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# Edge-Glued Panels From Alaska Hardwoods: Retail Manager Perspectives

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All photographs by David Nicholls.

## Abstract

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In Alaska, red alder (*Alnus rubra* Bong.) and paper birch (*Betula papyrifera* Marsh.) are both lesser-known hardwoods grown, harvested, and manufactured into appearance products, with potential for increased utilization. The production of edge-glued panels from red alder and paper birch offers one expansion opportunity for wood products producers. For this expansion to happen, retail managers' attitudes and preferences need to be understood and cultivated, as they represent an important link in the supply chain. In this research project, 11 edge-glued panels were prepared from Alaska red alder and birch lumber and presented to managers of retail lumber stores. Panels included different types and levels of character marks. Eight managers in interior and south-central Alaska reviewed the panels, offering their perceptions regarding overall sales potential in their stores. Clear wood was generally preferred in panels produced from red alder. High levels of natural stain were preferred for birch panels. Several panel attributes were identified as being important, including level of character, lack of surface roughness, and availability. Most retail managers ranked price and supply as less important than product quality. Retailers recommended that up to 12 standard panel sizes be provided. Retailers suggested several different end-uses for the panels, with the most promising applications being kitchen cabinet or furniture production.

Keywords: Red alder, paper birch, edge-glued panels, wood products, retail sales.



## Introduction

Edge-glued panels are a value-added product that could be manufactured by many small and medium wood products firms. The technical aspects of production are relatively simple, and the required financial investments are minimal. Production of edge-glued panels could be a natural extension to product lines for red alder (*Alnus rubra* Bong.) and paper birch (*Betula papyrifera* Marsh.) lumber producers in Alaska. This could allow them to add value to their products and to serve a wider variety of markets. Edge-glued panels can be produced with limited equipment and capital investment—many wood products firms would already have much of the needed equipment except for glue application and clamping. Because finished products are often wider than standard lumber, edge-glued panels can be used in more applications. Longer panels can be created by fingerjointing individual laminates, creating even more versatility in product sizing. Edge-glued panels can be manufactured for a variety of specific end uses including furniture, kitchen cabinets, doors, or made as standard sized blanks (fig. 1) (Bowyer et al. 1986).



Figure 1—Panel 11: paper birch edge-glued panel (high level of natural stain).

Edge-glued panels could represent an important niche-product opportunity for producers in Alaska and elsewhere. Several important elements for niche marketing involve analyzing existing markets, identifying underserved markets, and selecting a specialized “niche” that could offer competitive advantages (Smith et al. 2008). Key advantages of edge-glued panel production (versus other secondary wood products) include the relatively low cost of equipment, the potential use of smaller diameter stems, use of less valuable grades of lumber, flexibility in panel product sizes, and opportunities to sell within established local markets to current customers.

### **Red Alder and Paper Birch in Alaska**

Red alder and paper birch are both smaller diameter hardwoods that are managed under relatively short rotations (often 75 years or less). Because the prevalent limbs of the younger trees are less frequently shed and overgrown with clear wood (versus older trees), production of character-marked material is common. Past research on paper birch found considerable interest among consumers for knots and bark pockets in kitchen cabinet doors having an edge-glued construction (Donovan and Nicholls 2003). However, retailers were not evaluated as part of that study. Nicholls (2001) found that retail managers in south-central and interior Alaska were at least moderately interested in carrying random-width birch lumber from local sources. Almost all the retail managers contacted seemed interested in participating in marketing trials of local birch lumber (Nicholls 2001); however, edge-glued panels were not evaluated. An important concern among managers was that a steady supply could be assured. Very little red alder lumber is currently produced in Alaska, despite a growing resource base (Brackley et al. 2009). Birch lumber is produced at several sawmills in south-central and interior Alaska.

### **Research Objectives**

This study had four primary objectives: (1) determine what types of edge-glued panels managers would be willing to sell in their stores (if any), (2) determine what types and levels of character marks might be preferred in edge-glued panels, (3) determine how preferences differed between red alder and birch edge-glued panels, and (4) determine what end products represented the greatest sales potential for these edge-glued panels. All of these objectives relate to perceptions of retail managers about sales potential of edge-glued red alder and birch panels in Alaska.

## **Methods**

### **Panel Construction**

All panels were constructed to a standard size of 12 by 18 in, with individual boards being about 1 to 2 in wide (figs. 1 and 2). All lumber was kiln-dried, planed, and sealed with a coat of clear finish. A total of four red alder panels and seven birch panels were constructed (table 1). The red alder group included one panel of clear wood and three panels with varying levels of knots. The birch group included one panel of clear wood, three panels with varying levels of knots, and three panels with varying levels of natural stain. Selected boards from a recent lumber recovery study in Alaska (Brackley et al. 2009) were used to construct the edge-glued red alder panels for the current study. For the birch panels, kiln-dried Alaska lumber was used.



Figure 2—Panel 4: red alder edge-glued panel (high level of character-marked wood).

**Table 1—Description of edge-glued panels**

Panel	Species	Character feature	Level
1	Red alder	None (clear)	—
2	Red alder	Knots	Low
3	Red alder	Knots	Moderate
4	Red alder	Knots	High
5	Paper birch	None (clear)	—
6	Paper birch	Knots	Low
7	Paper birch	Knots	Moderate
8	Paper birch	Knots	High
9	Paper birch	Natural stain	Low
10	Paper birch	Natural stain	Moderate
11	Paper birch	Natural stain	High

## Data Collection

Eight managers of retail wood products outlets in interior and south-central Alaska were interviewed in the study. Responses were based on visual observation of all 11 edge-glued panels in one setting. Typically, this was in an office or a break room at the retail outlet. Panels were grouped together by species, and by defect group (e.g., the three birch panels containing knots were all presented together). Before each interview, managers were given a few minutes to review all of the panels. The first question asked was always an open-ended question of the form “What do you think of these panels, in terms of retail sales potential?” Questions were asked of retail managers on topics including overall panel preferences, preferred character marks, and species preferences. All questions were asked from the hypothetical standpoint that panels would be sold in the respondents’ store. Interviews typically lasted about 20 minutes.

Most retail managers were directly involved in lumber or edge-glued panel sales in their current positions. Retail stores sampled in Alaska were either “big box” stores (having national coverage) (three), or Alaska regional home improvement centers (five). Cesa and Sinclair (1988) found that larger “Top 100 home centers” and smaller home centers chose to merchandise different product mixes, occupying two distinct market segments. It was also noted that “Top 100 home centers” tended to stock products that were high quality and convenient to use, whereas the smaller home centers specialized in less standardized products requiring woodworking equipment for final processing (Cesa and Sinclair 1988). Thus, the interviewees represented a broad range of perspectives for evaluating the market potential for edge-glued red alder and paper birch panels in Alaska.



## Results and Discussion

### Preferred Panel Sizes and End Uses

Retail managers in Alaska generally preferred longer panels ranging from 4 to 16 ft in length (table 2). The preferred widths of edge-glued panels for Alaska retailers were generally between 4 and 12 in (roughly the same as for random-width hardwood lumber). These dimensions are longer and narrower than recommendations for standard-sized panels developed by Araman (1983). It was possible that respondents were equating the edge-glued panels as a substitute for hardwood lumber. For example, Wiedenbeck et al. (2003) found that furniture and cabinet manufacturers generally preferred lumber widths between 5 and 9 in.

Several retailers suggested a variety of product sizes including up to four standard widths and up to three standard lengths (for a total of 12 sizes). One retailer suggested test marketing just 4 standard sizes, and then expanding this selection to 10 to 12 sizes. These findings are generally consistent with past research on birch edge-glued panels in which almost one-third of respondents suggested marketing between five and eight retail size combinations when selling directly to consumers (Bowyer et al. 1986).

Furniture, kitchen cabinets, shelving, interior doors, and butcher blocks were all listed as possible retail products for edge-glued panels (table 2). Kitchen cabinets were most frequently cited as a potential end use, being mentioned by six of the

**Table 2—Preferred character-mark type, preferred end use, and preferred sizes of edge-glued panels, as indicated by retail managers in Alaska**

Retailer	Preferred character-mark type	Preferred end uses	Preferred width(s)	Preferred length(s)
			<i>Inches</i>	<i>Feet</i>
1	Knots and bark pockets	Shelving	6	8
2	NR	Trim applications, furniture	4, 6, 8, 12	8, 10, 12
3	NR	Cabinetry, light furniture	4, 6, 8	12, 16
4	Small knots, infrequent knots	Cabinets, bookcases, butcher blocks	48	8
5	Birch—natural stain, red alder—knots and bark pockets	Table tops, cabinets, shelving, bookcases, flooring	12 to 24 (range)	3 to 8 (range)
6	NR	Cabinets, interior doors, bookshelves, furniture, flooring, cutting blocks	4, 6, 8, 12	6, 8, 12
7	Birch natural stain	Cabinets, interior doors, trim	NR	NR
8	Birch natural stain	Bookcases, cabinets, butcher blocks, small end tables	24	4

NR = no response.

eight retailers. Kitchen cabinet manufacturers are common in south-central and interior Alaska. Therefore, this could represent an opportunity to substitute locally produced birch for other species, such as hickory (*Carya* Nutt.) or maple (*Acer* L.), in retail centers. Typically, kitchen cabinets from Alaska birch are custom produced by craftsmen, and sold directly to consumers.

Furniture was listed as a potential end product by four of the eight retailers. There are several small furniture manufacturers in Alaska, including some that specialize in rustic appearances. One respondent suggested different levels of character for different end uses, including cabinets and interior doors (character marks recommended) and trim (clear wood recommended). Three of the eight retailers mentioned butcher blocks or cutting blocks as a product type. There are numerous wood craft producers in Alaska, some of whom could utilize smaller cuttings not large enough for furniture or cabinet production. However, this would likely be a small market, as the median lumber use of these firms is typically less than 1,000 board feet per year (Braden and Nicholls 2004).

### Preferred Panel Types

Retailers preferred birch panels featuring natural stain. The panel having high levels of stain (panel 11) was chosen as the favorite by four of the eight retailers (table 3). The panels featuring birch natural stain (panels 9, 10, and 11) were preferred by a wide margin to the panels featuring birch knots (panels 6, 7, and 8). These results are in general agreement with consumer responses to the same 11 panels, evaluated at a recent home show in Fairbanks, Alaska.<sup>1</sup>

**Table 3—Favorite panels, as selected by retail managers in Alaska (based on retail sales potential)**

Retailer	1 <sup>st</sup> favorite	2 <sup>nd</sup> favorite	3 <sup>rd</sup> favorite
1	4	7	10
2	6	11	2
3	11	4	10
4	11	4	5
5	5	1	9
6	1	2	11
7	11	3	8
8	11	1	4

<sup>1</sup>Nicholls, D.L.; Bumgardner, M.S.; Barber, V.A. 2009. Preferences for edge-glued panels from Alaskan hardwoods. Presentation at 2009 Forest Products Society International Conference. Boise, Idaho. June 22.

There were no strong trends for favored species when making overall comparisons between red alder and birch. Here retailers were evenly divided, with four respondents preferring the overall look of red alder and four preferring birch (table 4). There were no clear preferences when retailers were asked whether they generally preferred clear (defect-free) panels or character-marked panels, without regard to species. Here, three respondents preferred clear panels and five preferred panels having character-marks. It should be pointed out that, by design, there was a high level of variability in appearance within the red alder panel group and the birch panel group, and this could have made it difficult to make broad comparisons between species.

**Table 4—Panel groups preferred by retail managers in Alaska**

Retailer	Preferred species		Preferred marking	
	Red alder	Birch	Birch knots	Birch natural stain
1	X			X
2		X		X
3	X			X
4		X		X
5		X		X
6	X			X
7	X			X
8		X	X	

### Preferred Panel Attributes

Appearance-related attributes were frequently listed as being important. For example, desirable appearance attributes included panels having a “natural appearance,” “no deep knots,” or “some color variation” (table 5). In general, the Alaska retail managers seemed receptive to including a certain amount of color variation in edge-glued panels. This finding somewhat contradicts previous market research on birch edge-glued panels, which sampled wood products distributors in Midwest United States. In this earlier research, almost 70 percent of respondents indicated that nonuniform color variations would represent a barrier for consumer acceptance (Bowyer et al. 1986). Other researchers have developed methods for sorting edge-glued panel parts so that uniformly colored parts are grouped together (Kline et al. 2000), where a basic assumption is that uniformly colored panels would have higher value.

**Table 5—Market barriers, selling points, and product attributes for edge-glued panels, as indicated by retail managers in Alaska**

Retailer	Market barriers	Selling points	Product attributes
1	NR	NR	NR
2	Need good selection of sizes (and widths)	NR	Price, level of character
3	Unclear incentive for home hobbyists to purchase	NR	Price, size
4	NR	NR	NR
5	Potential panel warpage; price needs to be competitive with other edge-glued products	“Made in Alaska” designation could help sales; steady supply and availability	No deep knots; some color variation; shrink wrap higher grade material
6	NR	NR	Price; availability; natural appearance; strength
7	High cost; too many knots (for red alder); slow lead time/product delivery	For birch—character, grain, and natural appearance; for red alder—some knots should be present	NR
8	NR	NR	Color, price, size

NR = no response.

Although price was listed fairly often as a product attribute (by four of the eight retailers), it was not as important as product quality (table 6). Several retailers commented that price should be competitive with similar products such as hardwood lumber and edge-glued panels made from other species. One retailer commented that higher prices for edge-glued panels might be realized if panels were labeled as “solid wood construction.” Quality was ranked most important by five of seven retailers (table 6), and had an average ranking of 1.29 (where 1 corresponded to highest ranking). Product supply and price were more evenly rated, but were less important than quality to retailers.

**Table 6—Importance of price, quality, and supply as ranked by retail managers in Alaska**

Retailer	Rank		
	Price	Quality	Supply
1	3	1	2
2	3	1	2
3	1	2	3
4	3	1	2
5	3	2	1
6	NR	NR	NR
7	2	1	3
8	2	1	3
Average	2.43	1.29	2.29

NR = no response.

General impressions and comments by retailers regarding edge-glued panels:

- Panel 11 (birch, high levels of stain) was of greatest interest. It has a “calico hickory look,” and should be good for cabinet makers.
- Panel 4 (red alder, high level of character) was preferred because of its knotty look and rustic qualities.
- Should offer a wide selection of panel sizes, ranging from 8 to 12 ft long, and 4 to 12 in wide.
- Panel 1 (red alder, clear) and panel 2 (red alder, low level of character) would be preferred for interior paneling in a library or study.
- Panel 10 (moderate level of stain) and panel 11 (high level of stain) would have strong appeal for log home interiors because of their rustic look.
- Very enthusiastic about panel 11 (high level of stain) for cabinet construction in rustic applications such as log homes.
- A panel thickness of  $\frac{3}{4}$  in is “perfect.”
- For panel 7 (birch, moderate level of knots) and panel 8 (birch, high level of knots), loose knots would not be acceptable.
- Panel 6 (birch, low level of knots) would need repair to surface irregularities.
- Customers would be willing to pay a price premium for panels: should label as “solid wood construction.”
- Should consider selling birch and red alder random-width lumber instead of edge-glued panels.
- A bright appearance would be good for Alaska interiors (i.e., panel 5, clear birch).
- Panel warpage is the most important quality consideration.
- Could consider selling edge-glued rounds for table tops; could shrink wrap higher grade material.
- Recommend test marketing about 4 sizes of panels, then expand selection to 10 or 12 sizes.
- Recommend producing just two classes of panels: larger panels for interior doors, and smaller panels for kitchen cabinets.
- Should focus marketing efforts on panel 11 (birch, high level of natural stain).

These results are in general agreement with past research on retailer perceptions (Cohen et al. 1992) in which appearance attributes (such as product straightness) were more important for treated lumber than either price, or technical parameters such as grade. This is in contrast to retailer perceptions of certain commodity products (i.e., oriented strand board) (Seward and Sinclair 1988) in which more than two-thirds of respondents made purchasing decisions based primarily on price. These contrasting studies suggest if birch and red alder edge-glued panels could be successfully marketed as specialty products, price would become less important. However, it is important to note that the previous research (Cohen et al. 1992, Seward and Sinclair 1988) evaluated construction wood products, which have end uses that are considerably different from the hardwood panels evaluated in the current study.

Bowe et al. (2005) also found that price was not the most important product attribute when retailers evaluated “surfaced 4 sides” (S4S) lumber; product quality and board consistency were both higher rated than price. Seale et al. (2004) also found that price was not the most important consideration for retailers when selecting lumber from small sawmills. This nationwide study of retailers found that overall quality, consistent grading, straightness, overall appearance, and neatness were all rated more important than price.

### Past Retail Sales History

Four out of seven responding retailers indicated past experience selling edge-glued panels in their retail outlet (hardwood or softwood panels). Four out of eight retailers indicated past sales of red alder random-width lumber, and this same number indicated past sales of birch random-width lumber. Past sales experience with edge-glued panels or related products could be beneficial to retailers regarding aspects such as lead time for orders, retail displays, number of sizes to carry, and product pricing.

### Potential Market Barriers

This study identified several potential market barriers for sales of edge-glued panels including high cost, potential warpage, too many knots (for red alder panels only), and slow product delivery (table 5). Bowe et al. (2005) also identified delivery time as an important concern of retail lumber managers when stocking S4S hardwood lumber. Here, more than 90 percent of respondents indicated that a 2-week delivery time would be needed. In Alaska, ensuring a steady delivery throughout the year is often a concern for smaller seasonal producers of lumber.

One Alaska retailer commented that incentives for home hobbyists to purchase edge-glued panels in retail outlets might be poorly defined. This could suggest the need for product education, developing an attractive display, or shrink-wrapping panels to promote sales of a new product to existing customers. Wang et al. (2004) found that developing and expanding markets for character-marked products requires a collaborative process between participants such as loggers, lumber manufacturers, wood products producers, and retailers. With smaller firms in Alaska, one or more of these functions may be conducted by a single person, most often the business owner. In these cases, the relationship between a business owner and the retail manager (or store manager) could be very important.

The tendency for retailers to treat all solid hardwood products as lumber could be an additional barrier. As discussed previously, this seemed evident when interviewees were asked to identify optimal dimensions for the edge-glued products. The results corresponded closely with typical hardwood lumber dimensions. Thus, a lack of familiarity with edge-glued hardwood panels to be used in appearance-based applications seemingly will be an additional barrier to more widespread use of edge-glued red alder and birch panels in Alaska. Otherwise, edge-glued panels will be competing directly with hardwood lumber from the perspective of many retailers. This could create a competitive disadvantage for edge-glued panels owing to the additional gluing and manufacturing that would be required.

## **Conclusions and Implications**

Retailers serve as an important link in the wood products supply chain, and therefore their perceptions are important in determining success of wood products in the marketplace. It is not uncommon for retailer and consumer viewpoints to differ, indicating the importance of accurately assessing both groups (Brinberg et al. 2007; Bumgardner et al., in press). Final determinations of whether to market products such as edge-glued panels should be based on combined input from retailers, consumers, and manufacturers.

Smaller producers wishing to market edge-glued panels can take advantage of their flexibility and small size. Seale et al. (2004) surveyed lumber retailers to determine characteristics that they sought in vendors, including number of products to carry, volume, and cost. Smaller producers, compared to larger producers, can overcome disadvantages in pricing by emphasizing customer service and embracing broad viewpoints of product quality.

In Alaska, the firms most likely to start producing edge-glued panels would be from two groups: (1) small sawmill owners who would continue producing both lumber and edge-glued panels and (2) custom cabinet or furniture producers.

On larger scales, stand-alone production facilities could be considered to produce standard-size panels. An important decision for smaller producers is providing the correct level of customer service (e.g., selling panels directly to consumers, through small retail outlets, or through big-box stores). Past research in Alaska has identified that finding suitable selling arrangements between relatively small lumber producers and retailers could be a potential barrier to successful sales programs (Nicholls 2001). Thus, producers may want to “test the waters” with small retail outlets or possibly hardware stores that carry wood products.

This research has found that retailers prefer birch panels having high levels of natural stain (versus knots). Key practical issues identified by retailers centered on product size, dimensional stability, and delivery time. Although product cost was not rated as important as overall quality or product supply, it was still a consistent theme often cited when retailers were asked to list important product attributes. Because many edge-glued panels already on the market are softwoods produced in large quantities, it would be difficult for Alaska producers to compete directly against these products. Therefore, hardwood panel producers would need to identify niche qualities that would induce consumers to purchase these more expensive panels.

Significant niche markets for character-marked wood products are possible when products are targeted at a given segment within a diversified group of consumers (Wang et al. 2004). In niche market strategies, a product is perceived as being unique on an industry-wide basis (Bush et al. 1991). In the context of birch panels produced in Alaska, this could involve promoting the benefits and desirable attributes of birch versus other more popular hardwoods. Natural color variations and unique grain patterns could help distinguish Alaska birch from these species. However, successful product differentiation strategies might be difficult for smaller producers having limited resources for promotion, advertising, and customer support (Bush et al. 1991).

A limitation of this study was that only eight interviews were conducted, and these occurred within three cities in Alaska (Fairbanks, Anchorage, and Wasilla). Therefore, these findings might have only limited relevance to broader markets. However, to the extent that birch lumber is produced at sawmills within these markets, it is hoped that producers who may be considering production of edge-glued panels will find these study results helpful. Furthermore, it is possible that the extended interview format elicited more thoughtful responses than would a standardized survey.



## Metric Equivalent

When you know:	Multiply by:	To find:
Inches (in)	2.54	Centimeters
Feet (ft)	.305	Meters
Board feet, lumber scale	.0024	Cubic meters, lumber

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