



# Preliminary 2002 Logging Cost Indices and Demographics of Participating Firms

William B. Stuart  
Laura A. Grace  
Clayton B. Altizer

December 2003

**This research is supported by:  
The Wood Supply Research Institute  
The Forestry and Wildlife Research Center  
Mississippi State University  
And  
The USDA Wood Utilization Research Program**



FWRC # FO 252

## Table of Contents

Table of Contents .....	ii
List of Figures .....	iii
Preface .....	iv
1 Preliminary 2002 Indices .....	1
1.1 Sample population .....	1
1.2 Production .....	1
1.3 Total Average Cost per Ton .....	2
1.4 Component Costs .....	3
1.4.1 Equipment Cost per Ton .....	5
1.4.2 Consumable Supplies Cost per Ton .....	6
1.4.3 Labor Cost per Ton Index .....	7
1.4.4 Insurance Cost per Ton Index .....	8
1.4.5 Contracted Services Cost per Ton Index .....	9
1.4.6 Administrative Cost per Ton Index .....	10
2 Study Participation and Recruiting .....	11
3 Demographics of the 2001 Population .....	12
3.1 Introduction .....	12
3.2 Selected support data types .....	13
3.2.1 Length of study participation .....	13
3.2.2 Business Form .....	13
3.2.3 Contractor Age .....	14
3.2.4 Education .....	15
3.2.5 Production per firm .....	16
3.2.6 Number of Crews .....	17
3.2.7 Employees per firm .....	17
3.2.8 Methods of Payment .....	18
3.2.9 Fringe Benefits .....	19
3.2.10 Trucking strategies .....	19
3.2.11 Stumpage acquisition .....	20
3.2.12 Species mix .....	21
3.2.13 Equipment age .....	21
3.3 Discussion .....	23
Appendix .....	24

## List of Figures

Figure 1. Production ranges by firm size.....	1
Figure 2. Total average cost per ton index, inflation (CPI) index, and producer price index (PPI Logging). 2	2
Figure 3. 2002 Average cost per ton range within firm size.....	3
Figure 4. Component cost distribution.....	4
Figure 5. Equipment cost per ton index.....	5
Figure 6. Consumable supplies and diesel indices.....	6
Figure 7. Labor cost per ton index.....	7
Figure 8. Insurance cost per ton index.....	8
Figure 9. Contracted services index.....	9
Figure 10. Administrative overheads index.....	10
Figure 11. Study participation for participating firms.....	13
Figure 12. Forms of business organization.....	14
Figure 13. Contractor age distributions.....	15
Figure 14. Highest level of education attained by study participants.....	16
Figure 15. Distribution of annual production per firm.....	17
Figure 16. Number of crews per firm.....	17
Figure 17. Employees per firm.....	18
Figure 18. Methods of labor payment.....	18
Figure 19. Fringe benefits offered.....	19
Figure 20. Trucking strategies.....	20
Figure 21. Methods of stumpage acquisition.....	20
Figure 22. Species mix.....	21
Figure 23. Equipment age classes by type.....	22

## Preface

The fundamental objective of the Wood Supply Research Institute (WSRI) is to enhance pro-competitive awareness of factors that affect the efficiency, stability, and economic viability of the industrial wood supply system. Thus, the members of WSRI believe that the industry needs some continuous, long-term, credible, index of trends related to the cost of producing wood and the financial health of the system.

The long term cost and productivity study at Mississippi State originated within the Industrial Forestry Operations Research Coop at Virginia Tech in 1990. The study has been supported by the Forestry and Wildlife Research Center at MSU since 1999. The objectives of this study have been to monitor the effects of changes in the wood supply system on logging business performance, to monitor the effects of externalities such as weather, tax law, fuel prices, labor legislation on business structures, and gather information and insights that could lead to the development of better understanding of, and management tools for, the wood supply system.

This research project, funded in part by WSRI, is designed to expand the current work being done at Mississippi State and to enhance the dissemination of this index to a broader audience.

This report, providing preliminary indices based on a sample population of 36 contractors for 2002 and descriptive information concerning the 42 firms included in the sample population at the end of 2001, is the third in a series of reports discussing the indices study. The first dealt with basic issues of developing a set of indices that would have utility for harvesting contractors, procurement and management foresters using a base population of 25 contractors for whom seven years of data (1995-2001) were available. The second used an expanded population of 37 firms to assess the potential instability in the indices as the number of firms expanded.

# 1 Preliminary 2002 Indices

## 1.1 Sample population

This report provides preliminary indices for 2002 using data from 36 contractors for whom complete, verified data were available as of 12/1/2003 and demonstrates some of the expected instability as the population is expanded. The indices will be subject to adjustment as additional firms are added until the population reaches a size where the addition or loss of any one contractor, even a large one, will have little effect.

The contractor population used for this report includes both participants who have been in the Mississippi State study since 1995 and some that have been added as a result of the support from WSRI. The population used is therefore different from, but similar to, that for the years 1995-2001. The number of firms increased by 44%, the total volume produced increased by 66% from the levels of the first report<sup>1</sup>.

## 1.2 Production

Annual production for firms included in this preliminary report ranged from 2,900 to 323,000 tons (Figure 1).

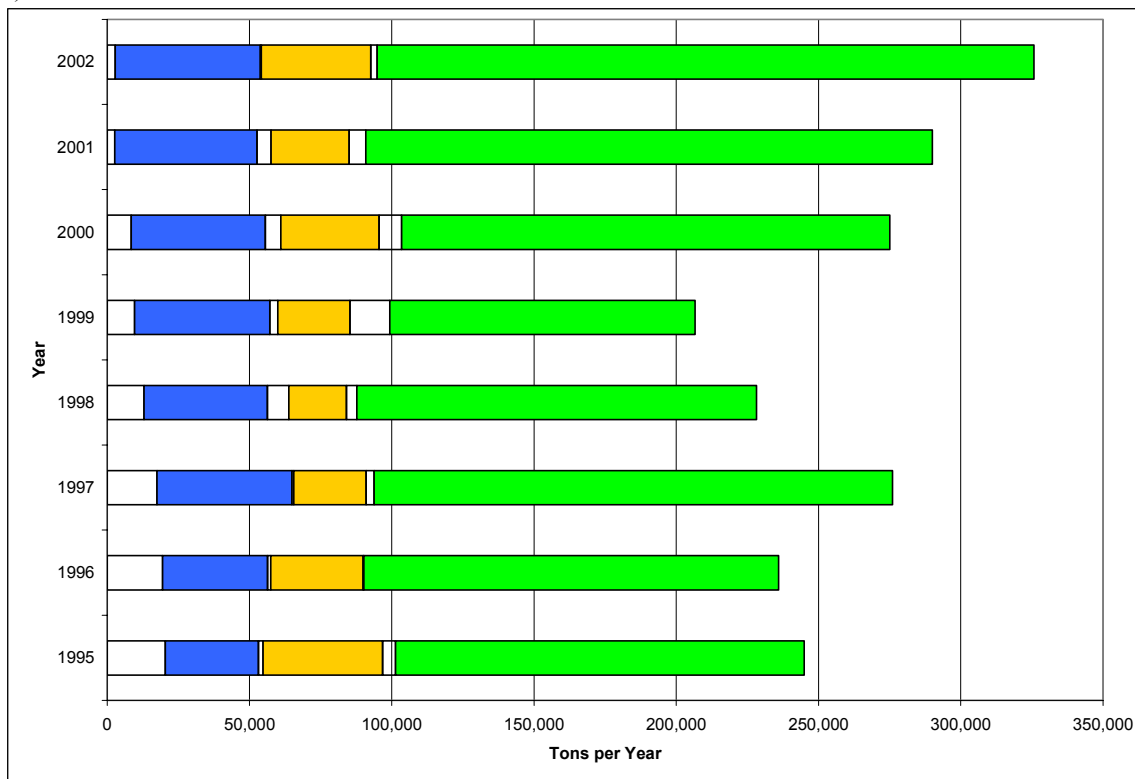


Figure 1. Production ranges by firm size. Small firms are indicated by blue, medium firms by yellow, and large firms by green.

<sup>1</sup> Stuart, W.B., L.A. Grace, B.D. Jackson, and R. Stutzman. 2003. Logging Cost Indices. Available at: [http://www.cfr.msstate.edu/forestry/Q1\\_IndicesWSRI\\_R1.pdf](http://www.cfr.msstate.edu/forestry/Q1_IndicesWSRI_R1.pdf).

The firm with the lowest production has participated in the project since the early 1990s; the firm with the highest production was added in the last year. The production range of the 10 smallest firms remained close to what it was in 2001, the range for the 10 mid-sized firms expanded both upward and downward. The largest firm pushed the upper bound higher.

Production continued to shift to the larger operations (Table 1). The share of reported production from larger operations increased from 52% in 1995 to 64% in 2002. That of the smallest group fell by four percent and the share from mid-sized contractors decreased five percent.

**Table 1. Percentage distribution of production across population groups.**

Firm Size	1995	1996	1997	1998	1999	2000	2001	2002
Small	14%	15%	14%	13%	13%	12%	11%	10%
Medium	31%	33%	32%	32%	31%	30%	28%	26%
Large	52%	51%	54%	54%	56%	58%	62%	64%
<b>Total</b>	<b>2,020,141</b>	<b>1,940,421</b>	<b>2,133,774</b>	<b>2,069,130</b>	<b>2,053,665</b>	<b>2,200,724</b>	<b>2,152,563</b>	<b>3,476,842</b>

### 1.3 Total Average Cost per Ton

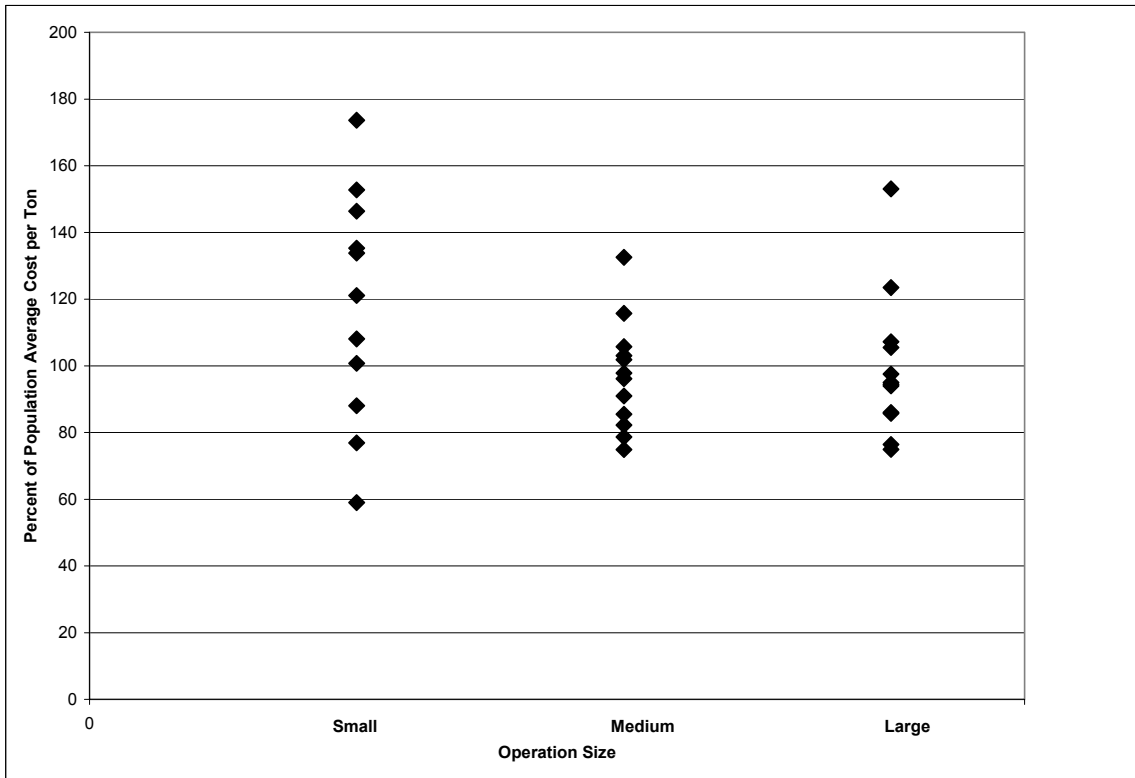
The average cost per ton for cutting and hauling a ton of wood continued to rise, at about the same rate as in 2001, running ahead of the inflation rate (Figure 2).



**Figure 2. Total average cost per ton index, inflation (CPI) index, and producer price index (PPI Logging).**

The Producer Price Index, the U.S. Census Bureau’s survey of the prices paid for logging services continued to fall, indicating that the gap between the cost of providing logging and transport services and the payments received for those services continued to widen.

Economies of scale are largely missing for logging contractors. The average annual cost per ton for individual firms expressed as a percent of the average for the entire population (Figure 3) shows some interesting relationships.



**Figure 3. 2002 Average cost per ton range within firm size.**

Some of the smaller firms tend to be “specialty” operations, harvesting small tracts, capturing grade products, performing harvests with specialized harvest prescriptions or clean-up requirements which command lower stumpage prices or higher contract rates. It is not surprising that the range of costs is wider. (One small operation with exceptionally high costs was not included here.) Five of the remaining eleven contractors experienced costs roughly equivalent to those of larger contractors.

There is no apparent difference in the range of average cost per ton between the mid-sized and larger contractors. These data, along with that from previous years, seem to indicate that logging costs are insensitive to firm size.

### 1.4 Component Costs

The distribution of component costs making up the total cost per ton shifted somewhat. Labor continued to account for an increasing share, rising from 30.7% in 1997 to 34.8% in the preliminary 2002 data (Figure 4). The percentage allocated for equipment fell and remained less than 20% for the third straight year. Consumable supplies, and insurance (excluding workers comp) were relatively stable. Contracted services cost increased, as more contract trucking was used. Administrative overheads, a relatively small component at 2.3% of total costs in 2001 had the largest percentage increase, to 3.0% in 2002.

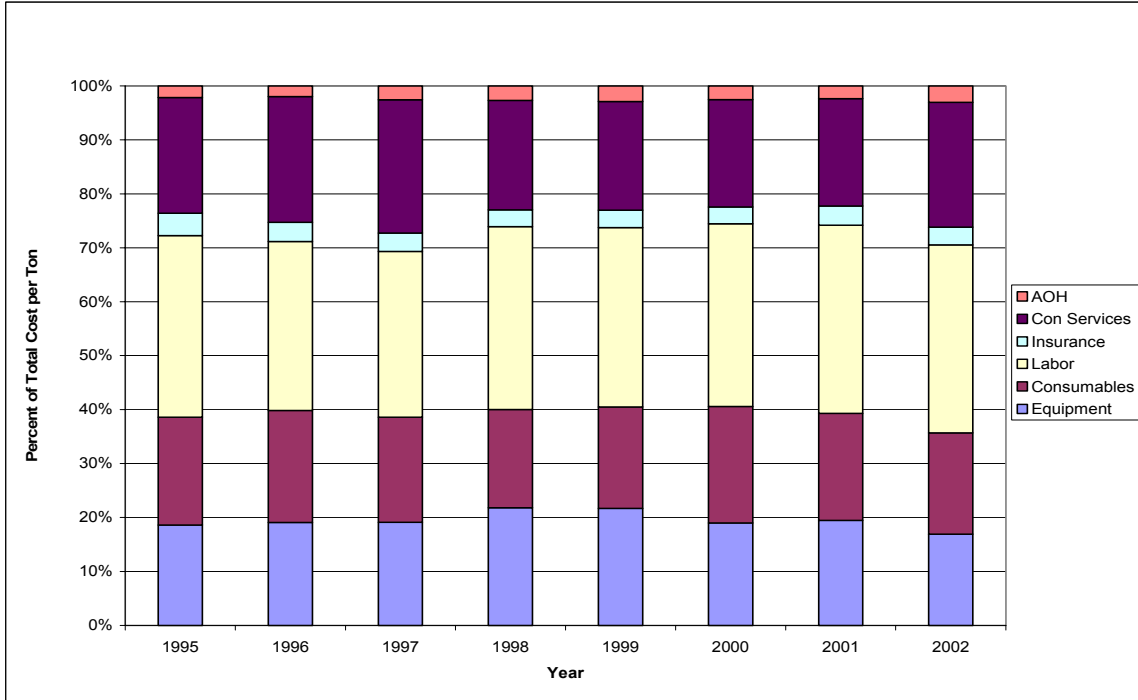


Figure 4. Component cost distribution.



### 1.4.1 Equipment Cost per Ton

Equipment cost per ton index for the expanded population fell below 1996 levels for the base population (Figure 5). This may be simply a function of the increase in sample size, a reflection of the market for logging services during the year, or a reflection of the move toward increased contract trucking. These sources will be explored further when the 2002 data set is complete.

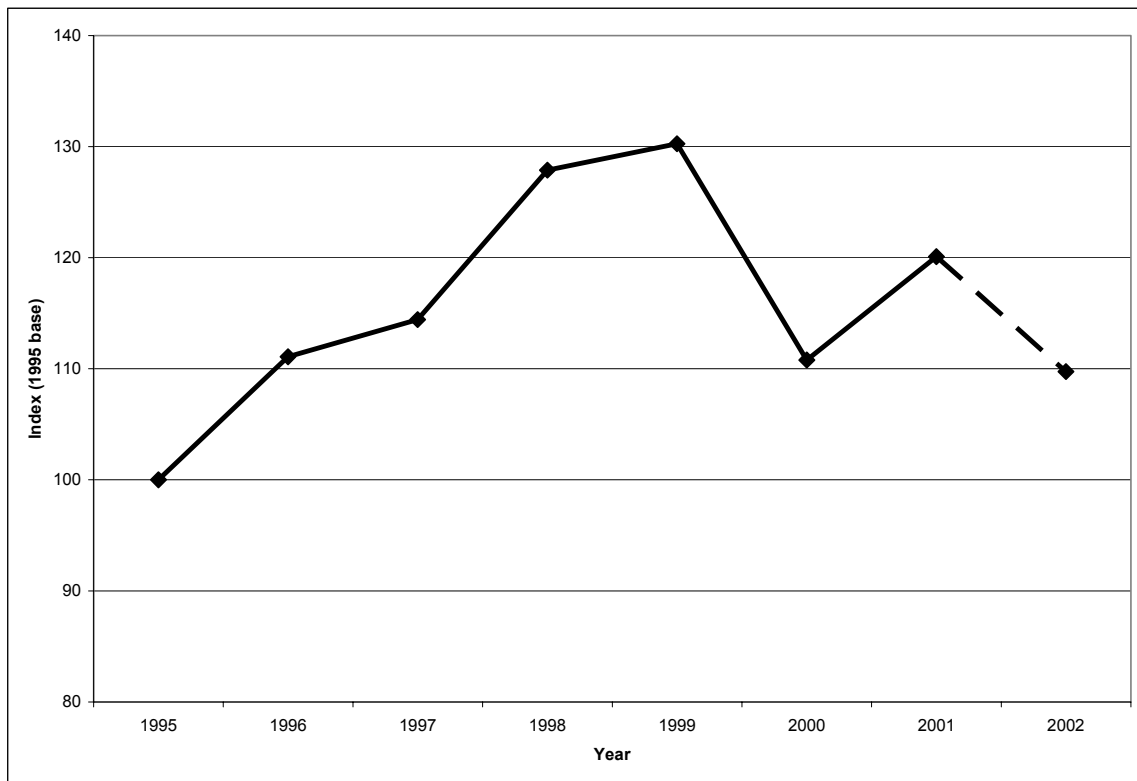


Figure 5. Equipment cost per ton index.

### 1.4.2 Consumable Supplies Cost per Ton

The consumable supplies index is overlaid with a monthly index for over-the-road diesel (1995 annual price as base) to demonstrate the volatility of fuel costs over the eight year period (Figure 6). Fuel prices for 2002 started below mid 2001 levels, went up early in 2002 then settled into a narrow range of variation. The annual consumable supplies index for 2002 remained essentially flat.

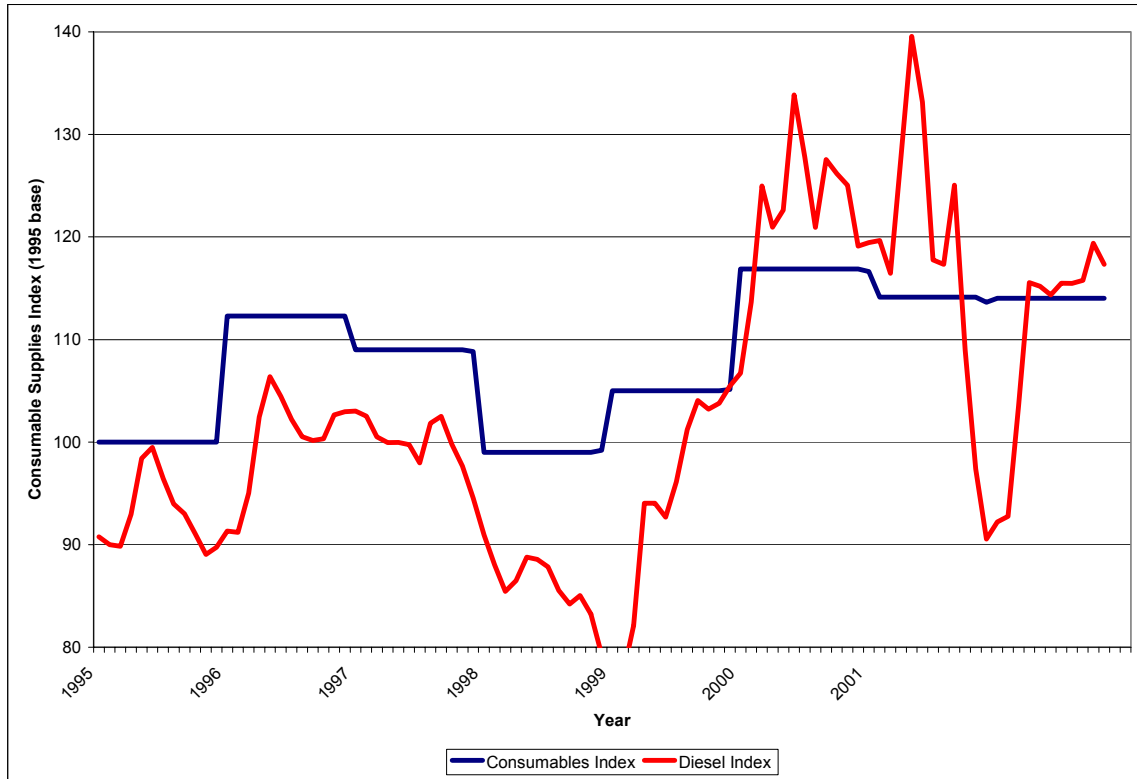


Figure 6. Consumable supplies and diesel indices.

### 1.4.3 Labor Cost per Ton Index

Labor cost per ton index advanced six points following a 10 point rise in 2001 (Figure 7). This item includes wages, Social Security and Medicare withholding, and workers compensation insurance payments. The increased use of contracted services (trucking) should have mitigated the increase in labor costs, for contract services includes labor, equipment, and supplies costs for those providing the services.

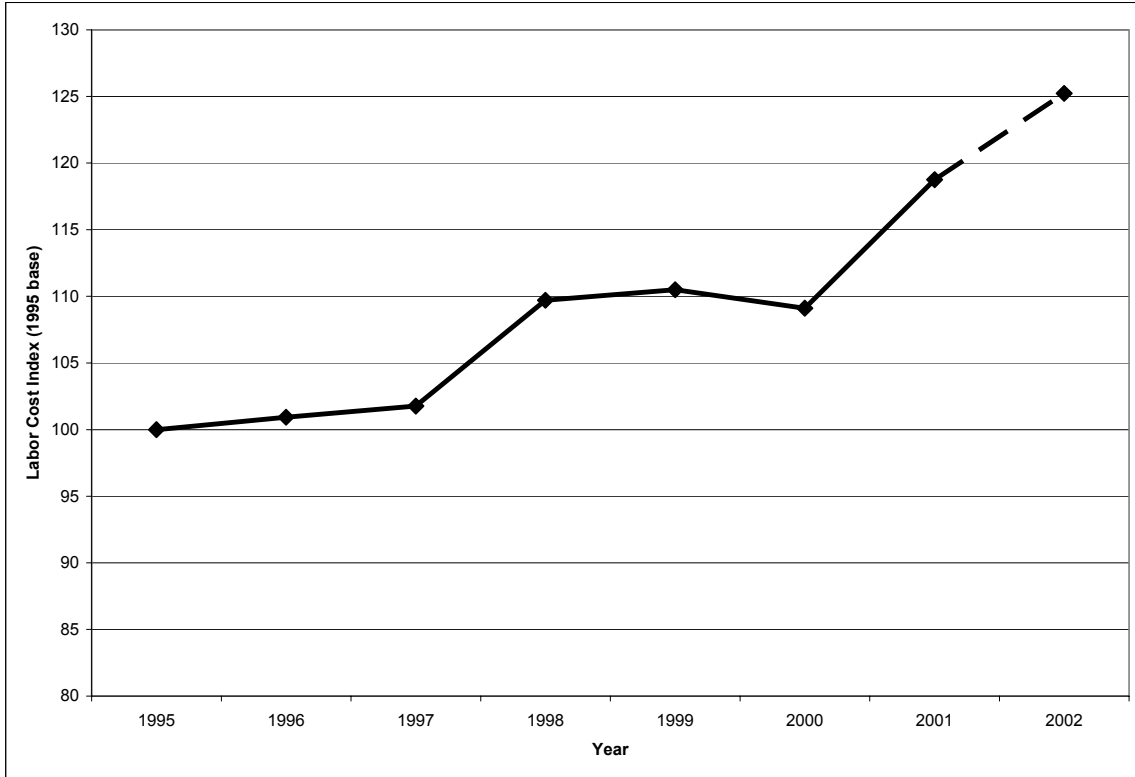


Figure 7. Labor cost per ton index.

#### 1.4.4 Insurance Cost per Ton Index

Insurance costs per ton (exclusive of workers compensation) is the only cost index that has remained below 1995 levels for the life of the study (Figure 8). The decline in 2002, after the rise in 2001, may have resulted from the increased sample size, from a decrease in coverage purchased or from the increased use of contracted services. Time has not permitted exploration of the true cause, but a decrease in coverage is suspected to be the most likely source.

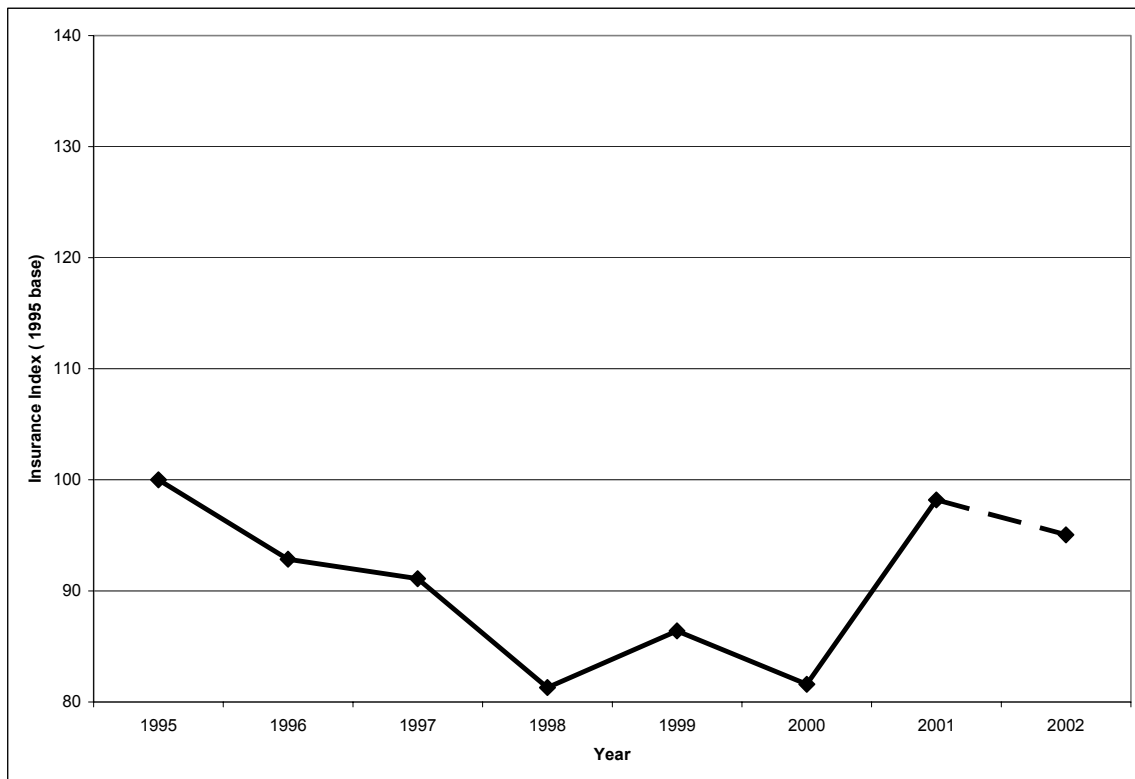


Figure 8. Insurance cost per ton index.

### 1.4.5 Contracted Services Cost per Ton Index

The cost per ton of contracted services rose rapidly in 2002 (Figure 9). Part of the increase may be associated with new participants in the study; however a cursory review of data from contractors who have been longer term participants indicate an increased reliance on contracted services during the year. This again may have resulted from the increase in sample size, from a desire to hold off on reinvestment in trucking until the market for services stabilized, or a desire to focus on one task (i.e., logging) instead of two (logging and trucking).

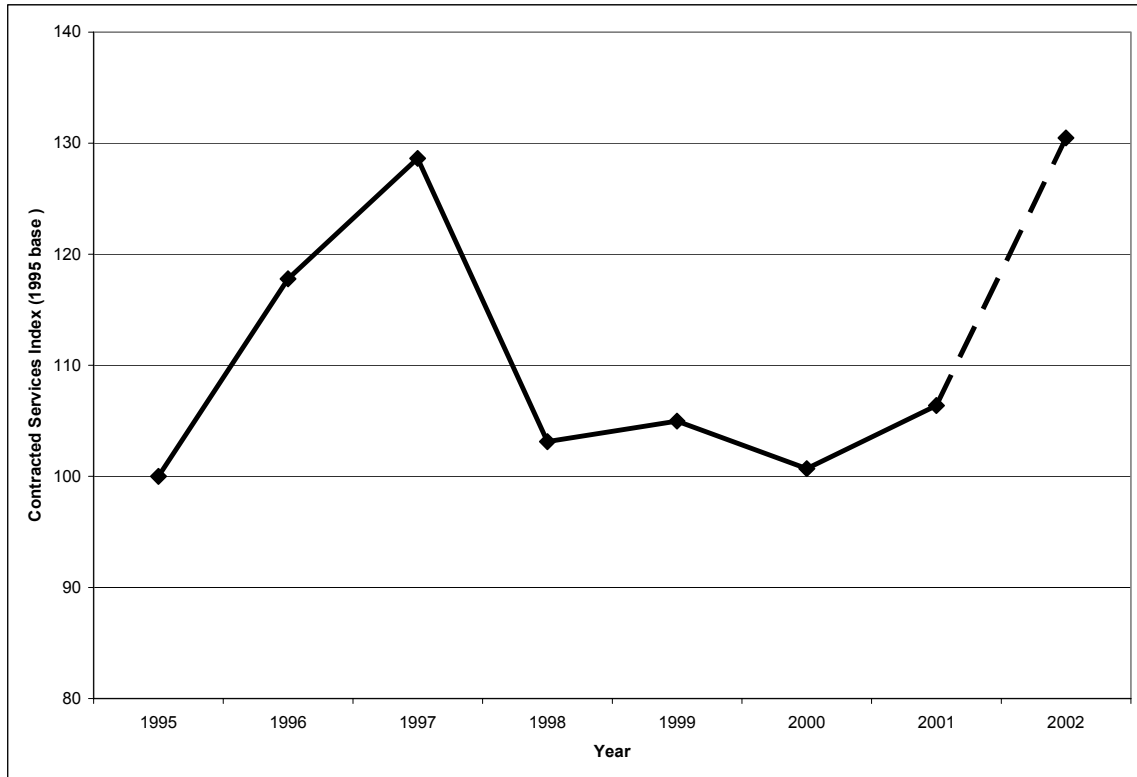


Figure 9. Contracted services index.

### 1.4.6 Administrative Cost per Ton Index

Administrative overheads account for a relatively small share of the total cost per ton for harvest and delivery, but increased at a rate greater than any other cost component in 2002 (Figure 10). The reasons for this rapid rise are not known at this time.

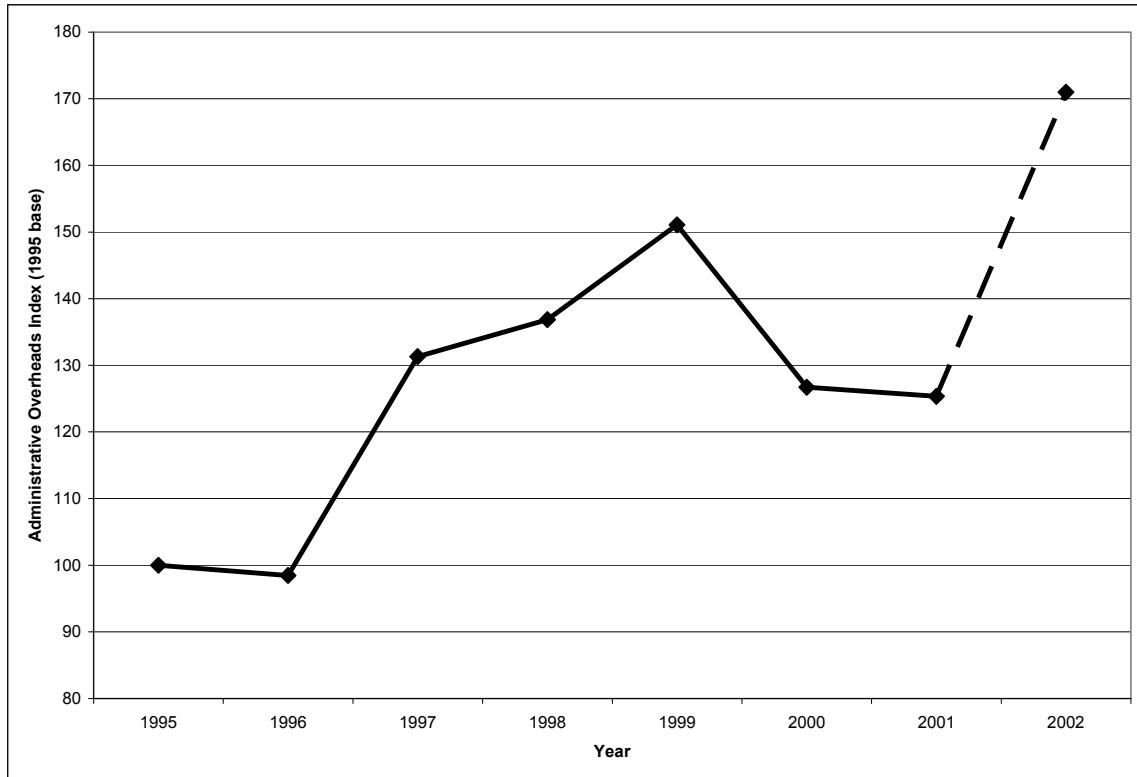


Figure 10. Administrative overheads index.

## 2 Study Participation and Recruiting

Complete annual data are available for 36 contractors were used in the previous section; data for another two is in the process of entry and verification. Partial data, generally cost data, has been provided by 14 additional contractors, these data sets are being completed. Another 3 contractors have agreed to participate in the study and are making arrangements for data transfer. An additional 20+ contractors have expressed an interest in participating, and will probably do so, but have not yet committed. Quarterly data for 14 of the 32 contractors is coming in on schedule. Efforts are being made to speed up and simplify data transfer by setting up a secure server dedicated to this project.

**Table 2. Geographic distribution of current and recently recruited study participants.**

State	Current	Probable
Alabama	8	10
Arkansas	1	4
Florida	1	4
Georgia	8	10
Louisiana	6	8
Michigan	3	4
Mississippi	8	10
New York	1	1
North Carolina	1	?
South Carolina	5	7
Texas	0	2
Virginia	6	10
<b>Total</b>	<b>48</b>	<b>70+</b>

The study team, in its recruiting efforts, has contacted and met with in excess of 50 new contractors so far this year. Initial emphasis was placed on expanding participation in Arkansas, Louisiana, and Texas as well as adding participants to fill voids in the data set as part of the normal data collection process. Recruiting trips are planned for Florida, North Carolina, Tennessee and Ohio in the near future. Uncertainty within the industry has made recruiting difficult. Several contractors who had expressed an early willingness to participate have since left the industry.

## 3 Demographics of the 2001 Population

### 3.1 Introduction

Most index efforts provide only rudimentary support documentation concerning the nature of the sources of the information used in the development of the published statistics. Cost and productivity are complex measures, difficult to reduce to a single number. It is even more difficult to demonstrate that the population from which the measures arise is representative of the population it purports to represent.

This is why considerable effort is expended to visit each firm each year to document changes that have occurred in the work and business environment, the equipment spread, the work force, and other variables that affect the enterprise. Some parameters, such as form of business organization or machine model year can be captured directly and precisely. Others, such as the percentage of wood harvested through a specific procurement arrangement or average haul distance must, in most cases, be accepted as best estimates – accurate but not necessarily precise.

Precision is desirable, but since much of this information will be used to describe the population, to document broad trends, or as bases for partitioning the data set for supplementary analyses, absolute precision is not an absolute necessity.

This sample of 14 data types were selected from Jackson's (2003) thesis<sup>2</sup>. The size of the sample has been expanded to 42 to include support data from firms that were added to the population but for whom we did not have the complete cost and productivity information required for Jackson's research. The discussion of two measures, business form and entrepreneur age has been extended to demonstrate how the information can be used in supplementary analyses. The other eight are presented as documentary support.

---

<sup>2</sup> Jackson, B.D. 2003. Evaluating the performance of independent harvesting firms in the Eastern United States, 1997-2001. M.S. Thesis. Mississippi State University, Mississippi State, Mississippi.



## 3.2 Selected support data types

### 3.2.1 Length of study participation

The cost and productivity study was started in 1990. A few firms, at that time, could provide information from earlier years. A total of 72 firms had participated between 1990 and 2001. The begin data and length of participation of individual firms (as of 1/1/2002) is shown in Figure 11.

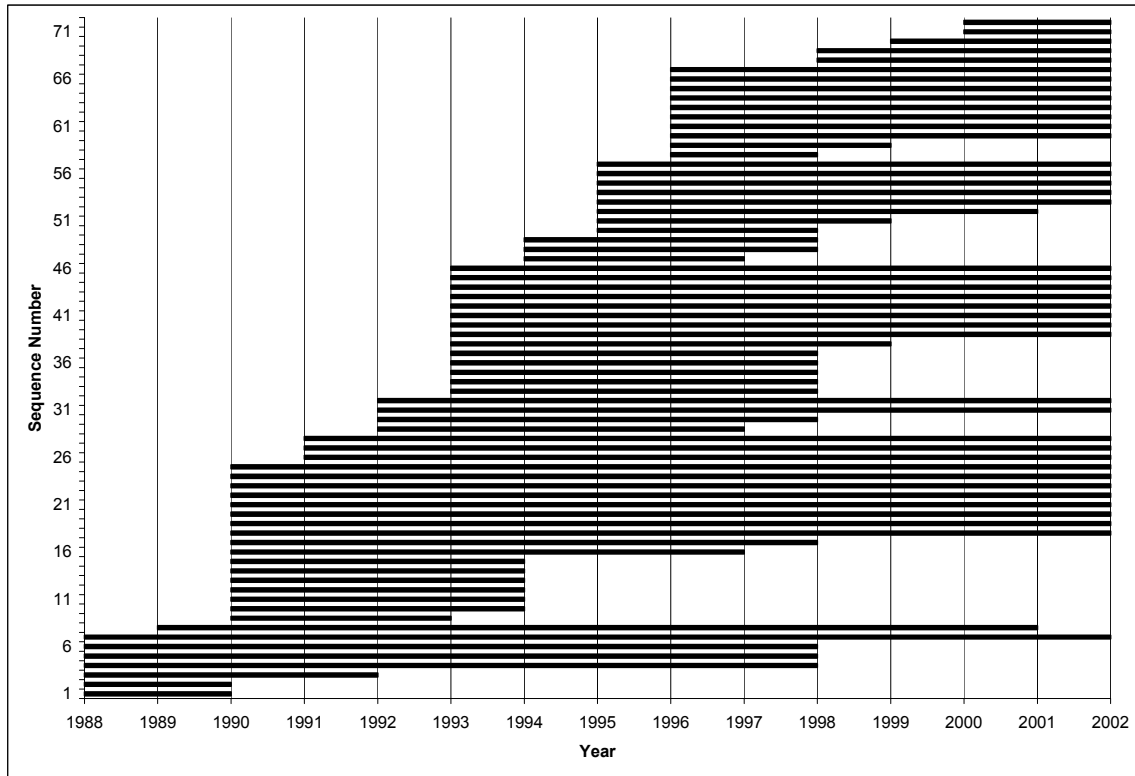
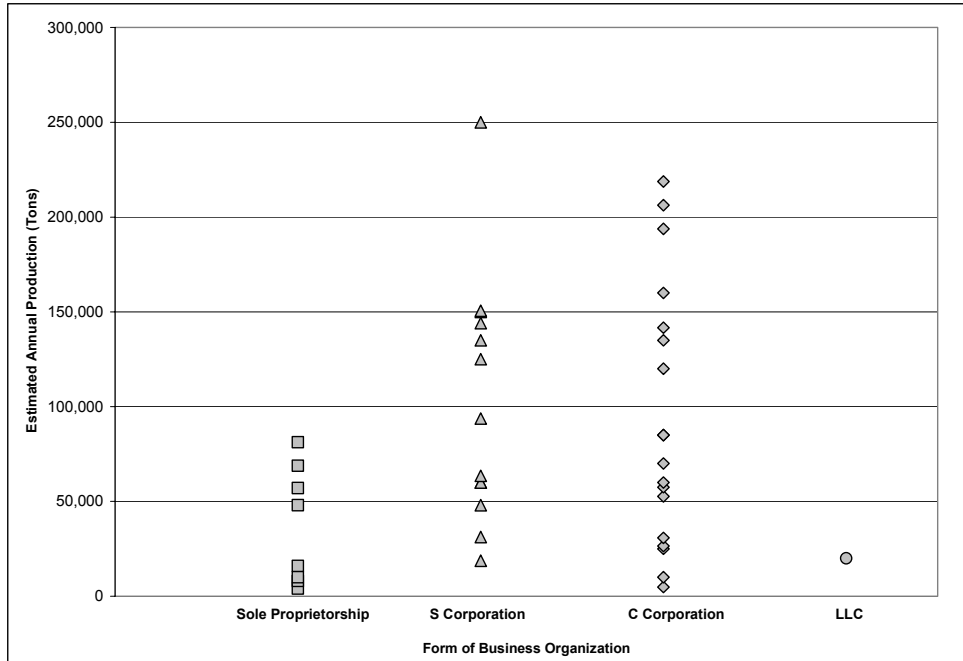


Figure 11. Study participation for participating firms.

Participation is voluntary; firms may choose to withdraw at any time and many have done so over the years. Reasons for withdrawal are generally firm specific. Some grew tired of providing data, some left the business, other firms changed hands, and some firms changed so much in structure and function that continued participation was not warranted.

### 3.2.2 Business Form

All of the operations included in the study are privately owned either individually, by family, or by close acquaintances. There are a few sole proprietorships and one LLC, but the most of the firms are incorporated, either as an S or closely held C corporation (Figure 12).



**Figure 12. Forms of business organization.**

Business organization has changed in recent years. Table 3 shows the differences in business form of participating firms for the years 1995-2002. The number of sole proprietorships has declined, the number of full corporations increased. This is generally independent of firms leaving or being added to the study. Those were spread across the business spectrum. The shift was more likely a function of SFI driven logger education programs encouraging loggers to revisit their business structure because of income taxes and liability exposure.

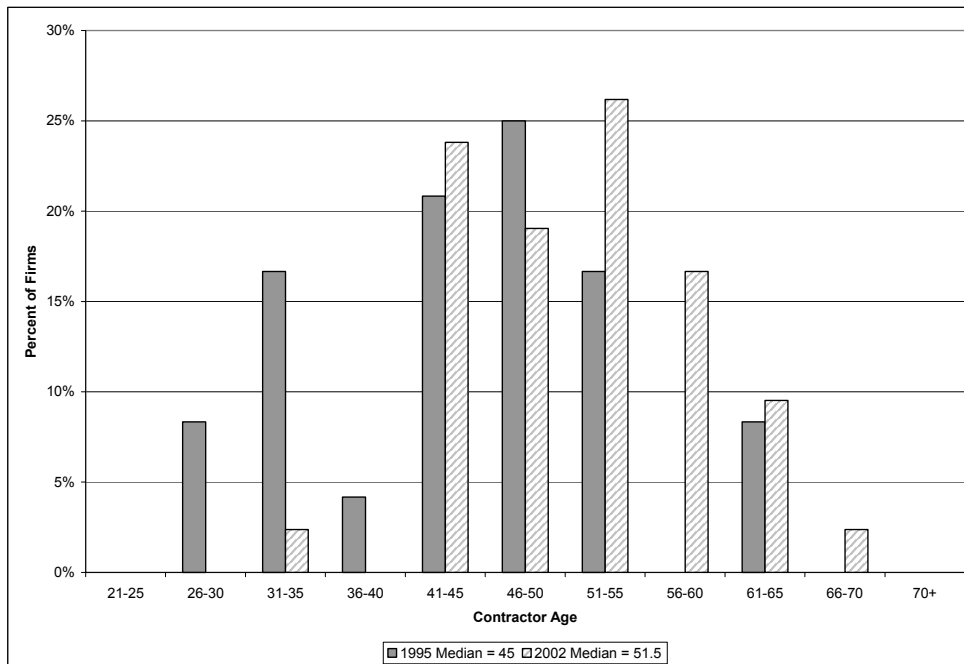
**Table 3. Changes in business form 1995 – 2002.**

Organization Form	1995	2002
Sole Proprietorship	33%	19%
General Partnership	8%	0%
S corporation	33%	33%
C corporation	26%	45%
Limited Liability Company	0%	3%

### 3.2.3 Contractor Age

Walter (1998)<sup>3</sup> in an earlier stage of the study found a bimodal age distribution of contractors in the study as of late 1995, nearly one quarter were age 40 or younger. Most of these younger contractors left the study and the industry since then. Recruiting younger operators proved difficult in recent years and continuing participants aged, leaving a truncated uni-modal distribution of contractors that are, with one exception, over 40 (Figure 13).

<sup>3</sup> Walter, M.J. 1998. Documentation of Productivity and Efficiency Relationships for a Group of Southern Logging Contractors. M.S. Thesis. Virginia Polytechnic Institute and State University. Blacksburg, Virginia.

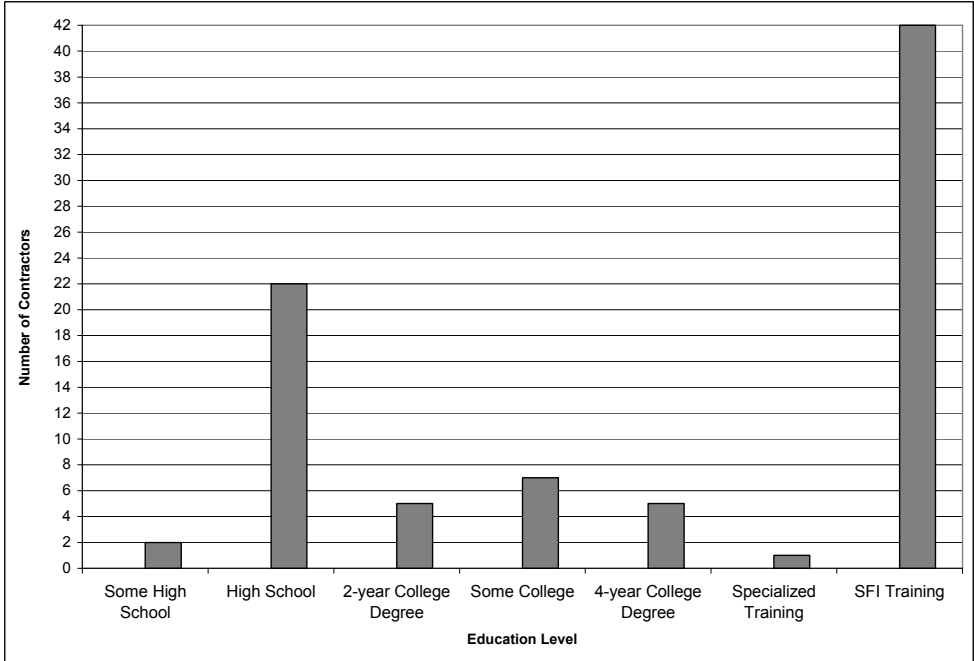


**Figure 13. Contractor age distributions**

### 3.2.4 Education

It is a common misconception that logging contractors are less educated and less prepared than others managing similar sized businesses. This may have been true in the past when education was undervalued, and often difficult to come by in rural areas. It is not the case with business owners meeting the criteria for inclusion in this effort, those of being recognized as good businessmen, being in compliance with relevant labor and business regulations, maintaining good business records and being well regarded by their peers.

Owning and operating a capital intensive business such as logging requires the manager to be both educated and savvy businessmen to be successful. All but one of the participants have completed high school. The highest level of education achieved by the participants, along with other formal training is shown in Figure 14. SFI training is not considered as equivalent to formal, classroom education but was included as an indication of participant to take advantage of educational opportunities.

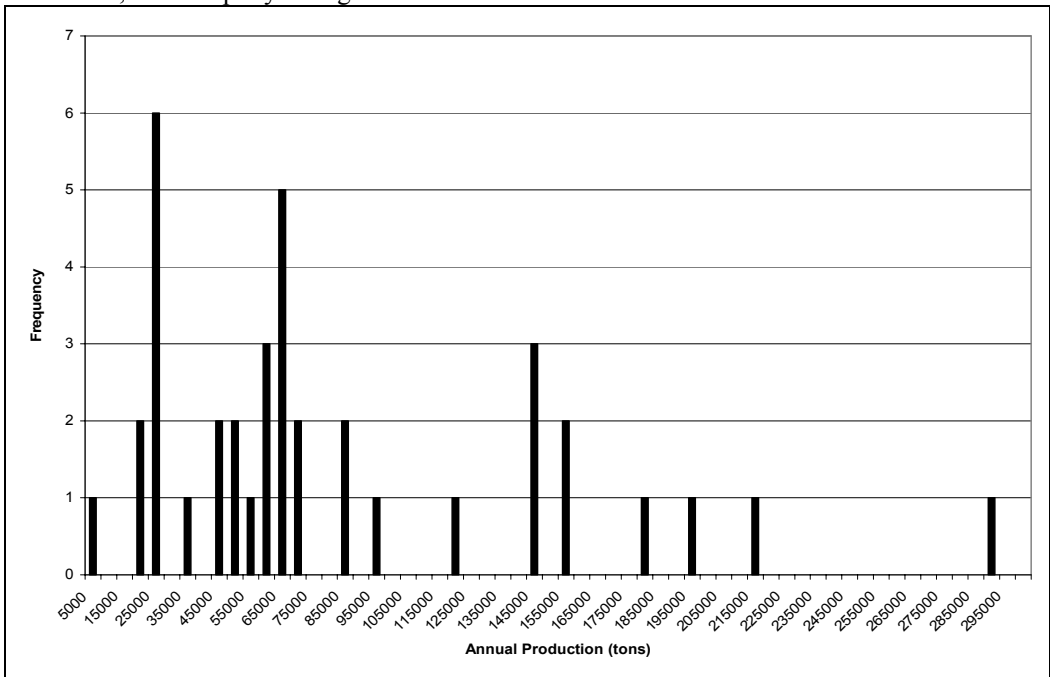


**Figure 14. Highest level of education attained by study participants**

Only two contractors had not completed high school, over 95% had high school diplomas. Fifty-two percent had high school completion as their terminal, formal education. Forty-three percent had attended at least some college. One contractor has had specialized training in lumber grading.

### 3.2.5 Production per firm

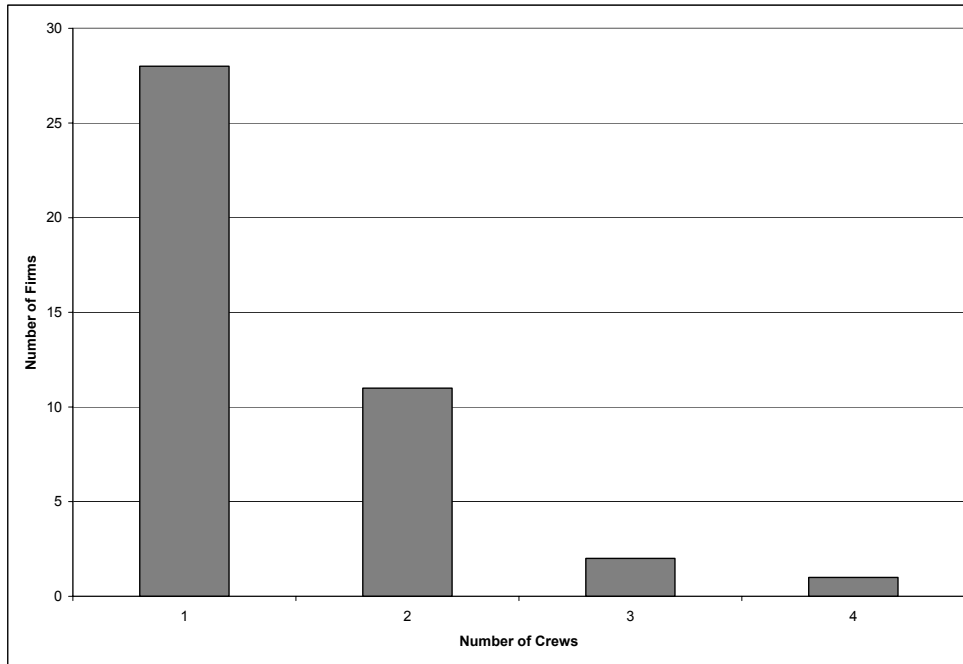
Production per firm (Figure 15) ranged from 2,900 tons per year to 290,000 tons per year but tend to cluster in 50 to 85,000 tons per year region.



**Figure 15. Distribution of annual production per firm**

### **3.2.6 Number of Crews**

Single crew operations are the most common (Figure 16). Eleven firms ran two crews, two had three crews, and one contractor was running four crews



**Figure 16. Number of crews per firm.**

### **3.2.7 Employees per firm**

Employees, logging and truck drivers, as of 2002 ranged from 2 to 21 (Figure 17). Truck drivers employed by a commonly owned firm providing contract hauling services for the logging operation are not included, since they technically were employees of a second business.

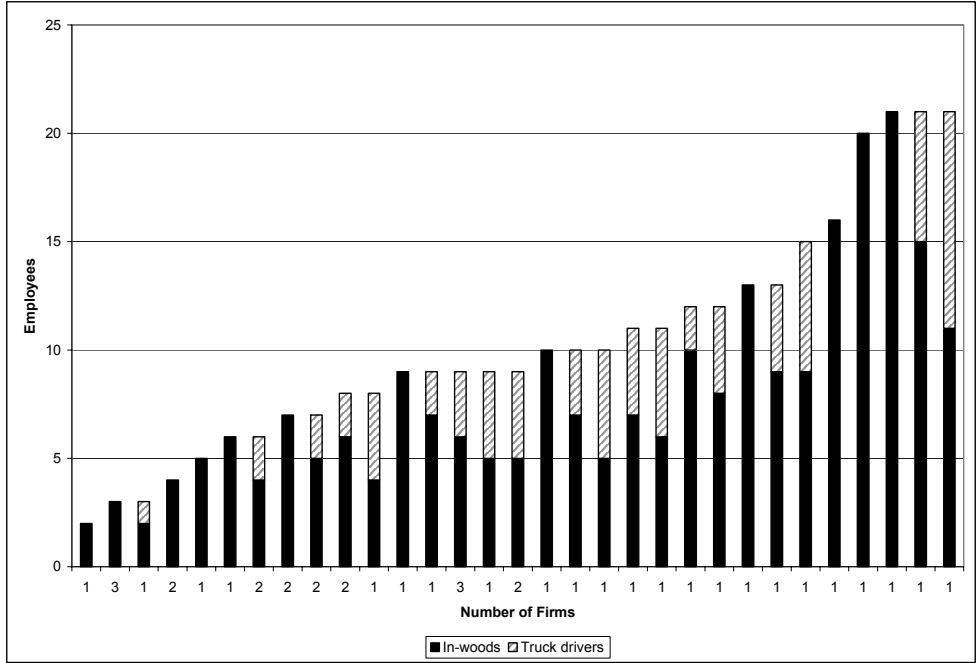


Figure 17. Employees per firm

3.2.8 Methods of Payment

Payment methods varied with employee duties. Crew foremen and owners usually drew a weekly salary. Saw hands and other machine operators tended to be paid hourly or daily; although some were paid on a production basis. This comparison is shown in Figure 18.

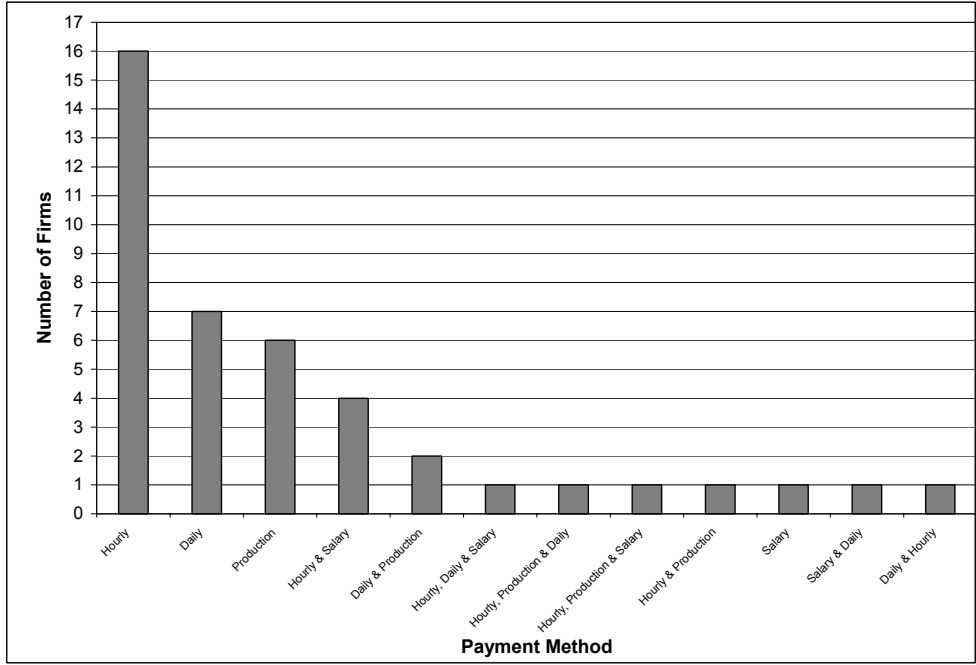


Figure 18. Methods of labor payment.

### 3.2.9 Fringe Benefits

All firms offered some type of fringe benefits for their employees – transportation to the job, paid vacations, holiday pay, or a Christmas bonus (Figure 19).

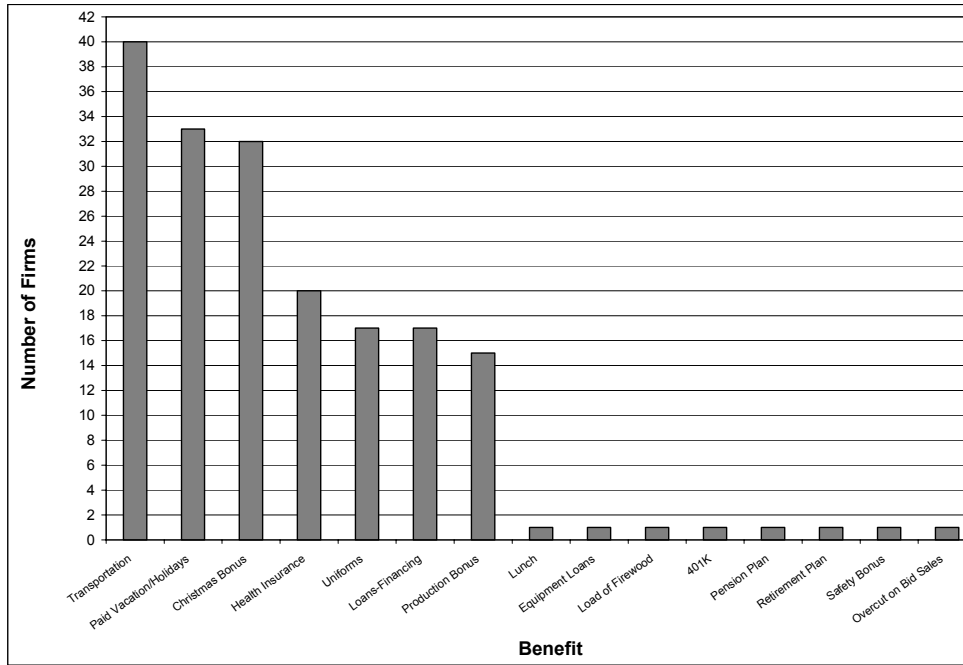


Figure 19. Fringe benefits offered.

Less than half were offering health or accident insurance beyond their Worker’s Compensation Insurance even on a co-pay or employee pay basis. Slightly fewer provided uniforms, offered short term loans/pay advances (a traditional benefit), or production bonuses. Benefits common in today’s labor market – pension plans, 401K, or retirement plans were very rare. Other informal benefits included lunch, equipment loans, firewood, safety bonuses and sharing of profits obtained from the over-cut on bid sales.

### 3.2.10 Trucking strategies

Only 7 of the 42 firms relied solely on external contract haulers to move their wood, nine had trucking incorporated as a separate business unit (Figure 20). The remainder either did all of their own hauling, or relied primarily on their own trucks but used contractors when necessary.

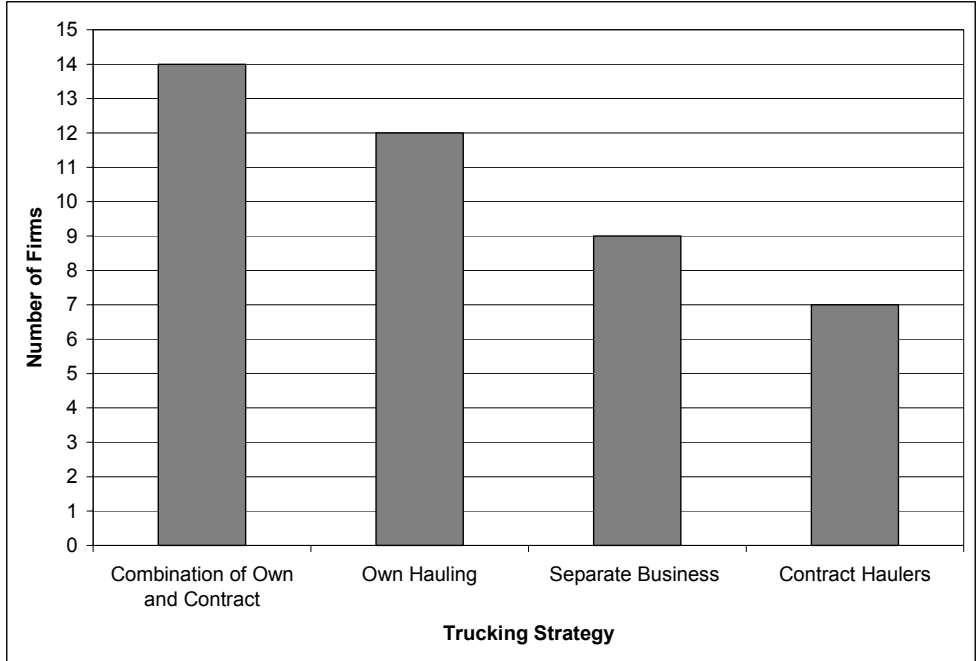


Figure 20. Trucking strategies.

### 3.2.11 Stumpage acquisition

Methods of stumpage acquisition ranged from the contractors buying their own timber and merchandizing products, through contracting with dealers to cut and haul timber from private and corporate lands, to contracting directly with corporations to harvest timber from company lands or company purchased timber. Most used some mix of the three methods (Figure 21).

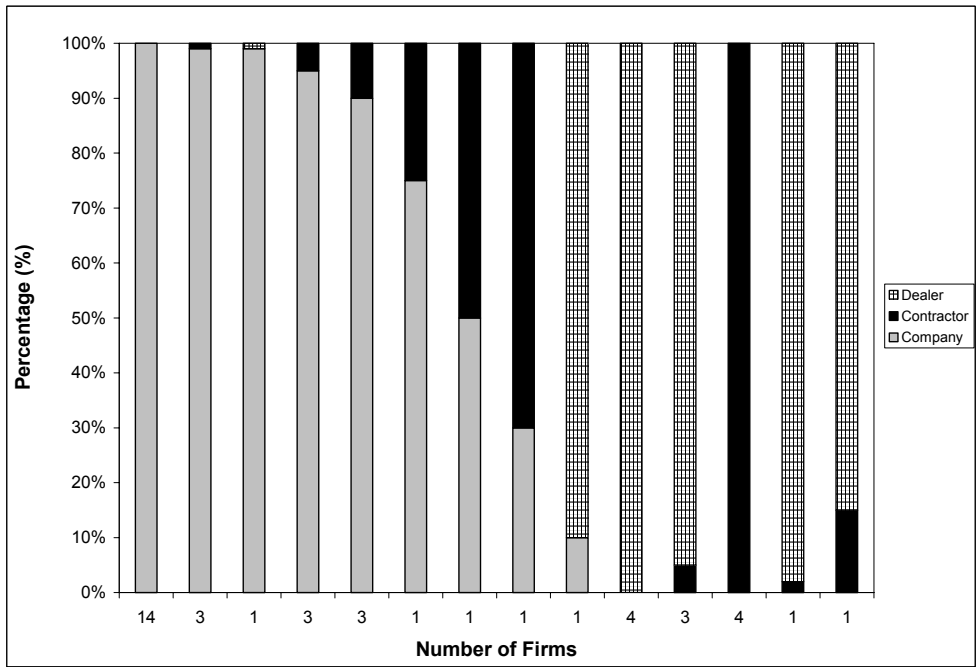


Figure 21. Methods of stumpage acquisition.



### 3.2.12 Species mix

Logging pine and hardwood timber require different skills and often different equipment, but relatively few contractors have the luxury of harvesting only one species group. Figure 22 demonstrates that most contractors must maintain the skills and equipment necessary to handle a mix of the two, a mix that may change from year to year depending on markets and weather patterns.

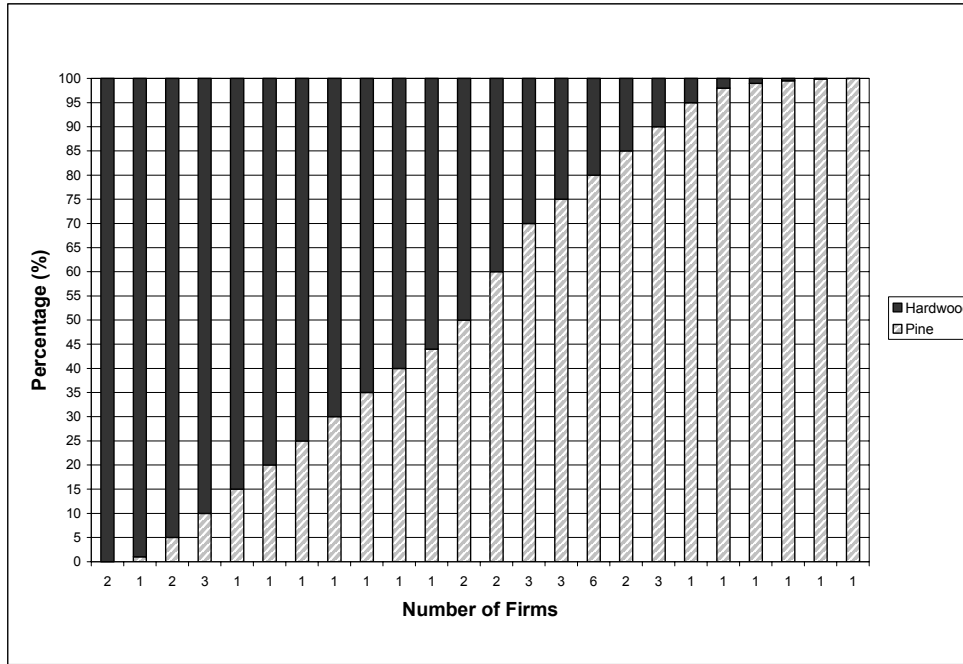


Figure 22. Species mix.

### 3.2.13 Equipment age

Most of the equity in a logging firm is tied up in equipment. The IRS considers the economic life (depreciation period) for most major pieces of logging equipment as five years. The life of road tractors is three. Equipment older than that is “depreciated out”, having little or no residual value. Figure 23 demonstrates that there is relatively little new equipment in these firms; most is approaching or past the end of its economic life.

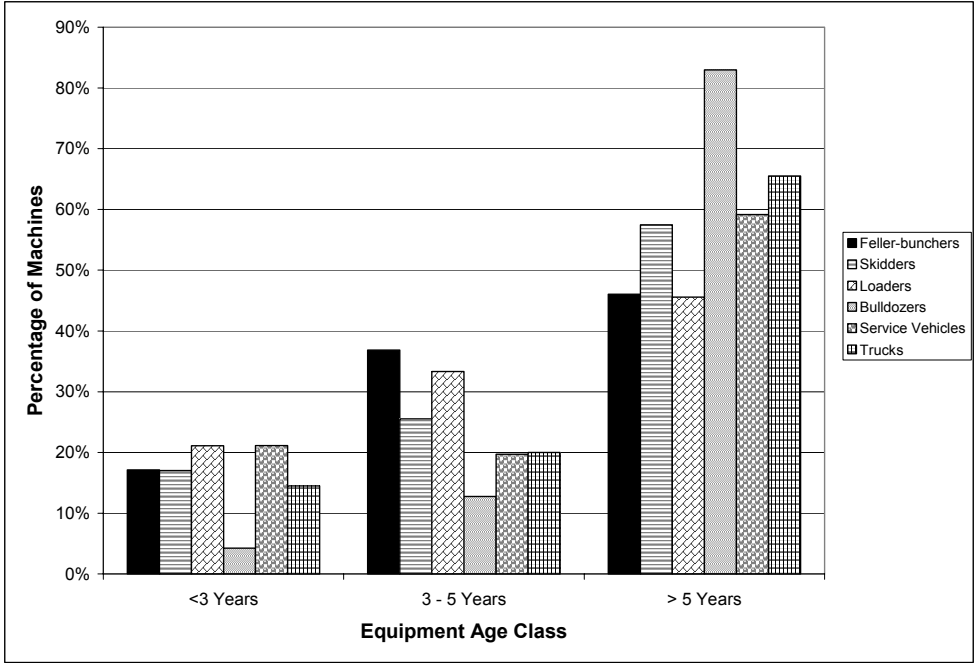


Figure 23. Equipment age classes by type.

### **3.3 Discussion**

The elements selected for inclusion in this section are a small sample of the confidential support documentation maintained concerning the firms, the principals, the labor force, the equipment, the operating and business environment, and other factors that affect cost and productivity. Having the same data available for a stable, representative sample of the industry on a year to year basis provides an excellent method of monitoring changes in firms and in the industry.

As discussed in the first two reports, developing indices, and identifying the causes of changes in the index are two independent, but related analyses. Without the second, changes in the index can only be accepted with out question, or rationalized without supporting documentation. Neither of which are satisfactory tools for managing the wood supply system or assessing methods for improving its performance.

The opportunities for supplemental analyses increase as the population size increases to the extent that it can be partitioned for analyses by region, operation type, job size, or procurement system, The complexity of the system mitigates against the effectiveness of simple or superficial investigations.

## Appendix

### Contents

Appendix Table 1. 2002 Production (Tons) Distribution by thirds .....	25
Appendix Table 2. Cost Indices .....	25
Appendix Table 3. Individual annual costs per ton as a percentage of population total average cost per ton. .....	25
Appendix Table 4. Percentage contribution of individual cost components .....	26
Appendix Table 5. Monthly diesel fuel and annual consumable supplies indices.....	26

Appendix Table 1. 2002 Production (Tons) Distribution by thirds.

Year	Small		Medium		Large	
	Low	High	Low	High	Low	High
1995	20,475	32,697	34,358	76,298	80,877	224,475
1996	19,450	36,953	38,064	70,456	70,789	216,520
1997	17,533	47,393	48,020	73,506	76,238	258,522
1998	12,975	43,303	50,896	71,144	74,747	215,193
1999	9,644	47,526	50,281	75,694	89,691	196,948
2000	8,496	47,100	52,523	87,073	95,011	266,504
2001	2,649	49,984	54,955	82,351	88,214	287,351
2002	2,855	49,250	49,486	87,973	90,211	322,829

Appendix Table 2. Cost Indices

Year	Cost/ Ton	Equipment	Consumable Supplies	Total Labor	Insurance	Contract Services	Admin. Overhead	CPI	PPI Logging
1995	100	100	100	100	100	100	100	100	100
1996	108	111	112	101	93	118	98	103	96
1997	111	114	109	102	91	129	131	105	98
1998	109	128	99	110	81	103	137	107	97
1999	112	130	105	110	86	105	151	109	94
2000	109	111	117	109	82	101	127	113	91
2001	115	120	114	119	98	106	125	116	86
2002	121	110	114	125	95	130	171	118	85

Appendix Table 3. Individual annual costs per ton as a percentage of population total average cost per ton.

Small Firms	Medium Firms	Large Firms
59	75	75
77	79	76
88	82	86
101	85	86
108	91	94
121	96	94
134	98	95
135	102	98
146	103	105
153	106	107
174	116	123
418	133	153

Appendix Table 4. Percentage contribution of individual cost components

Year	Equipment	Consumable Supplies	Labor	Insurance	Contract Services	Admin. Overhead
1995	18.6%	20.0%	33.6%	4.2%	21.4%	2.1%
1996	19.1%	20.7%	31.3%	3.6%	23.3%	2.0%
1997	19.1%	19.5%	30.7%	3.4%	24.7%	2.5%
1998	21.9%	18.2%	33.9%	3.1%	20.3%	2.7%
1999	21.7%	18.8%	33.3%	3.2%	20.1%	2.9%
2000	19.0%	21.6%	33.9%	3.1%	19.9%	2.5%
2001	19.5%	19.8%	34.9%	3.6%	19.9%	2.3%
2002	16.9%	18.8%	34.8%	3.3%	23.1%	3.0%

Appendix Table 5. Monthly diesel fuel and annual consumable supplies indices

Month	1995		1996		1997		1998	
	Diesel	Consumables	Diesel	Consumables	Diesel	Consumables	Diesel	Consumables
Jan	91	100	91	112	103	109	91	99
Feb	90	100	91	112	103	109	88	99
Mar	90	100	95	112	101	109	85	99
Apr	93	100	102	112	100	109	86	99
May	98	100	106	112	100	109	89	99
June	99	100	104	112	100	109	89	99
July	96	100	102	112	98	109	88	99
Aug	94	100	101	112	102	109	86	99
Sept	93	100	100	112	102	109	84	99
Oct	91	100	100	112	100	109	85	99
Nov	89	100	103	112	98	109	83	99
Dec	90	100	103	112	95	109	79	99

Month	1999		2000		2001		2002	
	Diesel	Consumables	Diesel	Consumables	Diesel	Consumables	Diesel	Consumables
Jan	79	105	107	117	119	114	92	114
Feb	77	105	114	117	120	114	93	114
Mar	82	105	125	117	116	114	104	114
Apr	94	105	121	117	128	114	116	114
May	94	105	123	117	140	114	115	114
June	93	105	134	117	133	114	114	114
July	96	105	128	117	118	114	115	114
Aug	101	105	121	117	117	114	115	114
Sept	104	105	128	117	125	114	116	114
Oct	103	105	126	117	109	114	119	114
Nov	104	105	125	117	97	114	117	114
Dec	105	105	119	117	91	114	115	114