**







## Benefits of Georgia's Forests - Ecosystem Services

Georgia's 24.6 million acres of forests provide a vast amount of essential benefits outside of traditional timber products. Water filtration, clean air, erosion control, aesthetics, wildlife habitat, and soil formation are just a few of the processes of nature that are of direct benefit to humans.



The monetary value of ecosystem services is difficult to estimate because few market opportunities for them exist. However, a 2011 report conducted by the University of Georgia, *Quantifying the Value of Non-timber Ecosystem Services from Georgia's Private Forests*, estimated that these services provided by privately owned forestlands are worth more than \$37.6 billion every year. This metric does not include traditional economic impacts listed previously. Three major services - carbon sequestration, water quality, and wildlife habitat - were estimated in the 2011 study to be valued up to \$381/acre, \$8,196/acre, and \$251/acre, respectively.

### Georgia Carbon Sequestration Registry

Forests have the unique ability to absorb carbon dioxide, store carbon in trees'

fiber, and replenish our atmosphere with oxygen. This carbon-capturing process, called carbon sequestration, is an important natural process that may serve to reduce the effects of climate change. Georgia's forests offset approximately eight percent of the state's carbon dioxide emissions, and can sequester one to four tons of carbon per acre, per year. In 2004, Georgia Senate Bill 356 established the Georgia Carbon Sequestration Registry ([www.gacarbon.org](http://www.gacarbon.org)) to promote environmental markets by enabling the voluntary reporting of carbon sequestration projects in Georgia, recognizing registry participants, advocating the importance of forestry in greenhouse gas emissions policy, and educating the public about carbon sequestration and other ecological services.

Lack of greenhouse gas policy that includes forest-based offset projects has prevented this market from expanding, although some industries voluntarily attempt to reduce their environmental impact and may purchase offset-credits from participating landowners. Creating markets and programs offering payments to landowners for managing ecosystem services can help ensure the future sustainability of Georgia's forests. Perhaps future state and federal policies will recognize these ecosystem services that benefit all citizens.

### Economic Impacts from Wildlife-Associated Recreation

Healthy forest ecosystems make strong contributions toward maintaining clean water, clean air, and abundant fish and wildlife populations. These resources not only enhance the quality of life in Georgia and make the state a desirable place to live, but also generate significant revenue from outdoor recreation and eco-tourism.

For example, fishing, hunting, and wildlife-associated recreation is big business in Georgia and has a \$5.5



billion economic impact supporting 40,000 jobs. Georgia has about 830,000 resident anglers and 400,000 resident hunters.

Georgia's rich and diverse forests provide and support these recreational opportunities, resulting in immeasurable value to the state's residents and visitors. Land use and management decisions that achieve sustainability by balancing growth and development with land conservation should be prudently considered now to ensure these opportunities and the associated economic returns remain available to both present and future generations.





## Benefits of Georgia's Forests - Water Quality

**Many of Georgia's 44,056 miles of perennial streams, 23,906 miles of intermittent streams, and 603 miles of ditches and canals begin in or flow through forestlands.** These forest streams filter and purify the water and make clean water available to millions of Georgians. In fact, water produced by these forest streams is much less expensive to treat at municipal water treatment plants than stream water flowing from land used for other purposes. Because an estimated 7,000 forestry operations are conducted on some 800,000+ acres per year statewide, it is important for forest landowners to follow Best Management Practices (BMPs) to protect these water resources.



### Best Management Practices

Since 1977, the Georgia Department of Natural Resources Environmental Protection Division has designated GFC as the lead agency to develop, educate, implement, and monitor the use of Best Management Practices (BMPs) for forestry operations, which, when used properly, minimize or

prevent non-point source pollution (primarily erosion and sedimentation) contributions.

Georgia's BMPs for Forestry were first developed in 1981 and are periodically updated, most recently in 2019. Upon passage of the Clean Water Act (CWA) Amendments of 1987, the EPA issued guidance on the relationship of non-point source controls to 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 monitors BMP implementation at a state-level basis every two years. GFC accomplishes this monitoring through random stratified surveys. The Statewide Water Management Plan recognizes GFC's Water Quality Program as a model for other land-use organizations.

### Ensuring Sustainability

Most forest industries in Georgia are members of the Sustainable Forestry Initiative (SFI) and require loggers who deliver forest products to their facilities to be 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 education 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 forestland.

### 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.
- 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 the forestry community to provide technical assistance and educational programs to other organizations (federal, state, local agencies and non-governmental).
- Forestry must be represented on regional water planning councils.



## Wildlife Benefits from Sustainable Forest Management



Georgia ranks eighth among all states in the number of species at risk and fifth in the number of extinctions.

### Strategies for Sustainability

A primary tool for guiding efforts to sustain overall forest wildlife in Georgia is the “State Wildlife Action Plan” (SWAP). This document, entitled *A Comprehensive Wildlife Conservation Strategy for Georgia*, was completed by the Wildlife Resources Division of the Georgia Department of Natural Resources in 2015, 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 more intensive forestry objectives, forestry practices not meeting the standards of Best Management Practices, and invasive/ alien species. Opportunities exist 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, intensifying forest management demands on the land base, and widespread corporate divestiture of timberlands. Conservation of forest habitat through a system of public and private conservation lands, and through policies that encourage private landowners to keep and manage their forestlands, will be necessary to sustain Georgia’s wildlife.

### Prescribed Fire Enhances Wildlife Habitat

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.

In the absence of prescribed fire, some habitat types will degrade and some species will dwindle and disappear. Fuel will also 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. A sustainable approach to forest and wildlife management must promote the responsible use of prescribed fire at the appropriate scale and frequency. This is accomplished through landowner education and training, public relations, and support from state and federal agencies, non-governmental organizations (NGOs), and private contractors.



Progress continues to be made toward increasing the wise use of prescribed fire as a management tool across Georgia's forests. The state has a very active Prescribed Fire Council comprised of state, federal, non-government organizations (NGOs), and private landowners and managers. GFC has worked closely with county commissioners to share information about the benefits of prescribed burning and the critical need to allow this vital tool to occur wherever possible. For the last decade, an average of 1.4 million acres have been burned annually across the state.

### 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 continuous 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. The growing urban/

wildland interface compounds other problems, including conflicts between wildlife and humans, pets, and livestock.

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

Georgia's Forest Action Plan (FAP), written and maintained by GFC as part of the 2008 Farm Bill, highlights the challenges and opportunities for managing and protecting the array of (healthy) forested ecosystems.

### Conservation and Preservation

One of our greatest opportunities for sustaining forest wildlife populations is to continue building a long-term statewide land conservation program consisting of more public lands and more private lands under permanent conservation easements. This will require significant ongoing 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 Georgia DNR Forestry for Wildlife Partnership Program, and technical assistance provided to forest landowners from GFC's professional foresters 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 FAP 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 National 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 State Government and Georgia's Forestry Community Address These Challenges?

The Georgia General Assembly can support sustainability by ensuring funding for essential forestry and wildlife conservation programs, including implementation of the Forest Action Plan and the State Wildlife Action Plan. Numerous opportunities for the conservation of lands exist, including the ad valorem tax structure which can encourage forest ownership and investments, permanent easement incentives, and public ownership.

It can also:

- Provide support for programs to fight invasive exotic species, promote practices which result in healthy forests, and facilitate prescribed burning.
- Develop outreach and incentive programs to encourage landowners to manage for various ecosystem services, link urban communities with rural communities, and facilitate ecosystem service markets, either in a compliance or voluntary market.
- Further fund research of ecosystem services - both detrimental effects of fragmentation and urbanization and precise valuation of important ecological services.
- Support technical forestry funding to ensure landowners have the knowledge to manage their forests wisely.
- Promote funding to prevent pest introductions.

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# III. Threats to Forest Sustainability in Georgia

## Threats to Forest Sustainability in Georgia



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

### Logging Infrastructure

During the recent recession and the slow recovery in housing markets, impacts to the logging industry in Georgia were substantial. As the forest products industry increases its production in response to slowly improving markets, however, the limitations of this reduced logging capacity are cause for concern.



In order to return to pre-recession capacity levels, significant re-investment in the industry will be necessary. The industry must be financially attractive to lure new business owners and employees into the woods. Challenges in recruitment (and retention) of logging workers and log truck drivers are prevalent nationwide. However, the likelihood of a secure job with a competitive salary will help the industry begin to recover some of its lost capacity.

### Forest Pests & Invasive Species

There are numerous native insects, diseases, and environmental stressors that can impact forest health, and GFC

monitors them and takes action as appropriate to minimize their impacts.



The southern pine beetle (SPB) and other pine bark beetles continue to represent the largest threat to pine timber in Georgia and the South. GFC monitors SPB activity annually and takes measures to thwart its spread. There have been no significant SPB outbreaks in Georgia in the last several years, however the Ips beetle (a less destructive bark beetle) was very active during the drought of 2016. GFC is mandated to monitor our forests for the presence of insect and disease outbreaks and is charged with taking action if warranted to suppress or limit the damage of these pests.

### Invasive Plants

Invasive plants such as cogongrass are finding their way into Georgia. Cogongrass, which destroys wildlife habitat, spreads aggressively and overcomes native grasses and herbaceous browse. It burns extremely hot, increasing the threat of wildfires, and provides no forage for wildlife or domestic livestock.

Established invasive plants including Chinese privet, Chinaberry, kudzu, and Japanese climbing fern, have increased an average of 14 percent in total population over the past two years.







These invasive plants will continue to actively compete with and displace native plants, and are predicted to increase in acreage by 30 percent in the next 50 years. New invasive species continue to appear, with species such as Nepalese browntop showing a 60 percent increase in acreage in Georgia over a two-year period, and invasive species that have been established in Georgia, such as Chinese tallowtree and wisteria, showing increases of 35 percent in acreage over the same two-year period. The challenge continues to be monitoring native forest health issues and aggressively monitoring and responding to new insects and disease in the forest, urban landscapes, and at points of entry. Control efforts are far more effective when actions are taken early to mitigate infestations while they are small and the chances of eradication or control are greatest.

In today's global market, the potential is very real for non-native insects, plants and disease organisms to find their way into Georgia and cause widespread damage. Global markets in Georgia have increased with the Port of Savannah becoming the fastest-growing container port in the nation. New introductions of non-native invasive insects have been attributed to facilities accepting and shipping international cargo containing solid wood packing material. These new introductions have the potential to devastate our native environments. New first introduction non-native invaders have no native enemies to limit reproduction and spread, and no native predators to control populations.

Legislative support and policies to prevent the introduction and spread of non-native exotic plants, animals, and pathogens should be considered. Interagency cooperation on invasive species management can also be increased through the development

and implementation of a statewide invasive species management plan and continued support by the state Invasive Species Task Force. Continued efforts are also needed to strengthen partnerships with Animal Health Inspection Service (APHIS), Customs and Border Protection (CBP), and state agencies in Georgia to function as the first line of defense at our port of entry. Ongoing education is needed for the general public regarding the ecosystem and impacts of non-native invasives. Interagency partnerships need to be strengthened to address the control and sale of invasive species in garden centers and retail establishments across Georgia.

### **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 forestland 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. Many of our forest ecosystems, flora and fauna, benefit from prescribed fire.

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 and wildfire suppression. The sustainability of Georgia's forest is dependent on attention to both prescribed fire and wildfire suppression.

### **Urbanization**

Urbanization is a major threat to forest sustainability, and continues to be the largest single reason forests are converted to non-forest uses. According to US Forest Service assessments, urbanization and fragmentation are the leading threats to the Southern forest. At present, 77 percent of Georgia's





population live in either urbanized or wildland urban interface (WUI) areas. Research has shown that in areas where population density exceeds 150 people per square mile, ongoing timber management ends. This land use change indicates a lack of economic support for local ongoing forestry operations on a significantly increasing land area. This trend is expected to continue, particularly as Georgia's economy improves. Additional studies will further assess the change in rural land acreage and the pressure of urban growth on the sustainable wood products market.

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 fire plays in ecosystems.

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

### Natural Disasters

Natural disasters pose a constant threat to our forest resources.



Georgia's most recent disaster, Hurricane Michael, brought heavy rain and hurricane force winds (124-150 miles per hour) to southwest Georgia on October 11, 2018. GFC estimates that 2,368,226 acres of forestland were impacted by the storm, with an estimated value of \$762,683,909. This devastation equated to generational losses for Georgia's private landowners.

Georgia's General Assembly recognized the extent of damage and convened a special legislative session in November to address it. The results of the special session were HB 1EX and HB 4EX, both passed by the House and Senate and signed by Governor Deal.

HB 1EX provides \$270 million for immediate and direct relief for those who have suffered from the storm. Provisions include \$20 million in emergency funding for forest debris cleanup efforts approved by GFC and administered by the Georgia Development Authority (GDA). In addition, \$7 million in funding was approved for new heavy firefighting

equipment for GFC. The new equipment will be focused on cleaning up debris and preventing future wildfire risks. GFC, working with the governor's office and our sister agencies, devised two programs to administer the \$20 million allocated for forest debris cleanup efforts: the Forest Debris Management Program and the Forest Access Road and Firebreak Restoration Project. Applications for both programs were being collected at press time, and the outcomes of the programs remain unknown. Initial forest landowner response to the programs has been overwhelmingly positive.

HB 4EX creates a \$200 million income tax credit program for forest landowners who incurred losses within the 28-county disaster area. The credit is contingent upon reforestation of the property, and it is expected to restore approximately 500,000 acres of forestland. Eligible forest landowners will be required to apply to the Department of Revenue (DOR) at 100 percent of the value of their timber loss with a cap at \$400/acre.



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Future aid packages to restore forestlands damaged by natural disasters would positively impact landowners' willingness and ability to reforest their lands and should be considered with future disasters.

### **Conclusion**

Georgia's forests supply abundant benefits today and are poised to remain sustainable well into the future. The state's forested acres have remained relatively stable for more than 60 years, delivering environmental and economic benefits

and enhancing the quality of life for all citizens. Georgia's wise investment in forestland has resulted in increased productivity, though challenges including urbanization, smaller tract sizes, and taxation continue to be faced. One of the most pressing issues is short term availability of markets for forest products, as landowners cope with the financial realities of land conversion options and long term forest investment. Georgia's landowners and Georgia's leaders hold the key to ongoing stewardship of our valuable forest resource.

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# Source References and Appendix

## Source References



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# Appendix Map - GFC Forest Management Regions



## REGION 1

**Field Offices: 21**

**Field Foresters: 6**

Counties:

Bartow, Butts, Carroll, Catoosa, Chattahoochee, Chattooga, Cherokee, Clayton, Cobb, Coweta, Dade, DeKalb, Douglas, Fayette, Floyd, Gordon, Haralson, Harris, Heard, Henry, Lamar, Marion, Meriwether, Muscogee, Newton, Paulding, Pike, Polk, Rockdale, South Fulton, Spalding, Talbot, Troup, Upson, Walker, Whitfield

## REGION 2

**Field Offices: 18**

**Field Foresters: 6**

Counties: Banks, Barrow, Clarke, Dawson,

Elbert, Fannin, Forsyth, Franklin, Gilmer, Glascock, Greene, Gwinnett, Habersham, Hall, Hancock, Hart, Jackson, Lincoln, Lumpkin, Madison, McDuffie, Morgan, North Fulton, Oconee, Oglethorpe, Pickens, Rabun, Stephens, Taliaferro, Towns, Union, Walton, Warren, Washington, White, Wilkes

## REGION 3

**Field Offices: 21**

**Field Foresters: 6**

Counties: Baldwin, Bibb, Bleckley, Bulloch, Burke, Candler, Chatham, Columbia, Crawford, Effingham, Emanuel, Houston, Jasper, Jefferson, Jenkins, Johnson, Jones, Laurens, North Bryan, Peach, Pulaski, Putnam, Richmond, Screven, Treutlen, Twiggs, Wilkinson

## REGION 4

**Field Offices: 25**

**Field Foresters: 6**

Counties: Baker, Ben

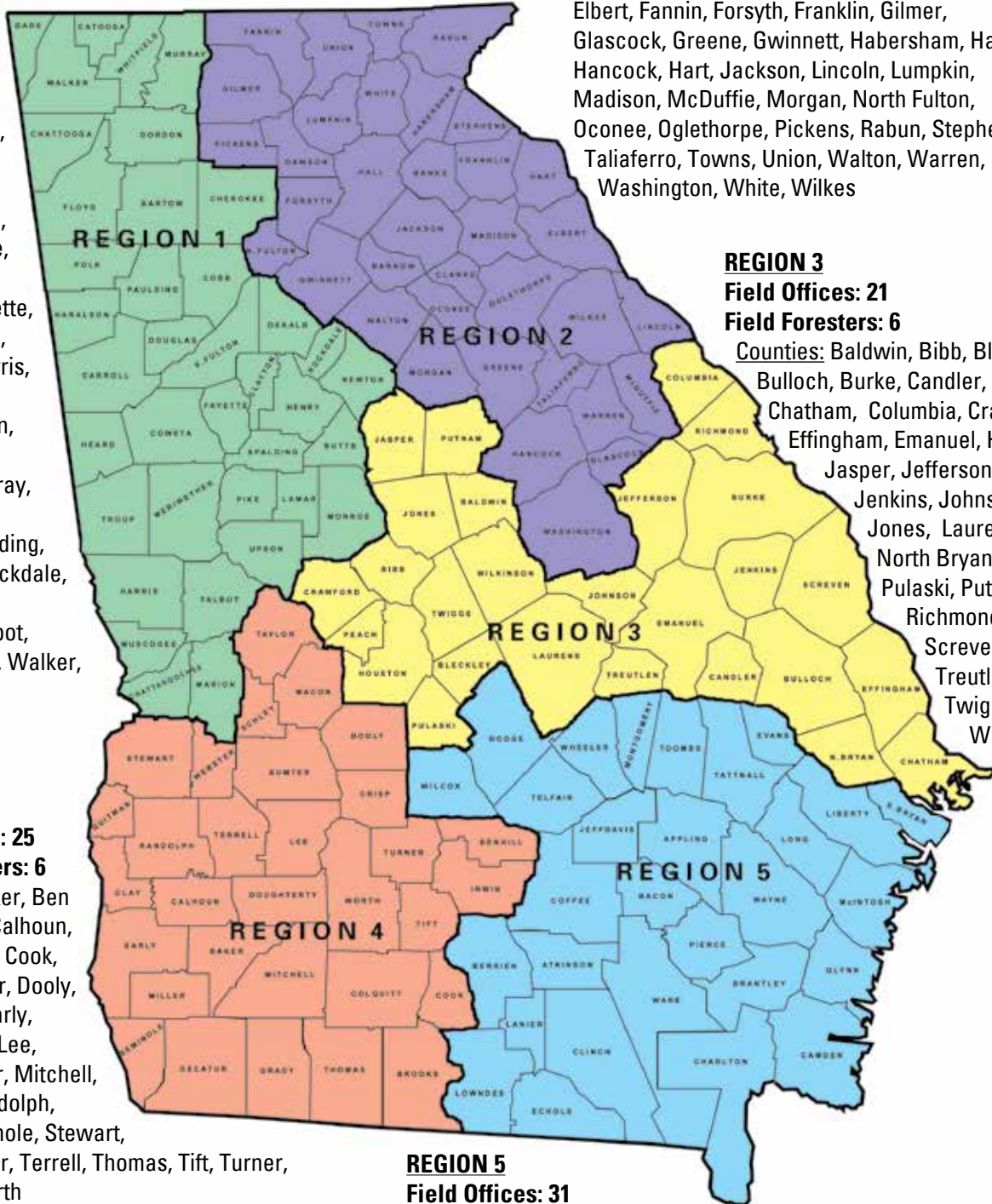
Hill, Brooks, Calhoun, Clay, Colquitt, Cook, Crisp, Decatur, Dooly, Dougherty, Early, Grady, Irwin, Lee, Macon, Miller, Mitchell, Quitman, Randolph, Schley, Seminole, Stewart, Sumter, Taylor, Terrell, Thomas, Tift, Turner, Webster, Worth

## REGION 5

**Field Offices: 31**

**Field Foresters: 6**

Counties: Appling, Atkinson, Bacon, Berrien, Brantley, Camden, Charlton, Clinch, Coffee, Dodge, Echols, Evans, Glynn, Jeff Davis, Lanier, Liberty, Long, Lowndes, McIntosh, Montgomery, Pierce, South Bryan, Tattnall, Telfair, Toombs, Ware, Wayne, Wheeler, Wilcox





# Map - GFC FMO Area Map

## AREA 1

### Response Units: 13

Counties: Bartow, Carroll, Catoosa, Chattooga, Cherokee, Cobb, Dade, Douglas, Floyd, Gilmer, Gordon, Haralson, Murray, N. Fulton, Paulding, Pickens, Polk, Walker, Whitfield

## AREA 2

### Response Units: 9

Counties: Banks, Barrow, Clarke, Dawson, Elbert, Fannin, Forsyth, Franklin, Gwinnett, Habersham, Hall, Hart, Jackson, Lumpkin, Madison, Rabun, Stephens, Towns, Union, White

## AREA 4

### Response Units: 8

Counties: Baldwin, Bibb, Crawford, Greene, Hancock, Houston, Jasper, Jones, Morgan, Oconee, Peach, Putnam, Twiggs, Walton, Wilkinson

## AREA 5

### Response Units: 9

Counties: Burke, Columbia, Glascock, Jefferson, Johnson, Lincoln, McDuffie, Oglethorpe, Richmond, Taliaferro, Warren, Washington, Wilkes

## AREA 8

### Response Units: 13

Counties: Bulloch, Candler, Chatham, Effingham, Emanuel, Evans, Jenkins, Liberty, Long, McIntosh, N. Bryan, S. Bryan, Screven, Treutlen

## AREA 3

### Response Units: 13

Counties: Butts, Chattahoochee, Clayton, Coweta, DeKalb, Fayette, Harris, Heard, Henry, Lamar, Macon, Marion, Meriwether, Monroe, Muscogee, Newton, Pike, Rockdale, S. Fulton, Spalding, Talbot, Taylor, Troup, Upson

## AREA 6

### Response Units: 11

Counties: Clahoun, Clay, Crisp, Dooly, Dougherty, Lee, Quitman, Randolph, Schley, Stewart, Sumter, Terrell, Tift, Turner, Webster, Worth

## AREA 9

### Response Units: 14

Counties: Baker, Berrien, Brooks, Colquitt, Cook, Decatur, Early, Echols, Grady, Lanier, Lowndes, Miller, Mitchell, Seminole, Thomas

## AREA 7

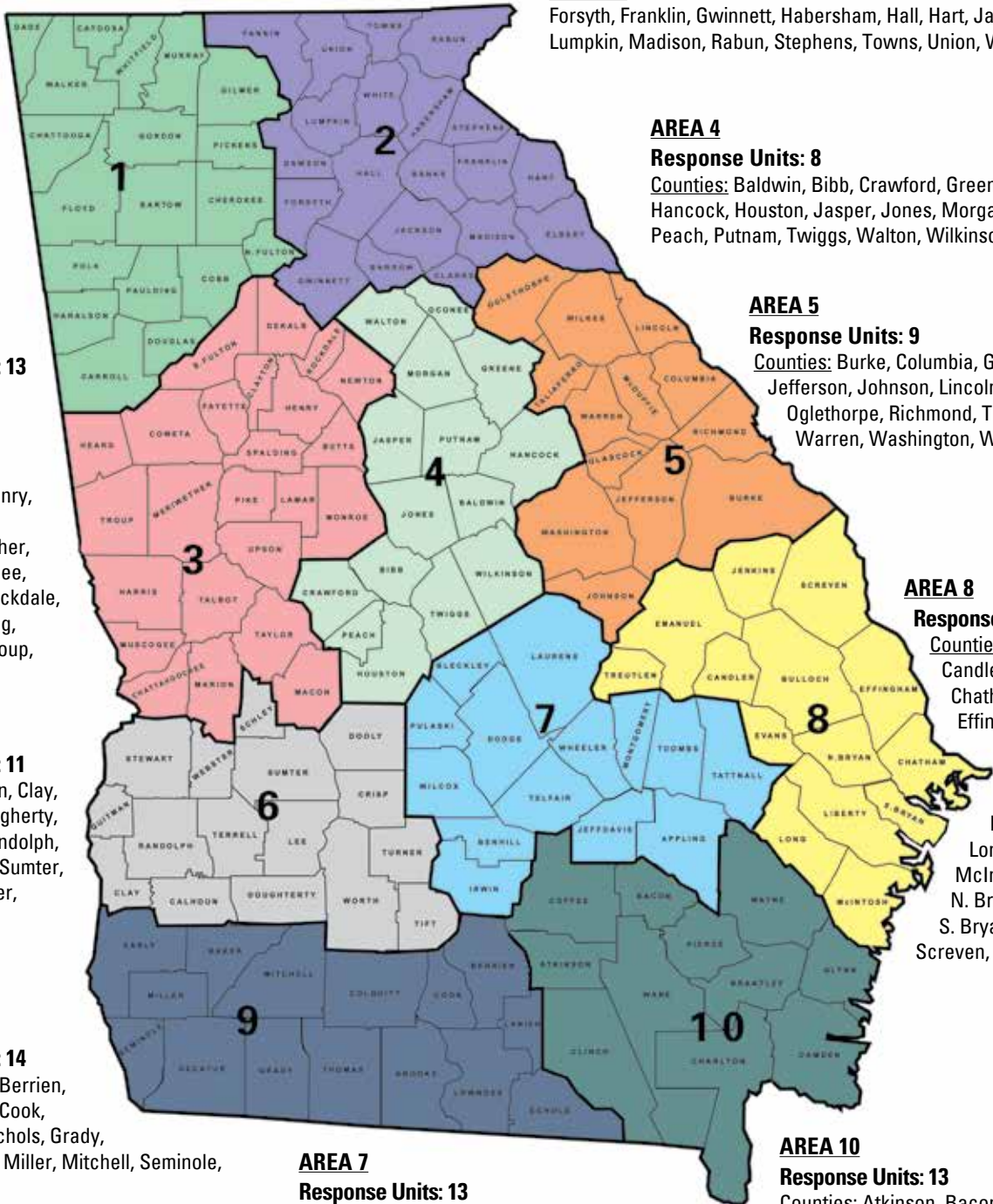
### Response Units: 13

Counties: Appling, Ben Hill, Bleckley, Dodge, Irwin, Jeff Davis, Laurens, Montgomery, Pulaski, Tattall, Telfair, Toombs, Wheeler, Wilcox

## AREA 10

### Response Units: 13

Counties: Atkinson, Bacon, Brantley, Camden, Charlton, Clinch, Coffee, Glynn, Pierce, Ware, Wayne



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