

A USDA Federal State Market Improvement Grant Report

From

The Massachusetts Department of Agricultural Resources

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**Finding and removing barriers to sustainable harvest and primary
processing of Massachusetts native woods**

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Executive Summary

We have an opportunity to:

- make Massachusetts more self-sufficient in its consumption of forest products,
- do so on a sustainable basis,
- improve the health of rural Massachusetts economies through increased production and employment in the primary and secondary forest products industries,
- lower the environmental, transportation and financial costs of importing (and exporting) wood and wood products that might otherwise be processed and sold locally.

This project has specifically assembled and surveyed, in both focus group and written forms, relevant stakeholders in the Massachusetts' forest products industry production and distribution chain. These groups include: forest landowners, foresters, loggers, sawmills, and wholesalers. Barriers to increased levels of harvest, production and sales of Massachusetts' underutilized species have been identified. Gap analyses, comparing responses of adjacent members of the production and distribution chain, has been performed to highlight and quantify mis-perceptions regarding hurdles to increased production and sales.

Key findings include:

Landowners

- Efforts to interest landowners in undertaking active forest management should focus on issues affecting: wildlife habitat, tree and plant quality, ecosystem services and water quality.
- When making the harvest decision landowners rank very high in importance all of the following:
 - Pre-harvest landowner education
 - Post-harvest stand condition
 - Fair price for stumpage
 - Logger reputation
 - Forester reputation

Foresters

Foresters see a clear need to develop markets for less desired/low value species including small diameter logs, and a biomass wood chip market. They also believe that promoting Massachusetts wood, developing niche markets for local wood and increased support for the forest products industry by the general citizenry is needed.

There is a great deal of frustration expressed with the interaction between foresters and Natural Heritage regulations. This interaction should be studied further and methods developed to streamline, and make more consistent, the implementation of Natural Heritage laws.

Loggers

Loggers are quite interested in being able to expand their businesses. Their operations are most hampered by rising operating costs, inability to harvest in adverse weather conditions, and the regulatory environment. The aging of the logger workforce is also a concern for future expansion.

Sawmills

As with loggers, sawmills are most concerned with operating, insurance, and energy costs. Further research may be able to yield solutions to the cost issues raised, perhaps through a coordinated effort to attract competitive insurance bids. Similarly, for energy costs, sawmills generate a significant amount of wood based raw material that could be used as energy feedstock, if appropriate scale wood fired electric generating technology could be developed.

As with results from foresters, and loggers, sawmill operators see a need for better coordination of government bodies in supporting the forest products industry. A task force of relevant agencies should be formed to investigate the specific bottlenecks.

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1. Introduction:

Massachusetts is the third most densely populated state in the United States with 6.3 million residents. The states' forests have seen cycles of decline and growth over the past 300 years. With the arrival of Europeans and an agrarian society, land was cleared for farming over the 18th and much of the 19th centuries. In the 1870's, this loss of forest cover was stopped. Forest area increased steadily from a low of about 30% of land area in 1870 to a high of nearly 75% in 1960. The most recent, 1998, forest inventory analysis yielded area estimates for forestland (62%), non-forest (33%) and agriculture (5%) (Alerich 2000).

Even though forest area is losing ground in Massachusetts, the volume of trees continues upward. The growing-stock volume of trees increased by 17% between 1985 and 1998 (Alerich 2000). A potential tool to help stem the conversion of forestland to development may lie in the increased volume of trees. If forest landowners can derive higher levels of revenue from the growing forest resource, then the economic incentive for converting to other uses may be lessened.

Ownership changes in the 20th century represent an impediment to active forest management and many forest landowners do not manage their forests at all (Beattie, Thompspon and Levine 1993). Years of high-grading, "cutting the best and leaving the rest", have left many forest stands too densely stocked and containing a high portion of low-grade trees (Barten et al. 2001). The average tenure of forest properties has been decreasing steadily (Birch 1996). In our increasingly mobile society, properties change hands more frequently, making it difficult to manage forests over a long time period. New landowners are often unaware of good management practices and may be ignorant of both the public and private benefits of active forest management.

The opportunity for increased sustainable harvest of wood in Massachusetts is clearly shown in the data from the USDA Forest Service forest inventory analysis (Alerich 2000). Although the tree volume continues to increase overall, it is not uniform across species. The rate of growth in volume across species reflects, in part, the relative market values and merchantability of the predominant species. The most recent analysis shows that only four species; red pine, red oak, white oak, and yellow birch were being harvested at a rate that exceeded their growth over the period 1985-1998. Table 1 shows the growing stock volume and the excess growth compared to removals for under-harvested species in Massachusetts from the most recent, 1998, forest inventory analysis (Alerich 2000). New markets and hurdles to harvest and production need to be developed for these under harvested species.

Berlik, Kittredge and Foster (2002) highlight the inconsistency of US consumers desire for global environmental protection and the reality of their current level of forest products consumption. Wood consumption in Massachusetts is estimated at over 13 million cubic meters annually but harvests from state timberland amounts to only 300,000 cubic meters. Massachusetts currently produces only 2% of the wood fiber that it consumes (Ibid. p. 13). This stems from a combination of increasing population

and demand for wood products coupled with a shrinking sawmill industry (Damery, Bellemer and Boyce, 2006)

Table 1 – Massachusetts Tree Volume and Excess Growth Rates for Under-harvested species

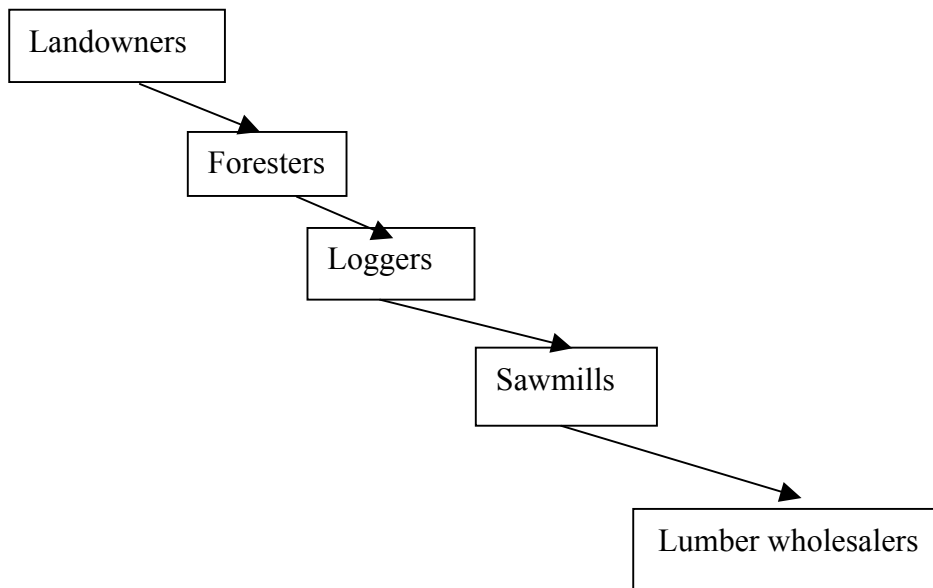
Species	Volume of Growing Stock (millions of cu.ft., 1998)	Excess of Growth to Removals (Average 1985-1998)
White Pine	1,346	87%
Red Maple	1,041	153%
Eastern Hemlock	598	1,075%
Sugar Maple	239	284%
White Ash	202	292%
Black Cherry	194	798%
Sweet Birch	194	195%
Beech	165	1,288%
Paper Birch	109	184%
Spruce/Fir	63	176%
Hickory	48	426%

The number of sawmills operating in the state has fallen by 63% from 1971 to 2006. Berlik et al. recommend reducing consumption and increasing harvest levels to improve the level of self-sufficiency. Current rates of forest growth exceed harvest rates by a significant margin. An argument can be made for higher levels of sustainable production of forest products within Massachusetts. Private landowners own almost 80% of the state’s forestland. Coordinating this diverse group through outreach and education activities presents a major challenge to achieving higher levels of sustainable production (Clawson 1979).

The problem with increasing Massachusetts self-sufficiency in forest products production and consumption is that we don’t have a clear idea what the most pressing barriers to growth are. This project has built on the efforts of an earlier FSMIP project focused on spreading the use of LEAN production philosophies to Missouri’s hardwood lumber industry (Missouri Dept. of Agriculture). This project has extended the Missouri work by:

- 1) Identifying specific bottlenecks that might be shared across businesses, and
- 2) Identifying “transaction” difficulties that might be present between levels of the value-added distribution chain.

Figure 2 Wood products distribution chain



The Missouri effort focused on productivity issues specifically within the logging, and sawmill sectors. This work has extended beyond these two sectors by addressing issues with log procurement from a diverse set of private landowners on the supply side. Downstream issues have also been addressed by analyzing the relationship between sawmills and wholesalers. Solutions to removing the barriers to increased local production and sales will be identified in the next phase of the research, and implemented, if feasible.

We have an opportunity to: 1) make Massachusetts more self-sufficient in its consumption of forest products, 2) do so on a sustainable basis, 3) improve the health of rural Massachusetts economies through increased production and employment in the primary and secondary forest products industries, 4) lower the environmental, transportation and financial costs of importing (and exporting) wood and wood products that might otherwise be processed and sold locally.

This project has specifically assembled and surveyed, in both focus group and written forms, relevant stakeholders in the production and distribution chain. These groups include: forest landowners, foresters, loggers, sawmills, and wholesalers. Barriers to increased levels of harvest, production and sales of Massachusetts underutilized species have been identified. Gap analyses, comparing responses of adjacent members of the production and distribution chain, has been performed to highlight and quantify mis-perceptions regarding hurdles to increased production and sales. Data have been analyzed and barriers ranked. Future phases of this project will propose solutions, and where feasible, implement them to improve.

2. Project Goals and Objectives:

Goals

Discover what the hurdles/impediments (labor, material procurement, competition, technology, financing, inadequate markets) are to increased harvest levels and primary production (sawmilling) and marketing of Massachusetts' native species.

This project utilizes a project Advisory Committee meeting semi-annually to provide overall project oversight and guidance.

Project Advisory Committee Members

Mary Jordan – Massachusetts Department of Agricultural Resources

Gordon Boyce, MA Dept. of Conservation and Recreation, Marketing and Utilization Forester

Matt Kelty, Department Head, UMASS-Amherst, Dept. of Natural Resources Conservation

Joseph Smith, Director, Mount Wachusett Community College, Forest and Wood Products Institute

Arthur Eve – President, Massachusetts Woodlands Cooperative, LLC

Objectives

- Identify target stakeholders for focus group interviews (landowner, forester, logger, sawmill, and wholesaler)
- Conduct focus groups and interviews
- Develop additional written surveys for gap analysis to focus on interface between levels (e.g. landowner-logger transaction, sawmill-processor transaction)
- Conduct surveys and analyze results

3. Literature Review:

The forest product sector in the US contributes over \$80 billion dollars to the GDP and employs 1.5 million people. With timber ranking high in the list of valuable agricultural crops produced in the US, Massachusetts has a lot to gain from its 60% forest cover. Being the third most densely populated state and having ready access to forestlands, one would expect a prosperous forest products industry. On the contrary, the Massachusetts forest products industry has witnessed a steady decline in recent decades.

The irony lies in the fact that despite such abundance of forest resources, an astounding 95% of the wood and wood products consumed within the state of Massachusetts are currently being imported. On the surface, this trend may depict a strategy intended to protect local forests to maintain the pristine environment by meeting forest product demands through importation. The underlying reality however is quite grim. A smaller forest products industry means a less healthy rural Massachusetts economy while increasing environmental, transportation and other costs associated with the importation of forest products. A better understanding of the underlying causes of a shrinking forest products industry will provide policy makers with recommendations to make Massachusetts more self-sufficient in its consumption of forest products.

A look back in history over 300 years shows that much of the forestlands in the east coast have gone through cycles of decline and re-growth. The arrival of European settlers prompted forestland clearing primarily for farming purposes. The conversion of forest to farmland continued until the mid and late 19th century; which was when farming industries started moving west. The abandoned farmlands in Massachusetts witnessed a re-growth of forests from a low of about 30% of land area coverage in the 1870's to a high of almost 75% in 1960 (Alerich, 2000). The 1998 forest inventory analysis yielded area estimates for forestland (62%), non-forest (33%) and agriculture (5%) (Alerich, 2000). At present, although the forest cover has declined from its peak in the 1960's, the forest growth exceeds harvest rates by a significant margin. The growing-stock volume of trees increased by 17% between 1985 and 1998 (Alerich, 2000).

While an array of problems are currently being faced by the forest products industry within Massachusetts, some of them extend to the national level. The US has the fourth largest reserve of forests in the world; however the immense demand for wood products coupled with reduced domestic production result in a high level of wood imports. Today the US is a net importer of wood consuming 20% more wood than it produces (Fiedler et al. 2001). The amount of timber and growth rates in the forestlands of the US could sustain substantial additional domestic forest products production and do so on a sustainable basis. The US logging industry faces fierce competition with Canada. There has been an on-going dispute over the trade in forest products between the two countries since 1982. Most of the timber in Canada is owned by the state and provincial governments unlike in the US where it is mostly owned by private owners. One argument on the US side is that the price charged to harvest

timber is decided administratively rather than through a competitively and does not fairly represent its value.

While it is important to assess problems associated with each segment of the forest products industry chain separately, the overall performance of the forest products economy can be viewed as a single unit with interdependent sectors. The relationship between these individual sectors becomes a key factor in maintaining the health of the entire industry. The primary focus of this paper is thus to examine the frictions that exist between the various stakeholders that are responsible for the decline of this particular industry within the state of Massachusetts.

The stakeholders in the harvest and primary processing sectors are characterized into five separate groups; although it is quite normal for some level of overlap between them. At the top of the industry are the entities or individuals that own the forestlands. Next on the chain are the foresters whose primary role is to facilitate the landowner by helping meet their forest management needs and to act as negotiating agents between forestland owners and loggers or sawmills. The function of loggers is to work with foresters to harvest trees assigned by the forester and haul the logs to a landing. The logs are then sold directly to a sawmill or through a log broker.

Birch and Dennis (1980) revealed that in Pennsylvania there were 40,000 new private forestland owners each year. The survey also revealed that among these new landowners, most were retirees, professionals or white collar workers with motives other than timber harvest for such ownership (Birch 1996). Most of them considered the forest to be an integral part of their land while others used them for domestic use such as fence, fuel wood, etc. Land investment and recreation or aesthetics were popular motives while only 1% indicated timber harvest as the primary reason for holding forest land (Birch 1996). The average holding of the ones who harvested timber was 443 acres, which is much larger than that of landowners with other objectives. In many cases the forestland owners with smaller lots are unable to harvest timber simply because it is not economically viable.

Birch's 1996 survey of forest landowners revealed that a lack of markets and low prices were key factors for under harvesting. While some were opposed to the idea of harvesting timber, there were some that thought it would destroy hunting and other aesthetic values. It appeared that many of the forestland owners lacked proper information regarding how to manage their forests. When asked, 63% of them were not interested in actively managing their woodlands and hence were unaware of who to consult for assistance. Also, there were some who stated their lack of trust of loggers as one of the reasons for refraining from harvesting.

Past studies show that lack of proper education of forest management practices is a key reason for many misunderstandings leading to low harvest rates. A study by (Downing and Finley 2005) identified some of the educational needs and desires of forestland owners. According to the study, the information desired most by forestland owners was forest and wildlife management which was followed by timber marketing and tree regeneration. Better access to foresters and loggers may be other areas to consider in order to encourage higher harvest rates especially among new forestland owners or ones with relatively smaller lots.

Forest management groups such as the Massachusetts Woodlands Cooperative, LLC are another promising avenue for promoting sustainable management practices (Damery 2007) . The goal of such cooperatives is to coordinate the value-added production chain to maximize benefits for the forest landowner. Also, collectively they can promote environmentally sound practices and support local businesses in order to strengthen local economies.

Consulting foresters play an important role in the professional management of private forest lands. The typical forestland owner is unaware of best forest management practices. Consulting foresters provide guidance to meet landowner goals for their forest property.

Concerns for the logging industry range from inadequate profit margins to an aging workforce. Also, idle logging capacity resulting from a lack of supply imposes significant costs (Egan et al. 2006). This study also revealed that almost two thirds of logging businesses experienced costs associated with such unused production capacity in 2000. According to a survey conducted by Egan (2005), better communication with landowners, safety, equipment maintenance, and business skills were stated as training needs for loggers. According to some loggers, the profession itself holds very low social prestige resulting in increased dissatisfaction with the job. Hence, in spite of having familial attachments to the logging business, many do not wish to encourage their children in continuing with the family business (Egan and Taggart 2004).

A national survey of 494 hardwood sawmills in 1998 indicated the US industry to be a relatively low technology segment (Bowe et al. 2001). This is due to the fragmented nature of the industry and the fact that most of the hardwood sawmills are small and can't afford to invest in improved technology. Some of the major drawbacks faced by sawmills were raw material scarcity and burdensome environmental regulations (especially with respect to sources of energy) as well as high stumpage prices (Luppold, 2004). In addition, concerns regarding the decreasing quality and diameter of logs show that years of high grading are slowly taking its toll.

Bratkovich and Miller (1993) studied the perceived educational needs of innovative sawmill operators in Ohio. According to their findings, forest products marketing and environmental awareness were considered to be the highest in their priority list. In terms of proper business management and communications, 'keeping up-to-date on worker compensation issues' and 'motivating employees' respectively were regarded as being extremely important.

Similar to the growing market for organic food products, the demand for certified wood (certification that ensures environmentally sound methods of growth and harvest) is likely to increase. Labels such as 'recycled wood' or 'locally produced wood' have a high potential for being the favored brand. A study by Bigsby and Ozanne (2002) on the relative importance of outdoor furniture attributes to New Zealand consumers revealed that the most important attribute was the source of wood followed by its type. Wood produced locally in New Zealand was preferred to imported ones and wood from plantations was preferred to ones from the natural forest. The third most important attribute was whether or not the wood was environmentally certified. Another avenue could be through the use of

alternative species. Alternative species of forests previously labeled as low quality and hence of less value can be marketed through an environmental theme to promote a well balanced mix of forest species and lessen the burden caused by high-grading.

Certification programs such as the Forest Stewardship Council aim to ensure that forest management practices are environmentally sound, socially beneficial and also economically viable. The certification process is designed to ensure that forests are managed sustainably. A study by Spinazee and Kant (1999) shows that people are generally environmentally concerned and are willing to pay a premium for such products. However, the lack of proper advertising/education of the consumers has led to much confusion in recognizing the type of information that is contained in various forest certification labels. The lack of adequate information regarding certified forest products was reinforced by a study by Hansmann et al. (2006) where they show that only 16% of those surveyed had heard about wood from sustainable forestry. Hrabovsky and Armstrong (2005) also found a great deal of confusion and frustration within the hardwood lumber industry regarding the variety of certification schemes.

The production of certified forest products will be largely demand driven. There is an opportunity for Massachusetts forest industry participants to provide for this growing niche market. However, as with consumers, industry participants themselves are struggling to understand the green building phenomenon. Acceptance and awareness of green certification among primary producers is still quite low (Spinazee and Kant 1999). It was indicated that the primary producers were willing to pay a premium for certified wood only if they could pass on the premium to the customers.

This study explores and expands on a number of the issues identified in this review.

4. Research Methodology:

4.1 Research Methodology: Landowners

Research direction was initially shaped by meetings with advisory group members. Given the deep body of literature on landowner attitudes (Birch 1996, Clawson 1979, Barten et. al. 2001, Damery 2006) and the scheduling of research into the other stakeholder groups, the focus group step of this analysis was skipped. Instead, the findings from focus groups and survey results from the logger, forester and sawmill analyses were used to inform the survey instrument that was developed for landowners.

Questions were organized into four broad categories as follows:

- Forest management views
- Harvest intentions
- Forester and logger relationships
- Background information

A stratified random sample of 229 addresses for forest landowners from across Massachusetts with greater than 10 acres of forest property was used. The list was developed from town Tax assessment records from 88 towns, representing 25% of the towns in Massachusetts. This database was stratified by acreage and 23 addresses were drawn from each acreage group to get a cross section of forest landholding sizes.

The survey consisted of two sheets (8.5"x11") printed front and back totaling 71 questions. The majority of questions were formatted as a 5-point likert scale fill-in-the-bubble style answers as follows:

1	2	3	4	5	uncertain/ need more information
not important		somewhat important		very important	
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

The survey was mailed, along with an explanatory cover letter in February, 2008. The complete survey instrument and cover letter are included in Appendix 1.

4.2 Research Methodology: Foresters

A focus group was conducted in August, 2007 and the results were used to develop a survey instrument that was mailed to all licensed foresters in Massachusetts. The Research Advisory Board suggested that the focus group consist of a broad array of forester types. Approximately 10 foresters were contacted, based on suggestions of experts, and 7 attendees participated including: consulting foresters (3), procurement foresters (2), and state service foresters (2). Notes from the focus group are included in Appendix 2.

The survey design for foresters was similar in format to that used for landowners as described in section 4.1 above.

The focus group resulted in 3 groupings of questions:

- Section 1 - Current Business Limitations - Barriers
- Section 2 - Interest and needs for business expansion
- Section 3 - Background information – Demographic data

Section 1 questions were further organized along marketing and operational categories as follows:

- Subsection 1 – Clients – retaining and recruiting – 20 questions
- Subsection 2 – Logger issues 12 questions
- Subsection 3 – Pricing – 9 questions
- Subsection 4 – Cost of doing business as a forester – 6 questions
- Subsection 5 – Regulations – 9 questions

Section 2 focused on foresters' interest in expanding their business and the types of resources that would help them to expand their business. This section contained a total of 19 questions.

The final background section included 10 questions related to demographic (age, education, job title) and business operations data. The complete survey instrument and cover letter are included in Appendix 2.

4.3 Research Methodology: Loggers

During the course of initial meetings with Research Advisory Board members, on-going current research regarding logger issues was identified (Egan and Taggart, 2004, Egan et.al., 2006). Given this research it was decided to forgo the focus group step for this stakeholder group and proceed directly to survey design. The survey was developed and pre-tested with experts familiar with the logging industry. The survey sample was obtained from Massachusetts Dept. of Conservation and Recreation and consisted of their 2007 list of 471 harvesters licensed to operate in Massachusetts.

The survey design for loggers was similar in format to that used for landowners as described in section 4.1 above.

The logger survey questions were organized in five parts: 1) The logging business; 2) The supply side; 3) The demand side; 4) Certified wood; and 5) Demographics. The complete survey instrument and cover letter are included in Appendix 3.

4.4 Research Methodology: Sawmills

The survey design for sawmills was similar in format to that used for landowners as described in section 4.1 above.

The sawmill survey questions were organized in three parts: 1) Current Business Limitations; 2) Business Expansion; 3) Background Information. The complete survey instrument and cover letter are included in Appendix 3.

4.5 Research Methodology: Wholesalers

The number of wholesalers of softwood and hardwood lumber that are located in Massachusetts is quite small. Random Lengths (2008) lists a total of 29 wholesale lumber distributors all of whom indicate that they distribute softwood lumber and 19 of which also distribute hardwood lumber.

Given the small number of wholesalers operating in the state, the commodity status of the products that they currently trade, and the expectation that demand, specifically for Massachusetts produced lumber products was minimal, it was decided to forgo the focus group/survey approach. Instead, a site visit and interview were conducted with one of the largest wholesale distributors. Results of this interview are included in Section 5.5.

4.6 Research Methodology: Gap Analysis

One goal of this research was to analyze barriers that might occur at the transaction points between stakeholder groups. In this analysis similar survey questions have been applied across two adjacent stakeholder groups. A “gap analysis” (Idassi et. al. 1994, Parasuraman et. al. 1985) has been performed to identify misperceptions between the two groups that may form a barrier to increased production and sales. Section 5.6 of this report discusses results of this gap analysis.

A gap analysis is used to identify discrepancies between how two adjacent members in the value-added distribution chain perceive the value of a particular product/service attribute. For example a customer may value the attribute “friendly service” when doing business with a seller as “high”. If, when the seller is asked to estimate how customer’s value “friendly service” and they respond “moderate” or “low”, then a negative gap is said to exist. This can have negative consequences for the buyer-seller relationship because the seller will fail to devote sufficient resources to delivering the desired level of “friendly service”. This might lead to customer dissatisfaction, lost customers, sales, and profits. On the other hand a “positive gap”, is not necessarily an altogether good thing. A positive gap exists when the seller over-estimates the customer’s value rating for a particular product/service attribute. In this scenario, the seller may be wasting money/resources in over-delivering that particular attribute when it is not appreciated by the customer.

5. Results:

5. 1. Landowner:

Landowner Survey Response

229 questionnaires were mailed and 21 bad addresses were returned. We received 54 useable responses representing a 26% response rate. Given the high level of management planning, and the prevalence of large parcel sizes associated with the respondents to this survey, the results are likely to be biased toward both large parcel sizes and actively managed properties. Care should be taken in applying these results as reflecting forest landowner attitudes of smaller holdings, and not actively managed properties.

5.1.1 Forest Management Views:

Survey respondents were first asked to a set of general questions

Question	Yes	No
Do you currently manage your forest land?	63%	37%
Do you have a written forest management plan?	40%	60%
Is your forest property enrolled in Chapter 61?	52%	48%
Do you live/reside on your forest property year-round?	69%	31%
Do you live/reside on your forest property in the summer?	70%	30%
Do you hunt on your forest property?	35%	65%

Most landowner respondents manage their land and most of those do so with a written management plan. About half of the respondents indicate that they are enrolled in Chapter 61 forest property tax program. This indicates that these landowner respondents are different from the general population which exhibits lower participation rates in all of these categories. More than 2/3 of respondents make their forest property their home, and about 1/3 hunt on their property.

The second area of inquiry consisted of 14 questions concerning forest management objectives. Landowners were asked to rate the importance of each objective in managing their property.

Question	Description	Average Ranking
1-11	Wildlife habitat	4.55
1-12	General tree and plant quality	4.55
1-14	Ecosystem health as a whole	4.49
1-13	Water quality	4.42
1-20	Keeping my forest property a nice place to live	4.12

1-16	Firewood – For home use	3.71
1-10	Recreation	3.58
1-9	Trails (hiking, skiing, snowmobiling etc.)	3.37
1-8	Views	3.30
1-18	Timber – sawlogs – for income	3.14
1-15	Managing the land to support the local economy	3.00
1-17	Firewood – for income	2.14
1-19	Non-traditional forest products (under-story crops, herbs, etc.)	1.85

Clearly this group of landowners values ecosystem services, wildlife (4.55), tree and plant quality (4.55), ecosystem health (4.49), and water quality (4.42), highest. Quality of life objectives, “nice place to live” (4.12), recreation (3.58), trails (3.37) and views (3.30) formed a second tier of management objectives that also included firewood (3.71) for home use. Last in this grouping of management objectives were income and economic objectives. Non-traditional forest crops(1.85) were rated least important timber for income (3.14), support the local economy (3.00), and firewood for income (2.14) were also ranked low.

Next, respondents were asked to rate their level of agreement (1=disagree, 3=neutral, 5=agree) with a series of statements regarding perceptions on forest management planning, harvesting, and intentions to sell or subdivide their forest property.

Question	Description	Average Ranking
1-22	My forest property is large enough to warrant management planning	4.56
1-23	The trees in my forest are valuable for harvesting as timber	4.36
1-24	I will own my property long enough to see benefits from planning	4.26
1-25	My heirs will see the most benefit from any activity I do on my property	4.09
1-26	I plan to sell or gift my forest property to my children or other heirs	3.95
1-28	I plan to gift/sell my forest property to a conservation org. or land trust	2.17
1-27	I plan to sell my forest property to someone other than my children/heirs	2.00
1-29	I plan to someday subdivide, or sell part of my forest property	1.87

Respondents agreed most strongly that their forest property was “large enough to warrant management planning” (4.56). They also agreed relatively strongly that “The trees in my forest are valuable for harvesting as timber” (4.36) and that they “will own their property long enough to see benefits of planning” (4.26).

They disagreed most strongly with “plan to someday subdivide, or sell part of my forest property (1.87), and with plans to sell to “someone other than my children/heirs” (2.00) or “to a conservation org. or

land trust (2.17). These results are consistent with the response to “sell or gift my property to my children...” (3.95), and represent a level of optimism for potential long-term forest management as opposed to conversion to other land uses.

Landowners were asked “How much longer do you believe that you will own your forest property”. 29 respondents who answered this question yielded a mean response of 23 years with a minimum of 1 year and a maximum of 50 years. Several additional respondents answered “forever” or “til death do us part”, which were not quantified for the analysis. This result also gives hope for the future of forest management and the ability to provide sawtimber for the Massachusetts forest products industry.

The last area of inquiry in the Forest Management Views portion focused on a landowners self-assessment of their knowledge level in regards to a variety of forest management issues. (1=not informed, 3=Somewhat, 5=Very informend)

Question	Description	Average Ranking
1-43	How to find a logger	3.65
1-41	How to find a consulting forester	3.51
1-40	How to contact a state service forester	3.49
1-44	How to judge the quality/reputation of a logger	3.31
1-31	How to manage my forest	3.31
1-33	How to conserve/preserve/protect my forest	3.29
1-32	Forestry best management practices	3.16
1-34	How to manage my forest for wildlife	3.04
1-42	How to judge the quality/reputation of a consulting forester	2.96
1-39	How to generate income from forestry	2.9
1-36	Natural history, forest ecology or cultural issues	2.87
1-35	Forest and forestry tax issues	2.76
1-37	How to manage my forest sustainably (green certification)	2.58

These mean responses fell within a narrow range bracketing “somewhat” informed across all questions.

5.1.2 Harvest Intentions

Question	Yes	No
Have you harvested your forest property in the last 10 years?	52%	48%
Do you expect to have a harvest on your property in the next 10 years?	67%	33%
Would you consider harvesting at the same time as a neighbor?	66%	34%

This group of respondents seems readily amenable to regular forest harvests with 50% indicating harvest in the past decade, and 2/3 expecting to harvest in the coming decade. There also appears a general willingness to cooperate/coordinate with neighbors, 66% answering yes, in a future harvest activity. This might represent an opportunity to combine harvests from smaller parcels to make harvesting more efficient for loggers and allow them to compete more effectively

To analyze the relationships between landowners, foresters and loggers a set of similar questions were posed to each of these stakeholder groups. How important are each of the following factors in making a decision to harvest forest property?

Question	Description	Average Ranking
2-5	Post-harvest stand condition	4.67
2-7	Logger reputation	4.62
2-6	Fair price for the stumpage	4.60
2-4	Pre-harvest planning with forester/logger	4.58
2-8	Forester reputation	4.48

These results show virtually no differentiation across factors with all of the listed factors ranking close to “very important”.

In addition, respondents were given the opportunity to list other factors that might be important.

Responses given included:

- Environment
- Weather
- Conservation restrictions on logging
- Dependability of logger
- Impact on rest of property
- Bad experiences with loggers
- Own planning and harvesting
- Emphasis is long-term forest Management that maintains biodiversity and health of native forest species, promotes forest generation and drinking water quality.

5.1.3 Forester and Logger Relationships

A second area of inquiry regarding landowner attitudes focused on their relationships with foresters and loggers.

Question	Description	Yes	No
3-1	Have you ever used the services of a forester, of any type (state, consulting, sawmill)?	69%	31%

3-3	Have you ever met with a state service forester to discuss your forest management options?	34%	66%
3-5	Have you ever contracted with a consulting forester to assist you in managing your forest land?	66%	34%
3-6	Do you currently use a consulting forester to assist you in managing your forest land?	42%	58%
3-8	Have you used more than one consulting forester?	39%	61%
3-10	Have you ever had a forester, employed by a timber buyer, assist you with managing your forest?	17%	83%
3-12	Have you ever worked directly with a logger to harvest or have other work done on your property, without the assistance of a forester?	42%	58%

A substantial majority of respondents indicate having used a forester (69%) at some point. More indicated having used a consulting forester (66%) than a state service forester (34%), with fewer still having had a relationship with a forester employed directly by a timber buyer (17%). A surprising number of landowners indicate that they have used more than one consulting forester (39%). This high level of “turnover” occurs despite the fact, that a frequent service provided by consulting foresters is development of long-term management plans.

A somewhat surprising result, given that 69% of respondents indicated that they had used a forester at some point, is that 42% of respondents stated that they had used a logger directly.

Landowners were asked how they made initial contact with their forester.

Question	Description	Yes	No
3-2(1)	Word of mouth	83%	17%
3-2(2)	State list of Licensed Foresters	23%	77%
3-2(5)	Advertising	9%	91%
3-2(3)	Referrals from the Massachusetts Dept. of Conservation and Recreation website	6%	94%
3-2(4)	Referrals from other websites	0%	100%

Certainly, word-of-mouth seems to be the most effective method of referrals for fostering the landowner-forester relationship. This has definite implications regarding the choice of promotional methods that foresters might emphasize in their client marketing efforts.

For those respondents indicating that had made use of the services of foresters or loggers, they were asked to rate their satisfaction with a variety of value and quality of service factors related to those relationships. Mean responses are provided below

For the services provided by a state service forester how satisfied are you with the:

Question	Description	Average Ranking
3-4(3)	Timeliness and responsiveness	4.47
3-4(4)	Professionalism	4.47
3-4(2)	Quality of work	4.41
3-4(1)	Value of the information/advice/service	4.27

For the services provided by your current consulting forester how satisfied are you with the:

Question	Description	Average Ranking
3-7(4)	Professionalism	4.22
3-7(2)	Quality of work	4
3-7(1)	Value of the information/advice/service	3.94
3-7(5)	Prices charged	3.88
3-7(3)	Timeliness and responsiveness	3.84

For the services provided by a forester employed by a timber buyer how satisfied are you with the:

Question	Description	Average Ranking
3-11(4)	Professionalism	3.67
3-11(3)	Timeliness and responsiveness	3.67
3-11(1)	Value of the information/advice/service	3.67
3-11(2)	Quality of work	3.5
3-11(5)	Prices charged	3.2

For the services provided by a logger how satisfied are you with the:

Question	Description	Average Ranking
3-13(4)	Professionalism	3.95
3-13(2)	Quality of work	3.91
3-13(1)	Value of the information/advice/service	3.86
3-13(5)	Prices charged	3.81
3-13(3)	Timeliness and responsiveness	3.71

On average, respondents indicated a higher level of satisfaction with the quality of work of State Service Foresters (4.41) and only “somewhat satisfied” with their interactions with foresters employed directly by timber buyers (3.5).

5.1.4 Background Information

86% of the respondents are male. The average age of landowner respondents is 60 years, indicating that a high percentage of these landholdings are likely to change hands over the next 20 years. 84% of respondents reported having received some form of college education and the remainder, 16%, being high school graduates. The average size of the forest property was 288 acres. Respondents were asked how long they had owned their forest property and the mean response was 30 years.

5.2 Forester Results

Forester Survey Response

The Massachusetts Bureau of Forestry, within the Dept. of Conservation and Recreation, licenses foresters in the state. The 2007 list included 162 licensed foresters and the entire sample was mailed the survey. One bad address was returned. We received 80 useable responses representing a 50% response rate.

5.2.1 Current Business Limitations

Results from the 5 sub-issues within current business limitations yielded the following ranking:

Subsection	Description	Average Ranking
3	Pricing	3.95
5	Regulations	3.71
2	Logger Issues	3.48
4	Cost of doing business as a forester	3.35
1	Clients—Recruiting and retaining	2.98

Clients---Recruiting and retaining

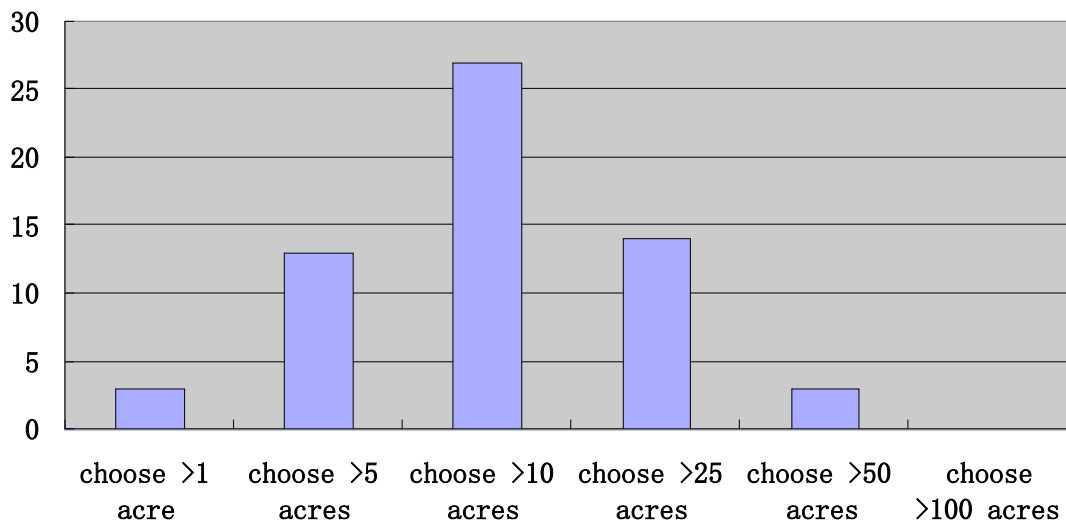
Survey respondents were first asked to rate barrier keeping them from achieving their business goals and/or expanding their business. These included 7 questions with results as follows:

Question	Description	Average Ranking
1-1(1)	Landowners not interested in having their forest managed.	3.42
1-1(7)	Forest parcels too small for a viable harvest	3.25
1-1(2)	Shortened land tenure (landowner turnover)	3.23
1-1(6)	Inability to develop long-term contracts for management services	3.04
1-1(5)	Difficulty in coordinating sale involving multiple small land owners	2.80
1-1(3)	Landowners, who have previously dealt with loggers, tending to use Loggers instead of professional foresters	2.73
1-1(4)	Too many foresters competing for limited number of clients	2.41

The first three results, landowner lack of interest in forest management, small parcel size, and short land tenure, all appear to be consistent with prior literature regarding forest harvest behavior. Foresters appear to perceive competition from other foresters, or from loggers as less important issues.

As for the minimum acreage that foresters would consider for management/harvesting, 90% of the respondents chose between 5 acres and 49 acres and 45% of them chose 10-24 acres.

Q1-1(8): What Is the Minimum Acreage That You Would Consider for Management/Harvesting? (n=60)



Respondents were asked which part of the state (East or West of Worcester) they performed the majority of their forestry services. 73% reported performing most services in western Massachusetts vs. 27% for the East. This result is consistent with the percentage forest cover difference with the Western counties being more heavily forested.

Survey respondents were asked how they attracted new clients. Which mechanisms were the most important?

Question	Description	Average Ranking
1-1(10a)	Word of mouth referrals	4.68
1-1(10b)	Referrals from the MA DCR website	2.84
1-1(10d)	Advertising your services	2.55
1-1(10c)	Referrals from other websites	2.15

Clearly, word-of-mouth represents the most important method of recruiting new clients. If additional forester-client relationships are desired, then mechanisms for improving word-of-mouth networking appear to be worthy of promoting.

A final area of inquiry into forester perceptions regarding hurdles to expansion was explored. IN order to more fully understand the forester-landowner relationship, survey respondents were asked to rate landowner perceptions with respect to factors that might influence the harvest decision. Results of their beliefs about landowner perceptions are as follows:

Question	Description	Average Ranking
1-1(12b)	Post-harvest stand condition	4.55
1-1(12e)	Forester Reputation	4.46
1-1(12c)	Fair price for the stumpage	4.31
1-1(12d)	Logger reputation	4.16
1-1(12a)	Pre-harvest landowner education	4.13

With mean scores averaging over 4.0 for all questions in this “landowner perceptions” section, clearly foresters believe that landowners find each of these factors important in making the harvest decision.

Logger Issues

Question	Description	Average Ranking
1-2(8)	Reduced harvesting window due to regulatory oversight	4.33
1-2(7)	Aging logger workforce with too few employees entering the field.	4.17
1-2(9)	Reduced harvesting window due to weather (rain, lack of frozen ground)	4.00
1-2(6)	Loggers un-willing to handle small lots	3.48
1-2(3)	Not enough loggers with small scale harvesting equipment	3.43
1-2(4)	Not enough loggers with low-impact harvesting equipment	3.34
1-2(2)	Loggers un-willing to harvest at current prices	3.27
1-2(1)	Too few loggers operating in Massachusetts	3.25
1-2(10)	Poor quality of work by loggers	3.20
1-2(11)	Poor planning by loggers	3.16
1-2(5)	Not enough loggers with high-volume, mechanized equipment	2.61

Foresters appear to be most sensitive to factors affecting the harvesting window, including natural heritage review (1st at 4.33), and weather (3rd at 4.00). They also are attuned to the aging logging workforce (4.17) and it’s potential future impact. Also of note, is the finding that high volume, mechanized equipment may not be important for increasing harvest of Massachusetts forests.

Pricing

Question	Description	Average Ranking
1-3(8)	Low cost of business in global economy making imports more competitive	4.54

1-3(4)	Lack of markets for lower valued species	4.30
1-3(7)	Global economy making local species less desirable	4.28
1-3(5)	Lack of markets for small diameter wood	3.95
1-3(1)	Low prices for stumpage make landowners choose to wait to harvest	3.84
1-3(3)	Low prices for certain species encourages poor harvesting practices	3.83
1-3(2)	Low prices for logs makes coordinating a harvest un-profitable	3.82
1-3(6)	Mills "short counting" loads, reducing logger/landowner/forester income	3.02

Foresters perceive global business costs to be lower than here in Massachusetts and this makes imports of lumber more competitive. This perception appears to be validated by the current buyer behavior for lumber in Massachusetts, the vast majority of which comes from out-of-state, though not necessarily from out-of-country. The increased importance of global economic trade is also seen as a factor in reduced competitiveness of Massachusetts species for the export market. Foresters appear to rank the influence of low prices for logs and stumpage as being less important factors in Massachusetts lumber production.

Cost of doing business as a forester

Question	Description	Average Ranking
1-4(2)	Health insurance costs	3.95
1-4(1)	Liability insurance costs	3.75
1-4(3)	Workmen's compensation	3.65
1-4(4)	Retaining employees	2.67
1-4(5)	Inability to attract and hire new employees	2.66

The areas of most concern for foresters cost of doing business are reported payroll and insurance costs including health, liability insurance and workmen's compensation. They are much less concerned with their ability to hire and retain employees.

Regulations

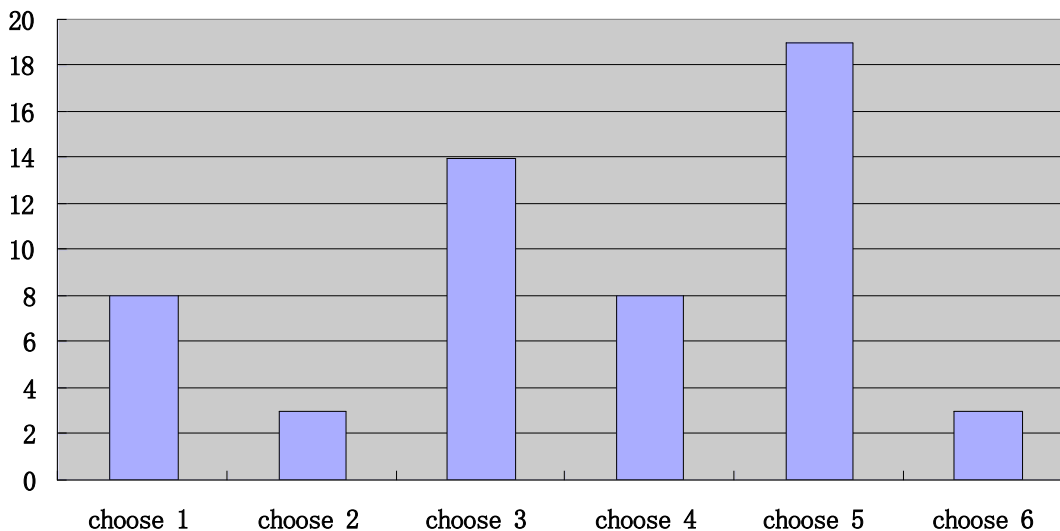
Question	Description	Average Ranking
1-5(1)	Natural Heritage (NH)---modifying or limiting harvesting	4.39
1-5(2)	NH-Inconsistency in recommendations interpretation of law	4.30
1-5(9)	Local/municipal regulations acting as an impediment to harvesting	4.21

1-5(5)	Chapter 61 acting as an incentive for management/harvesting	4.08
1-5(3)	NH---Lack of timeliness (delay) in responding	4.02
1-5(4)	NH---Inconsistency in response time (unknown turnaround time)	3.89
1-5(8)	Chapter 132 acting as an impediment to harvesting	3.09
1-5(7)	Chapter 132 acting as an incentive for management/harvesting	2.98
1-5(6)	Chapter 61 regulations acting as an impediment to harvesting	2.44

Foresters have a number of concerns with the effect regulation has on the ability to conduct forestry business at both the local and state levels. The effect of Natural Heritage (NH) rulings on modifying or limiting harvesting was ranked 1st, with inconsistency in NH findings, and impact of local/municipal regulations following closely. They seem relatively less concerned with the effects of Chapter 61 and Chapter 132.

5.2.2 Business Expansion:

Q2-1: Interest in Business Expansion
(n=52 mean=3.52 SD=1.43)



The figure above indicates that, for those foresters who had an opinion regarding their interest in expanding business, 79% of respondents indicated they were Somewhat interested (3) to Very interested (5).

Question	Description	Average Ranking
2-3(7)	More markets for less desired/low value species	4.84
2-3(10)	Promoting local demand for Massachusetts produced wood	4.61
2-3(8)	More markets for small-diameter logs	4.58
2-3(16)	Increased forest industry support from---Citizens in general	4.45
2-3(11)	Developing niche markets for locally produced wood	4.41
2-3(9)	A viable biomass wood chip market	4.39
2-3(5)	More buyers of softwood logs	4.16
2-3(6)	More buyers of hardwood logs	4.11
2-3(17)	Government promotion of the use of professional licensed foresters	4.03
2-3(14)	Increased forest industry support from---State Government	4.00
2-3(15)	Increased forest industry support from---Local Government	3.86
2-3(13)	Increased forest industry support from---Federal Government	3.60
2-3(12)	Marketing training for foresters	3.55
2-3(2)	Better communication/coordination with loggers	3.31
2-3(4)	More log trucks operating in Massachusetts	3.12
2-3(3)	Better communication/coordination with truckers	2.78
2-3(1)	Additional foresters/employees in the industry	2.58

Foresters see a clear need to develop markets for less desired/low value species, including small-diameter logs, and a biomass wood chip market as well. This ranked highest in importance in regards to their ability to expand their business. Along similar lines the promotion of Massachusetts wood, niche markets for local wood, and increased industry support from citizens in general. Foresters clearly ranked support from citizens as being more important than new support from government, at any level, local, state, or federal.

The number of buyers of both hardwood and softwood logs is a concern.

They believe there are sufficient foresters in the industry, and don't feel additional foresters are important to expanding their business. They also appear somewhat less concerned with the availability and coordination with truckers.

5.2.3 Background Information

Foresters were asked to indicate what types of clients they provided services to:

Client type	Percentage of Respondents
Private forest landowners	92%
Industrial forest lands	26%
State forest lands	27%
Municipal forest lands	53%
Land trusts	39%

Foresters were asked to indicate what types of services they provided. Results are as follows:

Service	Percentage of Respondents
Management plans	97%
Harvest management	93%
Forest land appraisal/tax services	43%
Timber stand improvement	75%
Road engineering	31%
Survey/boundary marking	80%
Wetlands Delineation	34%
Invasive Species Control	36%

Foresters were asked a series of questions regarding forest certification systems. 28% of respondents indicated that they were certified under a forest certification system. Of those certified, they estimated that 27% of the volume harvested from their managed projects was from certified lands, but only 5% of the volume of logs sold went to buyers specifying certified logs. 42% of respondents indicated that they had used Tree Farm as a certification label, 18% had used FSC and 12% SFI.

51% indicated that they felt the demand for “green certified” wood will increase, at least somewhat. Most foresters responded that “green certified” wood would only change the way they operated their business, slightly or not at all.

NaForesters generally work in very small businesses with the average number of employees being 2.3 and 64% of respondents indicated that their business had 1 (or fewer) full time employees.

The mean number of clients managed in 2006 was 22. The average harvest size was 46 acres. Total reported volume of trees harvested in 2006 averaged 4,728 MBF per respondent.

89% of respondents indicated they were their firm's owner. They averaged 26 years of working as a forester. All respondents indicated that they had studied at the college level, with 31% having completed a graduate level degree.

5.3 Logger

Logger survey response

Surveys were mailed to 471 licensed harvesters in Massachusetts and one was returned as a bad address. 140 usable surveys were returned resulting in a response rate of 30%

5.3.1 The Logging Business

The first section of survey was designed to assess the current business characteristics of the respondent's logging operation. 91% indicated that they were owner/operators, with 5% reporting they were owners (not in the woods) and 4% reporting they were employees. The average length of time that the respondent had been working in the logging industry was 23 years, which indicates an aging logging workforce, consistent with related research findings.

Among all the responders, 79% of them work in businesses with just 1-2 employees, 14% had 3-5 employees and only 7% had 6 or more employees.

Loggers were asked to estimate the total number of acres that they logged in 2006. The average estimated of total number of acres logged is 455, with a maximum of 20,000 and minimum of 0. The average estimated of total number of (cords) harvested is 8571, with the maximum of 500,000 and minimum of 0. The "average" logger operated on 5.5 sites in 2006, with a maximum reported of 40 and minimum of 0.

Respondents were asked to estimate the sources for stumpage. Among the 116 useable responses, 59 of them (51%) claim their stumpage for wood was obtained solely from private, non-industrial sources. 21% of respondents indicated sourcing a portion of their stumpage from industrial forest land and 30% indicated sourcing some of their stumpage from state or municipal land.

Loggers reported the average distance traveled to obtain stumpage was 28 miles with a maximum reported average distance of 150 miles and the minimum of 0.

74% of respondents indicated that they used a conventional skidder, with 34% indicating use of a harvester/forwarder and 15% using small-scale equipment. These sum to greater than 100% due to some respondents indicating the use of more than one type of equipment.

Respondents were asked to estimate the current value of their in-woods equipment with results as follows:

<u>Estimated value of in-woods equipment</u>	<u>Percentage of Respondents</u>
< \$50,000	42%
\$51,000 - \$100,000	22%
\$101,000 - \$500,000	24%
\$501,000 - \$1,000,000	9%
> \$1,000,000	3%

The majority of Massachusetts' loggers are operating skidders and other small scale, less capital intensive equipment.

Loggers were asked what percent of time they were idle, when they would have liked to have been working. Reported values averaged 26% idle time with the percent of respondents falling in the following ranges.

<u>% of Idle Time</u>	<u>Percentage of Respondents</u>
< 20%	42%
20 – 40%	31%
40 – 60%	18%
60 – 80%	3%
80 – 100%	6%

Loggers were asked to rate the importance of a variety of causes for unused logging production capacity with the following results.

Question	Description	Average Ranking
1-10(1)	Poor weather conditions	4.25
1-10(6)	Regulations	3.88
1-10(3)	Mechanical breakdown	3.82
1-10(8)	Mill closure	3.29
1-10(2)	Poor road conditions	3.27
1-10(7)	Inability to find stumps	3.03
1-10(4)	Mill-imposed quota	3.02
1-10(10)	Poor planning of the mill/buyer	2.79
1-10(9)	Poor planning by the logger	2.54
1-10(5)	Moving equipment	2.52
1-10(12)	Unproductive logging labor	2.20
1-10(11)	Lack of logging labor	2.16
1-10(13)	Inefficient unloading of delivered wood	1.80

The single factor with the highest importance rating was weather (4.25). Further study should be undertaken to analyze whether these importance ratings are correlated with equipment type or value of

in-woods equipment, assuming that equipment type may be a mitigating factor in being able to operate in adverse weather. Closely following weather, were Regulations (3.88) and Mechanical breakdown (3.82).

Loggers were asked what their level of interest would be in expanding their current business. There responses were as follows:

Rating	Percentage of Respondents
1 – Not Interested	22%
2	11%
3 – Somewhat interested	35%
4	7%
5 – Very Interested	26%
6 - Uncertain	1%

Clearly there is a distribution in the interest in expanding business, with 68% ranging from “not interested” to “somewhat interested”. A surprising finding is the distinct group of 26% of respondents indicating that they were “Very interested” in expanding their business. Efforts aimed at increasing logging capacity in Massachusetts might be well served if this cohort can be identified. Further research analysis may be able to identify specific needs of this cohort and whether they differ from the logging population in general.

Most loggers were interested in expanding their current business.

Level of desired business expansion	Percentage of Respondents
None	20%
10%	10%
25%	36%
50%	25%
100%	9%
More	1%

Loggers were asked to rank their level of concern regarding a number of potential barriers to maintaining or expanding their business.

Question	Description	Average Ranking
1-13(9)	Rising operating costs	4.45
1-13(11)	Health insurance costs	4.43
1-13(10)	Liability insurance costs	4.39
1-13(5)	Low market prices for wood	4.36
1-13(12)	Workmen’s Compensation	4.08
1-13(15)	Natural Heritage regulations	4.04
1-13(13)	Investment needed to upgrade/obtain new equipment	3.99

1-13(16)	Other regulations and guidelines on harvesting	3.79
1-13(4)	High stumpage prices	3.62
1-13(1)	Uncertainty about the future of the region's wood supply	3.44
1-13(6)	Not enough stumpage being sold or offered for sale	3.20
1-13(2)	Too much development in my area	3.13
1-13(14)	Too much competition	2.56
1-13(3)	Woodlots in my area are becoming too small to harvest economically	2.55
1-13(8)	Retaining in-the-woods employees	2.08
1-13(7)	Ability to attract and hire new in-the-wood employees	2.08

Loggers are clearly most concerned with costs of doing business and prices received for their product. Also of high concern was the effect of regulations, both Natural Heritage, and other regulations. On the whole they were less concerned with personnel issues, competition, and the wood supply. Other (please specify):

An open ended question, "Other" was answered by 29 respondents. 10 of these mentioned laws, including Natural Heritage laws, endangered species laws, truck weight laws, heritage regulations and other guidelines. They complain the laws are either too strict or changing too fast.

The last area of inquiry regarding their logging business was in the area of training. Respondents were asked to rate the importance of the following types of training with respect to improving the productivity, effectiveness and profitability of their business:

Question	Description	Average Ranking
1-14(3)	Marketing	3.59
1-14(2)	General Business Training	3.17
1-14(1)	Operations and techniques	3.00

This seems to indicate that future logging training might be well advised to focus on marketing.

5.3.2 The Supply Side

Loggers were asked how they obtained their logging jobs. Average responses indicated that direct marketing to landowners accounted for 45%, negotiating or bidding on sales managed by consulting foresters accounted 36% with logging on company owned lands averaging 16% of responses. An interesting finding is that many loggers worked exclusively through one of these three methods. 22% of respondents indicated they obtained 100% of their work direct from landowners, 16% worked only through consulting forester managed sales and 7% worked only on company owned lands.

Loggers were asked to gauge the importance of a number of harvest decision factors from the landowner’s perspective. Average rankings are as follows:

Question	Description	Average Ranking
2-2(4)	Logger reputation	4.81
2-2 (3)	Fair Price for the stumpage	4.57
2-2 (2)	Post-harvest stand condition	4.56
2-2 (1)	Pre-harvest landowner education	3.97

Loggers believe that their own reputation is most important when a landowner is making a decision to harvest their forest.

5.3.3 The Demand Side

A third area of inquiry for loggers concerned the demand for logs. We know that many logs harvested in Massachusetts are sold and transported for processing out-of-state. Loggers were asked what percentage of the logs they harvested were sold within Massachusetts, to other US states, to Canada, or to other countries. Average responses were:

Logs Sold to:	Average Percentage Response
Massachusetts	36%
Other US States	45%
Canada	18%
Other Countries	< 0.1%

These results are consistent with the hypothesis that most logs harvested in Massachusetts are sent out-of-state for processing. Log exports exceed in-state log sales by an almost 2:1 margin.

Respondents were also asked who their customers were. Loggers indicated that about 78% of their product was sold direct to sawmills with the remainder (21%) being sold to log buyers/log brokers. They were also asked to indicate whether there were enough buyers to sell their logs to. A surprising 37% said “No” they did not believe there were enough buyers with another 12% indicating they were “Not sure”. Only 50% of respondents believed there were enough log buyers in the market. When asked how important having more buyers to sell to would be in efforts to expand their business, respondents averaged a 3.9 rating out of 5 (5=Very important). These findings are consistent with the decline in the number of sawmills in the State and indicates the possibility of an inefficient market for logs in Massachusetts. Coupled with the finding for interest in market training in Section 5. 3.1 above, this represents an opportunity for business expansion through the development of improved log marketing.

Loggers were also asked to rate the importance of a number of other factors from a business expansion perspective. Results were:

Question	Description	Average Ranking
3-5(3)	Quality of work	4.39
3-5(2)	Long term relationship	4.29
3-5(1)	Better planning and communication with sawmills and log buyers/brokers	3.75
3-5(4)	Specific equipment capability	3.56

Clearly the loggers believe that quality of work and long term relationships are the most important of these factors.

5.3.4 Certified Wood

Only 31% of the respondents claimed they have conducted logging operations on “Green Certified” lands and 54% claimed they have not. There is another 15% claimed they were not sure. When asked about whether they believe the demand for “Green Certified” logs is growing, 47% chose not sure, 28% chose no and only 25% chose yes. In addition, 37% of the respondents believed “Green Certified” lands will not change the way they log, 32% were not sure and only 31% believed it will.

5.3.5 Demographics

Respondents were asked to indicate the county where their business was located. Responses were as follows:

County	Percentage of Respondents
Hampshire	26%
Worcester	21%
Berkshire	16%
Franklin	11%
Middlesex	10%
Hampden	9%
Plymouth	4%
Bristol	1%
Essex	1%

77% of the loggers are full time, 21% of them are part time and only 2% regarded logging as a hobby. Consistent with the findings of other researchers an average age of 48 years indicates an aging logger workforce.

Lastly loggers were asked to report their level of education.

Education Level	Percentage of Respondents
Less than 12 Years	8%
High School Graduate	46%
Some College	21%
College Graduate	25%

Massachusetts boasts a well-educated logger workforce.

5.4 Sawmill

Sawmill Survey Response

The sample population was derived from the most recent, Massachusetts Directory of Sawmills & Dry Kilns, 2006 (Damery & Boyce, 2006). 43 Sawmills were listed in the directory and cover letters and surveys were mailed to the entire list. 15 useable surveys were returned yielding a 35% response rate.

5.4.1 Current Business Limitations

The first section of the survey of sawmill businesses focused on seven areas of potential business limitations. The respondents were asked to rate the importance of factors that might be barriers to running the mill at full capacity or for expanding their business. The average of the averages of the questions in each of the 7 areas is presented below. Details of each subsection follow.

Question	Description	Average Ranking
6	Human Resources (Payroll & overhead costs)	4.37
5	Government and Rules	3.67
7	End Products Selling	3.47
1	Raw Material Procurement	3.2
4	Problems During Production	3.11
3	Planning and Consulting	2.91
2	Transportation and Storage	1.87

Raw Material Procurement

Question	Description	Average Ranking
1-1(6)	Logs being exported to Canada	3.93
1-1(5)	Low quality wood	3.54
1-1(3)	High cost for logs	3.38
1-1(2)	Unpredictable log supply	3.36
1-1(1)	Uncertainty about the future of the region's wood supply	3.29
1-1(4)	Not enough logs being sold or offered for sale	3.08
1-1(8)	Consulting foresters turn down stumpage bids because of low price	2.67
1-1(7)	Lack of access to information from consulting foresters	2.38

Exporting of logs ranked highest in importance among these factors. This is consistent with the findings from the logger survey, indicating a higher percentage of logs sold out-of-state vs. in-state. It is difficult to see how log exports directly affect the ability to expand business, particularly in light of the “Somewhat important” response to the question “Not enough logs being sold or offered for sale(3.08)”. It is more likely that in a competitive marketplace, exported logs are being purchased at a price higher than Massachusetts sawmills are willing or able to pay. If this is the case, then the solution to being more competitive in log purchases is through higher operating or marketing efficiencies that would expand operating margins. Other reasons mentioned as a barrier to buying logs was competition from high production mills to the North.

Transportation and Storage

Transportation and storage issues were not a concern for sawmill survey respondents.

Question	Description	Average Ranking
1-2(3)	Limited log handling space / Lack of lumber inventory storage space	2.23
1-2(2)	Lack of trucking (outbound) / Lack of transport equipment	1.77
1-2(1)	Log delivery problems / inefficient unloading of delivered wood	1.62

Other barriers in transportation and storage mentioned are high fuel price. It can be shown that generally speaking, transportation and storage are not regarded as major problems.

Planning and Consulting

Question	Description	Average Ranking
1-3(4)	Product price volatility makes it difficult to scheme	3.62
1-3(5)	Lack of knowledge to develop new products	3.5
1-3(1)	Too few inventory “sorts” to be able to compete against larger mills	2.85
1-3(2)	Need for knowledgeable business consultants.	2.62
1-3(3)	Needs “go to” consulting resources	2.42
1-3(6)	Lack of cooperation with other sawmills	2.42

Sawmill respondents are struggling with price volatility and with an apparent inability to develop new product lines that might improve profitability.

Problems during Production

Question	Description	Average Ranking
1-4(5)	Energy costs	4.54
1-4(6)	High production costs	4.23
1-4(8)	Too much land development in my area	3.38
1-4(9)	Too much competition	3.00
1-4(3)	Poor weather conditions	2.54
1-4(4)	Mechanical breakdown	2.54
1-4(2)	Inability to sell waste material	2.38
1-4(1)	Unable produce grade stamped structural lumber	1.67

Energy costs represent a severe hurdle for Massachusetts sawmill owners. This represents a key opportunity for business assistance. Sawmill owners might benefit from research and training in energy conservation best-practices and benchmarking with the industries most energy efficient firms. The same suggestion holds true for the respondents ranking of high production costs (4.23).

Other operating costs mentioned were: insurance cost, trucking cost, equipment repair cost, labor cost, fuel cost and electricity cost.

Other producing problems mentioned are: employee absenteeism, poorly cut logs and metal in logs.

Government and Rules

Question	Description	Average Ranking
1-5(2)	Lack of coordination between government agencies to support forest products businesses	4.55
1-5(5)	Lack of government support for native lumber	4.38
1-5(1)	Too much regulations / Regulatory restrictions	4.08
1-5(3)	Lack of access to low interest financing	3.69
1-5(7)	Delayed or inconsistent response from Natural Heritage	3.17
1-5(4)	Premium grade stamped lumber membership fees	3.00
1-5(6)	Delayed or inconsistent response from DCR / Service Foresters	2.85

Sawmill operators believe that lack of coordination between government agencies represents a barrier to business expansion (4.55). An initiative aimed at identifying specific problems, and coordinating across government departments. The focus group study specifically identified issues concerning:

- Energy
- Environmental values
- Economic Development
- Extension support

Other rules mentioned including: certified audit fees/standard, off road diesel rules and zoning.

Human Resources

Question	Description	Average Ranking
1-6(5)	Liability Insurance costs	4.92
1-6(6)	Health Insurance costs	4.92
1-6(7)	Workmen’s Compensation	4.46
1-6(8)	Cannot afford enough labor	4.00
1-6(2)	Lack of sawmill labor	3.31
1-6(3)	Unproductive sawmill labor	3.23
1-6(1)	Inability to attract and hire new employees	3.15
1-6(4)	Retaining employees	2.62

Consistent with complaints from other industry sectors, sawmill operators believe that insurance costs are very important issues in the ability to grow their business. It is unclear how these costs might be lowered. Sawmills are less concerned about the ability to hire and retain employees.

End Products Selling

Question	Description	Average Ranking
1-7(2)	Lack of market demand	4.46
1-7(5)	Lack of local buyers	4.08
1-7(1)	Inability to sell low quality products	3.69
1-7(6)	Can only sell to small volume customers (retailers) but not to large volume customers (wholesalers)	3.69
1-7(8)	Lack of effective advertising	3.67
1-7(7)	Lack of sales staff	3.15
1-7(4)	Poor planning by the lumber buyer / customer	2.6
1-7(3)	Poor planning of the mill / buyer	2.45

The slow market for lumber products is clearly a concern for sawmill operators.

Other selling problems mentioned included: low market, delinquent payments.

Other problems mentioned including:

“Bigger retailers want to make their customers think they buy from local small suppliers (us), but in reality they want to put us out of business with more global imported material”

“We seem to be able to sell everything we make. The problem is it cost us more to make it then we can sell it for”

“Competition with home depot etc for end products”

These types of responses have led to the formation of cooperatives in other industries, to leverage smaller businesses power in order to better compete with other market players.

5.4.2 Business Expansion

The second area of questioning directed to sawmill respondents were related to their interest in expanding their current business.

Most respondents were very interested in expanding their business.

Level of desired business expansion	Percentage of Respondents
None	0
10%	8%
25%	42%
50%	0%
100%	33%
More	17%

Survey respondents rated “having more buyers” very important (4.6 average rating).

Sawmills were asked to rate the importance of a number of factors related to expanding their business and increasing their sales.

Question	Description	Average Ranking
2-5(3)	Quality of lumber produced	4.88
2-5(2)	Long term relationship	4.75
2-5(4)	Additional value added processing	4.71
2-5(5)	Improved sales staff / advertising	4.63
2-5(9)	Loan package for new equipment for producing new products	4.41
2-5(6)	Business development support	4.25
2-5(8)	Market and sales advice	4.25
2-5(1)	Better planning and communication with buyers	4.00
2-5(7)	Advice on business plan	3.25

Traditional factors including product quality and long term relationships predictably top the list but there also seems to be a desire for additional value added production capacity and improved sales staff.

As with loggers, sawmills were asked a series of questions regarding the importance of training.

Question	Description	Average Ranking
2-6(3)	Marketing / Sales	4.3
2-6(4)	Management	3.88
2-6(1)	Operations and techniques	3.78
2-6(2)	General business training	3.67

Consistent with the previous question they ranked the need for marketing and sales training above other general business or operations training.

Sawmill respondents were asked two questions concerning their attitudes toward “Green Certified” Wood. 56% of the respondents believed the demand for “Green Certified” wood will increase. But when asked whether ‘green certified’ wood would change the way they did business the responses indicated only “slightly” (average rating 2.88).

To test the relations between loggers and sawmills, sawmills were asked to rank how loggers perceived the following factors with respect to selling logs.

Question	Description	Average Ranking
2-9(2)	Sawmill reputation	4.33
2-9(3)	Steady demand from the sawmill	4.33
2-9(1)	Fair price of logs	3.92

5.4.3 Background Information

Sawmill survey respondents came from the following counties.

County	Percentage of Respondents
Hampshire	38%
Franklin	25%
Worcester	19%
Middlesex	6%
Bristol	6%
Essex	6%

Two-thirds of respondents indicated that their sawmill business was a “full-time” operation with the other third indicating “part-time”.

Respondents were asked about the types of services their sawmill provides. Responses were as follows:

Service	Percentage of Respondents
Production Milling	60%
Planing or moulding	53%
Custom Milling	80%
Other value-add	33%
Kiln Drying	33%

In an effort to formulate an estimate as to whether the Massachusetts sawmill industry was operating at capacity, several questions regarding mill operations were posed. When asked to report the number of days their mill operated in 2006, responses averaged 204 days with a minimum of 50 and a maximum of 365. All mills appear to operate on one shift, with the average number of hours per day reported as 7 hours (minimum 4, and maximum 10). When asked whether their mill could operate with 2 or 3 shifts, only 29% indicated that they could with 61% reporting they could not. Additional information would be needed to get at the reasons mill operators believed that their mill would not be able to operate multiple shifts. On the whole, the above data would indicate that mills are not currently capacity constrained. This finding is consistent with the current downturn in the lumber industry in general, and with the decline in the number of sawmills in Massachusetts.

Sawmill respondents indicated a variety of sources for their logs. Average estimates of logs obtained from “own company’s loggers” was 44% with another 37% coming from “independent” loggers and a final 20% coming from “others” presumably, brokers or inter-company log purchases.

Sawmills were also asked to estimate percentage of sales to a variety of customer types. 33% of those surveyed indicated that they sold 100% of their production directly to contractors and homeowners. One additional respondent indicated that they sold 100% of their production to “retailers”. The remainder indicated they sold to a mixture of customers including: secondary processors, retailers, broker/wholesalers and contractors/homeowners.

Only one sawmill indicated that they had “chain-of-custody” certification for processing “green certified” lumber.

Sawmills averaged 8 full-time employees and 3 part time employees. 27% of respondents indicated the current value of their sawmill equipment was in excess of \$500,000 and another 27% indicated their equipment had a value of less than \$50,000.

The mills surveyed spanned a wide range of production. The average volume of softwood reported produced was 513 MBF (minimum 20 and maximum 3,000) and the average volume of hardwood produced was 486 MBF (minimum 5 and maximum 3,104).

93% of the people completing this questionnaire are either owners or both owners and operators. Their average years in the sawmill business is 24 and 79% have collage experience.

40% of survey respondents indicated they were the sawmill owner, with 53% reporting to be an “owner/operator” and 7% an “employee”. The average length of time the owner had been in the sawmill business was 24 years, with a minimum of 8 and a maximum of 50.

Lastly sawmill respondents were asked to report their level of education.

Education Level	Percentage of Respondents
Less than 12 Years	0%
High School Graduate	20%
Some College	40%
College Graduate	40%

Massachusetts boasts a well-educated group of sawmill owners.

5.5 Wholesaler

Hardwood Wholesale Lumber Distributor – Interview

We visited the offices of a major wholesale lumber distributor of hardwood softwood lumber serving New England on November 27, 2007. A series of questions structured around the 4-P's of marketing; Product, Price, Place and Promotion were posed specifically from the perspective of this research work. What are the barriers or opportunities for increased harvest and processing of Massachusetts native woods?

5.5.1 Product

What are there unique characteristics of Massachusetts' native woods that are recognized in the marketplace?

Ans: Take Red Oak, for example, in New England, including Massachusetts, the wood tends to have better color, however it is narrower and shorter than the Red Oak that comes from South of New England. Southern Red Oak does not have as appealing a color, but tends to come in longer and wider boards. Northern Red Oaks color, commands a premium. This product has recently gone out-of-favor since the high-demand period of the 1970's and 80's. Customer's demand for hardwoods is subject to changing tastes and preferences.

What about demand for certified products?

Ans: Most demand for certified hardwood lumber is going to Europe. We believe it is a growing market both there and domestically. One issue here, is the challenge of selling smaller volumes of different spec material to individual countries in Europe.

What about product quality? Are Massachusetts' sawmills able to deliver the quality product that you need?

Ans: By and large Massachusetts sawmills are capable of delivering the quality and grade of material that is demanded. Some mills are in need of upgrade, they could benefit from scanning technologies in order to tighten their tolerances and deliver a more consistent product.

Are the types/sizes of product you need generally available in Massachusetts?

Ans: We buy from roughly 200 mills throughout the region. It is tough to think of Massachusetts in isolation. Mills in Massachusetts can generally deliver the product we are looking for. Most mills produce 4/4 and 8/4 thickness material. Very few are supplying in other thicknesses that are

demand, 12/4, 10/4 and 8/4 it is also tough to find 5/4 material. We also sell a large volume of specialty sawn material such as quarter-sawn, which is also more difficult to source.

What is your belief in the demand for certified wood?

Ans: We were an early adopter of FSC chain-of-custody certification. There are currently a lot of problems with certified wood; rules change frequently and they seem arbitrary, they encompass not just environmental/ecological concerns but economic and social as well. All of the players in the environmental movement don't always get along, they argue amongst themselves. LEED is good but they specify FSC only. A typical example of a customer wanting certified wood might be someone like Middlebury College in Vermont. They want a "story" behind their new buildings, they want to source certified wood, locally, but that requires about an 8 month planning horizon in order to "buy local".

We believe demand is growing and will become huge for certified wood. We see Universities, State and other government priming the demand for "green certified" wood.

One thing we need is a Primer on selling certified wood spelled out in "laymen's terms". What are the key paperwork and distance, templates to achieve the various LEED credits?

5.5.2 Price

Can niche products/markets command a price premium?

Ans: Yes, On-grade commodity products, that meet length and width averages do not command a premium. But value-added sorts by dimension can. Another example is Cherry, it is getting sappier and coming in smaller and smaller pieces. A sort can be made for "rustic" cherry that will command a premium price for certain buyers, but it needs "enough" characters to qualify for "rustic".

Sorts, if you can find a "home" for a particular sort, this will enable a price premium.

Another area we need to work on, in order to command a premium for our product, is in end-sealing and in tarping our product for delivery.

What other price related issues are important?

Ans: Credit. Our sawmill customers want to get paid in 10 days. If we do this we can maintain a good relationship with our sawmill suppliers. This is still a relationship business, we want to buy from the same mills. However, relationships seem to be less important with each generation. We don't always buy on price, sawmills would do well to make "more" of their relationship with the wholesale buyer.

5.5.3 Place – Distribution

What issues are affecting your distribution and logistics operations?

Ans.: We use primarily trucks for both inbound and outbound product movement. Tolls, and other trucking expenses, such as diesel prices are affecting our cost structure. The rail system in our region is in poor condition, and there are not enough outbound flatbed cargo cars.

How important is eBusiness and online sales?

Ans.: Not much lumber is bought and sold online. There is a small amount of high grade stuff that is sold online.

5.5.4 Promotion

How do you sell your lumber?

Ans.: We rely primarily on our sales staff. They build the relationships with our customers.

What can sawmills do to improve their relationships with wholesalers and the industry as a whole?

Ans: Sawmills need to become less insular, and more participative. The National Hardwood Lumber Association has 200 sawmill members, but 1,300 business members that aren't sawmills. They need to help the industry speak with a broader voice. Participation in broader industry association allows more socializing and can improve the business relationship. For example, what if we've got too much of one grade/species. The industry as a whole could work together to figure out what the problems are. A larger industry voice can help promote, and influence homeowner tastes and preferences.

However, relationships seem to be less important with each generation. We do not always buy on price. Sawmills need to make more of their relationship with lumber buyers.

Can branding play a role in improving sales of Massachusetts' lumber?

Ans.: For branding to be effective, it needs to be done on some minimum efficient scale. We would need a longer term vision in order to determine the effectiveness of a branding strategy.

Is there a role for joint/collective marketing efforts?

Ans.: I believe so, but you will need to pick your partners carefully.

5.6 Gap Analysis

Landowners were asked, and both foresters and loggers were asked to estimate Landowner's perceptions of how important the following factors in making a harvest decision:

- Pre-harvest landowner education
- Post-harvest stand condition
- Fair price for the stumpage
- Logger reputation
- Forester reputation

Mean responses were as follows:

Factor	Landowner Mean Response	Forester Mean Response	Logger Mean Response
Pre-harvest landowner education	4.58	4.13	3.97
Post-harvest stand condition	4.67	4.55	4.56
Fair price for the stumpage	4.60	4.31	4.57
Logger reputation	4.62	4.16	4.81
Forester reputation	4.48	4.46	n/a

Responses to the first factor, pre-harvest landowner education, seem to indicate that foresters and loggers are underestimating the importance of educating the landowner. This negative gap indicates that foresters and loggers may be able to provide higher levels of landowner-client satisfaction by devoting more effort to educating the landowner prior to a forest harvest activity.

All three stakeholder groups rated post harvest stand condition as a very important factor, indicating that participants are paying an appropriate level of attention to this.

Loggers are correctly perceiving landowner values for the 3rd factor, "fair price for stumpage", where it appears that foresters again might be suffering from a negative gap. This result indicates that foresters are under-estimating how important stumpage revenue is to the landowner.

For the fourth factor, "logger reputation", again loggers and landowners seem to be on the same page, with foresters underestimating the importance of logger reputation to the landowner, in the forest harvest decision.

Lastly, foresters and landowners appear to have no gap in their perceptions regarding forester reputation. The logger survey did not include this question.

6. Conclusions and Recommendations

6.1 Conclusions and Recommendations: Landowners

As noted in section 5.1 above, the results of the landowner survey may be biased to reflect more closely with attitudes of landowners of larger parcels and those already under some form of forest management. This would indicate the need for further research to more clearly understand the attitudes of smaller forest landowners, and those who currently do not have formal management plans. There is the potential to do follow on analysis with the data gathered, and segregate the responses for un-managed and smaller parcels for analysis.

Given the above qualifications, important findings from this analysis include:

- Efforts to interest landowners in undertaking active forest management should focus on issues affecting; wildlife habitat, tree and plant quality, ecosystem services, and water quality
- Respondents were much more likely to have worked with a consulting forester than with a state service forester. This seems to be indicative of the relative numbers of each operating in the state.
- Perhaps surprisingly respondents seemed most satisfied with the “quality of work” and the “value of information/service” provided through their interaction with State Service foresters, followed by consulting foresters, directly with loggers, and least satisfied with services by foresters employed by timber buyers.

Recommendations resulting from this research include:

- Need for additional research to understand the motivating factors, and barriers to active forest management for small parcel size landowners, and those not actively involved in forest management.
- When considering harvest decisions all stakeholders interacting with landowners should know that they rank very highly all of the following factors:
 - Pre-harvest landowner education
 - Post-harvest stand condition
 - Fair price for the stumpage
 - Logger reputation
 - Forester reputation

6.2 Conclusions and Recommendations: Foresters

A number of categories of issues affecting current business limitations and barriers to expansion were investigated. On-the-whole, foresters were least concerned with their ability to recruit and retain clients, and their costs of doing business as a forester. They were most concerned with current low prices in the marketplace and the impact of regulations on the ability to conduct forestry operations.

The most highly ranked current business limitations included:

- Low cost of business in global economy making imports more competitive (4.54)
- Natural Heritage – modifying or limiting harvesting (4.39)
- Reduced harvesting due to regulatory oversight (4.33)
- Natural Heritage – inconsistency in recommendations/interpretation of law (4.30)
- Lack of markets for lower valued species (4.30)

In regards to factors that might promote business expansion, foresters see a clear need to develop markets for less desired/low value species, including small diameter logs, and a biomass wood chip market. They also believe that promoting Massachusetts wood, developing niche markets for local wood and increased support for a local forest products industry by the general citizenry would benefit business expansion.

There is very little that can be done on the local scale to effect global markets. Given the current decline in the value of the US Dollar in trading with global currencies, this might lessen the effect of imports on domestic markets, and might improve the ability of Massachusetts' producers to grow their exports. At a minimum, Massachusetts' producers would look for "fair trade" in global markets, which could be encouraged by mandating that imports be certified as coming from sustainably managed forest operations.

There was a great deal of frustration expressed with the interaction between foresters and Natural Heritage regulation. This interaction should be studied and methods developed to streamline, and make more consistent, the review and approval process.

Lastly, foresters would welcome development of markets for small diameter and less valued species. The most likely immediate market would appear to be the emerging woody biomass energy markets. Support for expansion of these would appear to benefit the ability to conduct harvest operations and improve their profitability, by adding a revenue stream from these materials that doesn't currently exist.

6.3 Conclusions and Recommendations: Loggers

Massachusetts' logger workforce is dominated by small scale operators with smaller scale equipment. They are an aging workforce with an average age of 48 years and 23 years experience as a logger.

Loggers appear eager to expand their business with 68% of respondents reporting they were "somewhat" to "very" interested in expanding their business.

Loggers reported that the most important causes of un-used logging capacity were:

- Poor weather conditions (4.25)
- Regulations (3.88)
- Mechanical breakdown (3.82)

Key barriers to maintaining or expanding their business included:

- Rising operating costs (4.45)
- Health insurance costs (4.43)
- Liability insurance costs (4.39)
- Low market prices for wood (4.36)

Loggers also felt that certain business characteristics were most important in their ability to expand business and they included the “quality of work” (4.39) and having a “long term relationship” (4.29).

Further research would be needed to determine whether a shift in equipment type would be able to extend loggers ability to work in adverse weather conditions. As with foresters, it appears that better coordination and a streamlining of the regulatory process may serve to assist business expansion in the logging industry. The aging workforce remains a concern for the ability to expand this sector. If additional markets, such as a biomass wood chip market were to develop, additional logging capacity would need to be developed for Massachusetts.

6.4. Conclusions and Recommendations: Sawmills

Sawmill survey respondents rated 11 factors most highly as current business limitations to maintaining their business as follows:

- Liability insurance costs (4.92)
- Health insurance costs (4.92)
- Lack of coordination between government agencies to support forest products businesses (4.55)
- Energy costs (4.54)
- Workmen’s compensation (4.46)
- Lack of market demand (4.46)
- Lack of government support for native lumber (4.38)

Additionally, sawmills identified four key factors they felt were most important in expanding their business and increasing their sales:

- Quality of lumber produced (4.88)
- Long term relationship (with buyers) (4.75)
- Additional value added processing (4.71)
- Improved sales staff/advertising (4.63)

Further research may be able to yield solutions to the cost issues raised, perhaps through a coordinated effort to attract competitive insurance bids. Similarly, for energy costs, sawmills generate a significant amount of wood based raw material that could be used as energy feedstock, if appropriate scale wood fired electric generating technology could be developed.

As with results from foresters, and loggers, sawmill operators see a need for better coordination of government bodies in supporting the forest products industry. A task force of relevant agencies should be formed to investigate the specific bottlenecks.

Consistent with the wholesaler interviewed, sawmills might benefit from strengthening their relationships with their customers. Identification of specific value added production operations might improve sawmill's ability to differentiate their product, capture more value-add, and tap into niche markets. Coupled with this they have identified a need for support/training in marketing and sales.

6.5. Conclusions and Recommendations: Wholesaler interview

The wholesaler analysis consisted of an interview with a large wholesaler located in Massachusetts, and statistically valid conclusions cannot be drawn from a single data point. However, the interview can be used to speculate on potential areas for improving demand for locally produced wood. We suggest the following, based on the interview:

- Demand for certified lumber is growing
- Can receive a price premium for niche products
- Scarcity of 12/4, 10/4, 8/4 and 5/4 thicknesses represent an opportunity
- Sawmills might be better served to improve their relationship with wholesale buyers and get more involved with industry associations

6.6. Conclusions and Recommendations: Gap analysis

A negative gap was found for both foresters and loggers in their perception of the importance of pre-harvest landowner education when landowners are making harvest decisions. This indicates that foresters and loggers may want to invest more time and energy in educating the landowner which may result in higher levels of customer satisfaction, and improved relationships.

Foresters were also found to underestimate the importance of logger reputation for landowners in their harvest decision. This indicates that foresters may benefit in their client relations by better informing the landowner with respect to logger reputation.

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