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Georgia Logging Businesses: Status and Challenges in 2017

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Abstract

Surveys of logging business owners have been conducted in Georgia at five-year intervals since 1987. The survey has documented impressive gains in productivity and significant consolidation in Georgia's logging industry. Questionnaires were mailed to 684 logging businesses during the first quarter of 2017 and 20% of businesses responded. In 2017, the average Georgia logging business employed approximately 10 people, two of which were relatives of the owner. The median owner age was 53 years and approximately one-third of business owners were older than 60 years. Half of all business owners had attended college and 32% earned a college degree. Feller-buncher/grapple skidder systems were used by 86% of businesses. Two-thirds of logging businesses had energywood markets in their area, but only 11% operated chippers. Average weekly production reached an all-time high of 2,110 tons per week. Median capital investment was estimated to be $1.47 million. Average weekly production and production per crew were significantly higher in the Coastal Plain than the Piedmont ($p < 0.05$). We estimate that all of the logging capacity losses during the 2007-2009 recession have now been replaced through productivity increases. Consequently, mill quota was the most common challenge cited by logging business owners. While mill quotas and truck insurance rates were immediate concerns of logging business owners, demographics, aging equipment fleets, and a nationwide truck driver shortage are long-term barriers to the logging industry as a whole.

Introduction

The State of Georgia, USA relies on more than 500 logging businesses (BLS 2017a) to harvest and deliver timber to support a forest industry with an annual economic impact of more than $35 billion (Georgia Institute of Technology 2017). Changes in Georgia's logging businesses have been documented by surveys of Georgia logging businesses conducted at five-year intervals by the University of Georgia beginning in 1987 (Greene et al. 1988, Baker and Greene 2008, Greene et al. 2013).

By 1987, more than 70% of logging businesses were fully mechanized using feller-buncher/grapple skidder systems (Greene et al. 1988). Since 1992, more than 85% of Georgia logging businesses have used these systems (Baker et al. 2008, Greene et al. 2013). Whereas cut-to-length systems are popular in Scandinavia and South America (Mac Donagh et al. 2017) and have been gaining acceptance in the Northeast and Midwest (Leon and Benjamin 2012, Rickenbach et al. 2015, Conrad et al. 2018), adoption in Georgia has been minimal (Baker and Greene 2008, Greene et al. 2013).

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Average logging business production has increased consistently since the 1980s, more than doubling between 1987 and 2012 (Greene et al. 2013). Production per man-hour increased at an average annual rate of approximately 2% 1987-2012, but production per $1,000 invested declined by 1.2% per year during the same period (Greene et al. 2013). During this period the average age of logging business owners increased to more than 50 years and excess logging capacity and the Great Recession led to major reductions in the number of logging businesses.

Successful logging businesses are essential to sustainable forest management and the vitality of Georgia's forest industry. Therefore, the primary objective of this study was to update information on Georgia logging businesses. Our specific objectives of this study were to 1) assess logging business owner demographics, 2) measure changes in logging business productivity, and 3) evaluate changes in logging capacity as forest industry emerged from the Great Recession.

Methods

A mail survey of Georgia logging businesses was conducted during the first quarter of 2017. The questionnaire consisted of questions on general timber harvesting practices, business structure, owner/manager demographics, and other topics. Questions in the first three categories were similar to past studies to allow for comparisons, while questions on energywood markets, insurance, and trucking practices were added in 2017. Questionnaires were mailed to 684 individual logging businesses that had completed Georgia Master Timber Harvester training and maintained the certification.

Capital investment per firm was estimated using depreciated equipment values for each piece of equipment owned by the logging business (Baker and Greene 2008). Equipment values were estimated using prices obtained from equipment dealers and personal communications with logging business owners.

Means between years were compared using analysis of variance and the Tukey HSD test. Differences between regions within Georgia were compared using an independent samples t-test assuming unequal variance. All statistical tests were conducted at $\alpha = 0.05$ using SPSS version 24 (IBM Corp. 2016).

Results and Discussion

Questionnaires were completed and returned by 134 logging businesses. After removing firms with undeliverable questionnaires and responses from non-loggers, the adjusted response rate was approximately 20%, which is consistent with previous surveys (Baker and Greene 2008).

The feller-buncher/grapple skidder system continued to be the dominant system employed in Georgia, used by 85% of respondents (Figure 1). While 67% of logging businesses reported having an energywood market in their area, just 11% owned a chipper. The percent of logging businesses operating chippers increased from 3.5% in 2002 to 10% in 2012 and 11% in 2017. Chainsaw systems declined from 21% of businesses in 1987 to 2% in 2017.

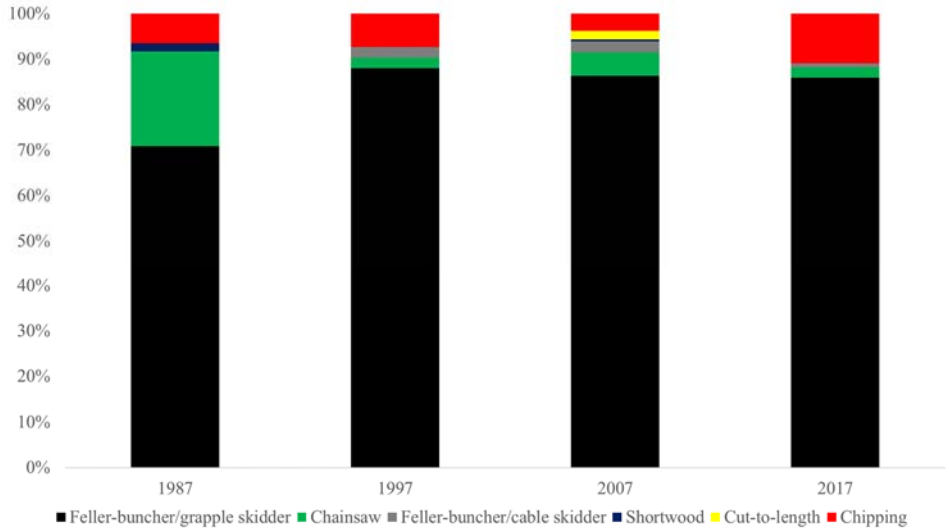

Figure 1: Harvesting systems employed by Georgia logging businesses in 1987, 1997, 2007, and 2017.

The average Georgia logging business employed approximately 10 people, including two relatives of the owner. Employees per firm has been consistent over the past thirty years with no significant differences between years ($p > 0.05$). Median owner age was unchanged from 2012 at 53 years, but was almost a decade older than during the 1990s. In 1997, more than one-third of logging business owners were younger than 40 years and less than 10% were 60 years-old or older (Figure 2). In 2017, just 14% of logging business owners were younger than 40 years and nearly one-third were at least 60 years-old. For the first time, the majority (51%) of logging business owners had attended college, with 32% having earned a college degree.

Average weekly production for all systems reached an all-time high of 2,110 tons (median = 1,337 tons) per firm and 1,160 tons per crew (Table 1). In 2017, average weekly production per firm was 150% higher compared to 1987 and 33% higher than in 2012. In 1997, 9% of logging businesses delivered 100 loads (~2,500 tons) of timber per week, while in 2017 25% of businesses reached this production level (Figure 3). Likewise, high production loggers (≥ 100 loads wk^{-1}) now account for 63% of the annual harvest, more than double the percentage in 1997. The largest businesses also appear to be more likely than smaller ones to take advantage (or have access to) energywood markets.

Logging businesses with chippers averaged 3,721 tons per week versus 1,617 tons per week for feller-buncher/grapple skidder businesses without chippers. Average weekly production per business was 68% higher in the Coastal Plain compared to the Piedment ($p = 0.048$) (Table 1). Tons per week per crew and average number of crews were both higher in the Coastal Plain than the Piedmont ($p < 0.05$). Logging businesses in the Coastal Plain were also twice as likely to specialize in clearcuts.

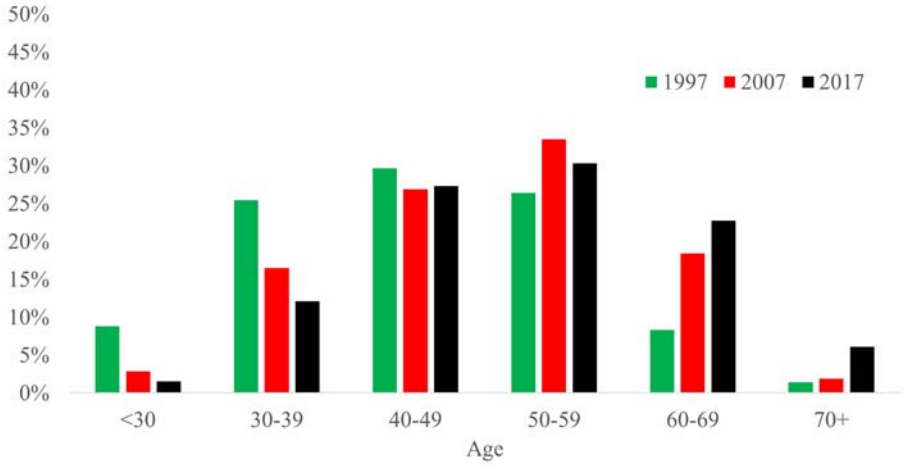

Figure 2: Georgia logging business owner/manager age distribution in 1997, 2007, and 2017.

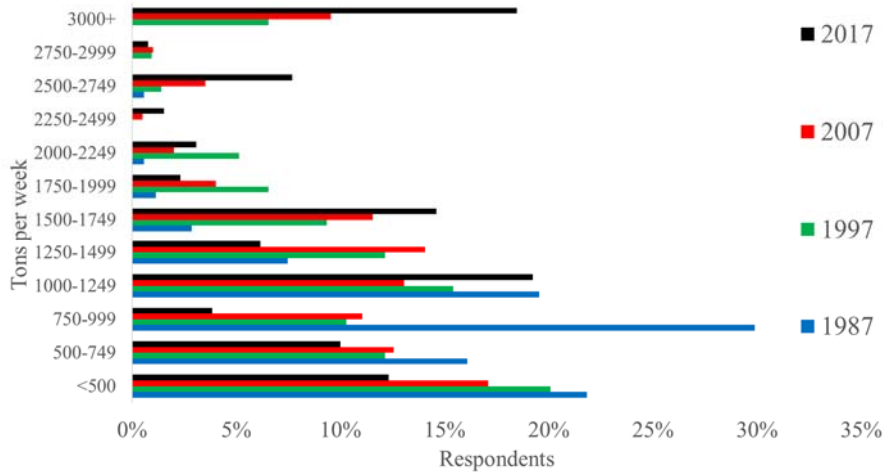

Figure 3: Weekly production by logging businesses in Georgia, 1987-2017.

Table 1: Average weekly production and most common harvest type by region in Georgia, 2017.

				Most common harvest (%)		
Region	Tons wk^{1}	Tons $crew^{-1}$ wk^{-1}	Number of crews	Clearcut	Thinning	Equal thinning & clearcut
GA Piedmont	1,526[a]	963[a]	1.40[a]	15	37	48
GA Coastal Plain	2,565[b]	1,307[b]	1.82[b]	38	16	46
Statewide	2,110	1,162	1.64	30	23	47

[a,b]Values in columns not connected by the same letter are statistically different $\alpha = 0.05$.

Capital investment has increased as logging businesses have grown in size and equipment prices have risen. In 2017, median investment in equipment reached $1.47 million, including trucks and trailers. Typical investment by Georgia logging business owners is substantially higher than in other states, although our approach to estimating capital investment differs somewhat from other

researchers. Virginia loggers reported average investments of $257,680, $491,810, and $794,730 in the Mountains, Piedmont, and Coastal Plain, respectively (Barrett et al. 2017) and logging businesses in the Midwest and Northeast typically invest less than $500,000 per business (Blinn et al. 2015, Rickenbach et al. 2015, Conrad et al. 2018).

The number of logging workers and businesses in Georgia declined by approximately one-third between 1990 and 2016, including a 19% decline in logging employment between 2006 and 2009 (BLS 2017a, Conrad et al. 2018). Greene et al. (2013) observed that logging capacity declined by 15-20% from 1999 to 2011 and the gap between logging capacity and harvest levels had decreased. They predicted that most additional logging capacity entering the market after the recession would come from existing logging businesses. Since 2012, we estimate logging capacity in Georgia increased by 20-30%, replacing all of the lost capacity suffered during the Great Recession (Figure 4). While logging employment is essentially the same as it was in 2009 (BLS 2017a) and the number of employees per firm has been consistent over the past thirty years, production per man-hour has increased across the board, but especially among high-production organizations with efficient management. Some of the larger businesses have added chippers to their operations and gained access to energywood markets. When production from chipping crews is excluded, production per man-hour increased by approximately 1.7% annually between 2012 and 2017, which is consistent with the long-term average rate of improvement. However, when chipping crews are considered, average production per man-hour increased by 4.2% annually, double the long-term average rate of improvement (Conrad et al. 2018).

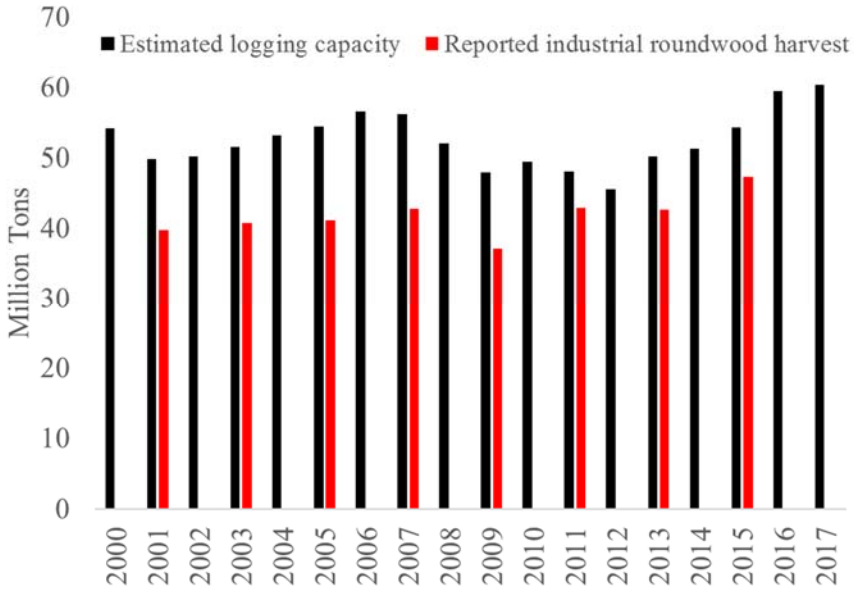

Figure 4: Estimated logging capacity and reported roundwood harvest (USDA Forest Service 2018) in Georgia 2000-2017.

As has been the case in recent decades, logging productivity increases outpaced forest industry demand (Figure 4). The result has been excess logging capacity, which creates wood supply

chain inefficiency and puts downward pressure on logging rates. Therefore, it is no surprise that mill quota was identified as the most important problem faced by a plurality (41%) of Georgia logging businesses in 2017. The combination of increased logging capacity as a result of productivity increases coupled with relatively dry weather resulted in restrictive quotas for approximately 18 months in 2016 and 2017 (RISI 2017).

Trucking (22%) and insurance (21%) were also identified as common problems by respondents to the survey. Logging business owners reported an average increase of 50% in truck insurance premiums between 2012 and 2017. Rising truck insurance rates coupled with a shortage of log truck drivers (Costello and Suarez 2015) make timber transportation an important challenge worthy of additional research.

In 2012, average logging equipment age had increased considerably from five years prior (Figure 5). Between 2012 and 2017, many loggers upgraded their equipment, which undoubtedly contributed to increases in labor productivity and logging capacity. However, on average, logging businesses are holding equipment longer than they did during the 2000s. Better equipment longevity, higher equipment prices, and the uncertainty of restrictive quotas all encourage loggers to hold equipment longer. The advanced age of log trucks is of particular concern given increases in insurance costs, truck driver shortages, and the need to improve trucking safety and efficiency.

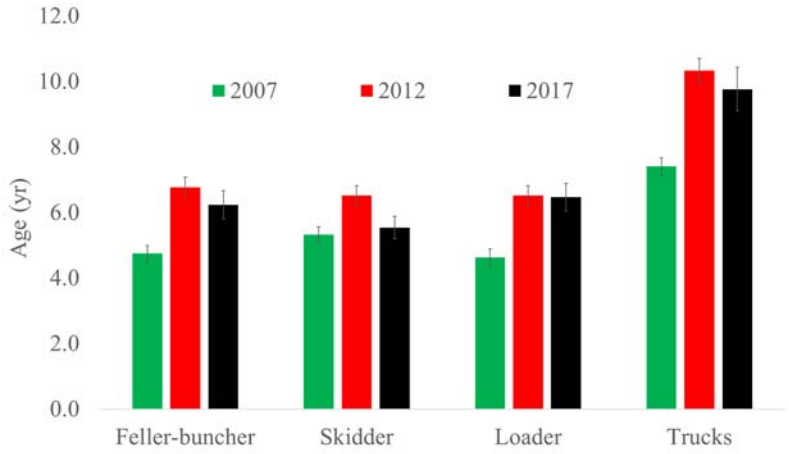

Figure 5: Average age of logging equipment in Georgia in 2007, 2012, and 2017 with standard errors of the means.

Conclusion

Georgia's logging businesses that survived the Great Recession reinvested in their businesses and increased their productivity since 2012. Unfortunately, productivity increases have again outpaced forest industry demand (Figure 4). Georgia's logging businesses face further challenges in the coming years with many owners at or approaching retirement age (Figure 2), the supply chain grappling again with excess capacity, and major constraints in timber transportation. Given these challenges and with consolidation in mill ownership in Georgia, the next decade may see

even further consolidation in the logging industry if mills choose to rely on a smaller group of core suppliers to meet their wood supply needs. Similarly, large logging businesses able to maintain their own trucking fleets or contract with large, independent trucking companies may gain advantages in recruiting log truck drivers, maintaining newer and safer truck fleets, and increasing percent-loaded miles by having trucks service multiple logging crews. The South has historically relied on a large number of small logging businesses and owner-operator contract truckers. Recent developments have challenged this model and it remains to be seen how much additional consolidation occurs before equilibrium is reached.

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