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Assessment of the Lumber Drying Industry and Current Potential for Value-Added Processing in Alaska

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Abstract

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An assessment was done of the lumber drying industry in Alaska. Part 1 of the assessment included an evaluation of kiln capacity, kiln type, and species dried, by geographic region of the state. Part 2 of the assessment considered the value-added potential associated with lumber drying. Various costs related to lumber drying were evaluated in an Excel spreadsheet. About 2.2 million board feet of lumber per year is currently being dried in Alaska, over 90 percent of which is softwoods. Total installed kiln capacity is about 94 thousand board feet. On a board-foot basis, lumber drying premiums and profitability were most influenced by species dried (whether softwoods or hardwoods) and not as strongly influenced by geographic location or type of kiln used.

Keywords: Economics, wood products, lumber, dry kiln, Alaska.

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Introduction

Although the commercial sawmill industry in Alaska currently includes several well-established mills, the lumber drying industry has just begun to become established within the past few years. The development of a viable lumber drying industry in Alaska has been faced with many of the same obstacles and constraints as the state's sawmilling industry including long transportation distances, relatively high wages, lack of lumber grading services, and concerns over availability of raw materials.

Before the 1960s, lumber drying in Alaska was limited primarily to air drying in outdoor storage areas. Kiln drying in Alaska has occurred since the 1960s when a facility was installed in Anchorage to dry local birch lumber. The first conventional steam-heated dry kiln was installed in Anchorage in the 1970s to dry spruce lumber for sale in local markets. During the energy crisis in the 1970s, a few small-scale vacuum and solar kilns were established in Alaska. In the early 1990s a steam-heated facility was started on the Kenai Peninsula of Alaska to dry softwood lumber produced at a local sawmill. Also in the 1990s, a second kiln was established on a different part of the Kenai Peninsula to dry softwood dimension lumber. This second kiln facility was considerably larger than any other kilns in Alaska. None of the four largest sawmills in Alaska (which collectively account for about 50 percent of lumber production in Alaska) currently operates a dry kiln facility.

Most of Alaska dry kiln facilities previously mentioned operated for a relatively short time before closing (typically 5 years or less). Many factors have contributed to the lack of sustainability of a lumber drying industry including mill shutdowns, and in at least one case, a fire. One relatively large hardwood drying facility was replaced by smaller kilns, which allow greater control over drying conditions and lumber moisture content.

A recent trend has been the establishment of relatively small dry kiln facilities in Alaska, with each installation typically having less than 25 thousand board feet (MBF) capacity. Within the past 5 years, nearly 10 such facilities have come on-line and are distributed throughout southeast, south-central, and interior Alaska. They dry a mixture of hardwood and softwood lumber for interior woodworking as well as construction-dimension lumber applications. Several softwood and hardwood lumber producers are currently drying lumber to the quality standards needed to market their products through local retail markets. In addition, several producers are beginning to engage in some form of secondary processing including lumber surfacing and profiling and pattern work.

Many of the smaller sawmills in Alaska have identified kiln drying lumber as a value-added process that will enable them to sell into local retail markets and to diversify the types of products they can market. One of the important elements of successful marketing is being able to grade and stamp lumber according to standardized criteria and rules. Grade stamps provide lumber buyers with useful information about lumber quality and recommended uses. Regional grading agencies, including the Western Wood Products Association (WWPA), which serves Alaska and other Western states, can be retained to provide lumber inspection and grading services.

Review of Past Literature Relevant to the Alaska Dry Kiln Industry

Several recent studies have evaluated the potential for lumber drying as a contributor to value-added wood products manufacturing in Alaska (Eastin and Braden 2000, Hill 1999, McDowell Group 1998). An analysis of a 1998 survey of sawmills throughout Alaska estimated the practical capacity of mills to produce over 200 million board feet (MMBF) of lumber per year, whereas the design capacity was estimated to be more than 241 MMBF (Hill 1999). For most respondents to the survey, the practical capacity for lumber production was typically about 10 percent lower than the design capacity. Most of the facilities, however, indicated a yearly production of less than 1 MMBF, with fewer than six relatively large facilities accounting for about two-thirds of the state-wide lumber production. Although the most common plan for business expansion among sawmill owners was the installation of a lumber dry kiln, high purchase costs often were indicated as significant barriers.

A separate study indicated that total sawmill capacity in Alaska has declined from 370 MMBF in 1990 to only 220 MMBF in 1997, during which time only 52 percent of installed capacity was used (Eastin and Braden 2000). Dry kilns will be needed for Alaska producers to enter and become competitive in value-added markets. Given these findings, and the abundance of smaller mills in Alaska, it is not surprising that most lumber producers in Alaska who are currently proposing dry kilns are focusing on either dehumidification or hot water kilns, both of which require considerably less capital investment than low-pressure steam systems.

The parallels between sawmills and dry kiln facilities in Alaska have been recognized, and the presence of several different production classes has been identified (Kilborn 1999). The current composition of the lumber dry kiln industry also is structured into different size classes, based on installed drying capacity. Several medium-sized facilities have about 10 to 25 MBF kiln capacity: the remaining smaller facilities have drying capacities of less than 5 MBF of lumber.

The current domestic market for Alaska solid wood products, including lumber and timbers, has been estimated to be between 90 and 100 MMBF per year, of which 80 to 90 MMBF is currently imported (primarily from the Pacific Northwest and Canada) (McDowell Group 1998). The same study estimated the Alaska market for kiln-dried, graded dimensional lumber to be 65 to 70 MMBF per year (McDowell Group 1998). Given the current population of Alaska, about 600,000, this would result in a per capita lumber consumption of about 158 board feet per year. By comparison, the national end-use consumption of softwood lumber was 50.8 billion board feet in 1997 (WWPA 1998). Based on a 1997 national population of about 267 million people, the U.S. per capita consumption of softwood lumber for 1997 would be about 190 board feet (U.S. Department of Commerce, Census Bureau 2001). These numbers indicate that the Alaska per capita consumption of softwood lumber is somewhat less than the national average. If other softwood products such as log homes and firewood were considered, it is possible that Alaska consumption would compare more favorably to the national average.

Several studies have evaluated lumber drying technologies that are well suited to the smaller scale producers found in Alaska. Dehumidification kilns are one of the leading practical technologies for drying lumber in many regions of the state, although electrical costs can be an important consideration. Although dehumidification kilns can be well suited to drying small amounts of lumber, their ability to dry wood to uniform moisture contents within kiln charges is a potential concern. For example, after evaluating the variation in final moisture content for yellow poplar (*Liriodendron tulipifera* L.) lumber dried in a dehumidification kiln (Armstrong et al. 1995), a brief equalization period was recommended after kiln drying in order to minimize moisture content variations between pieces of lumber. Other studies have focused on the economics of dehumidification drying for hardwood lumber (Wengert et al. 1988). Under normal conditions for drying 4/4 red oak lumber in a 50 MBF dehumidification kiln, a drying premium of about $200 per MBF was needed to achieve an internal rate of return of more than 12 percent. Airdrying lumber is a fairly common practice in some locations of interior Alaska during summer. In one study, 2-inch thick green softwood lumber that began airdrying in May reached a moisture content of less than 19 percent within 1 month (Sampson and Ruppert 1985).

Part 1—An Evaluation of State-Wide Dry Kiln Capacity

Current state-wide dry kiln capacity was evaluated based on site visits to dry kiln facilities, phone conversations with kiln owners, and past industry surveys. Most facilities are part of a sawmill operation, drying lumber for local retail markets and for their own needs. Some facilities have specialized in drying for local niche markets such as random width-random length hardwood lumber to be sold through retail outlets. Many operators are limited by seasonal factors such as rainfall and cold temperatures, which can prevent year-round production.

The sawmill industry in Alaska currently consists of about four relatively large producers manufacturing 10 MMBF or more of lumber per year, with 100 or more smaller producers operating either on a part-time basis or with limited production schedules. Ten dry kilns (including two under construction) are associated with sawmills throughout the state; however, none of the large producers mentioned previously operates a dry kiln. Adding new kiln facilities in Alaska would result in significantly greater lumber drying capacity, although the potential capacity and statewide impacts of the facilities are difficult to estimate. Idle kilns that could be reestablished, also have been considered. Five idle kilns, totaling about 400 MBF of kiln capacity, have been identified, and some of these could be brought on-line for continued use in Alaska. One recently installed kiln, having about 4 MBF capacity, is an experimental unit owned by a municipality in southeast Alaska. This is a portable facility planned for workshops, training sessions, and lumber drying research.

The average kiln size for active kilns in Alaska is about 8 MBF. Most of the facilities are either dehumidification or hot water kilns. Currently, no known low-pressure steam kilns are operating in Alaska; however, two of the idle kilns are steam kilns. About four of the kilns are heated with wood waste to fuel a hot water heating system, a fuel source that would lend itself well to other facilities having an abundance of wood waste. The remaining currently operating kilns are either dehumidification kilns (four), or a vacuum kiln (one) heated with electricity. Drying technologies commonly used in Alaska are described later in this paper.

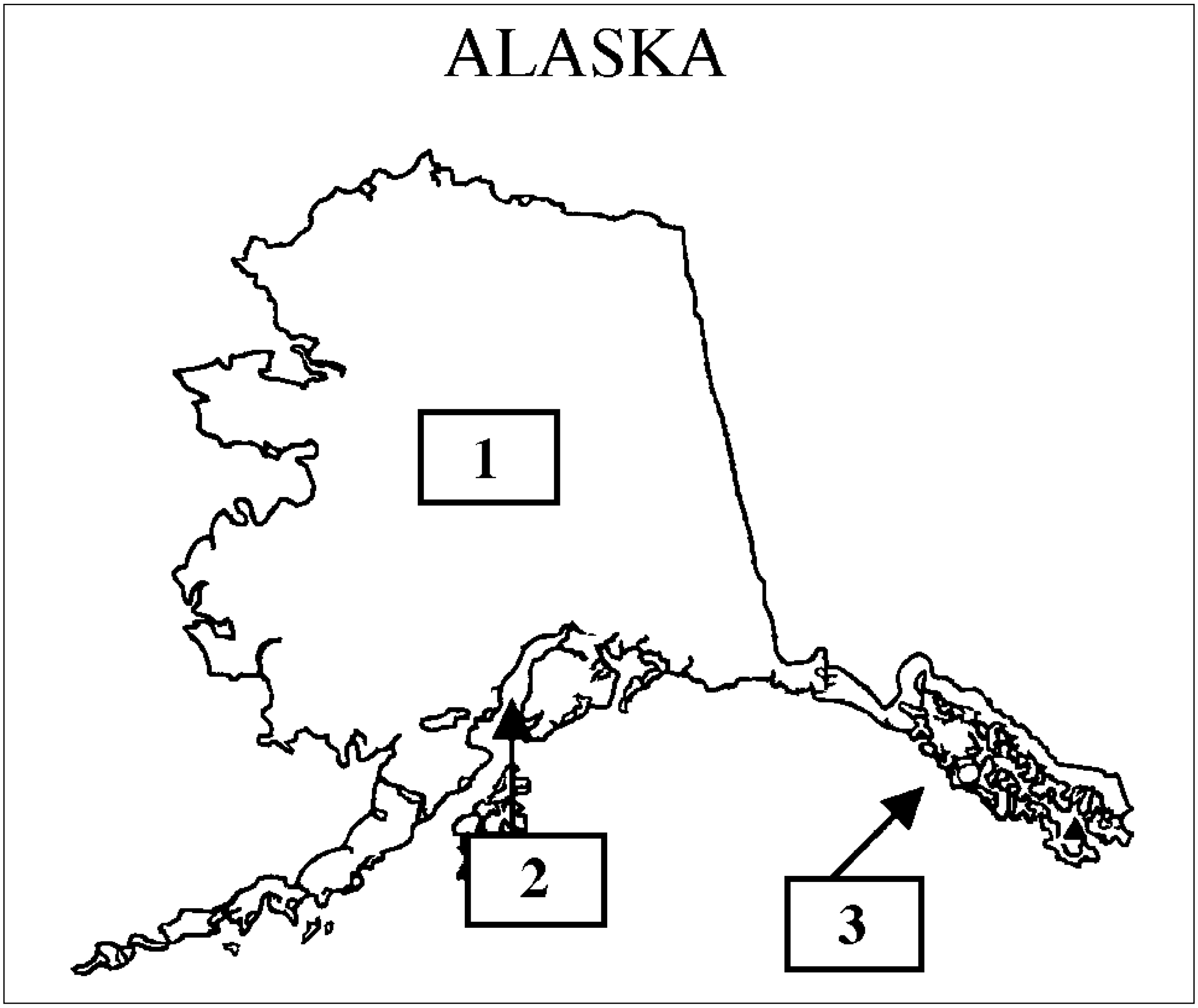

Figure 1—Primary wood products regions within Alaska, including (1) interior, (2) south-central/Kenai, and (3) southeast regions.

Regional Variations in the Dry Kiln Industry in Alaska

Wood-producing regions in Alaska can be divided into three general areas: (1) southeast Alaska, which is primarily either Tongass National Forest land or Alaska Native Corporation land; (2) the Kenai Peninsula, near Anchorage (Alaska's largest city), and (3) the interior region, serving the Fairbanks area and many other communities (fig. 1). Although softwoods predominate throughout all three regions, most of the softwood volume is in southeast Alaska (primarily western hemlock (*Tsuga heterophylla* (Raf.) Sarg.) and Sitka spruce (*Picea sitchensis* Bong. Carr.) and the Kenai region (primarily Sitka spruce, white spruce (*Picea glauca* (Moench) Voss), and Lutz spruce (*Picea xlutzii* Little). Lutz spruce is a hybrid species of Sitka spruce and white spruce. The interior region is comprised of mixed areas of hardwoods (primarily paper birch (*Betula papyrifera* Marsh), balsam poplar (*Populus balsamifera* L.), and aspen (*Populus tremuloides* Michx.) as well as softwoods (primarily white spruce). State-wide kiln capacity includes about 81 MBF to dry softwood lumber and 13 MBF to dry hardwood lumber. The interior region is the only area where airdrying is practiced regularly. Here, white spruce lumber up to 2 inches thick can be air dried during summer.

Potential for Increased Kiln-Drying of Lumber in Alaska

The number of dry kilns that have recently been constructed or are currently proposed is indicative of the high level of interest among Alaska lumber producers in value-added processing. Abundant supplies of manufacturing residues at many facilities could create additional incentives and opportunities for waste utilization, one of which would be energy to heat dry kilns.

Several of the proposed dry kilns in Alaska are associated with the larger sawmill facilities and could greatly add to the total state-wide capacity for lumber drying if they become completed. Efforts currently underway to help establish lumber grades for Alaska species also could assist in marketing dimension lumber to retail and construction or architectural markets, an issue of great interest to the larger sawmilling facilities.

The ability to assure consistent moisture contents in lumber drying is important in gaining entry into domestic markets. Lumber grading rules are used by grading agencies, such as the WWPA, to assess the influence of characteristics such as wane, knots, grain, wood texture, or manufacturing defects on the end-use characteristics of kiln-dried lumber. For dimension lumber, the structural properties are of primary interest, whereas for appearance grades, aesthetic values are of interest. For lumber products to be sold with consistent quality into retail markets, manufacturers must assure lumber products are graded according to standardized grading rules, by a certified grading agency. In Alaska, lumber grading is particularly important if local manufacturers are to compete with grade-stamped lumber imported from the Pacific Northwest or from Canada. Without lumber grading, it would be difficult for Alaska consumers to make valid comparisons between domestic softwood lumber and imported lumber. From a practical standpoint, government agencies and lending institutions may require that buildings be constructed to local building codes with graded lumber. Kiln-drying lumber to consistent and uniform moisture contents would be an important part of this process.

Several trends within the dry kiln industry in Alaska have been observed. Although installation costs are an important concern for most operators, so is the need for accurate technical information about dry kiln practices; particularly during construction and startup. Several people who have attended recent dry kiln workshops or training sessions are either planning to install a dry kiln or have already done so. Technology transfer efforts such as these seem to have strong potential for near-term results.

Quality assurance practices related to final moisture content control, proper stickering techniques, and the need for conditioning and equalizing treatments (among other practices) can be maintained and improved through close interaction between kiln operators and wood technology professionals within the state. Marketing and distribution efforts to reach local retail outlets can be enhanced for small hardwood producers who can develop niche markets for home hobbyists and craftsmen.

Table 1—Current status of Alaska dry kiln facilities, including total installed kiln capacity and number of facilities, November 2000

Kiln type	Installed kilns[a]		Proposed kilns[a]		Idle kilns[a]	
	Total capacity (MBF)	No. of kilns	Total capacity (MBF)	No. of kilns	Total capacity (MBF)	No. of kilns
Direct-fired	—	—	—	—	270	1
Dehumidification	29	4	—	—	50	2
Hot water	59	6	18	2	—	—
Miscellaneous	2	1	—	—	—	—
Steam	—	—	275	3	95	2
Experimental/research	4	1				
Total	94	12	293	5	415	5

[a] Includes 2 kilns currently under construction.

Larger producers of softwood lumber can develop local retail markets for more traditional products such as dimension lumber for housing construction. The most successful facilities seem to be those that take an integrated approach toward the management of all phases of their operations, including sawmilling, wood waste utilization, and lumber drying.

Current Drying Technologies

Dehumidification and hot water kilns are two dry kiln technologies that seem to be the most viable for current wood products producers in Alaska (table 1). Each type has advantages and disadvantages depending on factors such as kiln size, geographic location, local electrical rates, and size and species of lumber dried. Although both types of kilns are well suited to relatively small kiln capacities, dehumidification kiln operation is more sensitive to the cost of electricity, which is used to power the drying units. Dehumidification kiln systems, however, are available at relatively low prices compared to other types of systems. Hot water dry kilns can be heated by various sources, including fossil fuels as well as wood wastes from manufacturing residues. For dehumidification kilns, an auxiliary heat source is recommended to warm the kiln chamber to a temperature at which the drying units can begin functioning. Although hot water kilns are less dependent than dehumidification kilns on electrical costs, a certain amount of electricity will be needed for fans and motors regardless of what kiln type is used.

Most dry kiln facilities in Alaska (for both dehumidification and hot water systems) have a maximum drying temperature of about 160 °F. This relatively low maximum temperature can be an important consideration in some regions of Alaska, where winter temperatures are well below zero and long startup times are needed just to preheat frozen lumber before drying can occur.

Small kiln construction is typically done with an outside vendor supplying the necessary control equipment and the kiln operator-owner constructing the kiln facility primarily from locally available parts and lumber. In a few cases, producers have purchased complete kiln packages from commercial vendors in the continental United States. Most of the currently operating kilns lack sophisticated control systems. Nonetheless, lumber drying quality seems to depend greatly on operator interest and commitment to the lumber drying process, and several cases have been observed where surprisingly good quality lumber has been dried even where new kiln systems and equipment were not available.

A third means of heating dry kilns is with low-pressure steam, typically produced by the combustion of wood wastes or fossil fuels. Steam systems represent a relatively large capital investment and are best suited for producers drying large volumes of lumber. Most of the current lumber drying facilities in Alaska cannot justify steam-heated kilns; however, this technology may play a significant role in the future development of the industry.

Part 2—An Evaluation of Drying Costs of Lumber Produced in Alaska

The total volume of lumber dried and drying costs were evaluated for all known dry kiln facilities in Alaska. An Excel spreadsheet was developed to evaluate key operating costs associated with kiln drying lumber, and the overall results were categorized by region within the state, kiln type, and species dried. It was not within the scope of the project to evaluate costs that were not directly associated with lumber drying. Log handling costs, sawmilling costs, equipment depreciation, rent, and taxes were not considered, although they could represent significant expenses for many sawmill and dry kiln operators.

The following list shows several variable costs associated with drying lumber that were evaluated:

- Species dried
- Lumber type (hardwood vs. softwood)
- Lumber thickness
- Average initial (green) moisture content
- Average final (dry) moisture content
- Electrical costs ($ per kilowatt hour)
- Cost of labor (loading and unloading kilns)
- Lumber value undried ($ per MBF)
- Lumber value dried ($ per MBF)
- Annual volume of lumber dried (MBF)
- Anticipated lumber degrade (percentage of total lumber volume)
- Reduction in value for degrade lumber (percentage of original value)

The spreadsheet was designed to be used as a guide for proposed kiln facilities (based on expected operating conditions) or for estimating profitability of existing facilities (based on actual operating conditions). The spreadsheet is intended to provide preliminary information about key operating costs for kiln drying lumber but would not be suited for a complete investment analysis for capital spending projects.

The gross premium for drying lumber was defined as the lumber value after drying minus the value before drying ($/MBF). The net premium was then determined by subtracting key operating costs and estimated degrade from the gross premium. The net premium results are intended to provide comparative measures of profitability between kiln facilities, recognizing that several key lumber manufacturing costs have not been considered. The primary results of interest were the state-wide net premium values, based on region, kiln type, and lumber species. Because these values represent estimated lumber values before vs. after drying, they could be interpreted as a measure of value-added potential for lumber drying in Alaska.

Lumber Drying Costs

The **electrical costs** of running fans for air circulation were considered for all kiln types. For hot water kilns, this was usually the only electrical cost evaluated. For dehumidification-type kilns, electrical costs also included the cost of running a compressor and blower unit. Here, cost information was either provided by kiln owners based on monthly electric bills or was estimated based on published estimates from a dehumidification dry kiln manufacturer. The estimates from the dry kiln manufacturer assumed that the fans accounted for 40 percent of the total electric charges, whereas the remaining 60 percent were accounted for by dehumidification equipment. The demands on the dehumidification equipment likely could be reduced if an auxiliary heat source were used. However, because this would represent an added expense, its benefit in reducing electrical costs would need to be weighed against its purchase and operating costs.

Kiln maintenance costs were in most cases estimated to be 4 to 5 percent of the original installed kiln cost, although precise estimates were difficult to determine. Because most kilns were installed within the past few years, long-term estimates of kiln maintenance costs were not yet available. One factor favoring the relatively low maintenance costs used is that lumber is loaded manually into kilns at many of the smaller facilities surveyed. Here, one could reasonably expect less wear and tear than for kilns that are loaded by forklift.

Lumber degrade information was obtained from telephone conversations with kiln owners and was based on two estimates: (1) the proportion of pieces experiencing some loss in value (degrade) during drying and (2) the estimated loss in value of these degraded pieces. The two factors were then multiplied together to give an estimate of the loss in value owing to degrade, for an entire kiln charge. For example, if 5 percent of the lumber was estimated to experience degrade, and the estimated loss in value was 50 percent, then the overall reduction in value for the kiln charge was (5 percent) $\times$ 0.50 = 2.5 percent. Lumber degrade estimates were determined as a percentage of kiln-dried lumber value.

Labor costs to load and unload dry kilns were obtained either directly from kiln owners or were estimated based on the size of the kiln and the types of lumber dried. Labor estimates varied from 16 to 32 person hours per kiln cycle, depending

Table 2—Summary of lumber drying premiums in Alaska, by kiln type

Kiln type	No. of kilns	Total installed capacity	Annual volume lumber dried	Average gross drying premium	Average net drying premium[a b]	Total net drying premium[a]
		--------*Thousand board feet*--------		*Dollars per thousand board feet*		*Dollars per year*
Dehumidification	4	29.0	456.0	725	473.20	124,615
Dehumidification/ hot water and miscellaneous	3	7.0	141.6	1,633	1,088.00	157,834
Hot water	5	58.2	1,642.5	300	238.20	385,370

[a] Net drying premium = gross drying premium - (electrical costs + labor + lumber degrade + maintenance).
[b] Unweighted average values.

Table 3—Summary of lumber drying premiums in Alaska, by geographic region

Region	No. of kilns	Total installed capacity	Annual volume lumber dried	Average gross drying premium	Average net drying premium[a b]	Total net drying premium[a]
		--------*Thousand board feet*--------		*Dollars per thousand board feet*		*Dollars per year*
South-central/Kenai	6	42.0	716	783	556.80	246,693
Interior	4	29.2	1,184	1,000	631.90	339,526
Southeast	2	23.0	340	Estimates only	Estimates only	81,600

[a] Net drying premium = gross drying premium - (electrical costs + labor + lumber degrade + maintenance).
[b] Unweighted average values.

on kiln size. These estimates included the time needed to load and to unload kilns (i.e., total labor requirements per kiln cycle). Miscellaneous labor requirements for monitoring dry kilns, checking moisture content samples, and performing routine maintenance were not considered in this evaluation, although they most likely would require at least 1 hour per day during drying cycles.

Results

Current lumber drying premiums based on values for green vs. kiln-dried lumber are summarized in tables 2 through 4. Separate summaries are provided for type of species (hardwood vs. softwood lumber), region within the state, and kiln technology

Table 4—Summary of lumber drying premiums in Alaska, by species category

Species category	No. of kilns	Total installed capacity	Annual volume lumber dried	Average gross drying premium	Average net drying premium[a b]	Total net drying premium[a]
	------------------------------Thousand board feet--------------------------					*Dollars per year*
Hardwoods	5	13.0	177.6	1,400	924	180,541
Softwoods	7	81.2	2,063.0	329	247	487,278

[a] Net drying premium = gross drying premium - (electrical costs + labor + lumber degrade + maintenance).
[b] Unweighted average values.

Table 5—Current state-wide lumber drying capacity in Alaska, by geographic region, kiln type, and lumber type[a]

Region	Kiln type	Number of kilns	Lumber/ species type	Combined kiln capacity
				Thousand board feet
Southeast	Hot water	2	Softwood	17
South-central/Kenai	Dehumidification	2	Softwood	23
	Hot water	1	Softwood	10
	Dehumidification	3	Hardwood	15
Interior	Hot water	2	Softwood	25
	Dehumidification/hot water	1	Hardwood	2
	Vacuum	1	Hardwood	2
		—		—
Total		12		94

[a] Only active kilns considered.

used. Group averages are provided about the number of kiln facilities, total installed capacity (MBF), annual volume dried (MBF), and gross and net drying premiums ($/MBF). All average values were reported as unweighted averages.

The total net drying premium for all kiln-dried lumber in Alaska was estimated to be more than $667,000. An estimated 88 MBF of state-wide kiln capacity currently dries about 2,240 MBF per year. The average lumber value green (i.e., before kiln drying) was estimated to be $679 per MBF, and the lumber value after drying was estimated to be over $1,600 per MBF. This resulted in a state-wide average of $775 per MBF gross drying premium and a net drying premium of $529 per MBF. These results reflect the fact that the drying premiums for hardwood lumber were considerably greater than those for softwood lumber (table 4). In addition, neither the lumber yield nor the distribution of lumber grades was considered in this evaluation, which could reasonably influence the drying premiums achieved. For example, a purchase of 1,000 board feet of paper birch logs might yield only a fraction of that amount in high-grade cuttings suitable for retail sale. This is recognized as a shortcoming of the current model and could become a topic for future work.

Softwood lumber currently accounts for most of the lumber drying volume as well as the value-added potential in Alaska (table 5). This is evident although the total number of operating kilns is almost evenly divided between hardwood facilities (five kilns) and softwood facilities (seven kilns). About 92 percent of the total drying volume of the state is in softwood lumber, and about 86 percent of the total installed kiln capacity is for facilities drying softwoods.

Many of the hardwood facilities dry predominantly paper birch lumber in relatively small kilns, with drying cycles typically lasting several weeks. Softwood drying schedules (primarily for white spruce, Sitka spruce, and western hemlock lumber) are generally shorter, typically lasting 2 weeks or less. All the surveyed dry kilns would be expected to dry lumber at temperatures of 160 °F or less.

Although the lumber drying volume for softwoods heavily outweighs that of hardwoods, the net drying premiums were somewhat less uneven between the two species groups. The net drying premiums for hardwood lumber and softwood lumber were estimated to be $180,541 per year and $487,278 per year, respectively, even though hardwood lumber accounted for only 8 percent of the total lumber drying volume. The drying premiums for hardwood lumber on an MBF basis were considerably greater than for softwood lumber (table 4).

Hot water dry kilns currently account for the greatest amount of lumber drying volume (MBF) and net drying premiums, compared to other kiln types (table 5). Over half of the total net drying premium from all lumber dried is from hot water kilns. Dehumidification kilns had considerably less production than hot water kilns, and the average gross lumber drying premium was much greater for dehumidification kilns than for hot water kilns.

About 50 percent of the value-added processing resulting from kiln drying occurs in the interior region of Alaska (table 3), although the south-central/Kenai region has more active kilns and a greater installed kiln capacity. This is due largely to the presence of fewer dry kilns in the interior region processing larger volumes of lumber. The southeast region currently has the fewest active dry kilns (two) and the lowest total net drying premium of any region.

Conclusions

Currently, 12 kiln facilities are known to be active in Alaska, including 2 that are in the final stages of construction. The total installed capacity for these sites is about 94 MBF. Currently, about 50 percent of the operating kilns are heated by hot water systems (five kilns), the other 50 percent by dehumidification systems (five kilns). There is one known vacuum kiln operating in Alaska. On a board-foot basis, lumber drying premiums and profitability were most influenced by species dried (whether softwoods or hardwoods) and not as strongly influenced by geographic location or type of kiln used.

There is strong potential for further development of the dry kiln industry in Alaska to meet the state-wide demand for kiln-dried lumber. There is currently a wide range of kiln types and species dried within the state; however, most of the kilns are relatively small (25 MBF or smaller). Because none of the larger sawmills within the state have dry kilns, the addition of kiln facilities at one or more of these sites could greatly increase the state-wide capacity of Alaska.

Additional lumber drying facilities in Alaska could lead to further opportunities for value-added processing of lumber products. Lumber planing and grading will be key steps in marketing locally manufactured lumber for retail sale of dimension and construction lumber. Further manufacturing of dried and planed lumber could result in higher value products for interior applications or fine woodworking. Included in this group of products would be flooring, kitchen cabinets, paneling, and siding.

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