Minnesota’s Logging Businesses: An Assessment of the Health and Viability of the Sector

Charles R. Blinn, Tim J. O’Hara, Dave T. Chura, and Matthew B. Russell

With the closure of several mills within the state, industrial procurement managers became concerned about the status and trends of Minnesota’s logging sector. A mail survey and follow-up focus groups were conducted to assess the health and viability of the sector. Although there are many logging businesses producing up to 5,000 cords annually, those businesses produce a small percentage of the total annual volume harvested, have the oldest equipment, work during the winter, and are operating at the lowest level of their reported capacity. Over time, there has been a trend toward larger producers who harvest an increasing percentage of the total annual volume harvested. Business owners are keeping their equipment longer than in the past, which has both positive and negative effects. Although those small logging businesses will continue to have a niche with private landowners in the future, it is likely that their number will continue to decline and that there will be continued growth of producers harvesting >15,000 cords annually. To be successful in the future, the logging sector will need to help itself and will need assistance from public forest management agencies, procurement mills, and lending institutions.

Keywords: operating capacity, wood supply chain, production, season of harvest, logging equipment

Logging businesses play a critical role in the wood supply chain, providing wood to mills for use in the manufacture of various forest products. Thus, access to information about logging businesses is important to policymakers, land management agencies, procurement mills, logger training organizations, and logger and forest products associations. Across the United States, a national assessment was conducted (Anonymous 2011) and several states have collected baseline and/or ongoing information about logging businesses (e.g., Egan and Taggart 2004a, 2004b, Goldstein et al. 2005, Rickenbach et al. 2005, Milauskas and Wang 2006, Allen et al. 2008, Baker and Greene 2008, Egan 2009, 2011, Traver 2012, Traver et al. 2013). Combining data from a number of logging business surveys, Taylor and Barynin (2013) indicated that the wood supply chain is working through a unique set of conditions because of the long decline in wood consumption associated with the economic recession.

The last review of the logging sector in Minnesota was conducted by Powers (2004). Since then, annual harvest levels dropped by approximately 1 million cords (27%) between 2003 and 2011 (Minnesota Department of Natural Resources [MN DNR] 2006, 2012). Four oriented strand/structural board mills were closed permanently and one roof felt mill was shut down for several years, lowering demand and making it more difficult to market some species. Concerns were expressed by procurement managers about the status and capacity of Minnesota’s loggers.

To better understand the health and viability of Minnesota’s logging sector, a mail survey and focus groups were conducted. This article summarizes some of the results from those assessments.

Approach

Data were initially collected in 2012 using a mail survey of Minnesota’s logging business owners that assessed the status of this sector in 2011. Because the survey was designed to provide a broad overview of many factors without assessing the rationale for responses, focus groups with business owners and industrial procurement staff were subsequently conducted in 2013 to provide additional insight. Each approach is briefly described below. An exemption from review for both surveys was received from the institutional review board at the University of Minnesota. Additional details about the surveys are available in Blinn et al. (2014).

Mailed Surveys

A mail survey was designed and administered using standard mail survey procedures (Dillman 2000) to collect data similar to those in
previous surveys and other information. Drafts of the survey were shared with the Minnesota Forest Industries Forestry Affairs Committee and AgStar Financial Services. The final survey included sections for background information, harvest operations, equipment, future plans within the business, and training needs. Respondents were asked to answer questions on these topics using 2011 as the reference year. The survey was mailed to 427 logging business owners listed on the Minnesota Logger Education Program’s (MLEP) membership directory in the spring of 2012. Brokers were excluded from the mailing.

Data from returned surveys were entered into Excel. Traditional outlier analyses were conducted before analysis of the data. These included detecting outliers through the use of box-and-whiskers plots and the authors’ knowledge of unreasonable survey responses.

Basic summary statistics were calculated using Excel. Except where data are weighted by volume produced, the unit of analysis is the individual respondent. To better understand the effects of percentage of stumpage purchased by someone else (e.g., a mill or a broker) and annual production level on various factors, one-way analysis of variance or Pearson $r^2$ tests were performed, and individual treatment means were subsequently compared using Tukey’s multiple comparison procedure if an $F$-test yielded a significant result. All statistical tests were conducted at $\alpha = 0.05$ using the R statistical package (R Development Core Team 2012).

Focus Groups

Nine focus groups were conducted with loggers (three) and mill procurement staff (six) in northern Minnesota between May 20 and 24, 2013, to better understand some of the themes identified through the mail survey responses, to ask some new questions, and to understand how some of the mail survey results might affect the logging sector as a whole and some of the larger mills in northern Minnesota. Each focus group consisted of either a mix of logging business owners or procurement staff from one forest products firm. Logging business owners were selected to provide a range of business sizes (i.e., small and large), equipment configurations (i.e., conventional and cut-to-length), and length of business ownership (i.e., newer businesses and more well-established businesses). Focus group responses were summarized to identify themes for each question by respondent type (i.e., logging business owner or industry response).

Results and Discussion

A total of 243 respondents returned the survey for an overall response rate of 57.3%. Of the responding businesses, 11 indicated that they did not harvest any timber in 2011. Three of the mailed surveys were undeliverable. Surveys were then screened and only those firms producing at least 100 cords in 2011 were included in subsequent analyses (six surveys were thus excluded from the analysis). There were 226 useable responses, representing more than 73% of the volume harvested in the state in 2011, with the highest concentration from the northeast portion of the state and the least from the central/southern portions (Figure 1). The regional breakdown of responses is very similar to MLEP’s distribution of membership and volume production across Minnesota.

Firm Characteristics

The average logging business had been in operation for 28.1 years (median 29) in 2011 (Table 1). Approximately 70% of the responding businesses had been in operation for more than 20 years and 13% for as many as 10 years. The average length of time in the logging business has been increasing compared with that in previous surveys when it was 25.3 years in 2003 (Powers 2004) and 22.8 years in 1996 (Puettermann et al. 1998). Although the proportion of new logging businesses in Minnesota (up to 10 years) in 2003 was slightly less than that in 2011 (10.1% in 2003 versus 12.9% in 2011), the percentage of more well-established businesses (more than 30 years in operation) was 50% higher in 2011 than in 2003.

Respondents produced 1,989,220 cords in 2011, which represents approximately 73% of the estimated 2011 statewide production (MN DNR 2012). There was a considerable range in their production: from 100 to 138,393 cords. Only 8.8% of the respondents indicated that their average one-way haul distance was less than 30 miles and 24% indicated that it was more than 90 miles. On average, 4.64 gallons of fuel/cord were required to harvest and deliver each cord of wood produced.

The sector is characterized by a large number of firms that annually produce relatively small volumes and a few firms with high levels of production (Figure 2). The average respondent produced 9,518 cords in 2011 (median 4,000 cords) and purchased approximately 75% of their stumpage with the remainder purchased by someone else (e.g., a broker or a mill) (Table 1). The 38 respondents who each produced more than 15,000 cords (18.2% of the respondents) harvested 64.5% of the reported volume, whereas the 122 respondents who each produced up to 5,000 cords (58.4% of the respondents) harvested 11.8% of the reported volume. The presence of many small-volume producers and few large producers mirrors that in past surveys (Bolstad 1980, Jaakkio Pöyrö Consulting, Inc. 1992, Puettermann et al. 1998, Powers 2004), with a continued growth in average volume produced per respondent and the percentage of higher volume producers. The trend toward larger businesses mirrors what has happened in the agricultural sector where there has been a general reduction in the number of farms and an increase in the average size of remaining farms over the past 40 years (US Department of Agriculture 2013).

Approximately 64% of the volume harvested in 2011 was from public lands, with the MN DNR being the largest stumpage provider (Figure 3A). Compared with all other respondents, the smallest producers (100–1,000 cords) obtained a significantly higher percentage of their stumpage from family forestlands ($P < 0.001$) and harvested a significantly lower percentage of their volume during the summer ($P < 0.001$). Businesses that had more than 50% of

Figure 1. Summary of where respondent’s business was located by Minnesota county during 2011 ($n = 226$).
their stumpage provided by someone else produced a significantly higher percentage of their volume during the summer \( (P = 0.042) \) than businesses that purchase at least 50% of their stumpage.

About half of the reported volume was felled with a reach to tree feller-buncher (Figure 3B). Of the reporting businesses, 72 (35.3%) felled all of their volume with a feller-buncher. Although half of the respondents indicated that they fell some of their timber with a chainsaw, the total volume represented by that felling method is small. The percentage of volume felled using a chainsaw has continued to drop over time from a high of 27% in the 1991 survey (Jaakko Pöyry Consulting, Inc. 1992). The percentage of volume felled with a cut-to-length harvester has tripled since the 1996 survey (Puettmann et al. 1998).

Approximately 51% of the volume harvested during 2011 was reported to be produced during winter (December–February) (Figure 3C). The smallest percentage of wood was harvested during the spring (March–May). Although one of the respondents indicated that none of its production occurred during winter, 53.2% indicated that they did not produce any volume during the spring and 27.8% indicated that they did not produce any volume during the summer (June–August). Respondents who produced more than 5,000 cords in 2011 harvested a larger percentage of their total volume during the summer (20.8%) with 94.1% of those respondents producing some volume during the summer compared with summer production for smaller producers (12.2% of their total volume) where only 56.7% produced some volume during the summer. There was a continued trend toward a higher percentage of wood being harvested during winter and a decreasing percentage during summer than for the 1991 (Jaakko Pöyry Consulting, Inc. 1992) and 1996 surveys (Puettmann et al. 1998).

### Equipment Age and Replacement

Many pieces of equipment were reported as being owned and actively used in-woods within the reporting businesses. Much of the

**Table 1.** Descriptive statistics from a survey of Minnesota logging business owners for 2011.

<table>
<thead>
<tr>
<th>Factor</th>
<th>Average</th>
<th>Median</th>
<th>SD</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of employees and subcontractors ( (n = 216) )</td>
<td>7.43</td>
<td>5</td>
<td>7.8</td>
<td>1–62</td>
</tr>
<tr>
<td>Years in operation ( (n = 217) )</td>
<td>28.1</td>
<td>29</td>
<td>13.8</td>
<td>0–70</td>
</tr>
<tr>
<td>Tract size (acres) ( (n = 183) )</td>
<td>31.6</td>
<td>30</td>
<td>17.3</td>
<td>4–80</td>
</tr>
<tr>
<td>Percentage of stumpage purchased by respondent ( (n = 213) )</td>
<td>74.6</td>
<td>100</td>
<td>36.0</td>
<td>0–100</td>
</tr>
<tr>
<td>Volume harvested (cords) ( (n = 209) )</td>
<td>9,518</td>
<td>4,000</td>
<td>15,713</td>
<td>100–138,393</td>
</tr>
<tr>
<td>Age of newest piece of equipment ( (yr) )</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feller-bunchers ( (n = 138) )</td>
<td>14.8</td>
<td>15</td>
<td>8.7</td>
<td>1–42</td>
</tr>
<tr>
<td>Cut-to-length harvesters ( (n = 37) )</td>
<td>7.6</td>
<td>7</td>
<td>5.7</td>
<td>1–21</td>
</tr>
<tr>
<td>Cable skidders ( (n = 52) )</td>
<td>33.7</td>
<td>34</td>
<td>10.3</td>
<td>5–62</td>
</tr>
<tr>
<td>Grapple skidders ( (n = 152) )</td>
<td>13.8</td>
<td>14</td>
<td>8.8</td>
<td>0–38</td>
</tr>
<tr>
<td>Forwards ( (n = 40) )</td>
<td>11.3</td>
<td>8</td>
<td>10.1</td>
<td>1–42</td>
</tr>
<tr>
<td>Slashers ( (n = 115) )</td>
<td>14.0</td>
<td>14</td>
<td>9.0</td>
<td>0–42</td>
</tr>
<tr>
<td>Percentage of volume contract hauled to mill, weighted by annual volume produced ( (n = 197) )</td>
<td>36.1</td>
<td>40</td>
<td>43.2</td>
<td>0–100</td>
</tr>
<tr>
<td>Percentage of full production capacity ( (n = 176) )</td>
<td>60</td>
<td>63.5</td>
<td>22.2</td>
<td>8–100</td>
</tr>
<tr>
<td>Percentage who expect to be in business in 5 yr</td>
<td>75.4</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Percentage who plan to increase or maintain their annual volume harvested within the next 5 yr</td>
<td>72.8</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

NA, not applicable.
equipment is 11–14 years old (Table 1). Cable skidders are the oldest type of in-woods equipment, with an average age of 33.7 years. Compared with previous surveys (Jaakko Pöyry Consulting, Inc. 1992, Puettmann et al. 1998), respondents are holding on to their in-woods equipment longer than before. As the annual production rate increased, the average age of the newest piece of mechanized felling machinery (i.e., a cut-to-length harvester or a feller-buncher) decreased (Figure 4). The value of in-woods equipment was less than $500,000 for 71.4% of the respondents. Respondents identified 359 pieces of equipment that they planned to replace within the next 3 years, primarily as used purchases (66%). Grapple skidders were the most frequently cited piece of in-woods equipment to be replaced. Given the current age of logging equipment (Table 1), it may be useless to anyone else by the time a business seeks to replace it. Thus, although most businesses indicated that they were considering replacing current equipment with used equipment, the quality of that equipment when it becomes available may be suspect.

Reliable equipment with a high machine availability (percentage of scheduled time during which the machine is actually able to perform work) is important to a logging business. Logging business owners and industry procurement staff reported several advantages and disadvantages of operating with older equipment compared with newer equipment (Table 2). Both groups reported that although older equipment is more prone to breaking down than newer equipment and that replacement parts are expensive, it is better built (lasts longer), third-party technical support is not needed to maintain and repair the equipment, it can remain parked for a while when in-woods conditions or markets are unsuitable, and it is more affordable because it is already paid for and will not require expensive loan payments. Industry representatives added that older equipment can make it more difficult to fill mill contracts because of the reduced reliability. Owners expressed reluctance to purchase equipment with the new emission standards because they feel that it is expensive to own, less fuel efficient, and more complex to operate and repair.

Table 2. Advantages and disadvantages reported by logging business owners and industry procurement staff during focus groups for operating older equipment than newer equipment.

<table>
<thead>
<tr>
<th>Source (logging business owners, industry procurement staff, or both)</th>
<th>Advantages and disadvantages of older than newer equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advantages reported of operating with older equipment</td>
<td>Better built/lasts longer</td>
</tr>
<tr>
<td>Both</td>
<td>Easier to maintain and repair yourself</td>
</tr>
<tr>
<td>Both</td>
<td>Cannot afford new equipment</td>
</tr>
<tr>
<td>Logging business owners</td>
<td>Uncertainty about future product markets</td>
</tr>
<tr>
<td>Logging business owners</td>
<td>Allows smaller businesses to park equipment during summer, when operating conditions deteriorate, when they do not have a market for wood, because equipment is paid for</td>
</tr>
<tr>
<td>Procurement staff</td>
<td>Can be more affordable to operate if it is well maintained</td>
</tr>
<tr>
<td>Procurement staff</td>
<td>Delivery prices for wood have been relatively stable, whereas new equipment prices have increased</td>
</tr>
<tr>
<td>Procurement staff</td>
<td>Machinery lacks the complex technology and tougher emission standards of new equipment</td>
</tr>
<tr>
<td>Procurement staff</td>
<td>Because a specialized technician may be needed to fix new equipment, production may be lost for a day or more</td>
</tr>
<tr>
<td>Procurement staff</td>
<td>Concern that new equipment has lower fuel economy</td>
</tr>
<tr>
<td>Disadvantages reported of operating with older equipment</td>
<td>It breaks down more often (more down time)</td>
</tr>
<tr>
<td>Both</td>
<td>Repairs can be more extensive</td>
</tr>
<tr>
<td>Logging business owners</td>
<td>Spare parts are more difficult to find and cost more</td>
</tr>
<tr>
<td>Logging business owners</td>
<td>It is difficult to produce a lot of volume in a short period of time because of increased downtime</td>
</tr>
<tr>
<td>Procurement staff</td>
<td>When machinery is down, it is not producing and thus the owner may not be able to fill contracts with a mill</td>
</tr>
<tr>
<td>Procurement staff</td>
<td>Concern that new equipment has lower fuel economy</td>
</tr>
<tr>
<td>Procurement staff</td>
<td>It is becoming increasingly difficult and expensive to get replacement parts for older equipment</td>
</tr>
<tr>
<td>Procurement staff</td>
<td>Employees may not be working when the equipment is idle</td>
</tr>
</tbody>
</table>
Industry focus group respondents indicated that some of the better logging business owners have been purchasing new equipment over the past year. The new equipment tends to be for feller-buncher/grapple skidder systems. Some reasons that loggers are purchasing new equipment include the following: the new equipment has increased reliability due to reduced needs for maintenance; equipment needs to be well maintained to build and retain a good reputation with private landowners; and newer equipment provides the ability to take depreciation on taxes (offsetting income).

Estimated Production Level at Full Capacity

As a business operates at a higher percentage of its full production capacity, it should be able to spread its fixed costs (e.g., labor and equipment loan payments) over more units of production. Respondents were asked to estimate how much volume their logging business could have produced in 2011 if they were able to work at full capacity (e.g., no downtime loss due to weather conditions, site conditions, delivery quotas, or stumpage or labor availability). On average, respondents estimated that they operated at 60% of their total operating capacity in 2011 (Table 1). Respondents who produced up to 1,000 cords operated at a significantly lower level of their reported capacity than businesses that produced more than 5,000 cords ($P < 0.001$). Businesses that had more than 50% of their stumpage provided by someone else operated at a significantly higher percentage of their total capability ($P = 0.032$) than businesses that purchase at least 50% of their stumpage.

Logging business owner focus group participants indicated that the top three issues limiting their ability to increase production are the lack of markets; the availability of stumpage that meets mills’ quality specifications, is affordable (especially during the summer), and in close proximity to markets; and the weather. Higher volume logging business owners who participated in the focus groups suggested that they had the greatest potential to increase their production during the summer and fall. However, stumpage availability and affordability and access to markets during the summer currently limit their operations. They noted that summer stumpage is expensive because of the limited amount offered for sale and that there tend to be more regulations on those sales. Participants in all focus groups indicated that public agency foresters should increase the volume of summer chance stumpage offered for sale. Smaller volume producers felt that they could increase their production during the winter. During other times of the year, they may farm, be retired, or do other things. Regardless of their annual production level, several respondents noted that markets were most limiting during the summer.

Change in Profitability: 2011 versus 2008

Respondents were asked to compare their profitability in 2011 versus 2008. The rationale for selecting 2008 as the comparison year was as follows: first, there had been several mill closures before 2008 (MN DNR 2010); second, statewide harvest levels in 2008 were down nearly 800,000 cords compared with 2005 levels (MN DNR 2011); and third, asking respondents to recall their profitability more than 3 years in the past seemed unlikely to provide reliable comparisons.

Nearly 61% of respondents said that their business’ profitability was worse in 2011 than in 2008. Approximately 20% said that their profitability was better in 2011 than in 2008. Whereas 15.8% of respondents who produced up to 5,000 cords indicated that 2011 was slightly or much better than 2008, 28% of respondents who produced more than 5,000 cords indicated that 2011 was slightly or much better than 2008. In the focus groups, logging business owners felt that this difference was due to larger producers (1) receiving a higher price per cord (unit) from mills, (2) being more efficient in their operations, (3) being better able to retain their employees during the summer, facilitating higher levels of production, and (4) being more likely to have established a relationship with a mill that purchases some of the logging business’ stumpage, saving the business time marketing their wood and reducing the need to purchase and hold stumpage.

Future Plans for Their Business

Nearly 73% of respondents indicated that they plan to maintain or increase their annual volume harvested within the next 5 years. For both factors, the highest percentages were reported by respondents who produced more than 15,000 cords annually.

Logging businesses tend to be family-run operations that are often passed from one generation to another. Approximately 75% of the mail survey respondents indicated that they expect to be in the logging business in 5 years. Similar findings were reported for the 2003 (Rickenbach et al. 2005) and 2010 (Traver 2012) surveys for Michigan and Wisconsin logging businesses. The nearly 25% of Minnesota respondents who indicated that they do not expect to be in business in 5 years tended to be smaller producers (average production of 5,763 cords) with older equipment (average age of their newest piece of cut-to-length harvester or feller-buncher was 15.6 years). Of the mail survey respondents, 73% would like to maintain or increase their annual volume harvested over the next 5 years, a result similar to what was found in 2003 (Powers 2004).

Twenty respondents (8.9%) reported that it was very likely that a future generation of their family would take over the business. Although industry representatives indicated during the focus groups that they are concerned that many logging businesses do not have a succession plan for their business which includes a family member, they also reported that some attrition of businesses should be expected as markets shrink. Because of the difficulty in maintaining a successful business and with opportunities elsewhere that offer higher pay, better benefits, and more steady work, some owners are not encouraging family members to become involved with the business.

Industry representatives also indicated that passing a business to a family member does not guarantee that the business will remain healthy and financially viable and that every family does not have a logical relative with the skills necessary to guarantee success of the business. Thus, owners may need to consider transferring ownership to an employee who demonstrates those skills. Regardless of whether a business is transferred to a family member or an employee, it was noted that the transfer process should be gradual, extending over a period of time of at least 1 year to allow the successor to learn all of the aspects of the business (e.g., bookkeeping, procure stumpage, in-woods operations and trucking, managing labor, and markets) and to be seen as a reliable owner by agency foresters, lending institutions, and procurement mills.

Focus group participants identified several factors that preclude young people from entering the logging business. For example, they indicated: the poor work attitude and ethic of young people, the high start-up cost to purchase and finance equipment, the difficulties in securing and maintaining a dependable labor force, the low profit margin, and the amount of time it takes to secure diverse and steady stumpage markets. Several times, focus group participants...
mentioned that increased competition for labor from the taconite mines in Minnesota and oil fields in North Dakota was making it difficult to maintain a dependable labor force.

**Future Business Size**

Given a gradual shift over time toward logging businesses producing more volume with a higher percentage of businesses producing more than 15,000 cords annually, focus group participants were asked to think about the distribution of logging business sizes in the future. They were given the following three scenarios to consider:

1. Continue to have many small logging businesses that produce a relatively small percentage of the total volume and few large businesses that produce a relatively large percentage of the total volume: status quo scenario.
2. Increase the number of small producers and the percentage of the total annual volume harvested by small producers (5,000 cords or less): growth of smaller producers scenario.
3. Increase the number of large producers and the percentage of the total annual volume harvested by large producers (more than 15,000 cords): growth of larger producers scenario.

While smaller logging business owners at the focus groups thought that the status quo scenario was the most likely and larger logging businesses thought that it would be the growth of larger producers, industry members thought that status quo would be most likely with some continued growth of larger producers. Although smaller producers have advantages working on small private parcels, their relative lack of market diversity and older equipment may make it increasingly difficult for them to continue operations in the future. Firms that annually produce between 5,001 and 15,000 cords will need to consider whether they want to grow their business or stay at the current production level. Similarly, industry members will probably be looking at those same producers to identify the businesses that have the greatest potential for growth and success in the future.

**How to Be Successful in the Future**

To ensure their success tomorrow, logging business owners indicated that they need to make smart, conscious decisions so they log smarter and not just harder. Furthermore, they indicated that some logging businesses will need to exit the business to make the remaining businesses more stable and viable for the future. Industry respondents indicated that logging businesses will need to (1) diversify their operations (e.g., build roads or install septic systems) to keep their equipment operating and retain employees year-round, (2) do a better job marketing their wood to mills (e.g., develop niche markets or deliver to a diversity of stumpage markets), (3) build strong relationships with industrial foresters to demonstrate that they can harvest summer sales and to learn how they can continuously improve their work, (4) develop better communication skills for contact with everyone involved (e.g., landowners, foresters, and mills), (5) develop better business management skills (e.g., develop a business plan that includes stumpage and availability, track income and expenses better, determine equipment replacement schedules so that equipment remains dependable, and identify ways to become more efficient), and (6) develop succession plans that will allow the business to be passed to a family member or an employee.

Logging business owners and industry representatives identified several factors that they think lead to (or are the characteristics of) a successful/healthy logging business. Key factors identified by both groups include maintaining a profit, having a good business manager who can maintain good business records and an owner who will use that information in decisionmaking, conducting preventative maintenance of equipment, having steady/consistent/diverse markets, and retaining productive employees who operate safely. In addition, industry personnel also noted that it was important to be able to merchandise products to their highest value, plan sales to minimize move costs, build relationships with public agencies and mills, have a strong work ethic, and be open to adopting new technologies.

The two focus group audiences also identified several factors they think lead to (or are the characteristics of) a successful/healthy logging industry. Both groups indicated that it was important to maintain the health of mills/markets, to identify and address policies that increase cost or limit land management, and to provide additional training for new foresters so that they better understand the economic side of forestry (e.g., designing timber sales that offer a profit potential to a prospective buyer, markets, and cost of regulations). Logging business owners also indicated that it was important to have and project a positive attitude/image, build good relationships, be able to purchase equipment that has an appropriate level of technology so that it is easy to operate and maintain, and have fewer environmental regulations. Industry respondents also indicated that it was important to have access to an ample supply of affordable and quality timber, to not increase fuel prices, and to have young loggers coming into the profession so that there will be an adequate workforce and number of businesses in the future.

**Summary and Recommendations**

The logging sector in Minnesota appears to be evolving, headed in a direction similar to that of agriculture with fewer businesses overall and more larger businesses. For example, the production reported from 38 respondents (18% of total) accounted for nearly 65% of the total volume harvested in this survey. Whereas there is still a need for smaller businesses to harvest small tracts, especially on family forests, changing market dynamics may make it increasingly difficult for those businesses to survive. Other businesses will cease operations due to the lack of a succession plan.

To maintain a healthy logging sector and wood supply chain in Minnesota, the sector needs to help itself and will need assistance from others. Logging businesses in Minnesota may need to modify their operations to remain competitive in the future. In particular, businesses will need to assess how they can improve their internal operations, enhance linkages with others outside of their firm, and plan for the future if the business is to remain viable beyond the current ownership. Some of the things for businesses to consider in terms of improving internal operations include recruiting and retaining dependable labor forces and providing them with appropriate benefits, purchasing efficient/dependable equipment that allows productivity across the range of sites and conditions where stumpage is procured, maintaining better records and increasing the use of the data in decisionmaking, and diversifying during the summer if enough stumpage to maintain logging operations cannot be procured. Ways in which businesses can enhance linkages with external entities include improving communication with landowners and their markets to demonstrate that they are dependable, asking agency and procurement foresters for their suggestions about improvements in their operations, diversifying their markets, and becoming more passionate about their industry such that they actively advocate for their profession within their community and schools.
and at all levels of government. As business owners begin to think about succession of their firms to someone else, they need to determine whether there is someone within the business who can take over the operation in the future and work with that person before transferring the business to make sure that he or she is as ready as possible for the responsibility when the transfer occurs. Because only 20% of total volume is harvested during the summer, the ability to increase production during this season would make it easier for business owners to retain skilled labor year-round, to invest in new equipment, and to repay loans. Currently, concerns about site impacts (i.e., rutting) cause some agency foresters to require frozen soil conditions for many of their harvest sites. Forest management agencies need to assess existing road networks and determine opportunities for improved access or construction of new roads to increase “summer” chance harvest sites. Identification of these areas may require agencies to develop a soil operability rating system to allow foresters to assess soil impacts based on current local (e.g., soil, site, and moisture) and operator (e.g., equipment and harvesting system) considerations. Once these areas are identified and financial needs are estimated, state and county agencies should coordinate efforts to maximize legislative funding to improve existing roads or construct new roads.

Consuming mills and lending institutions also need to reconsider how they support logging businesses to ensure the stability of this sector. Long-term contracts would provide more stability to the logging sector. Longer term contracts will make it easier for businesses to get letters of credit and financing from banks and to maintain their workforce and equipment, which is now typically older than 10 years for low- to moderate-volume producers (Figure 4). Consuming mills should determine which logging businesses are viable and can maintain a consistent supply of stumpage to meet production needs. Keeping all of the existing logging operations in operation may make it more difficult for higher quality businesses to make investments to grow and thrive in a rapidly changing economic environment.

**Literature Cited**


