

**USDA Forest Service, Wood Education and Resource Center:  
Final Report<sup>1,2</sup>**

**Developing a New Delivery Method for NHLA Lumber Inspector  
Training**

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Recipient:              National Hardwood Lumber Association

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The purpose of the project was to investigate an alternative delivery model for lumber grader/inspector training. NHLA recognizes that the current 14-week training model in Memphis, TN, is not satisfying the lumber inspection needs of NHLA members and an alternative model might alleviate this situation.

Four project objectives were addressed as follows:

**Goal/Objective #1: Conduct a survey of NHLA members to determine their perspectives regarding lumber inspection, industry demand for inspectors, inspector compensation packages, member openness to alternative training models, current processes of acquiring the necessary lumber inspection expertise, etc., as a means of focusing efforts to identify an acceptable alternative model and promote the concept to Members.**

A survey instrument was developed by Learning Flow, Inc., with input and review by NHLA staff. This process was completed in January 2009. The survey was subsequently distributed electronically via email to NHLA members beginning on January 27, 2009 (a copy of the survey instrument is included in the Appendix). Respondents were asked to respond online. A second notice was emailed on February 3, 2009, and a final notice emailed on February 17, 2009.

A total of 77 surveys were completed, with an adjusted response rate of 8.7 percent. Survey results were analyzed and a manuscript prepared, summarizing the results. The full manuscript was posted on the NHLA website (see citation

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<sup>1</sup> The work upon which this project is based was funded in whole or in part through a grant awarded by the Wood Education and Resource Center, Northeastern Area State and Private Forestry, Forest Service, U.S. Department of Agriculture.

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below). A summary of the survey results was included in an issue of the NHLA monthly publication, *Hardwood Matters* (see citation below). Both the manuscript and the *Hardwood Matters* article are included in the Appendix.

Hassler, C. C., T. L. Pahl., and L. Kraus. 2009. An Assessment of Current and Future Status of the NHLA Lumber Inspection Programs. Unpublished manuscript, posted on NHLA website.

Hassler, C. C., T. L. Pahl, and L. Kraus. 2009. Insight for Future NHLS Curriculum Development Gained by Third Party Assessment. *Hardwood Matters*, Issue 96, November 2009, page 25. National Hardwood Lumber Association, Memphis, TN.

**Goal/Objective #2: A thorough review of the existing lumber grading curriculum will be conducted to determine how to structure the overall online program, segregate topics into manageable modules, and determine the best instructional approaches. A prototype module, of one component of the curriculum, will be developed for evaluation purposes.**

With all available curriculum material supplied by the NHLA instructor in Memphis, TN, and the instructor at the Wood Technology Center in Elkins, WV, a review of the curriculum was completed. Based on this review, a subset of the curriculum was selected for prototype development. The content of the prototype consisted of the *General Instructions* component of the curriculum. *General Instructions* covers rules No. 1 through No. 48 in the *Rules for the Measurement & Inspection of Hardwood & Cypress (2007)*, the official grading rules of the National Hardwood Lumber Association. Selection of the *General Instructions* component was based on the variety of topics covered and the ability to incorporate a variety of educational tools, including a learner-centered approach, testing/assessment at each stage of the module, built-in accountability measures that support the monitoring of student progress, performance, engagement through user access data, in-lesson formative assessment for performance feedback, and end-of-module summative assessments that capture knowledge acquisition.

The prototype can be viewed and accessed at: <http://nhla.learningflow.com>, using "Guest" as the Username and "Guest" as the password.

**Goal/Objective #3: Grader training and associated success is critically dependent upon hands-on, repetitive grading of boards. Several options were considered and proposed for achieving hand-on experience that meets or exceeds current training activities in Memphis.**

A project report was prepared that addresses the results of the investigation into this objective. A copy of the report is included in the Appendix.

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**Goal/Objective #4: A testing regime that meets or exceeds the 14-week in-house criteria must be an important part of the online model. Recommendations for addressing testing will be explored.**

A project report was prepared that addresses the results of the investigation into this objective. A copy of the report is included in the Appendix.

APPENDIX

An Assessment of Current and Future Status of the NHLA Lumber Inspection Programs - Manuscript

Hardwood Matters Article

Project Report

# **AN ASSESSMENT OF CURRENT AND FUTURE STATUS OF THE NHLA LUMBER INSPECTION PROGRAMS**

By

Curt C. Hassler  
Lee Kraus  
Timothy L. Pahl<sup>1</sup>

## **INTRODUCTION**

NHLA (National Hardwood Lumber Association) continues to provide a unique, internationally recognized service to the hardwood lumber industry in its promulgation and maintenance of hardwood lumber grading rules, in conjunction with a long standing grader/inspector training program. Until the recent decline in hardwood markets, existing demand for NHLA trained lumber inspectors was considered, from an anecdotal standpoint, to be exceeding available supply across the US.

Barriers to entry appear to offer the most logical explanation for lagging supply of trained lumber inspectors. This is being manifested in reduced class sizes for the 14-week courses being offered at NHLA headquarters in Memphis, TN, and the Wood Technology Center in Elkins, WV. The cost and lost employee work time for a company to send a grading candidate to a 14-week school are often cited as significant concerns. And, with the increasingly common practice of employees moving to new jobs for small incremental improvements in their compensation package, it is increasingly difficult for companies to commit to an investment in a 14-week lumber inspector candidate. Another barrier to entry may be that individuals interested in becoming inspectors are generally not willing, or able, to financially underwrite the training themselves. These trends have been supported by increased demand for short-term grading training at sawmill locations using national NHLA inspectors.

A concurrent issue is the supply of qualified trainers to conduct the existing 14-week courses. With a limited number of qualified instructors, loss of even one could directly jeopardize the overall NHLA training program, with qualified replacement candidates becoming a potential issue.

NHLA staff has speculated that the current training model is not satisfying the lumber inspection needs of NHLA customers. In order to quantify the current situation, a survey about lumber inspector training, availability, and alternative options for training lumber inspectors was conducted in conjunction with a US Forest Service, Wood Education &

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<sup>1</sup> The authors are respectively, President, Balkentier; President, Learning Flow, Inc., Weston, WV; and Vice-President, Balkentier, Morgantown, WV. The work upon which this publication is based was funded in part through a grant awarded by the Northeastern Area State and Private Forestry, US Forest Service.

Resource Center, grant received by NHLA in 2008. The survey was prepared and administered by Learning Flow, Inc. of Weston, WV.

## **METHODS**

A survey questionnaire was developed to elicit perceptions, concerns, and attitudes about a range of issues regarding the NHLA lumber inspector training program. The survey consisted of 33 questions covering basic mill data of respondents, the current lumber inspection situation at participating mills, speculation about future lumber inspection needs, and respondent opinions about current and alternative training options.

The survey population consisted of all NHLA members with email addresses, both national and international. This list contained a total of 1,055 email contacts. Each contact received an explanatory email, introducing the survey and providing an electronic link to a site where they could access and complete the survey online. The survey was administered through the Constant Contact tool, which allows creation of both online surveys and email campaigns. It is an effective and efficient approach to surveying populations such as the NHLA membership. Specifically, the service allows creation and review of the survey, management of the campaign, and electronically records and summarizes all survey responses. A separate file was produced, containing all the raw survey data, from which all subsequent analyses were conducted.

The tailored design method was used for the data collection procedure (Dillman 2000)<sup>2</sup>. Email contacts were made using the following protocol:

1. First email notice – January 27, 2009.
2. Second email notice – February 3, 2009
3. Final email notice – February 17, 2009

Statistical analysis was performed on a number of variables to determine any trends related to respondent characteristics (e.g., number of employees, annual production). For the purposes of this survey, Spearman rank correlation, a nonparametric statistic, was utilized. It is a non-parametric correlation that utilizes rankings of the data and does not require assumptions of normality and constant variance of residuals. All tests between survey variables used a probability threshold of 0.05 to determine significance.

## **RESULTS**

A total of 246 email contacts were returned as undeliverable, leaving an effective sample frame of 809. Seventy surveys were completed online, yielding an adjusted response rate of 8.7 percent.

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<sup>2</sup> Dillman, D. 2000. Mail and Internet Surveys: The tailored design method. John Wiley & Sons, Inc., New York, NY. 464 p.

The following results are a compilation of the 70 responses. However, many of these responses contained instances in which some of the survey questions were unanswered. Therefore, all results are reported with the number of useable responses.

Basic Mill Data of Respondents

A number of demographic questions were asked of each respondent, including the job title of the responder, the length of time in business, annual production, total employees and several questions that attempt to profile the population of lumber inspectors at the responding mills.

Ideally, respondents would be decision-makers at the mill, who have a vested interest in lumber inspection activities and have access to pertinent data about the mill operations and personnel. Table 1 summarizes the job functions of the respondents:

Table 1. Job responsibilities of survey respondents (n=70).

Role or Title of Respondent	Percentage Responding
Owner	48.6
CEO/President	14.3
Senior Executive	14.3
Manager	18.6
Employee	1.4
Other	2.8

Clearly, the responders were overwhelmingly in positions to provide accurate and informed data. Further, length of time the respondent’s company has been in business reflects the level of experience and familiarity with lumber inspection issues.

Table 2. Age of businesses included in survey responses (n=70).

Length of Time in Business	Percentage Responding
Less than 1 year	0.0
1-3 years	1.4
4-10 years	7.2
10 or more years	91.4

Clearly, the responding companies are overwhelmingly long-term participants in the hardwood industry.

Annual production has a direct impact on the level of lumber inspection required. Sixty-one respondents averaged 14.4 million board feet of annual production, with a median (median equals the value at which half of the responses are above the median and half of the responses are below the median value) of 8 million board feet. Average employment

of the 67 respondents was 110.0, with a median of 45. The largest workforce exceeded the second largest by nearly 1,000 employees. Without the largest employer included, average employment for the remaining 66 respondents was 86.0. Obviously, the data contained a few very large firms, which tends to skew the statistical results.

A series of four questions explored the number of facilities and lumber inspection requirements. Sixty-six respondents indicated that they operate 118 facilities, with 22 operating multiple facilities. Of the 118 facilities, 86 require at least one lumber inspector.

Respondents were also asked how many lumber inspectors they need to operate all their facilities and how many they currently employ. Interestingly, 59 respondents indicate they need 218 (3.7 average per mill) inspectors to operate all facilities, but currently employ 241 (4.1 average per mill) lumber inspectors.

Apparently, many mills are hedging their bets by employing more lumber inspectors than they actually need, in part no doubt, to ensure that they always have inspection capability available when one or more inspectors are not available or if they unexpectedly lose a lumber inspector. Experience would indicate that these lumber inspectors are not sitting idle, but rather, are cross-trained to perform multiple job tasks.

A general profile of the current lumber inspector workforce was developed from a series of 4 questions. Table 3 provides the age profile of currently employed lumber inspectors.

Table 3. Age distribution of lumber inspectors currently employed by survey respondents.

Age Category of Inspector	Number of Employees				Total Responses
	1-2 Employed	3-5 Employed	6-10 Employed	More Than 10 Employed	
20-25 years	16	5	0	0	21
26-30 years	18	5	1	0	24
31-35 years	16	4	1	0	21
36-40 years	19	3	0	1	23
41-45 years	13	3	0	1	17
46-50 years	7	3	0	0	10
50-55 years	10	1	0	0	11
Over 55 years	10	1	0	1	12

Clearly, the population of lumber inspectors is dominated by those 40 years and younger; 64.0 percent (n=89) of the 139 responses, with a fairly uniform distribution of the four age categories from 20 to 40 years.

The salary profile of lumber inspectors is detailed in Table 4. For the most part, the majority (72.0 percent) of annual salaries are concentrated in the \$26,000 to \$46,000 range. And, the distribution of salaries within this range is reasonably uniform.

Table 4. Salary profile of lumber inspectors currently employed by survey respondents.

Salary Categories	Number of Employees				Total Responses
	1-2 Employed	3-5 Employed	6-10 Employed	More Than 10 Employed	
Under \$20,000	2	0	0	0	2
\$21,000 to \$25,999	3	2	0	1	6
\$26,000 to \$30,999	14	4	1	1	20
\$31,000 to \$35,999	18	5	0	0	23
\$36,000 to \$40,999	22	2	0	1	25
\$41,000 to \$45,999	16	5	1	0	22
\$46,000 to \$50,999	12	4	0	0	16
Over \$50,999	11	1	0	0	12

The length of employment of lumber inspectors is summarized in Table 5. Nearly half of the lumber inspectors (45.7 percent) have been employed between 2 and 10 years, while nearly a third (29.7 percent) have been employed between 11 and 20 years.

Table 5. Length of employment profile of lumber inspectors currently employed by survey respondents.

Term of Employment	Number of Employees				Total Responses
	1-2 Employed	3-5 Employed	6-10 Employed	More Than 10 Employed	
Employed Less Than 2 Years	15	2	0	0	17
Employed 2 to 5 years	25	5	1	0	31
Employed 6 to 10 years	25	4	2	1	32
Employed 11 to 15 years	17	3	0	1	21
Employed 16 – 20 years	17	3	0	1	21
Employed 21 or More Years	15	0	1	1	17

Attracting and keeping lumber inspectors, as with most employees, is also dependent upon the overall financial package offered by the employer. Respondents were asked whether they provided any of 8 fringe benefits. Table 6 summarizes those results. Clearly, the most offered fringe benefits were paid vacation (93.8 percent) and healthcare/medical insurance (92.2 percent). In fact, the only benefit being offered by fewer than 50 percent of the respondents was eye care insurance (35.0 percent).

Table 6. Frequency of fringe benefits being provided to lumber inspectors by employers.

Type of Benefit	Provided Number Responding:(%)	Not Provided Number Responding:(%)
Healthcare/Medical Insurance	59 (92.2)	5 (7.8)
Retirement	42 (68.9)	19 (31.1)
Life Insurance	38 (69.1)	17 (30.9)
Dental Insurance	28 (54.9)	23 (45.1)
Eye Care Insurance	17 (35.0)	33 (65.0)
Disability Insurance	32 (58.2)	23 (41.8)
Paid Vacation	60 (93.8)	4 (6.2)
Paid Sick Leave	27 (50.0)	27 (50.0)

### Inspector Training

Several survey questions dealt with how current lumber inspectors received their training, including several questions on the 14-week courses available at both Memphis, TN, and Elkins, WV.

In an earlier question, 59 respondents indicated that they currently employed a total of 240 lumber inspectors. When asked how many received their inspection training in Memphis or Elkins, they indicated that 100 had, or 41.6 percent of the current inspector workforce.

In order to gauge the utilization of the 14-week schools in the recent past, respondents were asked how many inspector candidates they had sent to Memphis in the last 5 years. Sixty-five responses indicated that 29 trainees were sent to Memphis, coming from 18 different companies. Interestingly, the point of origin of these trainees varied considerably. For the 13 that could be identified, 2 each were from international locations, TN, and MI; and one each from VA, PA, WI, VT, NY, KY, and IN.

Similarly, respondents were asked the last time they sent a trainee to the Memphis Grading School. Table 7 summarizes the results.

Table 7. The last year in which survey respondents sent a trainee to the Memphis Lumber Inspection School (n=39).

Year Last Sent Trainee to Memphis	No. of Respondents	Year Last Sent Trainee to Memphis	No. of Respondents
Never	9	2000	3
2008	3	1999	3
2007	3	1998	1
2006	1	1997	2
2005	2	1994	2
2004	1	1993	2
2002	2	1986	1
2001	1	1980	3

With the recent reductions in enrollments at the 14-week inspection schools, it remains a question how the hardwood industry is addressing inspector grading needs. The survey asked respondents to assess their usage of five options for inspector training: NHLA Grading School, NHLA short course, NHLA national inspectors providing on-site training, On-the-Job, and hiring graders away from competitors. For each option, respondents were asked to rate the use of the option on a 5-point scale, ranging from “Used Rarely” to “Used Often”.

Table 8. Assessment of lumber inspection training options currently used by survey respondents.

Option for Obtaining Inspectors	Used Rarely .....Used Often				
	1	2	3	4	5
NHLA Grading School	28	6	7	3	4
NHLA Short Course	21	15	14	4	4
NHLA National Inspectors providing on-site training	31	4	6	3	6
On-the-Job training	13	6	9	9	22
Hiring Inspectors away from competitors	28	10	5	0	1

Taking the two rankings on the “Used Rarely” side of the 5-point scale, none of the options, except for On-the-Job training are being used to any great extent – NHLA Grading School (70.8%), NHLA Short Course (62.1%), NHLA Inspectors providing on-site training (70.0%), and Hiring inspectors away from competitors (86.4%). On-the-Job training is apparently being used to a much greater extent – 52.5% of the respondents selected the two ranking categories on the “Used Often” side of the scale. Also, there was no statistical significant correlation between any of the lumber inspection training options and annual production. That is, neither a higher, nor a lower, annual production causes a statistically significant trend in how respondents used the various options.

Similarly, there was no significant statistical correlation between number of employees and NHLA Grading School, NHLA Short Course, and NHLA Inspectors providing on-site training. However, there were statistically significant correlations between number of employees and on-the-job training ( $p=0.022$ ) and hiring inspectors away from competitors ( $p=0.049$ ). In the case of on-the-job training, the larger the company the more likely they use this method. Conversely, for hiring inspectors away from competitors, the larger the company, the less likely they were to use that method.

Respondents were also asked to expand on the issue of inspectors being hired by competitors. Of 62 respondents only 4 inspectors were lost to competitors in the last year. Over the last 5 years, however, 61 respondents reported losing 34 inspectors to competitors (about 7 per year). Certainly, the economic downturn had some effect on the loss of inspectors during the last year, since more capacity is being lost and thereby the need for inspectors would necessarily be reduced.

Of particular interest to NHLA is why companies are not inclined to send trainees to the Memphis grading school. The survey also assessed four factors that may be negatively impacting the decision to use the Memphis school: cost, length of time away from work, risk of losing the trained grader to a competitor, and lack of competent candidates.

Table 9. Assessment of barriers to sending trainees to the Memphis Lumber Inspection School.

Potential Barriers to Sending Trainees to the Memphis Lumber Inspection School	No Problem.....Major Problem				
	Number of Respondents : (%)				
Cost	17 (29.3)	5 (8.6)	10 (17.2)	12 (20.7)	14 (24.2)
Length of time away from work	10 (16.4)	6 (9.8)	6 (9.8)	14 (23.0)	25 (41.0)
Risk of losing the trained grader to a competitor	20 (34.5)	6 (10.3)	11 (19.0)	10 (17.2)	11 (19.0)
Lack of competent candidates	15 (26.3)	8 (14.0)	14 (24.6)	8 (14.0)	12 (21.1)

The responses to this question are interesting in that those tending to “no problem” and those tending to “major problem” are roughly equivalent, except in the case of length of time away from work, where 64 percent see it as tending towards a major problem.

The only barrier that showed statistical significance was cost versus both the number of employees ( $p=0.03$ ) and annual production ( $p=0.02$ ). That is, as employee numbers increase or as annual production increases, the cost of sending trainees to Memphis becomes an increasing problem. Or, in other words, cost is less important to smaller companies. In this case, the smaller companies may not see cost as an issue because they simply do not see sending an inspection candidate to Memphis as a viable option.

With increasingly tighter lumber markets, customers may be requiring special grading or proprietary grades from their suppliers. In this type of market environment, proprietary lumber grades could pose a situation in which NHLA grades are not necessarily required. Of 67 respondents, 53.7 percent indicated that they were using proprietary grades and, of those using proprietary grades, an average of 33.2 percent of their graded lumber is sold under a proprietary grade. However, only 4 respondents (12.1 percent) indicated that their use of proprietary grades eliminated the need for an NHLA inspector.

#### Availability of Lumber Inspectors

Anecdotal evidence holds that there is currently an inadequate supply of qualified lumber inspectors available in the marketplace. Of course, the timing of this survey, during a significant downturn in hardwood lumber markets, would tend to depress respondents' impressions about lack of qualified inspectors, since the expectation would be that more inspectors are available in the marketplace due to layoffs and cutbacks at many mills. Out of 66 respondents, 57.6 percent expressed a belief that there is an adequate supply of qualified inspectors. And, there was no statistical relationship between this and either annual production or number of employees, so that company size does not influence opinions about availability of inspectors.

However, when asked how many inspectors they would hire now, for those that believe there is an inadequate supply of inspectors, 14 out of 24 responding said they would hire none. Of the 10 indicating that they would hire an inspector, 7 indicated they would hire a total of 12, while 3 indicated they would hire what they needed and train in-house. This is undoubtedly a response to current market conditions. Once markets turn around, it is reasonable to believe that these numbers will change.

In order to address the downturn in markets, respondents were asked that, if they were to anticipate the hardwood industry rebounding back to pre-recession levels before the end of 2009, would there be sufficient lumber inspectors available to meet industry demand? Interestingly, the response was nearly identical to the earlier question about current inspector availability. For the 65 respondents, 55.4 percent believe there would be sufficient inspectors to meet industry demand. This is only 2.2 percent less than for current conditions regarding inspector availability.

Finally, starting salaries of new inspectors were explored. For the 53 individuals responding to this question, the average starting salary was \$31,250 and ranged from \$18,720 to \$42,000. There was no statistically significant correlation between starting salaries and either annual production or number of employees. That is, it would appear that smaller companies would offer starting salaries that are on a par with larger companies.

#### Alternative Inspector Training Options

Apart from this survey and the results reported here, the fact remains that enrollments continue to decline for the 14-week schools at Memphis and Elkins. Survey results

showed that there are significant barriers to sending trainees to Memphis, as well as some concern over current and future supply of inspectors (over 40 percent in both cases). The question becomes whether an alternative model would be acceptable to NHLA members and others wishing to utilize the training services of NHLA.

The last component of the survey addressed the issue of a possible online approach to inspector training. In order to set the stage for possible online training, respondents were asked whether they had ever organized training for any of their employees, on any topic, over the Internet. Of course, this presents several issues for any effort aimed at offering an online lumber inspector training alternative. First, if significant numbers have used online training and found it wanting, it could be a hard sell for NHLA to implement any form of online inspector training. If, on the other hand, they found it an effective tool, then implementation for an NHLA program would be easier. And finally, if very few have used online training, the reasons for that decision may be a result of bias against this form of training. Or, it could merely indicate that respondents may be open to the possibility, having no preconceived notions.

In fact, of the 64 respondents, only 15 (23.4 percent) had previously used any form of online training. So, are they operating with a built-in bias or merely open to the possibility? With 48 (72.7%) out of 66 respondents indicating that they would support NHLA offering an alternative model for lumber inspection in which training components are accessed electronically via the internet, it would certainly appear that they are open to the possibility. In fact, those with Internet training experience are statistically more likely to have supported online training ( $p=0.047$ ), an indication that they are positively inclined toward online training.

At least at this time, an online training alternative for lumber inspectors must have a strong hands-on grading practice component. How that would be handled is an open question. For those responding positively about online training, they were asked about their willingness to provide production setting lumber grading practice opportunities at their mill. Of 48 responding, 40 (81.3%) indicated a willingness to provide this kind of practical grading opportunity. And, in addition, 33 (70.2%) of 47 indicated that they had an experienced grader who would be willing to mentor an online trainee at their mill site for the purposes of providing training/practice opportunities.

Finally, respondents were asked if an online training alternative, with an adequate hands-on grading practice component were available, would they be more likely to send a trainee to Memphis or enroll in the online alternative. Forty-six (75.4%) of 61 respondents indicated that they would enroll in the online alternative.

## **DISCUSSION**

The primary purposes of this survey was to document the current lumber inspection environment among NHLA members, to introduce the concept of an alternative training method to the traditional 14-week course offered in Memphis (and more recently in

Elkins, WV), and to elicit member opinions about developing and implementing an online training alternative for lumber inspectors.

The current lumber inspector workforce appears to be fairly young (64% less than 40), reasonably well paid (70.2 percent between \$26,000 and \$46,000), with a fairly good benefits package, where healthcare insurance and paid vacations are common offerings. The average reported starting salary was \$31,250.

Mills appear to be employing more inspectors than needed, perhaps indicating that being short of inspection capabilities is more of a concern than having excess inspection capabilities.

Of the current lumber inspectors reported, about 42 percent (100 of 240) received their training through a 14-week course. Over the last 5 years 18 of the responding companies sent 29 trainees to a 14-week course (about 6 per year). And, 70.8 percent indicated they “Rarely Used” the NHLA grading school. The greatest barrier to sending trainees to a 14-week course is the time away from work, followed by the cost.

Somewhat unexpectedly, nearly 58 percent of respondents thought there was a sufficient supply of qualified graders available. Even if the current economic downturn was to end by the end of 2009, 55 percent believe there would be sufficient supply of qualified inspectors available. There was no correlation between those with excess inspection capacity and whether sufficient supply exists.

In general, NHLA members have not been active in the use of online training. Only 23.4 percent have used this method of training. Yet, the positive response to the possibility of NHLA offering an online lumber inspection program was overwhelming at nearly 73 percent. This certainly comports with the response that time away from home was the greatest barrier to sending trainees to a 14-week course in Memphis or Elkins, and the next highest barrier of cost.

Interestingly, respondents were also very willing to provide on-site grading opportunities (81.3 percent) and making one of their existing graders available as a mentor (70.2 percent).

Survey results definitively support the option of NHLA providing online lumber inspection training, with a strong, hands-on component that will be supported by NHLA members.

## INSIGHT FOR FUTURE NHLA CURRICULUM DEVELOPMENT GAINED BY THIRD PARTY ASSESSMENT

By Curt C. Hassler, Lee Kraus and Timothy L. Pahl \*

NHLA's hardwood lumber grading rules and Inspector Training School provides a unique, internationally recognized service to the hardwood lumber industry. Until the recent decline in hardwood markets, existing demand for NHLA trained lumber inspectors was considered to be exceeding available supply across the U.S. In order to quantify the current situation, a survey about lumber inspection, lumber inspector training, availability, and alternative options for training lumber inspectors was conducted in conjunction with a U.S. Forest Service, Wood Education & Resource Center, grant received by NHLA in 2008. The survey was prepared and administered by Learningflow, Inc. of Weston, West Virginia.

The survey consisted of 33 questions covering basic mill data of respondents, current lumber inspection situations at participating mills, speculation about future lumber inspection needs, and respondent opinions about current and alternative training options. The online survey was conducted during January and February 2009. The following is a summary of the survey findings. The complete survey results are available for review at [www.nhla.com](http://www.nhla.com).

One objective of the survey was to document the current lumber inspection environment among NHLA members. The results indicate that the current lumber inspector workforce appears to be fairly young (64% less than 40), reasonably well paid (70.2 percent between \$26,000 and \$46,000), with a fairly good benefits package, where health care insurance and paid vacations are common offerings. The average reported starting salary was \$31,250.

Mills appear to be employing more inspectors than needed, perhaps indicating that being short of inspection capabilities is more of a concern than having excess inspector capabilities. Further, clear majorities (57.6% and 55.4%, respectively) believed there is currently an adequate supply of inspectors and that this would continue to be the case if hardwood markets rebound by late 2009, somewhat in opposition to the common anecdotal evidence of inadequate supply of lumber inspectors.

Another objective of the survey was to obtain NHLA member perspectives on the current lumber training course, to introduce the concept of an alternative training method to the traditional 14-week course offered in Memphis and Elkins, West Virginia and to elicit member opinions about implementing an online training alternative for lumber inspectors.



According to survey results, the greatest barrier to sending trainees to a 14-week course is the time away from work, followed by the cost. In general, NHLA members have not been active in the use of online training with only 23.4 percent having used this method of training in the past. Yet, the positive response to the possibility of NHLA offering an online lumber inspection program was overwhelming at nearly 73 percent. This certainly comports with the response that time away from work was the greatest barrier to sending trainees to a 14-week course, with the next highest barrier being cost.

Any consideration of an online training alternative for lumber inspectors must necessarily have an adequate hands-on grading practice component. When asked about their willingness to provide production setting lumber grading practice opportunities at their mill, respondents were very willing to these grading opportunities (81.3 percent) and were also very willing to make one of their existing graders available as a mentor (70.2 percent).

Survey results provide strong evidence that NHLA members are open to an online lumber inspector training alternative and seem very willing to support that option through hands-on training opportunities. The NHLA Inspector Training School Committee is currently reviewing the results of the survey and will take the results into consideration for future curriculum, as it is its goal to keep the curriculum relevant to the industry while utilizing the best tools available for education. Questions regarding the survey or the Inspector Training School Program should contact Crystal Oldham, Director of Education, at 901-507-0312 or by email at [c.oldham@nhla.com](mailto:c.oldham@nhla.com).

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# HANDS-ON TRAINING AND TESTING REGIMES FOR AN ONLINE LUMBER INSPECTOR PROGRAM

## Project Report

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Objectives 3 and 4 of the WERC project involved with “Developing a New Delivery Method for NHLA Lumber Inspector Training” were intended to consider options for hands-on lumber grading (Objective 3) and for establishing an acceptable testing regime (Objective 4). One of the primary arguments against an online training model for lumber grading is the absence of hands-on grading practice.

Certainly, online instruction cannot directly substitute for hands-on experience in either a classroom setting or a production environment. However, technology-enabled materials can allow the formulation of grading exercises online as a precursor to actual hands-on practice. It is recognized that lumber inspection competency is critically dependent upon hands-on, repetitive grading of boards. A number of options are possible for a trainee to engage in the practice of grading, including: 1) working at their current place of employment with a competent, qualified inspector; 2) engaging NHLA Member mills to offer practice opportunities at their location; 3) developing an NHLA mentor program to provide hands-on grading experience to students; and 4) establishing a program in which national NHLA inspectors can provide hands-on training to participants in certain predetermined locations.

Option 1 is limited in its application to current mill employees embarking on a lumber inspection program while employed. An online program using this option would certainly be advantageous, assuming that a qualified lumber inspector is available at the mill site. The on-site inspector would need to be qualified by NHLA as an on-site mentor. Opportunities for this option are significantly limited for online trainees not currently employed at a mill requiring lumber grading.

Options 2 and 3 were addressed as part of the online survey conducted under Objective 1 of this project. Forty-eight of 66 respondents (72.7 %) indicated that they would support NHLA offering an alternative model for lumber inspection in which training components are accessed electronically via the internet. Those 72.7 percent responding positively about online training were asked if they would be willing to provide production-setting lumber grading practice opportunities at their mill. Thirty-nine respondents (81.3%) indicated a willingness to provide this kind of practical grading opportunity. The names and locations of these mills are listed in Appendix 1.

With regard to a mentor program, 33 of 47 respondents (70.2%) indicated that they had an experienced grader who would be willing to mentor an online trainee at their mill site

for the purposes of providing training/practice opportunities. The names and locations of these companies are listed in Appendix 2.

Option 4 represents a somewhat limited applicability alternative, as it would require national NHLA inspectors to travel to remote locations to work with individual trainees or with a small group, with little or no prospects of a revenue stream. And, arrangements would still need to be made with a local sawmill to provide an opportunity to the national inspector and trainee(s) to access lumber.

Given the very positive response among survey respondents to providing practice opportunities and mentors (Options 2 and 3), both in a production environment, these two options appear to offer the most reasonable hands-on grading experience opportunities. And, the geographical range of these respondents indicates that these opportunities can be well distributed to accommodate prospective online trainees. Additionally, this approach certainly provides NHLA with additional opportunities to engage and interact with Members in a way that enhances the availability of trained lumber inspectors.

An intermediate lumber grading option that can be incorporated into the online training curriculum is also possible. HaLT2 (Hardwood Lumber Training Program) is a computer program that provides lumber grading training<sup>1</sup>. The features of HaLT2 include:

- Nine types of defects, including stain, checks, sound knots, unsound knots, wane, pith splits, holes, and decay, can be displayed and color coded with high resolution graphics.
- The user can zoom into a 4-foot section of the board to view greater detail.
- On-screen rulers are provided for measuring defects and board dimensions.
- The program allows for consideration of both faces while grading a board, which is a significant advantage over other computer-based grading programs.
- A board editor allows the user to create a board using either the keyboard or a mouse.
- Boards can be accessed in four ways.
- Does not require prior knowledge of the grade of a board.
- Species-specific exceptions to the standard rules may be entered.

In addition, ReGS (Realistic Grading System), which is an extension of the basic algorithm used in HaLT, HaLT2, and HaREM (a lumber remanufacturing program), is also available<sup>2</sup>. The primary extension in ReGS allows users to grade boards with shapes other than perfect rectangles. Features in addition to those in the HaLT2 program include:

- An additional defect called “void”.
- Consideration of the differences between measured and full width.

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<sup>1</sup> Klinchachorn, P., C. Gatchell, C. McMillin, R. Kothari, and D. Yost. 1992. HaLT2-An Enhanced Lumber Grading Trainer. *Forest Products Journal* 42(10):32-36.

<sup>2</sup> Gatchell, C., Klinchachorn, P., and R. Kothari. 1992. ReGS-A Realistic Grading System. *Forest Products Journal* 42(10):37-40.

- A surface measure editor.
- A timer.

These types of software programs could easily be incorporated into an online training curriculum to enhance the trainee's opportunity to practice board grading. However, this option should not be considered an adequate substitute for hands-on lumber grading experience during training.

The culmination of any training curriculum is the testing of the trainee's ability to perform the desired function or job task and meet the criteria for successful completion of the lumber grading course. In the case of lumber inspection and the implications for an online training program, the testing regime must be at least equivalent to the test of competency for the 14-week program at Memphis.

Because of the willingness of NHLA member companies to be involved in providing practical grading experience at their facilities and in a mentoring program, the establishment of an acceptable testing regime is imminently possible. Of critical importance is the "final test" of grading skills, which includes a final 100-board test and a final exam, with a required overall average of 75% to successfully complete the course.

These final exams could easily be handled through a regional program of cooperating mills, qualified by NHLA to offer and administer the 100-board runs and final written exam on a regular basis (perhaps quarterly). And, provided the process could be made cost-effective, NHLA could use national inspectors to administer these tests at regional locations.

Also, given the grading practice opportunities available through HaLT2 and ReGS, intermediate lumber grading tests could be administered electronically, with a timed option like ReGS provides. Boards could easily be created by the grading software and emailed or posted on a website for exam purposes. The student would then have a fixed amount of time to complete the test.

Based on the preliminary activities of this project, it certainly appears feasible to develop and offer an online lumber inspection curriculum that has adequate hands-on grading that equals or surpasses the experiences of the Memphis school, particularly when considering the options for providing production-setting practice opportunities. And, a testing regime that meets current evaluation of student grading proficiency could certainly be developed along the guidelines proposed.