

Logging across Borders and Cultures: An Example in Northern Maine

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Abstract

Persistent concerns about the continued use of foreign labor and the viability of northern Maine's logging industry prompted further research on the cross-cultural logging workforce found in Maine's counties that border the province of Quebec. Two distinct populations of woods workers are employed in these border counties: Maine residents and Quebec residents. This study examined sociodemographic attributes, sense of occupational choice and prestige, and familial attachment held by these two populations of loggers, as well as barriers to business expansion felt by logging entrepreneurs. Significant differences in age, education, logging experience, attitudes toward logging, and perceptions of public image were found between Maine and Quebecois loggers. Additionally, despite an intergenerational labor supply that historically characterizes the logging industry, more than 50 percent of loggers from both countries would not encourage their children to enter the logging profession. These factors may not only pose challenges for logging business stability and labor recruitment efforts in this region but also impact the economic vitality of the forest products industry as a whole. Furthermore, the findings from this research may be of interest and pertinent to those engaged in forest products industries within other cross-border regions.

Maine's forests provide both commodity- and non-commodity-based values to individuals and businesses in the state and surrounding region. Among the multiple benefits these forests offer, the renewable timber resource provides the foundation for sustainable economies, especially in Maine's rural communities. Maine's forest products industry is a vital dimension not only of many local economies but also of the state's economy. Throughout Maine, especially in the northern region, the logging and log hauling sectors comprise a significant portion of the employment base in the rural areas where alternative employment opportunities are limited. Furthermore, as well as being the suppliers of raw materials for forest products, professional loggers are instrumental agents in the sustainable management of northern Maine's forests, a region traditionally characterized by industrial forest ownership, production forestry, and a cross-cultural workforce composed of domestic and Quebecois labor.

However, as has been experienced in other regions of the nation, the logging businesses that rely on these forests face considerable uncertainty. There are heightened concerns not only about the future of the region's logging sector but also the overall forest products industry because of declining domestic logging labor supply and labor recruitment challenges (Pan Atlantic Consultants/The Irland Group 1999; Office of Policy and Legal Analysis, Maine State Legislature [OPLA] 2001; Egan and Taggart 2004a, 2004b; Goldstein et al. 2005); uncertainty in the procurement of

wood raw material associated with the region's proximity to large population centers (Egan et al. 2007, Egan and Morin 2010); shifts in forestland ownership and forestland use values; deterioration in harvesting conditions resulting in diminished logging opportunities, increased equipment moving costs, and reduced logging productivity; mill closures and reduced mill operations (OPLA 2004; Innovative Natural Resource Solutions 2005; Maine Department of Economic and Community Development 2005; Office of the Attorney General, State of Maine 2009); and depressed demand for Maine's forest products as a result of the recent housing crisis and economic recession.

Because these concerns are not unique to northern Maine, other studies across the nation have addressed similar issues. For example, Virginia logging business owners expressed concerns about the future of forestry in their state and noted that the major challenges they faced were a lack of markets for their products, rising fuel and operational costs, and dwindling prospects for future markets (Bolding et al.

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2010). Similarly, logging business owners in Southern New England (Egan 2011) and New York (Egan 2009) noted that the most challenging barriers to maintaining or expanding their logging businesses were the direct “costs of doing business”—fuel, equipment and insurance costs, price of stumpage, and a shrinking forest land base. Primary logging business constraints noted in the Inland Northwest were less availability of timber as a result of the reduction of harvesting on public lands and recruitment of younger employees (Allen et al. 2008). More than half of logging businesses in the North Central region of the country reported decreased profit margins over a prior 5-year period (Allred 2009). Mouldenhauer and Bolding (2009) found that South Carolina loggers were concerned about the challenges and costs associated with harvesting reduced tract sizes and moving equipment more frequently in addition to rising fuel and fixed costs. Moreover, in Georgia, an aging workforce and lack of a replacement labor supply as well as financial pressures partially attributable to increased fuel prices and equipment moving costs were prominent concerns among logging business owners (Baker and Greene 2008).

However, perhaps more relevant to Maine are concerns about the ongoing cross-border labor conflict and wage rate setting procedures that have fueled further research on the compensation structure, logging labor supply, and recruitment methods of the two diverse populations of loggers found in Maine’s north woods where these issues are most acute (Office of the Attorney General, State of Maine 2009; Maine Forest Service 2010).

In conformity with time-series studies performed on the logging workforce in Georgia (Baker and Greene 2008) in which baseline data were obtained by an original survey conducted in 1987 and in which several subsequent efforts in 5-year increments were conducted to build on and directly compare results, a second study was performed on Maine’s logging community with the same intentions.

During a previous study by Egan and Taggart (2004b), logging contractors expressed concerns about a shortage of reliable logging labor and the difficulty of attracting new workers into the woods. Furthermore, several barriers to maintaining and expanding a logging business were identified, including but not limited to mill prices that were deemed to be too low and logging equipment prices that were deemed to be too high, while urban development and sprawl were factors that posed diminished logging opportunities. These findings, suggested the authors, may have consequences for labor recruitment efforts, the future logging labor supply, and the viability of logging enterprises in a region whose economic vitality is primarily dependent on the forest products industry.

As noted by other studies of the region (Public Affairs Research Center 1968, Donovan and Swain 1986, Pan Atlantic Consultants/The Irland Group 1999), the concepts of occupational choice (the decision process an individual goes through to select a particular profession among potential alternatives; Auster 1996) and occupational prestige (an occupation’s perceived social status) are pivotal to understanding the past, present, and future composition of this cross-border logging community. Pivotal to our study are the cross-cultural relationships among loggers’ socio-demographic attributes and their sense of occupational choice and prestige, their intentions to either continue or leave logging, and their inclination to recommend the

logging profession to their children in an industry with a relatively high degree of familial attachment (Egan and Taggart 2004b, Goldstein et al. 2005, Allred 2009). Research hypotheses tested for differences in the aforementioned attributes between domestic and Quebecois loggers as well as changes in these attributes held by both populations from one study to the next and assessed the impact these outcomes would have on labor recruitment efforts, the future of Maine’s logging labor supply, and the viability of logging enterprises in the study region. The study region consisted of the four counties that border the province of Quebec, Aroostook, Franklin, Oxford, and Somerset, plus Piscataquis County, which is located less than 15 miles from the border (Fig. 1.).

Background

Logging labor issues have been described in the forestry literature as “the woods labor problem” (Cottell 1974). The forest products industry has not always recruited an adequate labor force in return for the wages and working conditions it offered. However, in Northern Maine, the “woods labor problem” is more complicated than this classic labor supply issue. Historically, Maine’s logging sector has faced tension over the use of French–Canadian labor in Maine’s north woods. During the mid-nineteenth century, Quebecois “farmer-lumberjacks” (McNutt 1978) from the border province of Quebec began migrating to work in Maine’s remote north woods. Subsequently, Maine lumbermen complained that the presence of these seasonal foreign workers depressed wages and working conditions. However, the Quebecois woods workers were less difficult to recruit than domestic lumbermen because of the proximity of Quebec’s eastern townships to northern Maine’s remote harvesting areas (Parenteau 1993).

Today, the factors contributing to Maine’s logging labor competition include the traditional migration of Quebecois workers via the Federal H-2B guest worker program (bonded labor), prevailing wage rates, and challenging working conditions. The prevailing wage rate is adjusted

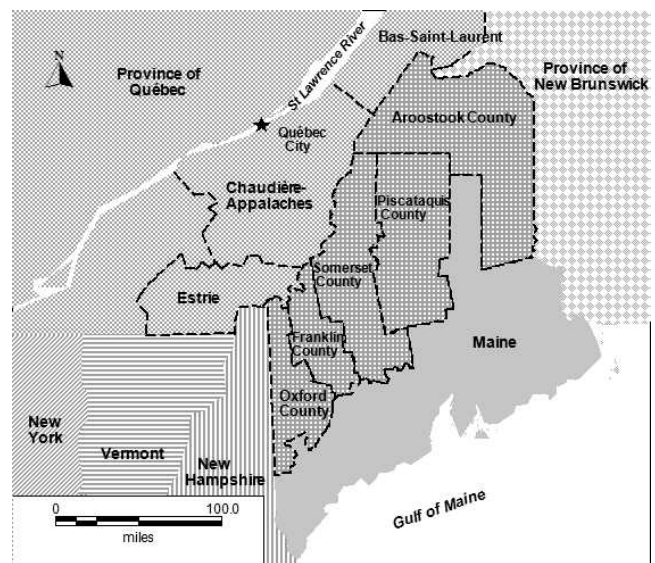


Figure 1.—The Maine–Quebec border region showing Maine border counties and Quebec administrative areas.

annually by the US Department of Labor based on the annual Northeast Regional Woods Wage Survey, which encompasses Maine, New Hampshire, Vermont, and New York. Many believe the rate does not adequately reflect factors associated with the transition to mechanized operations, such as capital-intensive equipment expenditures and requisite skill levels needed to operate mechanized equipment, or the labor conditions in northern Maine. Moreover, many argue that prevailing wages set by the US Department of Labor and the presence of H-2B guest workers in northern Maine are contributing factors that keep wages for woods work low (Pan Atlantic Consultants/The Irland Group 1999, OPLA 2004).

Divisive debates persist over whether domestic workers are willing to work for the wages and working conditions being offered by the logging industry. Historically, Quebecois loggers have worked for less money while receiving their wages in US funds because of a favorable exchange rate variance between US and Canadian currencies (OPLA 2004). However, this trend may be challenged because of recent exchange rate fluctuations that have resulted in the two currencies being more competitive. Additionally, although the 2010 overall unemployment rates in Quebec and Maine were comparable, 8.0 and 7.9 percent, respectively (Institut de la statistique Québec 2010; Maine Department of Labor, Center for Workforce Research and Information 2010), the rates per administrative regions versus counties were not. In 2010, the unemployment levels reported for the three administrative regions that border Maine (Bas-Saint-Laurent, Chaudière-Appalaches, and Estrie; Fig. 1) averaged 7.7 percent; individual unemployment rates were 10.0, 5.2, and 8.1 percent, respectively (Institut de la statistique Québec 2010). On average, the 2010 unemployment rate reported for Maine's counties in the study region were considerably higher, at 10.3 percent, and ranged from 9.7 percent (Aroostook County) to 11.2 percent (Piscataquis County; Maine Department of Labor, Center for Workforce Research and Information 2010). Better employment prospects in Quebec coupled with high commuting costs may likely affect the willingness of many Quebecois loggers to commute to work in Maine's north woods. However, the forest products industry in Quebec has faced challenging economic conditions over the past few years as a result of a downturn in the US housing market, a strengthening Canadian dollar that has hurt the industry's export markets, and rising energy costs that have adversely impacted the manufacturing sector.

Methods

A mail questionnaire was developed from several sources, including logger focus groups and key informant interviews with industry specialists, both of which provided insight into issues of concern within the industry and information from previous research (Public Affairs Research Center 1968; Pan Atlantic Consultants/The Irland Group 1999; Egan and Taggart 2004a, 2004b). Questions derived from these presurvey efforts solicited information on the respondent's sociodemographic attributes, the respondent's reason(s) for becoming a logger (occupational choice), the respondent's familial attachment to the logging profession, and the respondent's perceptions of how the public views the logging profession (occupational prestige). The questionnaire was first written in English and then

translated into French for the Quebecois loggers who were certified to work in Maine's five-county border region.

Mailing lists of loggers located within the study region were derived from two sources: lists of both English-speaking and French-speaking loggers who had been trained by the Certified Logging Professional (CLP) program and a list of all loggers who had filed a mandatory harvest notification with the state of Maine in 2005. Forests located in the study region are dominated by industry ownerships and mills that participate in the Sustainable Forestry Initiative, an independent certification program that promotes sustainable forest management practices via certification standards and requires CLP certification of all loggers who sell wood to participating mills, and therefore the vast majority of loggers in the region are CLP certified, and those who are not certified are extremely hard to locate.

Following a modified Dillman (2000) approach, multiple mailings—a cover letter and survey, followed by a reminder postcard, and then a second cover letter and survey—were sent to the 638 French-speaking loggers and 1,205 English-speaking loggers who were identified from the CLP source list as being employed in the five-county Maine-Quebec border region. Multiple survey mailings were used to increase the response rate and reduce nonresponse bias (Dillman 2000). Nonresponse bias was estimated by comparing survey responses from early respondents (first survey mailing) and late respondents (second survey mailing; Armstrong and Overton 1977). Survey data were analyzed using bivariate, multivariate, and analysis of variance techniques. Consistent with the prior study, only responses from full-time participants were analyzed. Additionally, comments offered by survey participants were summarized to highlight some survey responses. Survey responses from Quebec resident loggers were received in French and have been translated and presented in English.

Results and Discussion

Overall, 533 full-time loggers responded to the survey. Of these, 366 (68.7%) were Maine resident loggers who were employed in the state's five-county border region with Quebec (response rate = 30%), and 167 (31.3%) were Quebec resident loggers who were also employed or were certified to work in the study region (response rate = 26%). Response rates were consistent with rates achieved in other logger studies (Egan and Taggart 2004b; Allen et al. 2008; Baker and Greene 2008; Egan 2009, 2011). Nonresponse bias was estimated by investigating the differences in responses provided by early and late survey respondents to several survey questions (Armstrong and Overton 1977). On average, while early Maine resident respondents appeared to be slightly older, less educated, and more experienced than were late Maine resident respondents, analysis of variance tests indicated that none of these differences were significant at $\alpha = 0.05$. Similarly, while early Quebec resident respondents appeared to be slightly younger and less experienced than were late Quebecois respondents, these differences were not significant at $\alpha = 0.05$. Moreover, no differences were found among early versus late survey respondents relative to their reactions to statements describing their reasons for becoming loggers. These results strongly suggest that early and late respondents from both Maine and Quebec were representative of their respective populations.

Sociodemographic attributes

Comparable to findings in the prior study (Egan and Taggart 2004b), Maine resident and Quebecois loggers who work in the study region were found to be significantly different in their average educational level, logging experience, weeks worked per year, hours worked per week, and distance traveled to work (Table 1). Although the magnitude of these differences decreased from 2001, the average Quebecois logger was less educated, was more experienced, worked fewer hours per week, and traveled twice as far to job sites than did his Maine colleague. However, the age difference between the two populations was no longer significant. Evidently, while the Maine logging workforce aged, the Quebecois workforce became younger. During the 5-year period between studies, the Maine logger's average age increased 1.5 years, educational level increased 0.4 year, and logging experience increased 1 year, while the average age and logging experience of his Quebecois colleagues declined by 2.5 and 2.6 years, respectively, and his educational level increased 1.8 years (Table 1). These findings imply that the Quebecois logging

Table 1.—Comparison of 2006 and 2001 attributes between Maine resident (ME) and Quebec resident (QC) loggers who work in Maine.^a

Attribute	ME	QC
Age (y)		
2006	45.8	46.9
2001	44.3 ^b	49.4 ^b
Education (y)		
2006	12.7 ^b	10.5 ^b
2001	12.3 ^b	8.7 ^b
Time spent logging (y)		
2006	23.3 ^b	27.4 ^b
2001	22.3 ^b	30.0 ^b
Time spent logging (wk/y)		
2006	40.7 ^b	37.8 ^b
2001	39.1	37.3
Time spent logging (h/wk)		
2006	50.1 ^b	45.4 ^b
2001	48.7 ^b	42.3 ^b
Distance traveled to work (mi)		
2006	38.1 ^b	87.6 ^b
2001	35.9 ^b	81.7 ^b
Do you expect to be in the logging business in 5 y? (%) ^c		
Yes		
2006	62	44
2001	50	36
No		
2006	16	29
2001	27	30
Not sure		
2006	22	27
2001	23	33

^a $n = 366$ Maine resident full-time loggers; $n = 167$ Quebec resident full-time loggers. Numbers reported are means for each attribute.

^b Analysis of variance indicated that the means are significantly different at $\alpha = 0.05$.

^c $G^2 = 17.63$; $P < 0.01$.

workforce may be experiencing a trend toward the retirement of its older members and/or the entry of younger slightly better educated recruits into the industry.

The average age, educational level, and logging experience data reported for Maine and Quebecois loggers were comparable to those reported in other logger studies conducted in northeastern states. For example, in southern New England the average logger was 46.9 years old with 12.8 years of education and 24.4 years of logging experience (Egan 2011) and in New York these statistics were 46.5, 12.4, and 25 years, respectively (Egan 2009).

On average, Quebecois loggers reported traveling 87.6 miles one way to work, which was more than twice the distance of their Maine colleagues (Table 1). This difference in commute time most likely explains the significant differences in actual hours worked per day and weeks per year between the two populations.

Likelihood ratio χ^2 analysis indicated that the expectation to remain in the logging profession over the next 5 years was dependent on whether the logger was from Maine or Quebec. However, expectations to remain in logging rose on both sides of the border from those reported in the prior study, which suggests a more optimistic outlook than previously conveyed (Table 1). Responses were related to the age of the survey participant regardless of residency and were consistent with Allred (2009), who found that the likelihood of remaining in business over the short term decreased with increasing age. The average age for those who indicated that they expected to remain in logging over the next 5-year period was 43.7 years, while the average age for those indicating they did not expect to remain in logging over the next 5-year period was 54.3 years ($F = 30.03$; $P < 0.01$). Additionally, those indicating that they would remain in logging were more educated (12.3 y) than those who did not expect to remain in logging (10.7 y; $F = 12.12$; $P < 0.01$). Responses were also indicative of a logger's familial ties to the logging industry at the time of the survey: 60.5 percent of those who had relatives in the logging industry intended to remain in logging over the next 5 years, while 35 percent who said that they intended to leave logging and 35 percent who said they were unsure did not have relatives who were loggers.

Occupational choice

Significant differences were again noted between Maine and Quebec respondents in their responses to questions pertaining to their occupational choice (Table 2). Although the majority of both Maine and Quebecois respondents indicated many reasons for having become a logger, such as the enjoyment of working outdoors, the sense of independence, and the challenging nature of the work, most Maine resident loggers in the study region remained more positive about their chosen profession and did not consider it to be their only option because of an inadequate education or limited employment opportunities, as was indicated by many of their colleagues from Quebec.

Likelihood ratio χ^2 analysis indicated that responses to statements describing reasons for becoming a logger, "I don't have the education for a different job" and "I could not find another job nearby," were dependent on whether the respondent was a resident of Maine or Quebec. In 2001, the percentage of Quebecois loggers who agreed with the statement, "I became a logger because I don't have the education for a different job," was almost double that of

Table 2.—Comparison of 2006 and 2001 responses (percentage who agreed with statements) to questions related to occupational choice by Maine resident (ME) and Quebec resident (QC) loggers who work in Maine.

	2006				2001			
	ME	QC	G ²	P	ME	QC	G ²	P
I became a logger because								
I enjoy working outdoors	98.6	90.4	16.19	<0.01	98.6	89.8	47.78	<0.01
I enjoy the sense of independence	98.6	90.8	18.34	<0.01	93.2	93.7	3.77	0.287
It's challenging work	96.6	81.6	32.12	<0.01	91.7	81.6	17.21	<0.01
It gives me a feeling of accomplishment	93.5	80.1	19.40	<0.01	89.2	77.0	22.93	<0.01
I come from a logging family	70.3	88.4	21.53	<0.01	62.1	75.9	11.23	0.011
I don't have the education for a different job	25.0	38.7	9.35	0.002	26.5	52.0	41.72	<0.01
I could not find another job nearby	23.5	33.6	6.19	0.013	18.9	33.1	13.33	0.004

Maine resident loggers (Table 2). Although still a significant difference, in 2006 the percentage of respondents who agreed with this statement dropped 13.3 points for Quebec residents as compared with a 1.5 percent decline for Maine residents. This result is most likely explained by the change in the Quebecois sociodemographic mix to a younger and better educated logging labor force.

Contingency table analysis also revealed that the magnitude in which a respondent indicated positive reasons for becoming a logger (e.g., “I like working outdoors,” “It gives me a sense of accomplishment,” and “It’s challenging”) was dependent on whether the respondent was from Maine or Quebec (Table 2). Although the majority of loggers from both sides of the border agreed that these factors were among the top reasons for becoming a logger, Maine resident loggers were significantly more enthusiastic about the aforementioned aspects of the profession.

Comparable to prior findings, a majority of both Quebecois and Maine respondents reported a strong familial attachment to the logging industry, since previous genera-

tions of their families were loggers and they currently had relatives in the logging industry. However, significantly more Quebecois loggers than Maine resident loggers in the study region indicated that they were loggers because they came from a logging family (Table 2) and 90.9 and 74.7 percent, respectively, reported that previous generations of their families were loggers (Table 3). Although declining significantly from 2001, in 2006 over 50 percent of respondents from both sides of the border indicated that they would not encourage a son or daughter to become a logger (Table 3). Whether or not one had relatives currently in the logging industry and had previous generational ties to logging were both found to be significant in explaining whether a respondent would encourage a son/daughter to become a logger (Table 4).

As similarly tested in 2001 (Egan and Taggart 2004b), logistic regression was used to clarify relationships between responses to questions related to occupational choice and several explanatory variables. Dichotomous categorical responses (agree/disagree) to the statement, “I became a

Table 3.—Comparison of factors for familial attachment to logging: number of preceding generations who were loggers, whether a respondent had relatives in the logging industry, and whether a respondent would encourage a son/daughter to be a logger, partitioned by whether the respondent was from Maine (ME) or Quebec (QC) and the study year.

	2006				2001			
	ME (%)	QC (%)	G ²	P	ME (%)	QC (%)	G ²	P
How many generations of your family preceded you in the logging profession? ^a			37.83	<0.01			17.28	0.008
None	25.3	9.1			28.6	12.1		
1 generation	21.7	13.9			18.1	18.1		
2 generations	25.9	34.6			26.4	31.9		
3 generations	20.8	29.1			17.0	26.7		
4 generations	5.1	9.1			7.4	6.9		
5 generations	0.6	3.6			1.6	2.6		
6 generations	0.6	0.6			0.8	1.7		
Do you have relatives in the logging industry? ^{b,c}			4.48	0.034			0.16	0.93
Yes	68.2	77.1			67.5	75.8		
No	31.8	22.9			32.5	24.2		
Would you encourage your son/daughter to be a logger? ^c							2.55	0.28
Yes	21.6	25.6			11.1	10.3		
No	54.7	56.4			69.9	71.8		
Not sure	23.7	18.0			19.0	17.9		

^a Responses were dependent on whether a respondent was from Maine or Quebec.

^b 2006 Responses were dependent on whether a respondent was from Maine or Quebec.

^c 2001 Responses were *not* dependent on whether a respondent was from Maine or Quebec.

Table 4.—Likelihood ratio P values assessing the overall effect of the explanatory variables on the outcome variables related to familial attachment to logging.

	2006	2001
Would you encourage your son/daughter to be a logger?		
Relatives in logging	0.021	0.42
Previous generations of loggers	0.046	0.09
I became a logger because I come from a logging family		
Maine vs. Quebec residence	<0.01	0.49
Relatives in logging	<0.01	0.01
Previous generations of loggers	<0.01	<0.01

logger because I come from a logging family,” were used as the outcome variables and (1) whether the respondent was from Maine or Quebec, (2) whether they had relatives in the logging industry, and (3) the number of generations preceding them in logging were the explanatory variables. Contrary to previous results, all three factors were found to be significant in explaining the outcome variables (Table 4), suggesting that occupational choice for loggers in the region was dependent not only on the respondent’s country of residence but also their familial attachment to the industry.

Occupational prestige

Likelihood ratio χ^2 analyses showed significant associations between statements reflecting occupational prestige and whether the respondent was from Maine or Quebec (Table 5). In 2006, Quebecois respondents were considerably more likely to agree with statements that suggested a sense of social acceptance of loggers and logging (i.e., “Logging is a respected profession in my community” and “The public respects loggers and the work they do”) than they were in 2001. Although still significantly different from the opinion of their Maine colleagues, the Quebecois belief that “The public views loggers as having certain professional skills” in 2006 was slightly diminished from 2001. Conversely, a significantly greater percentage of Maine resident loggers agreed with the statement, “The public views loggers as unskilled.” This latter result is consistent with the findings in a previous study, which found that most Maine resident loggers statewide perceived the public to hold the logging profession in low esteem (Taggart and Egan 2002).

Despite the 84 percent of Quebecois respondents who indicated that logging was a respected profession in their community, several comments written on returned surveys suggested a common theme implying that logging as a profession offered little respect in terms of compensation, working conditions, and living conditions. Comments such

as “little compensation for the number of hours worked and the estrangement from the family during the week,” “no improvement in economic standing, deterioration of working conditions,” “low salary with no social benefits,” and “salary has not increased with cost of living” were most often cited. Additional statements reflected concern about the increasing difficulty in obtaining temporary work visas (bonds) in order to work across the border in Maine and forcing them to seek local employment opportunities.

Moreover, comments made by several Maine resident loggers echoed the aforementioned sentiments voiced by their Quebecois colleagues regarding lack of adequate compensation, lack of benefits, and poor working conditions. Recently, a study initiated by the of Maine State Legislature, which engaged several state agencies, was performed to investigate the logging industry’s compensation structure and competitive fairness in order to address the ongoing concerns of reasonable compensation, working conditions, and potential market power in wage rate setting practices (Office of the Attorney General, State of Maine 2009). Among the recommendations in this study was enforcement of current labor laws that determine the classification of a worker as an employee versus an independent contractor. The “misclassification of workers in an employment relationship as independent contractors results not only in loss of income and benefits to the worker, but also in loss of income to worker protection programs such as unemployment insurance and workers compensation” (Office of the Attorney General, State of Maine 2009, p. 2). Furthermore, misclassification can lead to an unfair competitive climate in which businesses that do classify workers properly pay higher costs for labor and compete with those who do not and therefore do not pay the associated payroll costs.

When Maine resident participants were asked to explain their reasons for exiting the logging profession in the near future, their responses reflected apprehension about wood market volatility, industry instability, foreign competition, and speculation about the direction of industry. For example, one Maine respondent wrote, “The industry is shaky, foreign competition is changing things.” Others were more concise: “Volatile markets,” “Unstable industry,” and “Uncertain future.” Another Maine logging contractor embellished his response, “Unstable future, mechanical harvesting is taking over my conventional logging profession.”

Last, loggers were asked whether they had experienced vandalism of their logging equipment or had been personally taunted. Responses to the question, “I have personally experienced vandalism of my equipment,” were dependent on the nationality of the respondent. Approximately 54 percent of Maine resident loggers and 33 percent

Table 5.—Comparison of 2006 and 2001 responses (percentage who agreed with statements) to questions related to occupational prestige by Maine resident (ME) and Quebec resident (QC) loggers who work in Maine.

	2006				2001			
	ME	QC	G ²	P	ME	QC	G ²	P
Describe the public’s perception of logging								
Logging is a respected profession in my community	63.5	84.1	20.43	<0.01	61.3	68.2	8.48	0.037
The public respects loggers and the work they do	54.3	82.4	39.74	<0.01	42.7	77.2	75.37	<0.01
The public views loggers as having certain professional skills	43.8	72.3	35.23	<0.01	41.6	73.4	64.84	<0.01
The public views loggers as unskilled	57.9	37.3	20.05	<0.01	62.5	40.8	43.90	<0.01

Table 6.—Responses (percentage who agreed with statements) relating to equipment vandalism and personal taunting experiences.

	ME		QC		G^2	P
	2006	2001	2006	2001		
I have personally experienced vandalism of my equipment	54	63	33	37	19.25	<0.01
I have personally been taunted by people who don't like logging	29	31	20	26	3.37	0.297

of Quebec resident loggers reported such vandalism in 2006 (Table 6). In 2001, these percentages were higher for both Maine and Quebecois loggers. Conversely, responses to the question, “I have personally been taunted by people who don't like logging,” were not dependent on whether a respondent was from Maine or Quebec; 29 percent of Maine loggers and 20 percent of Quebecois loggers said that they had experienced taunting in 2006.

Conclusions

Our comparisons indicate that more differences than similarities exist between the two distinct populations of loggers that are employed in Maine's counties that border Quebec with respect to their sociodemographic qualities, occupational choice tendencies, and occupational prestige perceptions. These populations remain inherently defined not only by their native origins but also by their respective cultural, historical, and socioeconomic characteristics.

Although the average age of both Maine and Quebecois loggers in the study region were similar, different trends within each population were noted. While the Maine logging community grew older, the Quebecois workforce grew younger. Additionally, although the average educational level of Quebecois loggers had risen since the last study, on average they had still received fewer years of formal education than their Maine colleagues. Quebecois participants were more likely to imply that they did not have the education for a different job, while several respondents expressed that the limitation of employment opportunities had an impact on their sense of occupational choice and showed a slightly greater degree of resignation toward the logging profession than did their cohort from Maine.

The increase in the level of formal education reported by Quebec resident respondents in our study is consistent with the overall trend toward a more highly educated Quebecois citizenship as reported in recent census data. According to Canada census data, the percentage of Quebecois citizens who did not hold a high school graduation certificate decreased from 24 percent in 2001 to 17 percent in 2006, while the percentage of citizens with some form of postsecondary education rose from 75.6 percent to 82.9 percent during the same period (Statistics Canada 2001, 2006). Similarly, the percentage of Maine citizens possessing postsecondary education increased from 85.4 percent in 2000 to 88.7 percent in 2006 (US Census Bureau 2000, 2006).

The Maine participants in our study region remained highly committed to their chosen profession because of perceived positive attributes. However, overall industry conditions were a deterring factor in their consideration for future commitment to remain in logging and encouragement of children to enter the profession. Therefore, what are the implications for logging business stability in an often perceived “sunset” industry with a speculative future?

Implications that may impact the future in Maine's north woods include a continued decline in the availability of a domestic skilled labor force either willing to participate or capable of competing in an industry characterized by an imperfect compensation structure, reduced harvesting opportunities, rising operating costs, depressed wood prices, and other economic restrictions. These challenges may be further exacerbated by a continued decline in the availability of a Quebecois skilled labor force deterred by restrictions on temporary work visas, rising commuting costs, and a stronger Canadian dollar.

Furthermore, these factors may be compounded by the fact that over 50 percent of loggers surveyed from both sides of the border would not encourage their children to pursue logging as a career, a troubling statistic for an industry that is historically known for its intergenerational labor supply chain. Moreover, as witnessed nationwide, the younger generation is more attracted to computer- and technology-based industries than an industry that is not only traditionally perceived as dangerous and physically intensive but also capital intensive with an uncertain future.

Another potential implication is a limited domestic labor pool in Maine's border region. Franklin, Oxford, and Somerset counties experienced what is considered below average population growth from 1990 to 2010, while Aroostook County experienced negative population growth during the same period, and Piscataquis County experienced negative population growth from 1990 to 2000 and below average population growth from 2000 to 2010 (Maine State Planning Office, Census State Data Center 2010). These trends in below average and negative population growth in the study region could promote the necessity for the industry to rely more heavily on the Quebecois labor force (despite opposition from domestic woods workers), unless logging labor demand is offset by continued mechanization of harvesting operations or a slump in demand for forest products as being experienced in other regions of the country. The degree to which demand may be compensated for by increased mechanization in harvesting operations is speculative. Baker and Greene (2008) reported that since 1992 over 80 percent of logging firms in Georgia have employed feller-buncher/grapple skidder harvesting operations, and manual harvesting crews only represented 8 percent of logging operations in 2007. Production per man-hour steadily rose 57 percent over the 20-year period from 1987 to 2007. Despite increased mechanization, Pan Atlantic Consultants/The Irland Group (1999) concluded that there will be a shortage of people willing to enter the logging workforce in northern Maine, a region with a high rate of harvesting mechanization, because of the prevalence of industrial forestry. This conclusion was later confirmed by Goldstein et al. (2005), who reported that a chronic shortage of individuals willing to work in Maine's north woods did exist, despite a decline in logging labor demand

attributable to increased output productivity generated by mechanized harvesting operations.

Although Goldstein et al. (2005) found that improvement in the public's image of the logging profession substantially increased the probability of entry into the logging industry and that relative earnings among alternative employment opportunities had no statistically significant effect on the likelihood of choosing the logging profession over the alternative choices, the key finding was that a strong, but threatened, intergenerational labor supply chain existed in the logging industry. Historically, the logging industry has been characterized by its strong intergenerational labor supply. Rural and isolated labor markets with limited career opportunities; labor market participants with limited education, skills, and economic means; and a strong self-sufficiency work ethic all have sustained this phenomenon.

Compounding concerns about recruitment into the logging work force in Maine, a survey of Maine's citizens suggested general agreement that logging was a skilled profession and acknowledgement of its importance to the state's economy (Egan and Taggart 2009). However, despite an apparent respect for the profession among those surveyed, results suggested that most Maine citizens also recognized the challenges associated with logging and preferred other, less dangerous and less physically demanding work. The study also showed that females were far less likely than males to encourage a son or daughter to consider logging as a career and suggested that logging in Maine will need to overcome some image issues, perhaps especially among females. This appears to be consistent with another study of logging in the region, in which females were more likely than males to express negative impressions about the sights and sounds of logging (Eckley and Egan 2005).

Proposed solutions to address the challenges of recruiting, retaining, and reproducing a skilled labor force have included appealing to the technological interests of the younger generation via high school educational programs and/or vocational programs that highlight the industry's technological advancements and development of requisite technological as well as entrepreneurial and business skill sets. Certainly, greater use of various news and social network media, trade shows, and logging site tours that target the younger generation would help to promote the logging industry's positive attributes. And the technical aptitude required to operate logging equipment and the business knowledge needed to succeed in the industry would help to attract this audience.

Last, the issue of whether or not there will be an adequate supply of Quebecois loggers willing to work in Maine's north woods should be further considered, since this could be detrimental to the entire raw wood supply chain in the region's forest products industry with subsequent adverse ripple effects experienced in local and regional economies and ultimately at the state level. As previously noted, we found significant differences between the two populations of loggers studied in reference to the question of whether or not they expected to remain in the logging profession over the next 5 years, and we found that responses were not only related to country of residence but also age, education, and familial attachment. Although the percentage of Quebecois respondents who expected to remain in logging over the next 5-year period increased to 44 percent (vs. 62% of Maine loggers) from 36 percent in 2001, the potential for a

shortage of Quebecois loggers in the study region is feasible given changing conditions in rural living. As stated by loggers during the focus group meeting in Beauce, Quebec: "there is a lack of labor" most likely attributable to "fewer and fewer families in rural areas, young people leave so our history of family as a basis for forest work is changing." That is, the days of McNutt's (1978) Quebecois "farmer-lumberjack" appear to be drawing to a close, as the younger generation is drawn to the more technological- and service-oriented industries located in urban areas.

Despite a considerable familial attachment to logging and a widely held perception that logging has a favorable social image in the Quebecois public's view, these results and comments provided by several Quebecois respondents suggest that factors extraneous to logging's positive attributes and perceived social prestige potentially play a more influential role in their dissatisfaction with the logging profession. These factors include relatively low compensation, lack of social benefits, restricted bond availability, increasing fuel costs, long commuting distances, and poor living conditions while working in Maine. As experienced by loggers throughout the United States, the Quebecois loggers may be forced to seek jobs in other industries that are closer to home for which they may need additional training and education.

Periodic follow-up studies on these two diverse populations will provide additional information in which further trends may be detected regarding this cross-border, cross-cultural workforce that remains so vital to the economy of Maine's north woods. Results from future research may also be beneficial to public administrators in their efforts to address any prevailing and/or new issues that might dominate this cross-border region as results from previous studies have been used to do so.

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