

Forest sustainability in the state of Georgia, USA

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DRAFT

1. Introduction

The combustion of wood for energy purpose is not considered to contribute to the augmentation of greenhouse gases concentration in the atmosphere, as long as the CO₂ emissions released during the combustion of wood are balanced by the growth of new trees. It is therefore essential to investigate if the forests in the region where the wood used for energy purpose are managed in a sustainable way, avoiding resources associated with overexploitation of forests, land use change, depletion of carbon stocks, etc...

In this framework, literature research was carried out to produce a summary of forest management in Georgia, including general condition, management and sustainability assessment.

2. Georgia forests overview

2.1. Location and distribution

Georgia is located in the South East of the USA and covers a total surface area of 153 909 km²

Figure 1: General maps of Georgia



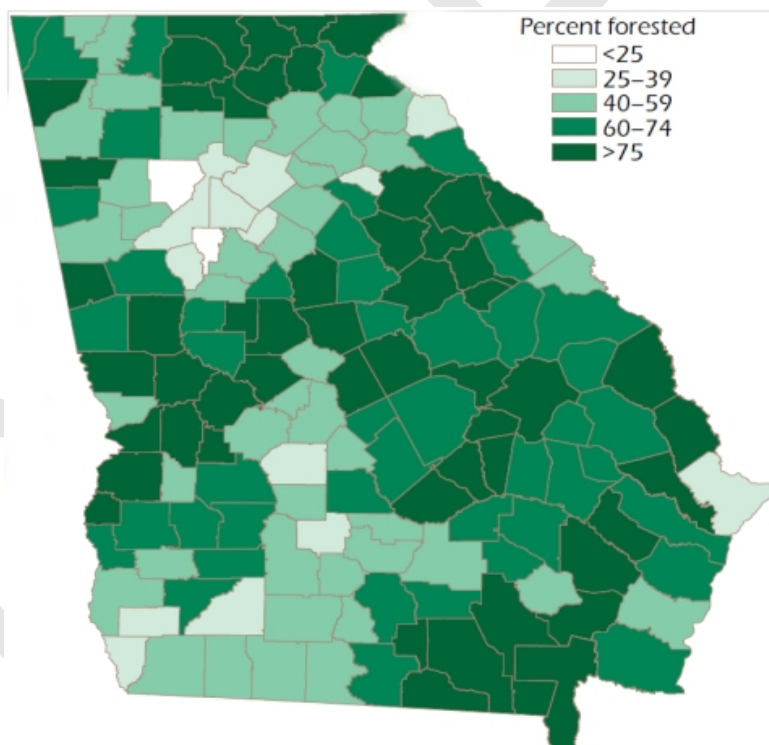
Georgian forest is part of the large forest area of the East coast of the United States of America as shown at the figure 4. Georgia contains the largest area of forest cover in the South with 10.02 million

ha, accounting for 67% of the State's land area (situation as per 2012 Forest Inventory and Analysis, USDA – Forest service).

As shown on the figure below, the forests are well-distributed amongst the State and 128 of the 159 counties are covered over 50% forested. These counties account for 91% of the forest land area and 89% of the live-tree inventory volume. We can notice that regions are less forested than the rest of the State:

- the Atlanta Metropolitan Area and its surroundings, which are highly urbanized and residential;
- the South West of the State (East Gulf Coastal plain region), where there are more agricultural activities.

Figure 2 : Percentage of land in forest by county



Source: Forest Inventory & Analysis Factsheet Georgia 2011

2.1. Ecological zones

Georgia is under humid subtropical climate. It includes six main ecological zones:

- the Lower Coastal Plain,

- the Upper Coastal Plain (or Southeastern Plains),
- the Piedmont,
- the Blue Ridge,
- the Ridge and Valley Region
- the Appalachian Plateau (South Western Appalachian Plateau)

The Lower Atlantic Coastal Plain occupies about one fourth of the State and consists in low landscape. The East Gulf Coastal Plain is similar to former plain but is less sandy and is partly occupied by the Okefenokee Swamp. The Piedmont shows a hilly landscape with an elevation of around 460 meters to the North and 120 meters to the South. The Blue Ridge is a small part of Georgia with mountain peaks rises from 600 to almost 1 500 metres above the sea level. The highest peak of Georgia, the Mount Etonah rising at 1 458 meters, is found in this part of the State. The Appalachian Ridge and Valley Region consist of series of broad, fertile valleys separated by parallel ridges of sandstone. The Appalachian Plateau, taking place in the extreme northwestern part of the State consist of narrow valleys and wooded ridges with elevations of about 600 meters.

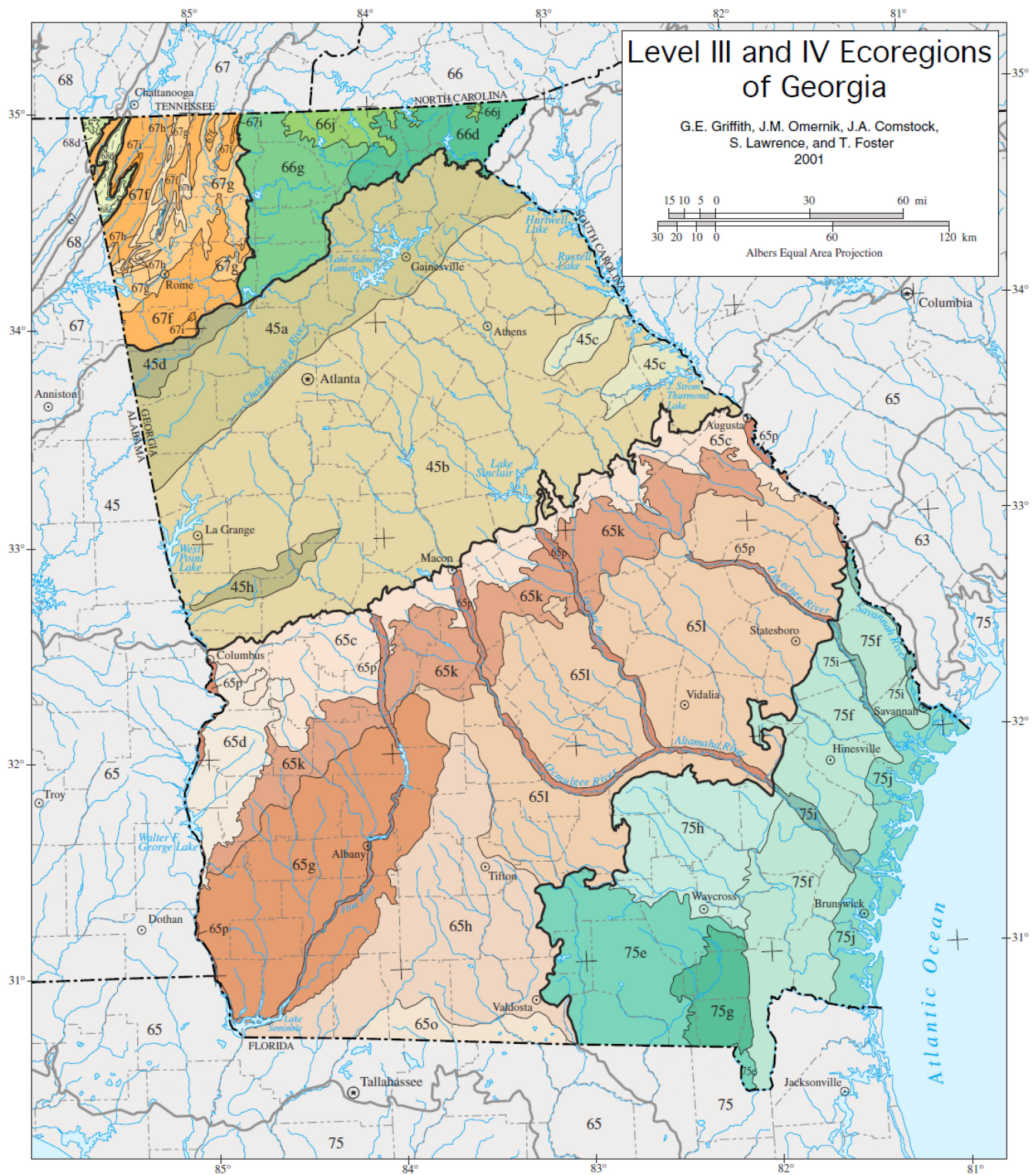
Georgia has a subtropical humid climate.

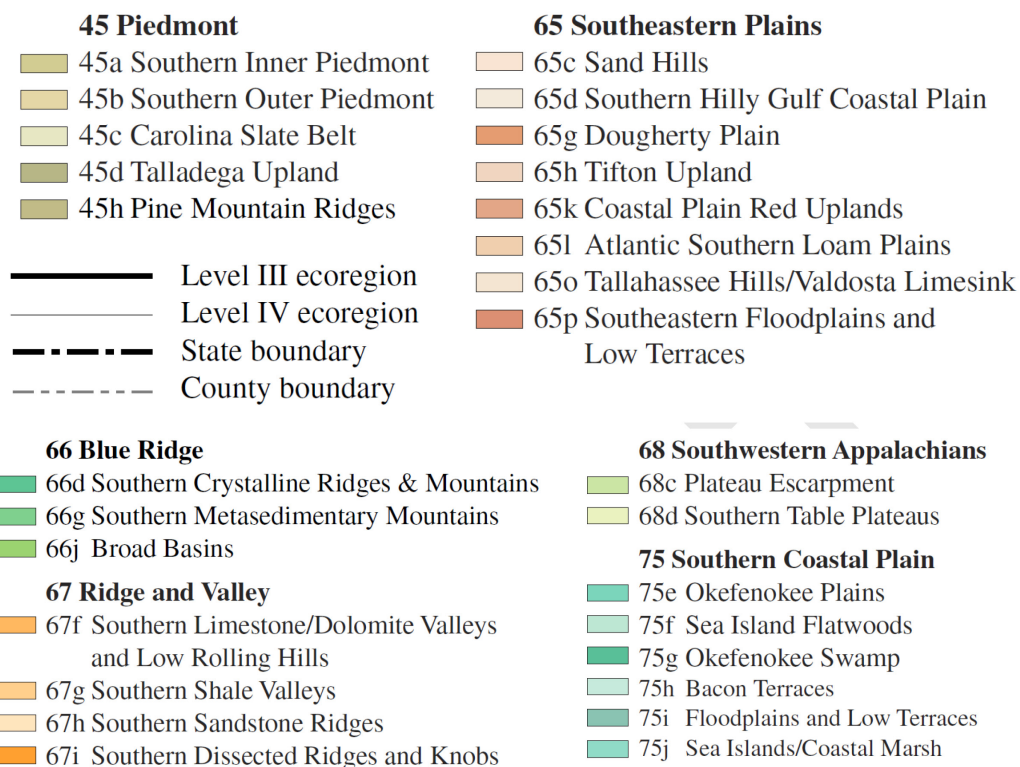
Depending on the place, the average of maximum temperatures recorded in July are in the range 31 to 34 °C while the average of the minimum temperatures recorded in January are in the range -2°C to 5°C ¹.

Depending on the place, the average precipitations range from 1 100 to 1 800 mm per year².

¹ <http://www.ustravelweather.com/weather-georgia/>

² <http://www.griffin.uga.edu/aemn/cgi-bin/CLIMATE.pl?map=p&b=01&e=12>

Figure 3 : Ecological zones of Georgia



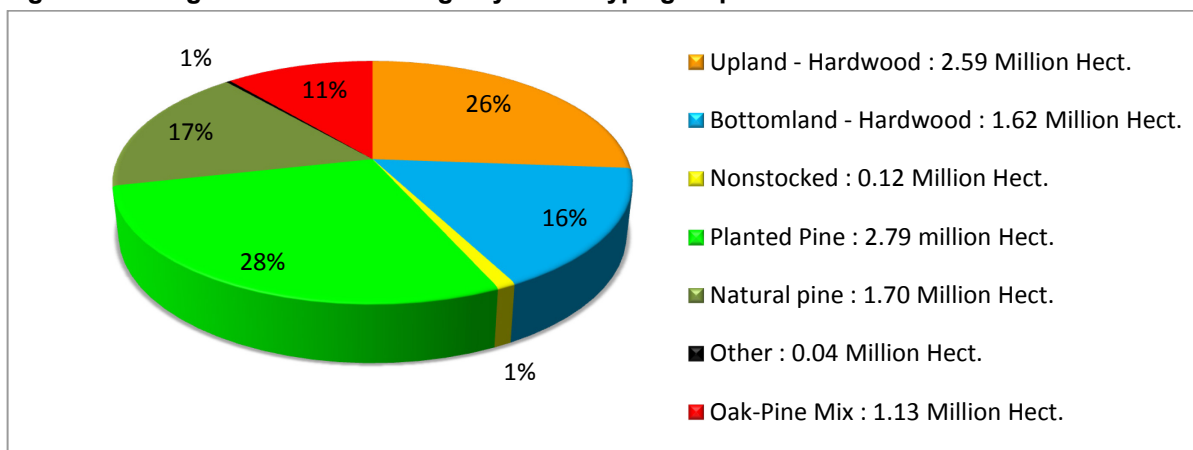
Source : http://ftp.epa.gov/wed/ecoregions/ga/ga_eco_sml.pdf

2.2. Forest species

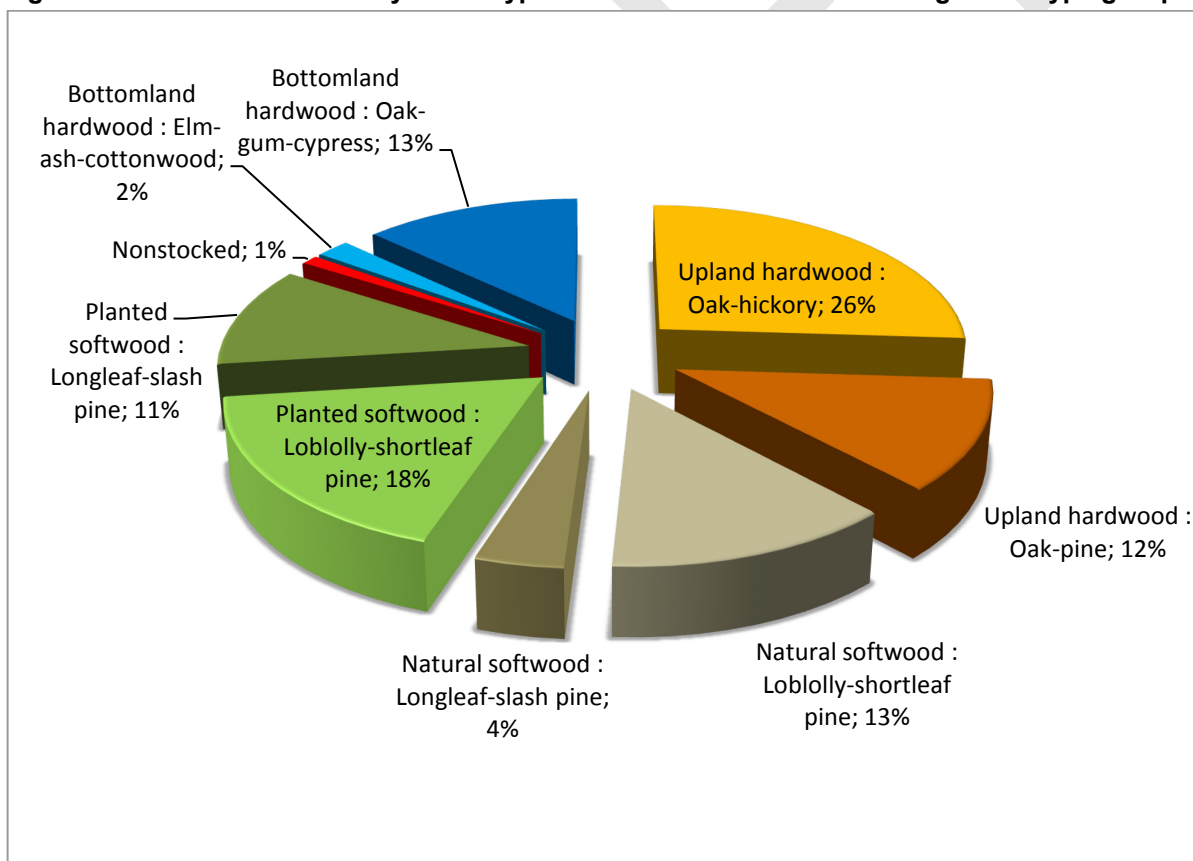
Conifers make up around 45% of the forest area, hardwood 42% and mixed conifers/hardwood forest 12%. The main forest species found in Georgia are: several species of pine (longleaf, slash, loblolly and shortleaf pine), oak, hickory, maple, yellow poplar and sweetgum.

Loblolly-shortleaf pine is the predominant forest type covering 31% of area followed by oak-hickory with 26%. Longleaf-slash pine covers 13%. Since 1997, longleaf pine forest-type area has increased 53000 hectares to a total of 220500 hectares and the planted portion has increased 92200 hectares or fivefold.

The area distribution occupied by these species is presented on the figures below:

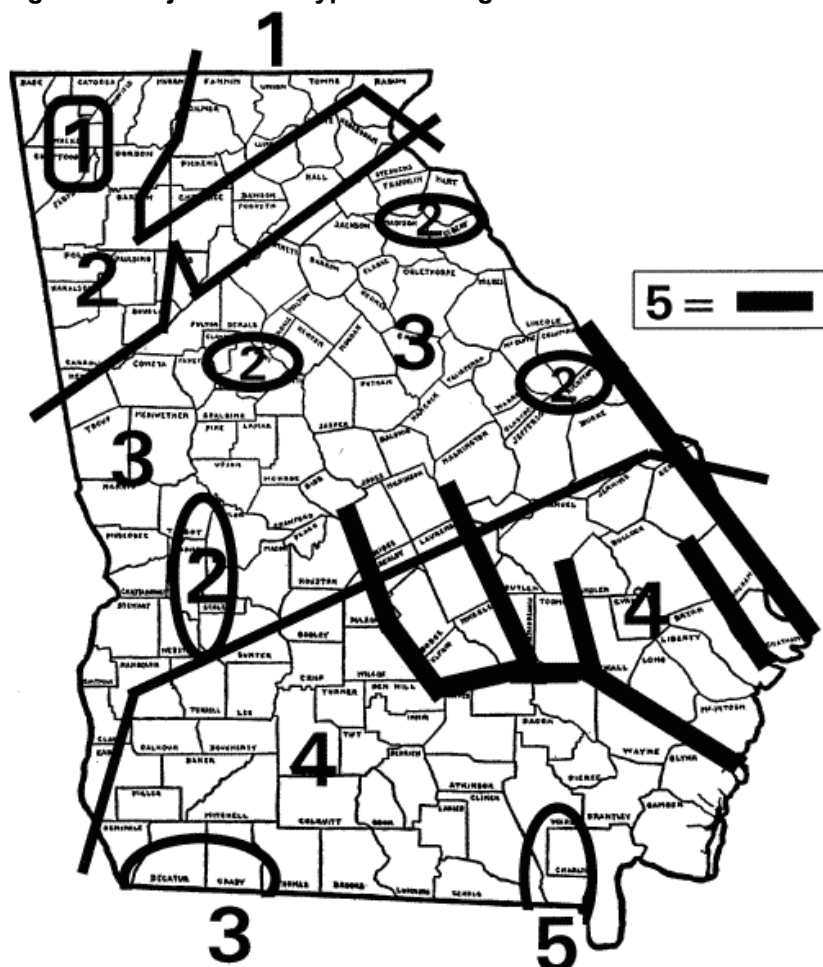
Figure 4: Georgia forestland acreage by forest-type group

Source: adapted from Forest Inventory & Analysis Program – Updates for Georgia's Forestland – 2012 FIA Data

Figure 5 : Area of timberland by forest-type and consolidated forest management-type groups

Source: adapted from Forest Inventory & Analysis Factsheet – Georgia 2011

Figure 6 : Major Forest Types of Georgia



1. oak, hickory
2. oak, pine
3. loblolly, shortleaf pine
4. longleaf, slash pine
5. oak, gum, cypress

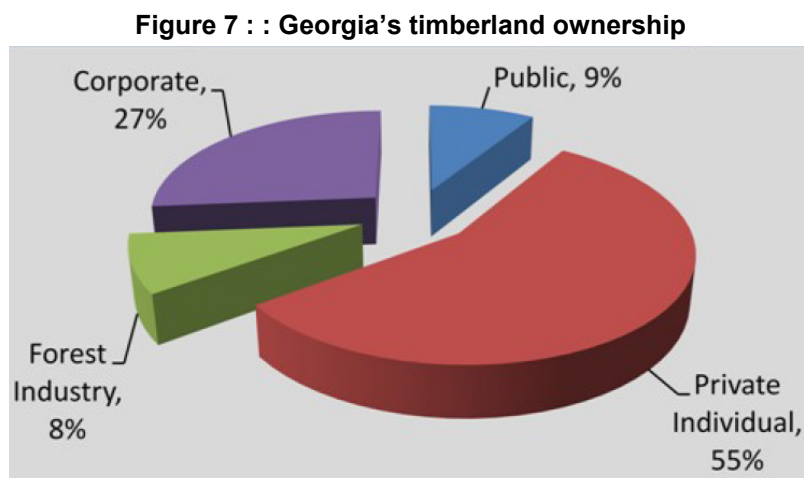
source: Forest Ecology Map Pack, Kim D. Coder, Warnell School of Forest Resources, The University of Georgia, 1996 ³

2.3. Forest ownership

Georgian forests are mainly owned by private owners (91%). Individual/family forests dominate private ownership with 5.46 million hectares or 55% of the timberland area. The 9% remaining belongs to federal, state and local public owners. Georgia has the largest privately owned timberland acreage in the United States. Georgia's timberland ownership pattern is given on the following figure.

³ <http://warnell.forestry.uga.edu/SERVICE/LIBRARY/index.php3?docID=107&docHistory%5B%5D=5>

According to the report “State of the forest: a report on Georgia forests 2007”, some 168 000 individual forestland owners own 4 or more hectares.



Source: Forest Inventory & Analysis Program – Updates for Georgia's Forestland – 2012 FIA Data

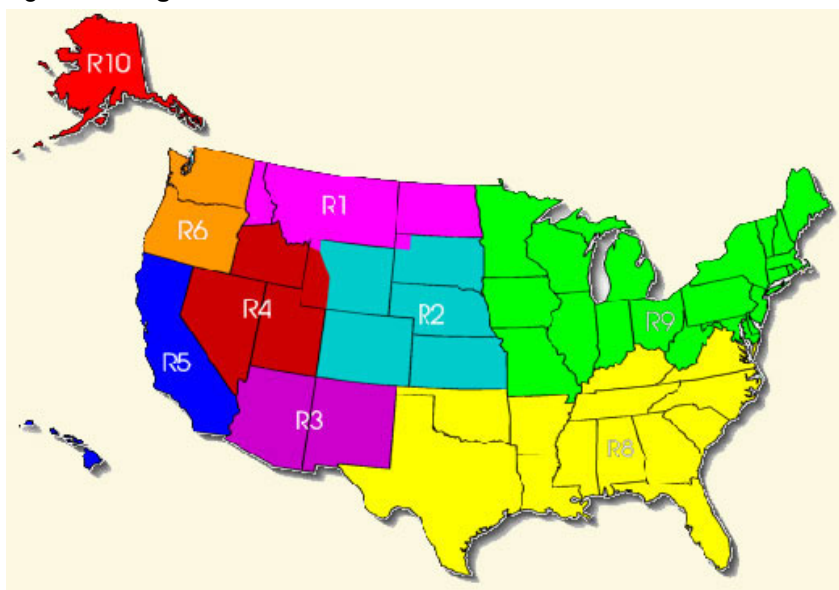
2.4. Competent authorities

Forest management in the United States of America, at the federal level is under the authority of the US Department of Agriculture and more specifically it's agency of the US Forest Service whose mission is to:

“Sustain the health, diversity, and productivity of the Nation's forests and grasslands to meet the needs of present and future generation”⁴

Forest management of the territory of the United States is shared in 10 different parts belonging to regional divisions of the Forest Service. As shown on the figure below, Georgia and other States like Alabama and Florida belongs to the R8 region: Southern Region.

⁴ Forest Service Agency Financial report- Fiscal Year 2008

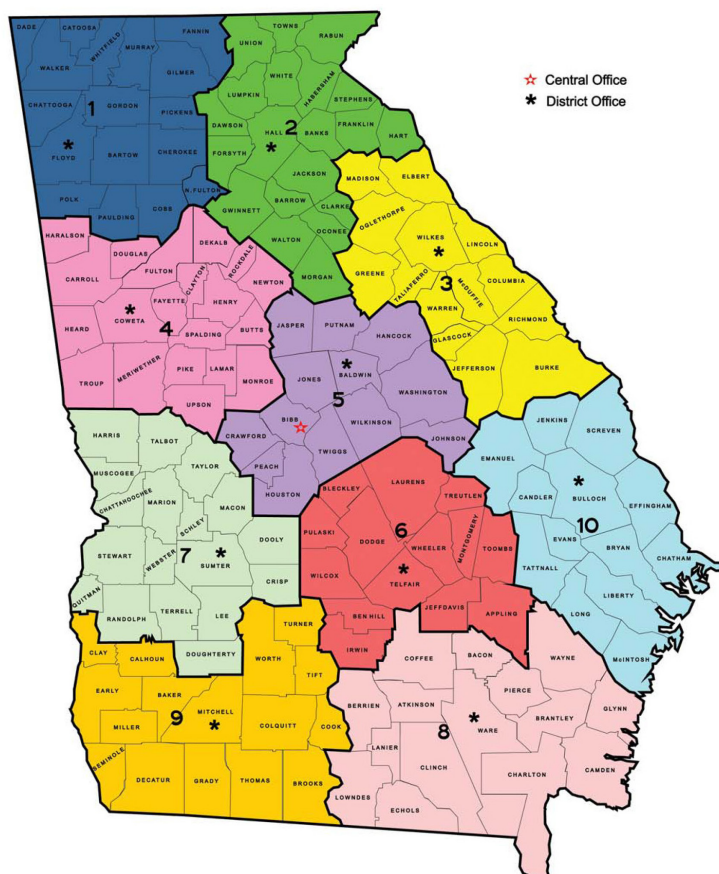
Figure 8 : **Regional areas of the Forest Service**

Source : <http://www.fs.fed.us/>

The authority responsible for forest management in Georgia is split into two levels: federal and state. The Forest Service – an agency of the Department of Agriculture – is responsible at federal level for the coordination of forest policies and the management of federal forests. At state level, the Division of forestry of the Georgia Forestry Commission is in charge of forest management. Its mission is to provide leadership, service and education in the protection and conservation of Georgia's forest resources. The Commission contains several services in relation with her core missions:

- Forest fire protection and prevention,
- Forest management;
- Reforestation;
- Sustainable community forestry;
- Forest marketing and utilization.

Georgia's territory is divided in some district as shown on the figure below:

Figure 9 : Georgia Forestry Commission's districts

Source : www.gfc.state.ga.us

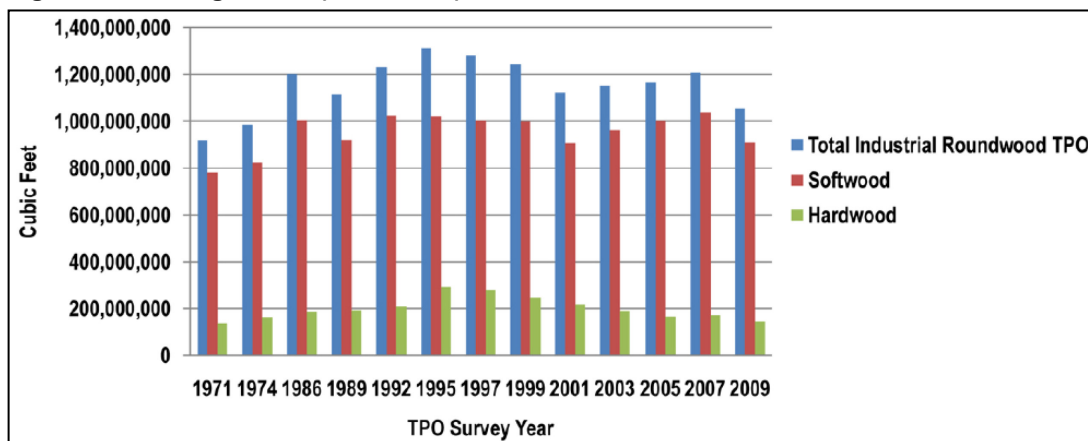
2.5. Overview of wood-related industry

Following the Commission, the wood-related industry employs more than 154 000 Georgians and generates an annual turnover of almost 26 billion dollars. Forestry ranks 2nd in the State's manufacturing economy. Georgia has 12 pulp mills 9 engineered-wood products mills, 140 sawmills/pole mills, and over 1200 other industries that provide secondary processing to Georgia's wood products.

The figure below present a few highlights about Georgia's timber product output (TPO) from 1971 to 2009. Softwood TPO is the largest component of total TPO averaging 83% for the period.

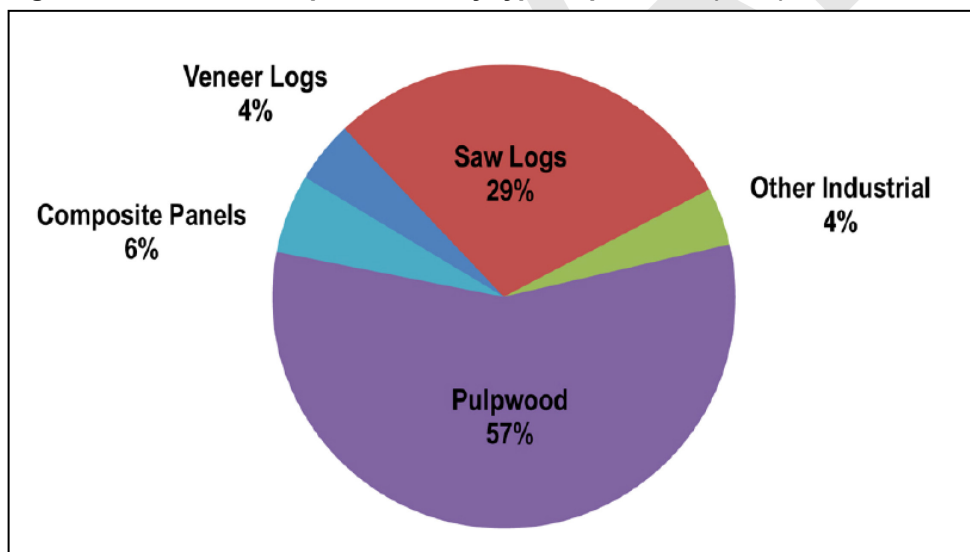
Between 2007 and 2009:

- Softwood TPO declined -12.5%
- Hardwood TPO declined -16.0%
- The combined softwood and hardwood TPO declines equates to a loss of 305 truck loads per day of roundwood deliveries to mills for processing

Figure 10 : Georgia TPO (1971-2009)

Source: Georgia Forestry Commission – 2011 Georgia Timber Utilization Update

In 2009, pulpwood and saw logs were the principal roundwood products, as shown on the figure below. Combined output of these two products totalled about 25.7 million m³ and accounted for 86% of the state's total industrial roundwood output.

Figure 11 : Roundwood production by type of products (2009)

Source: Georgia Forestry Commission – 2011 Georgia Timber Utilization Update

3. Sustainability of Georgia forest

3.1. *Evolution of forest area an risk of conversion*

As shown on the Figure 12, Georgian forest area has strongly increased in the first part of the 20th century and fluctuated in the second part. The forest area has been rather stable since the year 1990, even though we do observe that the latest trend is slow but consistent decrease, with a loss of about 1% of the forest area between 2005 and 2012 (i.e. 0.15% decrease yearly on average). The evolution in the period 1997 to 2012 is shown on Table 1.

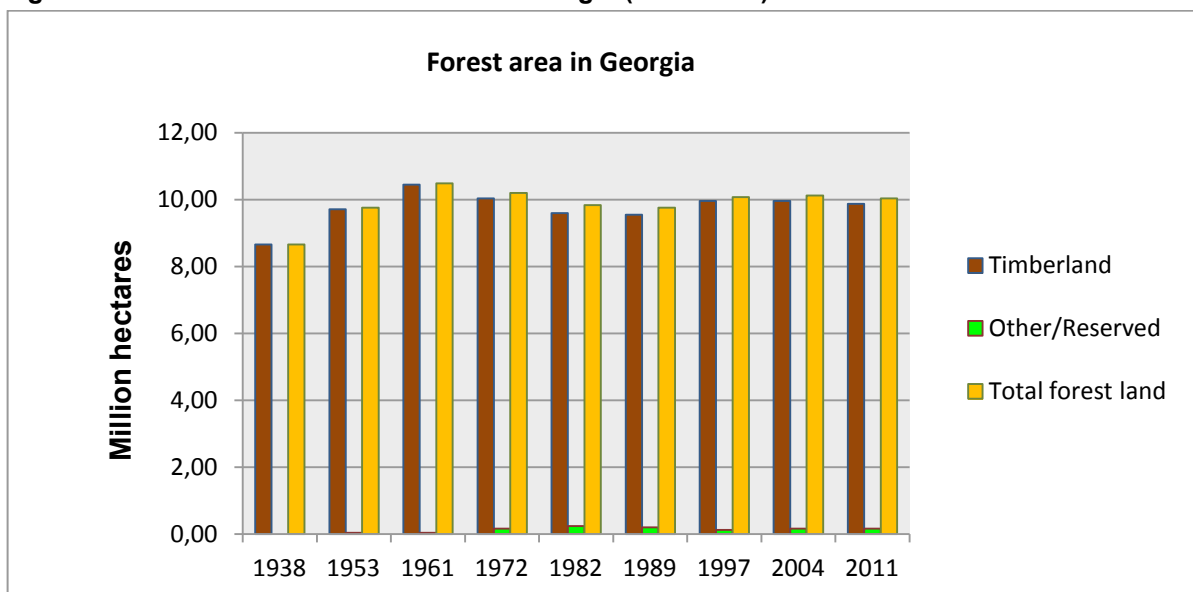
The yearly data of the Forestry Inventory and Analysis (FIA) makes possible to further investigate the recent decrease of the forest areas in Georgia, through the evolution of forest area by county (see annex 1). Not surprisingly, most of the counties where the large losses of forest were recorded are situated in the surroundings of Atlanta Metropolitan Area, where most of the state population is concentrated and where important areas of forests are reported to be converted for urbanization and in particular residential developments (e.g. counties of Clarke, Barrow, Fulton and Gwinnett, where about 20% of the forests were lost between 2005 and 2012).

To a lesser extent, counties with a large contribution to the state forest loss also appear in the Upper Coastal plain region, which is more cultivated and less forested than the rest of the state.

The Georgia Forestry Commission has identified urbanization as one of the major threats to Georgia forest, mainly in the region of Atlanta⁵, where an estimated 12 000 ha forest area was lost yearly during the period 1991-2001 (i.e. 0.12% of the state forest cover). Despite those losses, the total forest area during the period 1991 to 2011 has increased thanks to new land being reforested elsewhere in the state. But when those losses can not be compensated any longer, a net decrease of forest surfaces is recorded, and this is what we can see happening during the period 2005-2012.

About 98% percent of the total forested land is used for commercial timber production. The remaining forested area is reserved forest land or other type of forested land out of production (this is the difference between forest land and timberland as on Figure 12).

⁵ <http://www.gfc.state.ga.us/resources/publications/SustainableForestManagementinGeorgiarev0309.pdf>

Figure 12 : Evolution from forest area in Georgia (1938-2011)

Source: adapted from Forest Inventory & Analysis Factsheet - Georgia 2011

Table 1 : Evolution from forested area in Georgia (1989-2012)

year	Forestland (ha)	chnage (ha)	change (%)
1997	10 055 626	-	-
1998	10 095 375	39 749	0.40%
1999	10 086 524	-8 851	-0.09%
2000	10 104 789	18 265	0.18%
2001	10 117 731	12 942	0.13%
2002	10 113 083	-4 648	-0.05%
2003	10 093 972	-19 111	-0.19%
2004	10 124 369	30 397	0.30%
2005	10 126 333	1 963	0.02%
2006	10 087 529	-38 803	-0.38%
2007	10 080 618	-6 911	-0.07%
2008	10 053 338	-27 280	-0.27%
2009	10 038 249	-15 089	-0.15%
2010	10 030 621	-7 628	-0.08%
2011	10 023 705	-6 916	-0.07%
2012	10 016 973	-6 732	-0.07%

The FSC risk assessment platform www.globalforestregistry.org considers the USA are at unspecified risk in terms of conversion of forest to other land uses, because the following criterion is not verified in the country:

- There is no net loss AND no significant rate of loss (> 0.5% per year) of natural forests and other naturally wooded ecosystems such as savannahs taking place in the eco-region in question

Indeed, even though at the national level, forested area in the USA increase by 0.1% yearly on average, there are important regional variations and forest extent is known to be decreasing in different parts of the country. Hence the Global Forest Registry recommends performing an analysis at the state level.

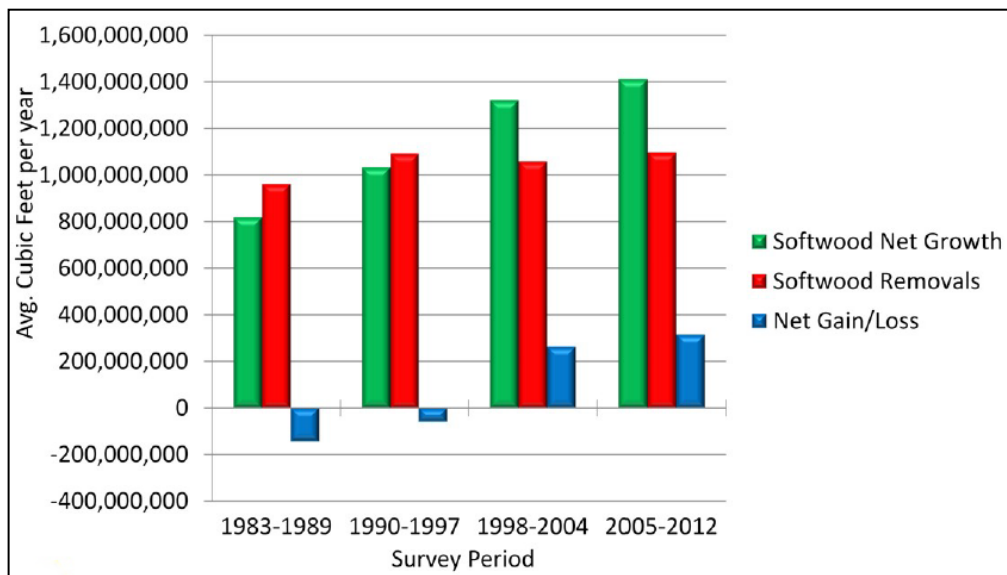
As we have seen above that the most recent trend in Georgia was the loss of 1% of the forested area between 2005 and 2012, we can't exclude a risk of conversion and recommend an analysis at a finer level. The risk can be seen as unspecified at the state level.

At the county level annex 2 makes possible to identify counties where the average annual losses of forest were in excess of 0.5% (which is the threshold the Global Forest Registry refers to in its risk assessment). There are 48 counties where the 0.5% threshold was exceeded as yearly average in the period 2005-2012 (out of the 159 counties in Georgia).

3.2. *Living wood volumes and removals*

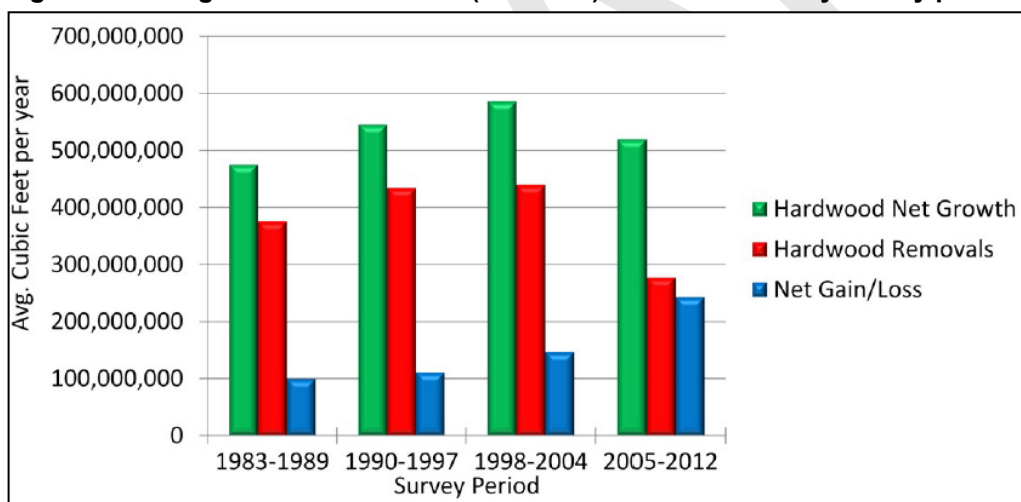
Despite the slight recent decrease of forest areas in Georgia (as described in the previous section), the volume of living wood shows a very significant and consistent increase during the same period. This indicates an increased maturity of the forests and guarantee the possibility to keep on harvesting in the future volumes of wood that are similar to what is currently harvested, or even more.

According to Georgia Forestry Division (Data 2012), the net growth of softwoods (mostly pines) has exceeded removals (through harvesting) for the past 16 years (figure 12). The net growth of hardwoods has exceeded removals since at least 1982 (figure 13). The figure 14 shows net growth versus removals for all species combined. Georgia has been growing more wood volume than its harvesting since 1990's.

Figure 13 : Net growth VS Removals (Harvests) for Softwoods by survey period

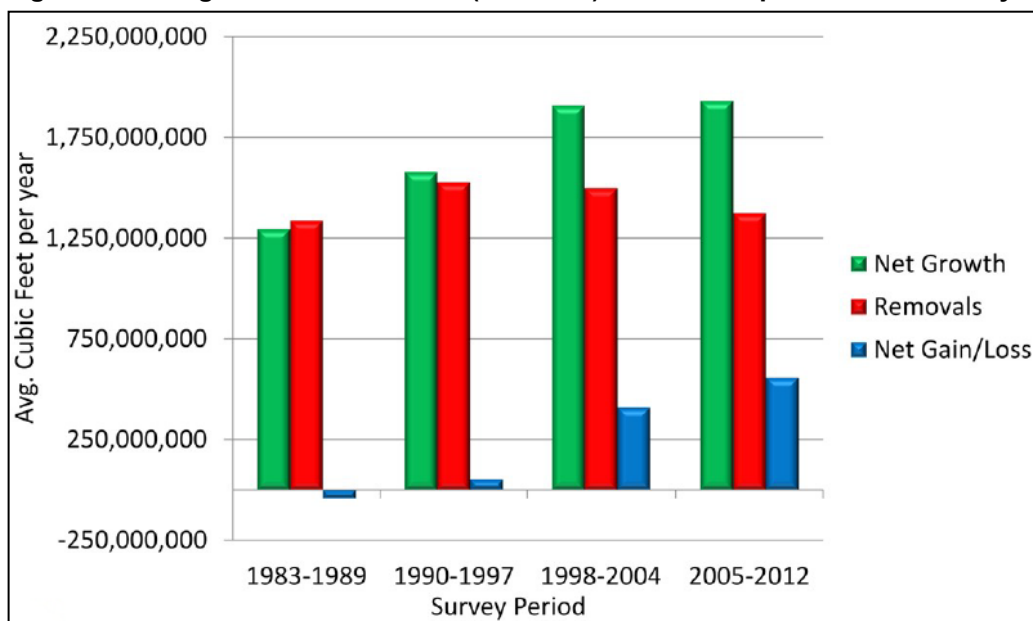
Net growth = total growth of the trees minus natural mortality

Source: Forest Inventory & Analysis Program – Updates for Georgia's Forestland – 2012 FIA Data

Figure 14 : Net growth VS Removals (Harvests) for Hardwoods by survey period

Net growth = total growth of the trees minus natural mortality

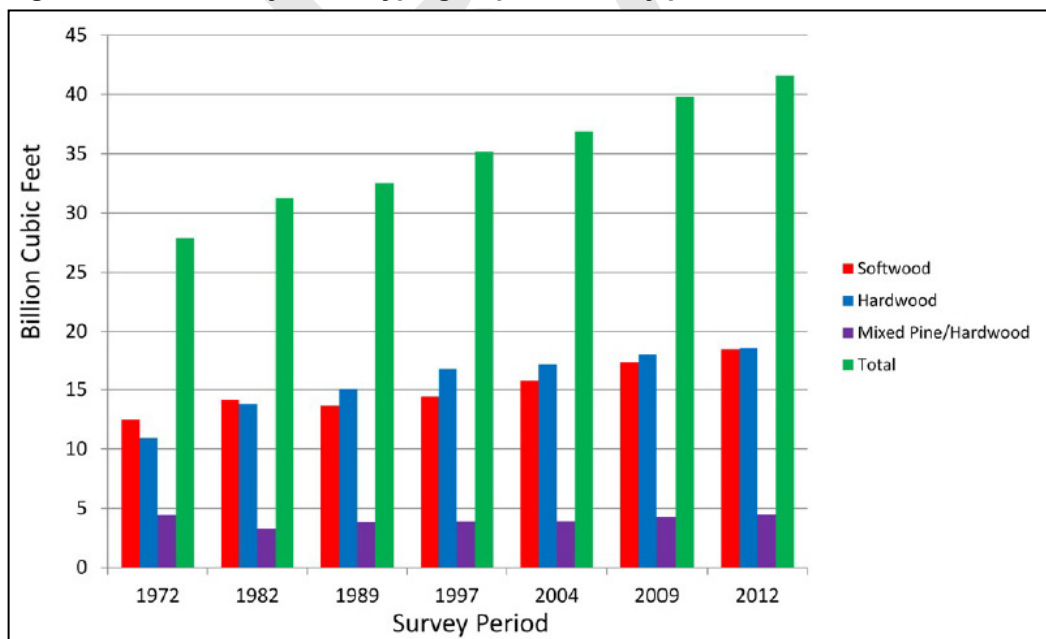
Source: Forest Inventory & Analysis Program – Updates for Georgia's Forestland – 2012 FIA Data

Figure 15 : Net growth VS Removals (Harvests) for all tree species combined by survey period

Net growth = total growth of the trees minus natural mortality

Source: Forest Inventory & Analysis Program – Updates for Georgia's Forestland – 2012 FIA Data

The figure below shows volumes for the different forest-type-group through the years. Volumes have increased across all broad forest-type-groups when comparing 2012 to 1972.

Figure 16 : Volume by forest-type-group and survey period

Source: Forest Inventory & Analysis Program – Updates for Georgia's Forestland – 2012 FIA Data

3.3. *Protection of ecosystems and biodiversity*

As shown on Table 2, the conservation land in Georgia covers 8448 km², which is about 5.5% of the state area. This include both public and private land, under various conservation status. Figure 17 shows an overview of all protected land in Georgia. Those protected areas are either public (federal, state, county or local) and private lands. A map of National Parks is provided on Figure 18 and a map of States Parks is given on Figure 19.

Table 2 : Land under conservation status in Georgia (as of 2011)

	status 1	status 2	status 3	total
acres	451296	799798	836552	2087646
km ²	1826.3	3236.7	3385.4	8448.4
percentage of state area	1.19%	2.10%	2.20%	5.49%

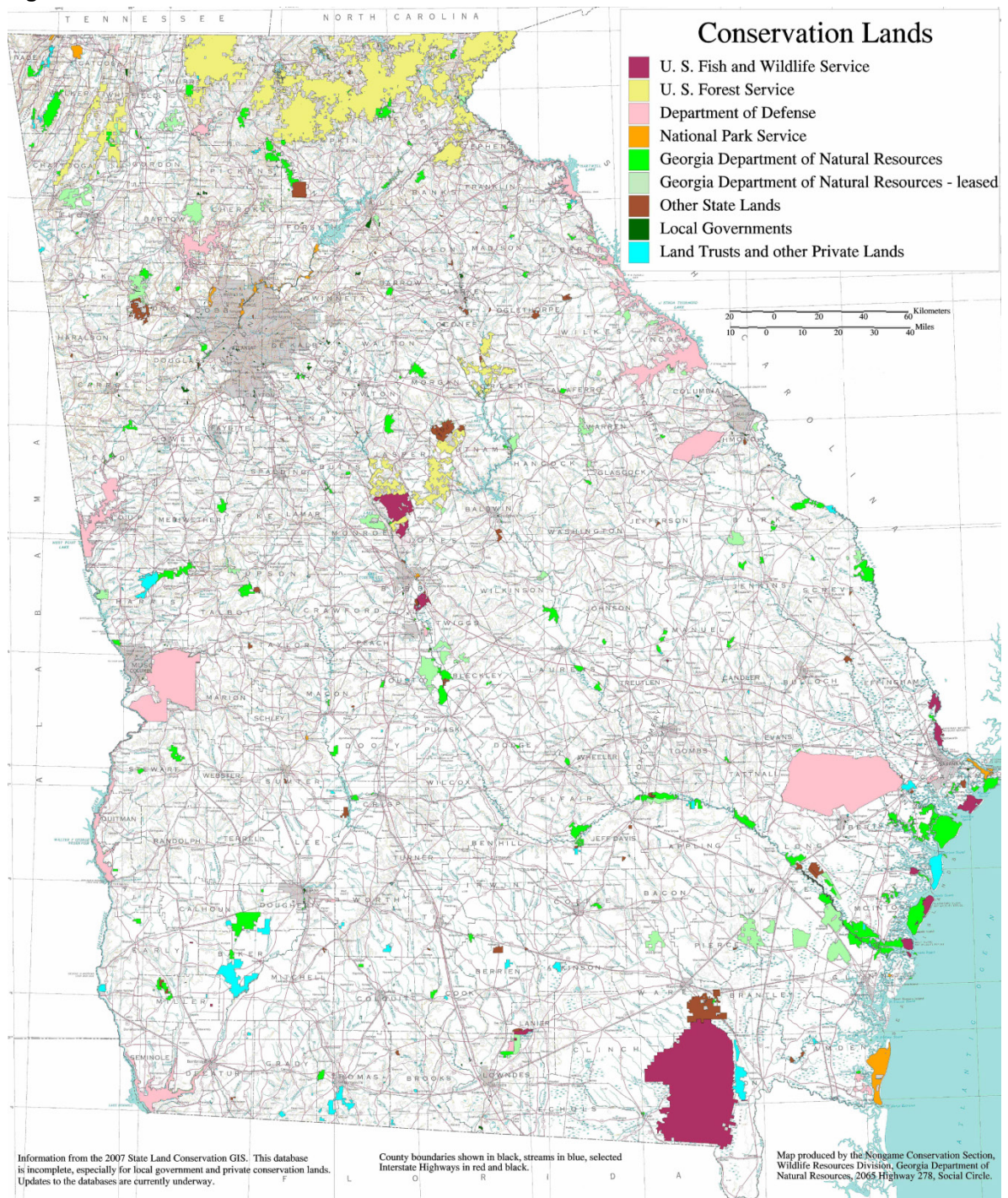
source : USGS Gap analysis <http://gapanalysis.usgs.gov/>

Status 1: An area having permanent protection from conversion of natural land cover and a mandated management plan in operation to maintain a natural state within which disturbance events (of natural type, frequency, intensity, and legacy) are allowed to proceed without interference or are mimicked through management.

Status 2: An area having permanent protection from conversion of natural land cover and a mandated management plan in operation to maintain a primarily natural state, but which may receive uses or management practices that degrade the quality of existing natural communities, including suppression of natural disturbance.

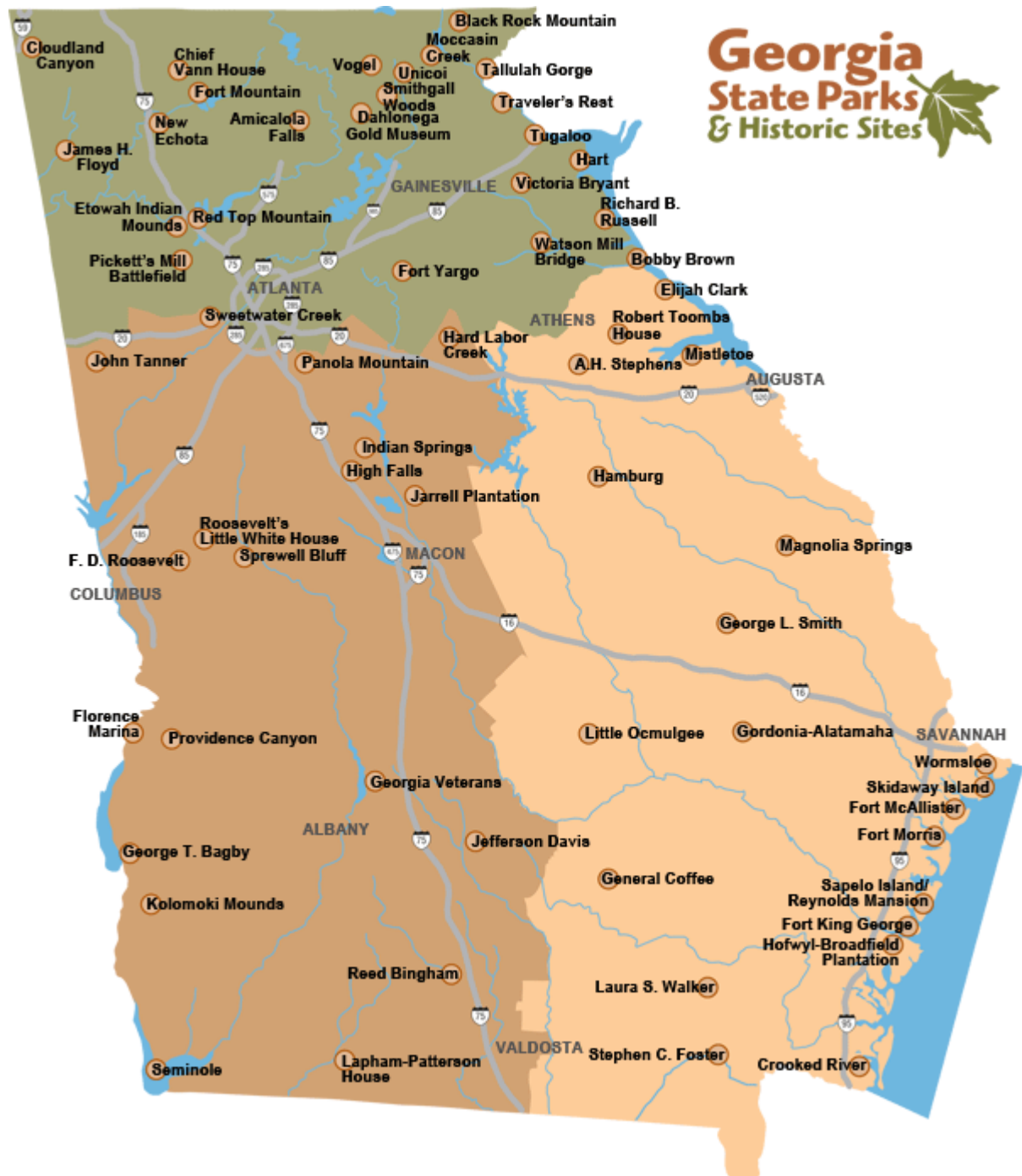
Status 3: Area having permanent protection from conversion of natural land cover for the majority of area. Subject to extractive uses of either broad, low-intensity type (eg. Logging) or localized intense type (eg. Mining). Confers protection to federally listed endangered and threatened species throughout the area.

Note that different figures exist in terms of total conservation area in the State, depending on the categories of protection that are taken into account (particularly in the status 3 as defined above). For example Figure 17 includes military zones, which are not designated for the purpose of biodiversity and ecosystems protection, even though they might be of considerable interest because the areas are very large and continuous, with most of the time very little human disturbance.

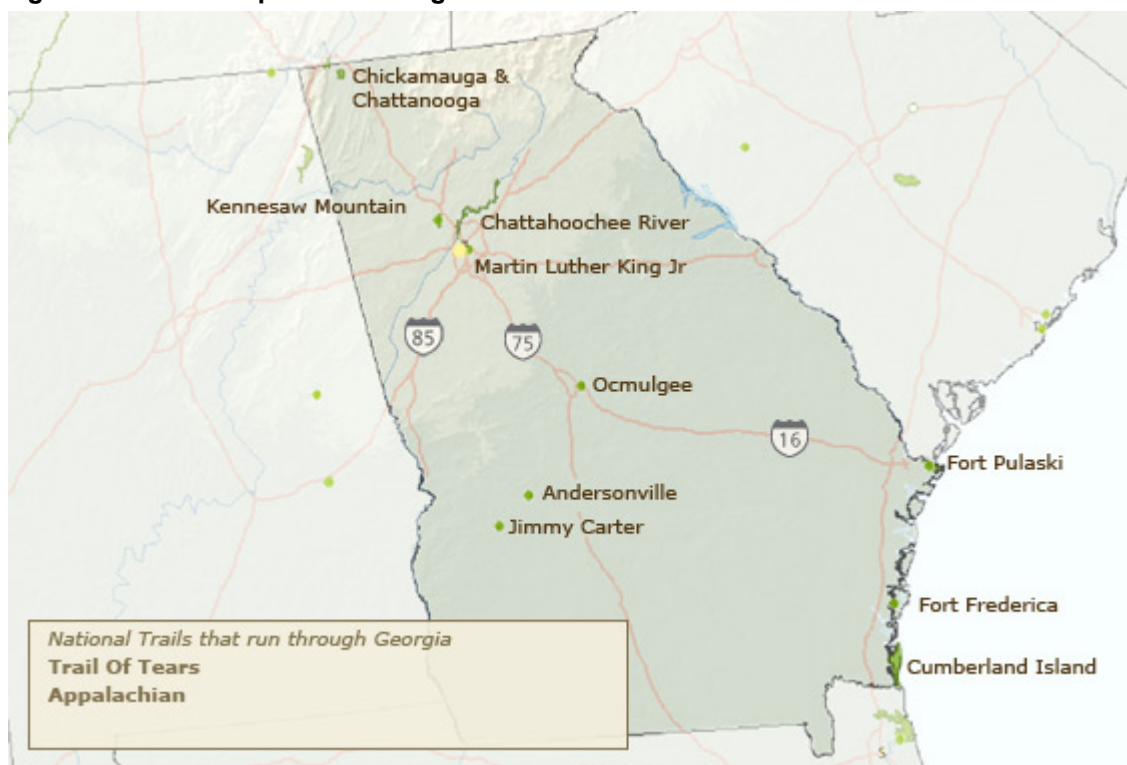
Figure 17 : Conservation lands

Source : Georgia Forestry Commission

Figure 18 : State parks in Georgia



Source: <http://www.gastateparks.org/>

Figure 19 : National parks in Georgia

Source: <http://home.nps.gov/state/fl/>

The GAP analysis ("Geographic Analysis Program") aims at assessing to what extent the animal and vegetal species are represented in the conservation areas in a defined region and identifying the species that are insufficiently protected (gap species). Such a GAP analysis was performed for vertebrate species in the State of Georgia in 2003 by College of Agricultural and Environmental Sciences of the University of Georgia⁶. The conclusion includes:

- that Georgia generally has a rather low level of protection compared to other states
- that most protected land are in zones which would not be easily used by human activities anyway (steep slopes, wetlands, etc...) while other habitats such as bottomland hardwoods, non-wetland hardwood forests outside of the mountains and early successional areas are very little protected.
- that most species which are very little represented in protected areas are those associated with human activities (agriculture, gardens etc...) and are of least concern (with some exceptions such as loggerhead shrike and the Alabama map turtle),

Even though the protected areas in Georgia are rather limited, there have been recent efforts to improve the situation. Table 3 and Figure 20 : New land under conservation status per year in

⁶ <http://narsal.uga.edu/gap>

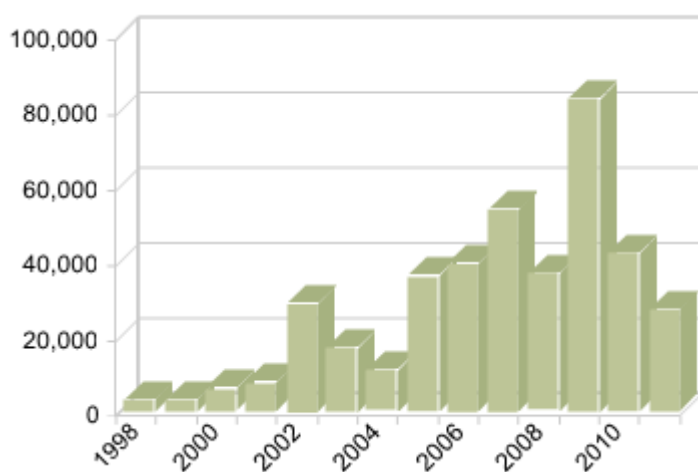
Georgia (1998-2011) Figure 20 show that the new surfaces put into conservation have significantly increased after 2000.

Table 3 : New land under conservation status per year in Georgia (1998-2011)

Year	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Total
Acres	3398	3239	6268	7817	28960	17126	11079	36015	39487	53706	36407	83206	42245	27072	396025
ha	1375	1311	2537	3164	11720	6931	4484	14575	15980	21735	14734	33673	17097	10956	160271

<http://www.conservation Almanac.org>

Figure 20 : New land under conservation status per year in Georgia (1998-2011)



<http://www.conservation Almanac.org>

A number of conservation schemes have been introduced recently to increase the conservation land in Georgia, including initiatives to encourage conservation on private land (which is particularly important given the proportion of private forests in Georgia). The most important programmes are described hereunder⁷:

- **The Georgia Department of Natural Resources**⁸ manages over one million acres of public land in state parks, natural areas, public fishing areas and wildlife management areas. These properties are managed to protect and conserve Georgia's diverse wildlife populations. Statewide planning initiatives, including the State Comprehensive Outdoor Recreation Plan (SCORP) and the State Wildlife Action Plan (SWAP) identify land conservation as a top priority to provide quality outdoor recreational opportunities and to protect wildlife diversity.

⁷ <http://www.conservation Almanac.org/secure/almanac/southeast/ga/programs.html#top>

⁸ <http://www.gadnr.org>

- **The Forest Legacy Program** protects environmentally important working forests threatened by conversion to non-forest uses by donation or purchase of conservation easements of the lands from willing participants who wish to keep their land in forestry use.
- **The Georgia Land Conservation Program** offers grants for fee title or conservation easement purchases from the Georgia Land Conservation Trust Fund. It also offers low-interest loans for fee title or conservation easement purchases from the Georgia Land Conservation Revolving Fund.
- **Georgia Conservation Tax Credit Program** provides a financial incentive to landowners to encourage dedication of their property for conservation uses. The incentive is provided in the form of a state income tax credit that can be applied in the tax year of the donation; any unused tax credit can then be carried forward and applied to the landowner's tax liability for up to five additional years.
- **State Incentive for Local Land Conservation** offers grants for fee title or conservation easement purchases from the Georgia Land Conservation Trust Fund. It also offers low-interest loans for fee title or conservation easement purchases from the Georgia Land Conservation Revolving Fund. Tax incentives are also available for donations of conservation lands or conservation easements.

3.4. Protection of water

In the US, the Clean Water Act (CWA) was introduced in 1972 to regulate the discharge of pollutants in water. In this framework, forestry operations are considered as nonpoint sources and, hence, are generally exempted for permit under CWA as long as Best Management Practices (BMP) are developed and implemented. It is the responsibility of states to develop, implement and assess the Best Management Practices, under the control and funding of the federal Environmental Protection Agency (EPA). Even though the impact on water is the core of the BMP, many states have gone further and used the BMP as a tool for other management purpose (soil, landscape, wildlife etc...).

In the state of Georgia, the Best Management Practices were first published in 1981 and the latest version was released in 2009⁹. The administration in charge of the BMP is the Georgia Forestry Commission. The topics covered by the BMP:

- Planning for Water Quality
- Road Location, Construction, Stream Crossings Maintenance and Retirement
- Timber Harvesting
- Site Preparation and Reforestation
- Management and Protection (including fire, fertilization and stabilization by vegetation cover)

⁹ <http://www.gfc.state.ga.us/resources/publications/BMPManualGA0609.pdf>

- Additional Management Objectives (wildlife, landscapes...)

In Southeast USA, there are specific arrangements for the site preparation before establishing pine plantations on wetlands¹⁰. Such operations are no exempt of permitting on wetlands and a specific permit under CWA section 404 has to be obtained. This makes possible for the administration to better control the mechanical works in sensitive environment.

Additionally, according to the BMP in the state of Georgia, the installation of ditches in order to improve drainage of wetlands is exempt of a CWA section 404 permit as long as it does not result in converting a wetland into a non wetland or modifying any stream, lake, swamp, bog or other surface water body or wetland.

Under the CWA, it is required to regularly evaluate to what extent the BMP are actually implemented in the practice. The last assessment in the state of Georgia was performed in 2011 on a sampling of forestry operations in public and private land (BMP Implementation and Compliance Survey¹¹). It shows very good results: it was estimated that over 95% of the relevant BMP were implemented and that over 99% of the forest surface surveyed was found to be in compliance.

3.5. Protection of soils

The protection of soil, including soil erosion, soil compaction and soil fertility, is addressed in the Best Management Practice applicable to forestry in Georgia. It includes considerations of soil in the following topics:

- forest management planning
- site preparation before plantations
- mechanical plantations
- fertilization
- fire management

As described under section 3.4, it appears from the BMP Implementation and Compliance Survey (latest report dated 2011) that the BMP are generally well implemented in the State of Georgia. Despite some search about this topic, we are not aware of any monitoring programme at the State level exists in order to assess the soils condition (erosion, compaction, fertility) as well as its their evolution over time.

3.6. Protection of carbon stocks

In forest land the carbon stocks mainly includes:

- living above ground and below ground woody biomass,

¹⁰ <http://water.epa.gov/lawsregs/guidance/wetlands/silv2.cfm>

¹¹ <http://www.gfc.state.ga.us/forest-management/water-quality/bmps/2011BMPSurveyResults.pdf>

- soil organic carbon and, in particular, peat in specific areas (including coastal marshes and mangroves in the case of Georgia).

We have seen in sections 3.1 and 3.2 that the volume of standing trees has been consistently and significantly increasing in Georgia over the last three decades, and this despite a recent slight decrease in the forest areas recorded (-1% during the last seven years). In this context, the sequestered carbon stock in living biomass has increased.

In terms of peatlands, we have seen in section 3.4 that significant drainage of wetlands (possibly resulting in conversion of wetlands to another status) as well as mechanical works for the preparation of land before pine plantation are subject to permit. Even though it does not exclude the possibility of peatland drainage (and subsequently the release of carbon) it does provide adequate protection through approval by the authorities of the works to be carried out in the sensitive wetlands (including peatlands).

3.7. Protection of air quality

The main impact of forestry on air quality relates to the use of fire. Using fire under controlled conditions is a common practice Georgia forestry ("prescribed fire"), and can have different objectives:

- Reduce hazardous fuels under tree stands to prevent wildfires
- Prepare sites before seeding and planting
- Improve wildlife habitat improve forage for grazing (through changes in underbush vegetation)
- Manage competing vegetation
- Control insects and disease
- Enhance appearance (refresh forest appearance, improve flowering....)
- Improve access (clear underbush before harvesting or other operations)

The BMP describes appropriate use of fire and prevention of wildfires, including appropriate implementation of firebreaks.

The use of fire is subject to permit issued by the Georgia Forestry Commission. As burning vegetation has an impact on air quality, open fires are banned in summer months from many counties in Georgia to preserve the air quality around Atlanta where ozone concentrations in summer can be unhealthy high.

3.8. Illegal logging

The FSC risk assessment platform www.globalforestregistry.org considers the USA are at low risk in terms of illegal logging, because the following criteria are all verified:

1.1 Evidence of enforcement of logging related laws in the district ¹²

¹² www.illegal-logging.info ; www.eia-international.org ; <http://www.ahec-europe.org/>

1.2 There is evidence in the district demonstrating the legality of harvests and wood purchases that includes robust and effective system for granting licenses and harvest permits ¹³

1.3 There is little or no evidence or reporting of illegal harvesting in the district of origin ¹⁴

1.4 There is a low perception of corruption related to the granting or issuing of harvesting permits and other areas of law enforcement related to harvesting and wood trade ¹⁵

3.9. Civil rights and traditional rights

The FSC risk assessment platform www.globalforestregistry.org considers the USA are at low risk in terms of violation of civil and traditional rights, because the following criteria are all verified:

- There is no UN Security Council ban on timber exports from the country concerned
- The country or district is not designated a source of conflict timber (e.g. USAID Type 1 conflict)
- There is no evidence of child labor or violation of ILO Fundamental Principles and Rights at work taking place in forest areas in the district concerned
- There are recognized and equitable processes in place to resolve conflicts of substantial magnitude pertaining to traditional rights including use rights, cultural interests or traditional cultural identity in the district concerned
- There is no evidence of violation of the ILO Convention 169 on Indigenous and Tribal Peoples taking place in the forest areas in the district concerned

3.10. Forest certification

The main forest certification schemes used in Georgia are:

- SFI (Sustainable Forestry Initiative ¹⁶), which is endorsed by PEFC (Programme for the Endorsement of Forest Certification)
- ATFS (American Tree Farm System ¹⁷), which is specifically suitable for small private owners.

Even though the FSC standard is used in some US states, no FSC certified forest is reported to exist in Georgia.

The certified forest area under each of those schemes as for 2011 is presented in the table hereunder :

¹³ www.illegal-logging.info ; www.eia-international.org ; <http://www.ahec-europe.org/>

¹⁴ www.illegal-logging.info ; www.eia-international.org ; <http://www.ahec-europe.org/>

¹⁵ <http://www.transparency.org/cpi2012/results>

¹⁶ <http://www.sfi-program.org>

¹⁷ <https://www.treefarmssystem.org>

Table 4 : Certified forest land in Georgia (2011)

	SFI	FSC	ATFS	total certified
acres certified	2 532 586	0	2 322 393	4 854 979
ha certified	1 024 938	0	939 872	1 964 810
percentage forests	10.2%	0.0%	9.4%	19.6%

source:

<http://www.southernforests.org/resources/publications/SGSF%20Forest%20Certification%20Report%20r1.pdf>

4. Conclusions

Georgia has an important forest that covers about 67% of the state. Most of this forest is privately owned (91%).

The forest area is rather stable even though the latest trend shows a slight decrease, mainly due to urbanization, which has not been fully compensated by new forests being installed elsewhere, with a decrease of forest surface of about 1% between 2005 and 2012. The current forest area remains much larger than what it used to be at the beginning of the 20th century.

Despite the recent slight decrease in forest surface, the estimated volume of standing trees has been consistently increasing for the last 30 years, because tree stocks have been allowed to develop more and become more mature. The annual harvested volume and other losses does not exceed the annual growth.

Because of the increase of the volume of standing trees, the carbon stock associated to living woody biomass is growing. Another major carbon stock associated with forest is soil organic matter, and in particular peat, which can be found in some wetlands, particularly in coastal region (mangroves). Even though the drainage of peatlands is not forbidden by law, it is strongly regulated by the clean water act and significant drainage activities are subject to permit.

Georgia has various types of conservation lands dedicated to the protection of biodiversity and ecosystems, including State parks, National parks, private reserves... The extent of the protected areas is rather limited (5.5%), and some ecosystems are very little included in the conservation lands (bottomland hardwoods, non-wetland hardwood forests outside of the mountains...), possibly resulting in an insufficient level of protection of some species. The recent trend shows that progress are made, with an increased rate in the creation of new conservation land, and various schemes being developed to promote conservation land, in particular on private grounds through tax incentives mechanisms.

Georgia has developed Best Management Practices (BMP) for forestry to comply with the Clean Water Act. Those BMP address both water and soil conservation. The Georgia Forest Commission is

in charge of implementing and assessing the BMP. The most recent survey shows a good level of compliance and implementation of the BMP in the actual forestry operations.

Even though controlled fires are very often used in forest management practices in Georgia, the use of fire is strongly regulated and fire is banned from specific places during summer months to protect the most populated areas from air pollution.

The FSC risk assessment platform www.globalforestregistry.org considers the USA are at low risk in terms of violation of illegal logging and in terms of violation of traditional and civil rights.

The forest certification systems are little developed in Georgia, with just less than 20% of forest certified under 2 systems SFI and ATFS.

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ANNEX 1:**Forest area in Georgia by county (forest area in ha) from 2002 to 2012**

County	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Appling	105 251	106 570	104 026	101 808	101 592	102 621	100 063	100 277	98 880	97 982	97 984
Atkinson	68 321	69 019	67 509	69 430	66 789	67 321	66 943	69 369	69 264	69 085	67 092
Bacon	52 989	56 085	58 417	58 433	57 955	58 069	58 217	57 580	55 639	54 343	51 700
Baker	49 238	49 937	49 338	49 405	48 678	49 865	49 434	49 384	49 384	51 082	52 747
Baldwin	53 777	53 285	51 234	51 273	50 711	49 326	48 895	48 838	48 861	48 773	48 828
Banks	35 958	33 618	35 871	35 904	34 005	34 005	34 062	33 928	33 346	33 315	36 228
Barrow	25 118	25 917	24 747	23 488	21 215	21 196	21 187	18 804	18 792	18 785	18 702
Bartow	78 634	78 872	78 643	78 260	78 273	78 261	73 116	74 833	73 269	71 452	71 234
Ben Hill	42 954	43 145	39 882	40 415	38 422	38 454	38 546	38 503	38 503	38 409	38 385
Berrien	73 369	69 969	71 330	72 328	72 340	72 314	72 509	72 081	71 997	71 820	72 434
Bibb	32 830	32 979	32 926	32 347	33 536	30 968	32 453	32 380	32 411	30 469	30 023
Bleckley	32 823	32 458	32 329	32 267	31 184	32 085	32 141	32 083	32 669	32 449	33 047
Brantley	105 199	105 007	106 325	104 124	104 970	103 612	101 980	101 176	101 927	101 941	102 063
Brooks	68 234	70 692	70 498	71 073	71 140	72 748	75 012	75 683	76 074	75 903	74 504
Bryan	85 926	88 113	84 588	84 666	84 524	84 167	86 290	86 357	85 662	84 832	82 765
Bulloch	120 759	125 312	132 053	131 183	128 996	123 809	124 325	121 092	121 979	122 954	121 843
Burke	125 310	125 835	134 914	135 128	135 827	136 006	135 318	135 120	134 910	134 464	133 894
Butts	31 818	32 675	33 216	31 879	31 931	31 616	31 567	32 645	33 836	33 804	33 527
Calhoun	30 908	31 051	30 654	30 596	30 634	30 409	30 447	29 926	29 913	31 607	31 703
Camden	120 771	115 864	114 127	116 225	116 315	114 234	113 375	112 876	112 890	113 690	113 383
Candler	35 799	31 594	31 981	31 960	32 178	33 598	34 095	33 488	36 293	36 272	36 274
Carroll	75 901	75 630	77 005	77 522	77 844	78 835	77 199	76 582	75 058	74 383	74 466
Catoosa	13 623	13 530	15 222	15 260	15 243	15 255	15 326	17 731	17 749	17 774	19 102
Chatham	179 335	170 645	173 533	177 292	181 483	181 382	178 746	181 986	178 692	179 898	171 184
Chattahoochee	43 650	40 790	43 199	40 349	40 524	40 550	39 535	35 170	35 301	35 515	37 065
Chattooga	60 321	60 795	59 809	62 045	59 177	58 030	55 689	55 588	55 590	55 192	53 251
Cherokee	82 719	81 866	81 214	81 487	81 240	78 840	77 472	75 547	75 661	75 814	76 594
Clarke	76 379	71 302	71 668	68 377	66 398	63 967	63 069	63 051	64 270	63 630	61 296
Clay	17 098	17 160	17 190	15 247	14 688	13 065	10 479	9 764	9 763	9 750	10 058
Clayton	37 076	34 700	34 586	34 606	34 781	34 446	34 394	34 358	34 370	34 335	34 296
Clinch	13 178	10 594	8 319	8 319	8 319	6 189	6 201	6 192	6 190	6 183	8 382
Cobb	223 407	228 855	232 677	229 265	230 401	230 759	230 668	228 516	231 985	233 851	235 786
Coffee	16 488	14 445	11 712	8 955	8 992	10 443	10 153	8 352	8 512	8 384	9 869
Colquitt	94 618	95 042	92 713	93 337	90 291	90 516	91 573	89 606	89 375	89 194	87 239
Columbia	61 193	59 463	61 651	63 962	63 684	63 781	66 439	65 717	66 040	65 730	66 640
Cook	43 999	44 946	45 012	45 010	44 180	41 166	43 670	43 622	43 642	43 841	43 727
Coweta	29 728	29 955	29 796	30 017	30 001	29 960	30 400	30 381	30 381	30 302	30 610
Crawford	80 858	75 799	75 050	76 537	76 432	71 494	70 498	70 043	69 786	71 800	74 177
Crisp	79 142	80 013	79 271	78 932	76 711	75 849	74 092	73 300	73 287	72 564	72 727
Dade	31 219	31 525	31 109	31 137	32 638	32 589	32 818	32 685	32 619	33 437	32 905
Dawson	25 435	29 336	29 061	29 181	29 138	28 643	29 354	29 531	29 573	29 630	32 221
Decatur	43 355	42 978	40 197	40 475	39 444	39 395	39 718	42 389	42 381	44 061	44 695
Dekalb	77 566	77 766	79 091	79 634	81 548	81 302	80 901	78 566	77 392	76 041	76 273
Dodge	18 171	18 229	19 350	20 922	20 786	20 749	20 091	20 690	19 834	19 031	19 649
Dodge	88 635	87 391	94 112	93 204	93 695	91 735	92 924	94 520	96 473	98 293	100 807

County	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Dooly	34 983	36 096	42 585	42 067	42 106	40 443	40 491	38 784	39 952	37 143	37 664
Dougherty	49 833	57 623	59 912	62 232	62 164	58 866	58 856	59 359	57 885	57 087	57 447
Douglas	29 435	29 442	30 478	30 566	30 406	28 647	32 575	32 793	32 869	31 170	30 771
Early	70 419	70 475	68 040	70 165	70 247	70 508	70 681	70 697	70 697	70 535	71 006
Echols	103 099	100 473	98 824	98 980	99 352	99 631	100 462	99 780	100 556	100 641	99 861
Effingham	95 576	94 947	97 128	97 112	95 835	92 933	92 518	92 586	92 634	92 616	95 415
Elbert	54 597	54 920	57 580	57 309	53 094	53 134	54 271	54 078	54 071	54 370	54 014
Emanuel	126 562	130 504	132 368	131 847	131 823	132 447	132 771	131 905	132 210	132 313	132 247
Evans	30 344	30 342	28 347	30 824	30 493	30 846	30 973	36 202	35 663	35 684	35 838
Fannin	84 393	86 372	87 356	87 781	87 428	86 689	85 354	83 523	83 659	84 259	82 546
Fayette	14 675	14 119	13 362	13 373	13 367	13 387	13 406	13 474	13 479	13 500	14 154
Floyd	84 606	83 985	82 573	81 941	79 838	79 345	79 145	76 823	77 013	77 919	79 446
Forsyth	25 470	23 265	23 446	23 484	22 819	24 176	23 883	24 537	23 943	23 987	26 565
Franklin	39 549	37 751	35 976	33 015	33 015	33 050	32 503	34 320	34 320	34 239	34 041
Fulton	60 702	61 133	57 287	56 333	52 237	52 479	49 252	48 959	48 953	50 222	46 377
Gilmer	97 585	99 251	100 355	100 758	100 712	100 607	100 028	103 120	103 268	103 341	100 607
Glascock	27 183	26 919	28 614	28 574	28 585	28 760	31 174	31 049	31 064	31 222	31 758
Glynn	63 399	60 540	58 536	57 943	57 147	57 322	57 753	59 735	60 753	59 512	59 722
Gordon	52 002	51 586	51 233	51 158	50 301	50 586	48 969	46 703	46 756	47 367	45 537
Grady	58 206	59 625	61 650	58 521	58 705	61 784	64 252	65 835	65 705	65 585	63 938
Greene	78 984	79 295	83 560	84 180	84 105	84 389	83 487	82 977	83 009	86 028	85 583
Gwinnett	45 420	45 672	45 345	43 087	39 519	38 700	38 746	35 804	37 092	35 199	35 896
Habersham	46 436	46 457	43 170	42 906	43 369	43 309	43 560	43 280	42 694	42 418	45 360
Hall	43 240	44 207	43 896	42 197	42 578	42 559	41 990	41 858	41 837	41 775	42 856
Hancock	115 730	109 725	109 326	109 289	109 239	110 951	110 921	108 222	108 162	106 722	108 738
Haralson	49 858	50 226	49 611	49 641	49 967	49 145	49 228	48 290	48 262	48 848	46 045
Harris	102 517	96 784	89 928	89 964	90 013	91 730	91 806	91 446	91 512	93 844	93 397
Hart	22 944	23 050	21 674	21 687	22 859	22 915	22 946	22 900	22 893	22 424	22 775
Heard	54 022	55 031	56 790	56 866	56 459	56 420	54 231	53 987	53 707	51 096	50 704
Henry	45 139	43 756	42 587	37 697	36 998	37 910	36 707	38 794	37 024	36 996	36 532
Houston	49 977	46 496	52 541	52 003	52 326	53 301	53 234	52 166	52 481	52 326	52 400
Irwin	40 520	40 562	44 296	43 982	44 055	46 444	44 121	44 117	42 591	44 426	44 617
Jackson	48 813	46 888	44 279	44 530	43 124	43 228	43 295	43 212	43 409	43 404	44 243
Jasper	82 438	81 375	81 384	82 059	81 494	82 306	82 290	82 002	82 055	81 309	81 593
Jeff Davis	61 684	61 648	62 496	64 395	66 298	65 302	65 916	61 372	61 739	61 827	61 138
Jefferson	93 818	92 454	100 367	100 382	100 471	99 820	99 717	101 975	101 364	100 066	99 642
Jenkins	67 760	65 884	61 437	61 493	59 335	58 586	61 466	60 921	61 121	61 096	61 911
Johnson	67 490	67 595	67 938	68 000	68 313	68 556	66 805	63 948	64 941	64 931	63 836
Jones	85 655	82 034	82 046	82 305	81 000	83 598	84 765	84 615	85 335	84 435	84 944
Lamar	37 949	37 312	39 721	39 733	39 729	40 366	42 134	38 937	38 961	38 951	38 657
Lanier	45 441	45 531	42 886	42 535	42 632	42 738	42 757	43 310	43 375	43 286	42 543
Laurens	143 917	145 118	140 339	139 583	136 621	139 053	137 802	137 795	137 964	142 664	146 981
Lee	42 636	42 925	45 523	49 982	55 076	55 360	57 128	58 839	59 521	59 370	58 316
Liberty	96 609	98 792	94 159	94 147	94 263	92 961	90 883	92 829	92 511	91 302	92 992
Lincoln	41 750	41 188	41 427	41 439	43 753	44 403	44 336	44 287	44 305	46 794	46 551
Long	98 205	100 559	95 966	95 562	95 273	95 812	95 757	93 930	93 867	93 754	93 007
Lowndes	89 476	87 384	88 730	88 711	85 887	86 085	84 895	84 900	84 458	84 844	85 242
Lumpkin	63 534	65 652	65 061	65 381	64 990	63 681	64 088	61 852	61 957	59 721	58 794
McDuffie	49 050	47 057	44 777	46 578	46 528	49 706	50 054	49 997	50 362	48 375	48 076
McIntosh	73 179	68 402	69 961	69 886	71 643	67 144	68 125	67 229	67 880	67 867	66 514
Macon	59 624	59 626	57 260	57 242	57 952	57 764	58 506	60 923	60 960	60 885	61 401

County	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Madison	36 616	38 268	38 196	38 247	38 257	38 226	38 287	38 245	38 235	38 199	38 546
Marion	68 005	72 883	74 530	74 086	73 120	72 737	72 753	70 622	70 601	70 501	68 975
Meriwether	99 773	102 239	101 849	103 901	104 298	106 729	106 293	105 782	105 807	105 761	101 478
Miller	31 623	28 457	28 117	28 233	28 282	28 307	28 414	28 469	28 523	28 726	28 817
Mitchell	50 432	52 493	56 524	55 071	57 345	56 829	54 568	54 542	53 943	53 806	55 479
Monroe	81 853	75 553	73 284	73 315	75 662	76 564	76 157	76 075	76 160	75 385	75 557
Montgomery	52 575	54 141	54 753	54 797	54 725	54 586	54 543	54 540	54 649	54 656	55 280
Morgan	60 116	61 637	60 395	61 664	61 549	62 319	62 297	66 577	66 604	66 516	67 035
Murray	57 314	57 175	56 913	57 699	59 946	59 926	59 644	60 053	58 950	58 863	58 565
Muscogee	27 456	28 369	28 426	28 863	26 864	26 868	26 829	26 844	26 881	29 213	30 277
Newton	40 944	35 355	33 547	33 635	34 646	33 962	34 370	33 350	33 378	30 719	30 247
Oconee	26 834	26 948	27 048	27 059	27 077	27 130	27 085	27 210	27 192	27 186	26 827
Oglethorpe	97 027	97 334	97 264	97 374	99 011	99 105	99 602	98 593	98 657	98 035	95 892
Paulding	52 667	50 508	52 460	52 028	49 897	49 755	48 019	47 764	45 788	45 765	45 169
Peach	16 689	15 862	15 881	15 892	15 511	15 167	14 580	14 543	14 567	14 689	14 503
Pickens	48 118	49 673	49 387	47 100	47 028	51 214	51 320	49 737	49 652	48 706	49 273
Pierce	48 682	48 885	46 865	46 826	44 708	45 370	44 835	45 283	45 511	45 485	45 091
Pike	39 192	38 103	38 140	38 690	38 651	38 493	38 480	38 396	38 413	38 348	39 329
Polk	54 681	54 975	56 991	60 626	58 656	56 095	56 181	55 841	53 632	53 642	52 641
Pulaski	27 528	33 178	32 741	32 686	32 926	32 274	32 305	32 257	32 248	32 217	34 771
Putnam	62 248	61 984	60 178	60 219	59 468	59 492	59 449	57 608	57 679	57 838	57 941
Quitman	33 978	32 939	33 021	35 320	35 282	36 273	36 265	36 171	36 214	36 143	36 537
Rabun	91 018	91 037	92 163	92 532	92 131	91 548	92 408	92 979	92 321	92 610	91 726
Randolph	78 015	75 882	77 560	77 494	75 805	73 935	73 353	77 299	77 327	75 144	76 642
Richmond	56 953	56 198	53 079	53 025	53 020	53 634	51 269	54 882	53 046	53 014	52 706
Rockdale	9 431	9 452	8 785	8 801	8 792	8 824	8 607	9 219	9 328	9 521	9 836
Schley	43 263	45 889	45 921	45 921	45 973	45 693	45 665	45 581	45 615	45 418	45 118
Screven	120 304	120 040	121 106	124 174	128 447	132 706	134 026	133 790	133 840	133 809	132 833
Seminole	19 286	19 336	16 900	17 029	16 432	16 410	16 431	16 411	16 411	16 367	16 315
Spalding	34 733	34 339	32 657	32 832	34 597	34 623	32 671	34 069	34 487	34 448	33 956
Stephens	35 027	34 788	36 147	36 281	36 228	36 250	36 954	37 097	37 019	37 183	38 236
Stewart	96 508	94 996	97 708	95 306	95 323	95 994	96 729	97 180	97 160	96 923	96 733
Sumter	70 358	72 466	77 095	78 979	79 189	78 269	77 617	78 050	78 101	79 355	79 274
Talbot	84 769	83 683	84 314	84 512	84 551	85 135	85 044	87 438	87 483	86 723	86 356
Taliaferro	49 734	49 473	49 576	48 960	48 948	47 360	47 325	47 963	48 218	48 142	48 532
Tattnall	77 452	77 734	77 093	77 168	75 303	74 234	75 755	77 167	76 356	76 403	76 134
Taylor	101 119	102 215	101 409	101 242	98 674	95 398	96 069	93 552	91 729	93 807	93 792
Telfair	93 098	97 837	101 771	102 143	102 443	105 248	105 109	107 648	105 129	105 102	103 929
Terrell	58 824	61 781	64 246	63 291	61 292	64 253	64 165	64 046	64 084	63 988	66 138
Thomas	88 619	89 800	89 077	88 728	88 266	88 741	82 089	83 501	83 683	83 550	80 765
Tift	31 065	30 769	30 564	30 734	32 542	31 930	33 391	33 346	33 346	33 263	33 077
Toombs	69 970	70 635	68 011	67 455	67 785	65 674	62 435	62 786	63 580	63 560	63 567
Towns	29 226	28 448	28 240	28 353	28 270	28 250	28 414	27 978	28 019	28 074	27 745
Treutlen	44 677	44 779	46 216	43 890	43 568	44 063	43 576	44 010	43 542	43 527	45 645
Troup	76 805	77 165	78 602	78 666	78 629	78 037	80 092	79 847	80 321	80 118	79 674
Turner	24 937	25 362	25 641	27 320	28 911	28 989	28 523	29 662	29 662	29 471	29 038
Twiggs	80 238	83 903	82 881	82 826	83 002	81 474	81 455	81 328	81 346	81 239	79 255
Union	66 579	68 742	70 761	71 090	70 611	70 504	69 172	67 684	67 793	67 975	67 157
Upson	60 246	59 836	59 647	59 550	57 637	60 477	62 932	62 814	62 816	62 831	60 984
Walker	66 655	62 213	62 002	61 530	61 587	64 596	64 935	65 247	65 798	67 362	66 559
Walton	54 639	51 965	52 585	52 624	52 450	55 203	53 521	53 463	53 462	52 874	52 768

County	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Ware	203 921	200 254	195 647	197 367	192 162	189 996	184 028	185 241	185 853	189 159	193 992
Warren	66 888	67 867	67 966	66 674	66 654	66 356	65 703	65 590	66 741	66 592	66 815
Washington	122 588	123 479	125 812	127 953	125 821	128 212	126 968	127 127	127 187	125 805	125 726
Wayne	139 878	140 140	143 807	144 129	148 742	150 692	150 287	147 628	147 372	146 732	144 321
Webster	34 232	34 622	31 490	29 290	29 046	28 977	28 979	28 905	28 934	28 879	29 134
Wheeler	59 179	60 977	61 576	64 005	63 539	62 980	63 348	60 628	60 966	60 948	59 121
White	53 070	51 639	51 307	52 066	51 378	51 382	50 320	50 561	49 556	49 669	48 752
Whitfield	33 516	35 691	37 662	37 701	35 413	35 418	36 226	36 560	36 613	36 717	38 971
Wilcox	70 319	70 722	70 368	68 286	68 299	68 602	71 190	71 160	71 160	71 000	71 556
Wilkes	93 709	95 411	95 224	95 184	91 018	94 895	96 824	96 645	96 701	96 557	96 780
Wilkinson	101 163	104 844	109 283	109 326	111 416	109 190	109 067	108 880	108 517	108 237	108 543
Worth	71 205	71 798	74 671	73 876	76 331	75 539	75 996	73 493	73 493	69 447	68 924
Totals:	10 113 083	10 093 972	10 124 369	10 126 333	10 087 529	10 080 618	10 053 338	10 038 249	10 030 621	10 023 705	10 016 973

ANNEX 2 :

Loss and gain of forestland (in %) by county between 2007 and 2012

State	total change 2005-2012	yearly average 2005-2012
Clarke (59)	-38.32%	-5.47%
Barrow (13)	-21.60%	-3.09%
Fulton (121)	-18.63%	-2.66%
Gwinnett (135)	-17.35%	-2.48%
Chattahoochee (53)	-15.01%	-2.14%
Paulding (223)	-13.89%	-1.98%
Polk (233)	-13.87%	-1.98%
Bacon (5)	-12.02%	-1.72%
Gordon (129)	-11.38%	-1.63%
Heard (149)	-11.26%	-1.61%
Cherokee (57)	-10.72%	-1.53%
Dooly (93)	-10.57%	-1.51%
Lumpkin (187)	-10.45%	-1.49%
Newton (217)	-10.16%	-1.45%
Bartow (15)	-9.10%	-1.30%
Thomas (275)	-9.03%	-1.29%
Peach (225)	-9.00%	-1.29%
Crawford (79)	-8.10%	-1.16%
Dougherty (95)	-7.81%	-1.12%
Wheeler (309)	-7.79%	-1.11%
Chatham (51)	-7.70%	-1.10%
Taylor (269)	-7.47%	-1.07%

State	total change 2005-2012	yearly average 2005-2012
Haralson (143)	-7.31%	-1.04%
Bulloch (31)	-7.24%	-1.03%
Marion (197)	-7.07%	-1.01%
Bibb (21)	-6.77%	-0.97%
Worth (321)	-6.66%	-0.95%
Coffee (69)	-6.65%	-0.95%
White (311)	-6.51%	-0.93%
Johnson (167)	-6.16%	-0.88%
Chattooga (55)	-6.10%	-0.87%
Fannin (111)	-6.08%	-0.87%
Dekalb (89)	-5.96%	-0.85%
Toombs (279)	-5.75%	-0.82%
Union (291)	-5.64%	-0.81%
Elbert (105)	-5.61%	-0.80%
Ben Hill (17)	-5.03%	-0.72%
Jeff Davis (161)	-4.88%	-0.70%
Baldwin (9)	-4.84%	-0.69%
McIntosh (191)	-4.66%	-0.67%
Twiggs (289)	-4.36%	-0.62%
Seminole (253)	-4.22%	-0.60%
Decatur (87)	-4.21%	-0.60%
Carroll (45)	-3.96%	-0.57%
Lowndes (185)	-3.92%	-0.56%
Putnam (237)	-3.80%	-0.54%
Appling (1)	-3.78%	-0.54%
Pierce (229)	-3.64%	-0.52%
Charlton (49)	-3.31%	-0.47%
Atkinson (3)	-3.24%	-0.46%
Floyd (115)	-2.99%	-0.43%
Coweta (77)	-2.81%	-0.40%
Henry (151)	-2.77%	-0.40%
Long (183)	-2.69%	-0.38%
Camden (39)	-2.45%	-0.35%
Columbia (73)	-2.45%	-0.35%
Lamar (171)	-2.33%	-0.33%
Meriwether (199)	-2.25%	-0.32%
Bryan (29)	-2.20%	-0.31%
Towns (281)	-2.15%	-0.31%

State	total change 2005-2012	yearly average 2005-2012
Brantley (25)	-1.97%	-0.28%
Schley (249)	-1.76%	-0.25%
Washington (303)	-1.71%	-0.24%
Effingham (103)	-1.66%	-0.24%
Ware (299)	-1.58%	-0.23%
Oglethorpe (221)	-1.49%	-0.21%
Tattnall (267)	-1.27%	-0.18%
Liberty (179)	-1.15%	-0.16%
Burke (33)	-0.91%	-0.13%
Clay (61)	-0.89%	-0.13%
Rabun (241)	-0.86%	-0.12%
Oconee (219)	-0.85%	-0.12%
Randolph (243)	-0.85%	-0.12%
Taliaferro (265)	-0.81%	-0.12%
Jefferson (163)	-0.70%	-0.10%
Wilkinson (319)	-0.68%	-0.10%
Jackson (157)	-0.58%	-0.08%
Jasper (159)	-0.56%	-0.08%
Webster (307)	-0.52%	-0.07%
Hancock (141)	-0.44%	-0.06%
Richmond (245)	-0.20%	-0.03%
Gilmer (123)	-0.07%	-0.01%
Lanier (173)	0.04%	0.01%
Berrien (19)	0.15%	0.02%
Wayne (305)	0.22%	0.03%
Warren (301)	0.23%	0.03%
Emanuel (107)	0.31%	0.04%
Sumter (261)	0.40%	0.06%
Walton (297)	0.46%	0.07%
Madison (195)	0.78%	0.11%
Houston (153)	0.80%	0.11%
Jenkins (165)	0.88%	0.13%
Montgomery (209)	0.88%	0.13%
Echols (101)	0.90%	0.13%
Mitchell (205)	0.96%	0.14%
Early (99)	1.20%	0.17%
Troup (285)	1.31%	0.19%
Banks (11)	1.42%	0.20%

State	total change 2005-2012	yearly average 2005-2012
Stewart (259)	1.49%	0.21%
Murray (213)	1.59%	0.23%
Hall (139)	1.60%	0.23%
Pike (231)	1.67%	0.24%
Greene (133)	1.73%	0.25%
Telfair (271)	1.83%	0.26%
Douglas (97)	1.86%	0.27%
Irwin (155)	1.86%	0.27%
Wilkes (317)	1.87%	0.27%
Cook (75)	1.97%	0.28%
Miller (201)	2.05%	0.29%
Talbot (263)	2.20%	0.31%
Bleckley (23)	2.52%	0.36%
Upton (293)	2.68%	0.38%
Clinch (65)	2.83%	0.40%
Monroe (207)	3.08%	0.44%
Glynn (127)	3.13%	0.45%
Franklin (119)	3.23%	0.46%
Jones (169)	3.24%	0.46%
Quitman (239)	3.43%	0.49%
McDuffie (189)	3.48%	0.50%
Whitfield (313)	3.72%	0.53%
Calhoun (37)	3.73%	0.53%
Spalding (255)	3.78%	0.54%
Harris (145)	3.80%	0.54%
Treutlen (283)	4.06%	0.58%
Colquitt (71)	4.20%	0.60%
Terrell (273)	4.62%	0.66%
Wilcox (315)	4.75%	0.68%
Brooks (27)	4.81%	0.69%
Pickens (227)	4.96%	0.71%
Hart (147)	5.07%	0.72%
Butts (35)	5.17%	0.74%
Laurens (175)	5.31%	0.76%
Stephens (257)	5.31%	0.76%
Muscogee (215)	5.46%	0.78%
Crisp (81)	5.68%	0.81%
Fayette (113)	5.79%	0.83%

State	total change 2005-2012	yearly average 2005-2012
Habersham (137)	5.81%	0.83%
Turner (287)	6.37%	0.91%
Pulaski (235)	6.51%	0.93%
Baker (7)	6.70%	0.96%
Screven (251)	6.86%	0.98%
Macon (193)	7.12%	1.02%
Tift (277)	7.63%	1.09%
Dodge (91)	7.96%	1.14%
Walker (295)	8.01%	1.14%
Morgan (211)	8.59%	1.23%
Grady (131)	9.13%	1.30%
Clayton (63)	9.87%	1.41%
Dawson (85)	10.26%	1.47%
Dade (83)	10.32%	1.47%
Glascok (125)	10.92%	1.56%
Rockdale (247)	11.48%	1.64%
Lincoln (181)	11.95%	1.71%
Candler (43)	13.12%	1.87%
Forsyth (117)	13.15%	1.88%
Cobb (67)	14.16%	2.02%
Lee (177)	16.03%	2.29%
Evans (109)	16.38%	2.34%
Catoosa (47)	23.83%	3.40%
Total	-1.08%	-0.15%

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