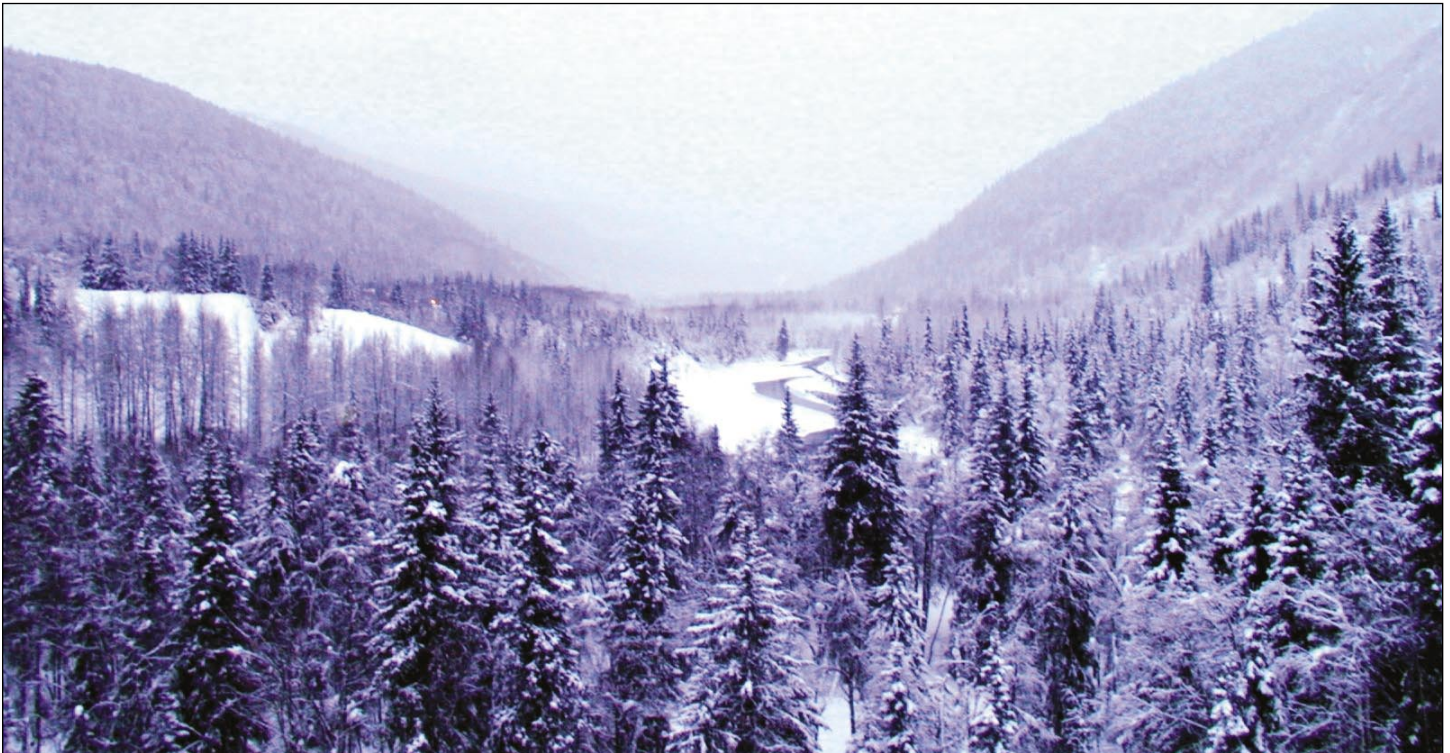


## ALASKA FOREST PRODUCTS: USING RESOURCES WELL



### IN SUMMARY

Despite abundant forest resources in the state, the Alaska forest products industry declined throughout the 1990s and early 21<sup>st</sup> century. In a state with lots of trees, mills are going out of business and most finished lumber used in the state is imported from the lower 48 United States and Canada.

The Alaska Wood Utilization Research and Development Center (Wood Utilization Center) was established in 1999, as part of the USDA Forest Service Pacific Northwest (PNW) Research Station. Its goal was “to put the value in value-added,” as one observer said—finding technological and economic solutions for a durable forest products industry in Alaska.

Forest products work begins when the tree is cut. The Alaska Wood Utilization Center team carries out studies and pilot projects on every step of the process from the forest to the sawmills and on through to retail marketing.

They have found that wood recovery could be improved at nearly every sawmill in Alaska. Strong potential exists for sawmills to add kilns to dry lumber, which could sell at higher prices. Special grades based on the qualities of Alaska woods would increase lumber values further. Wood residues such as chips and sawdust should be viewed as resources instead of wastes. Value-added products could supply the domestic market in Alaska. Specialty products such as birch craft and cabinetry may bring higher prices if they are sold as made-in-Alaska products.

The Alaska Wood Utilization Center’s goal is to find ways to make the best possible uses of forest resources in Alaska. The team works closely with universities, state and other government agencies, and industry to achieve that goal. Better use of forest resources gives people possibilities for viable businesses and helps to sustain communities.

## What are the challenges facing the Alaska forest products industry?

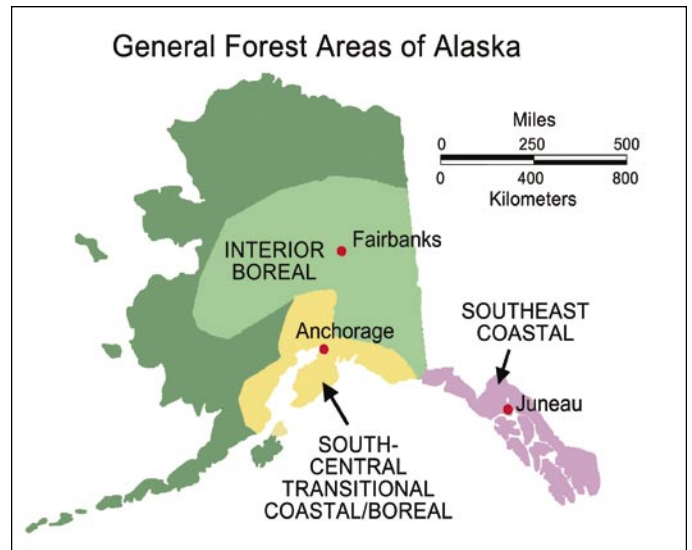
Alaska has abundant forests with both hardwood and softwood species, and yet the forest products industry in the state declined steadily through the 1990s and early 21<sup>st</sup> century. Congress established the Alaska Wood Utilization Research and Development Center in 1999 to “identify and evaluate ‘value-added’ activities that may provide a durable mix of employment, profits, and forest products industry in Alaska.”

The center’s mission is as extensive as the forest products industry in Alaska, which stretches from interior Alaska to the southeast Alaska panhandle (see map). The sawmill industry in Alaska currently includes four mills that manufacture 10 million board feet (MMBF) or more of lumber per year, and more than 100 small mills, many of which are family-run businesses, often producing less than 1 MMBF of lumber per year.

Perennial challenges for the industry were the distances from forests to markets, limited capacity for making value-added products, high labor and energy costs, and mills less efficient than mills in other regions. Added to those factors were beetle-killed spruce on the Kenai Peninsula, yellow-cedar decline in southeast Alaska, and reduced harvest from federal forests in southeast Alaska.

The most obvious market for local mills is the domestic (within Alaska) market. For solid wood products, the domestic Alaska market is estimated at between 90 and 100 MMBF per year. Of that total, the estimated demand for kiln-dried lumber is 65 to 70 MMBF per year.

Yet Alaska sawmills export most of their wood as rough, green lumber. Construction and retail businesses import about 80 to 90 MMBF per year of finished lumber and other wood products from the lower 48 States and Canada. This “coal to Newcastle” situation occurs because the Alaska



John (Chris) Maisch (by permission)

Alaska has three forest regions. The *southeast coastal forest* covers the islands and fjords of the Alaska panhandle. Dominant species are western hemlock and Sitka spruce. The *south-central transitional coastal/boreal forest* grows on the Kenai Peninsula and other areas of south-central Alaska. Sitka spruce and white spruce are dominant species. To the north, the *interior boreal forest* extends across the interior of Alaska. Paper birch, balsam poplar, and aspen are mixed with white spruce.

wood products industry evolved in such a way that it manufactures few value-added products.

The Alaska Wood Utilization Center team begins its studies when the trees are being harvested. Ken Kilborn, team leader for the center, explains, “We have a broad spectrum of research topics revolving around the primary and secondary wood processing industries—wood products technology, lumber recovery, dry kilns, wood energy, wood waste products, birch and alder products, economics research, and marketing research.”

One focus of the research is how to get maximum productivity and economic return from the resources available. “If we can get higher recovery from saw logs delivered to sawmills, then we can meet wood product demands with fewer trees,” says Kilborn.

## Could Alaska sawmills improve their lumber recovery, making better use of the available logs?

Yes. Wood recovery could be improved at nearly every sawmill in Alaska. Cutting logs into boards is the first major step in manufacturing wood products, and this step was a logical place for the Alaska Wood Utilization Center team to start its work.

Ken Kilborn studied lumber recovery at softwood mills in Alaska from 1997 to 1999. Although about 70 softwood sawmills were operating in Alaska in those years, the 22 mills evaluated produced over 90 percent of the softwood lumber manufactured in the state. “I found that lumber recovery at most Alaska sawmills was lower than in other areas of the United States,” Kilborn says.

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Bob Szaro

*In southeast Alaska coastal forests, the primary softwood species are western hemlock and Sitka spruce; the main hardwood species is red alder.*

“Many of the improvements needed could be achieved inexpensively,” Kilborn notes, “requiring only more aggressive quality control and maintenance programs.”

***If Alaska sawmills improved their lumber recovery, it would be a considerable savings of forest resources—and would lead to greater profits for mills.***

Oversizing was a significant problem. When cutting lumber, operators need to allow for shrinkage, variation, and planing. Thus a standard 2 by 4, for example, is cut oversized, but only by 0.25 inch or less. In many Alaska mills, however, the oversizing was excessive. Although the amount was slight for each board cut, cumulatively a great deal of potential wood products was lost. This problem can be corrected largely through machine settings, alignment, maintenance, or quality control programs, with little new investment required.

### **Key Findings**

- Wood recovery (recovery of products per unit of log volume) could be improved at nearly all sawmills in Alaska, which would improve their competitive position. Improved practices and quality control could increase recovery significantly, with minimal cost.
- Kiln-dried lumber has a significant price premium (gain in market value) over undried lumber. For Alaska wood, the drying premium for hardwoods is estimated at \$924 per thousand board feet (MBF), and the drying premium for softwoods at \$247 per MBF. To get these premium prices, particularly for softwoods, the kiln-dried lumber must be graded and stamped according to standardized criteria and rules.
- Wood residues produced by sawmills can be used to produce energy, including onsite energy for dry kilns or offsite energy to heat buildings. Wood residues also can be used to produce wood compost, and combined with fish wastes to produce a high-nutrient compost.
- Consumers seem willing to pay significant price premiums for made-in-Alaska and character-marked birch products. For birch lumber to be commercially successful, log supplies must be dependable and moisture content must be controlled consistently.





*Circular saws cut much wider kerfs than bandsaws. Some wood is lost as sawdust.*

Sawing variation was another major problem. Total variation of  $\pm 0.03$  inch is a goal set by many sawmills in the United States and Canada. Some variation can be reduced by proper alignment of the saw and attention to mill adjustments, but new equipment is often required to truly minimize variation. “Many Alaska mills are still using circular saws,” Kilborn points out. Bandsaws have thinner blades than circular saws and cut a much thinner kerf. This improvement would require investment in new equipment, and maintenance costs can be higher for bandsaws than for circular saws.

The study found that if Alaska sawmills attained the average lumber recovery achieved by modern sawmills in the Pacific Northwest, the mills could maintain their current production levels with 41 percent fewer logs. This improvement in efficiency would be a considerable savings of forest resources—and would lead to greater profits for mills.

## **What changes would be needed for the Alaska forest industry to manufacture and sell value-added wood products?**

Another way sawmills can improve their competitive position is to manufacture value-added products. “Before the export market collapsed in the 1990s, it was profitable for Alaska’s timber industry to sell logs and cants,” Kilborn explains, “so

***The more volume of wood the industry could put into value-added products, the more likely it would have thriving, sustainable companies, whether large or small.***

they didn’t invest in the equipment needed to make value-added products. After the export market collapsed, the mills couldn’t afford to invest in needed equipment.” (Cants are the initial piece of lumber made from a log by sawing off two or more sides, essentially “squaring the log.”)

Forest product technologist Joey Pavia adds, “Alaska was doing primary processing—at most, mills were making cants and selling them to Japan.”

A promising approach, then, would be for the Alaska wood industry to change from one that survives on high volumes of raw wood, to one that thrives on high values of processed wood. The more volume of wood the industry could put into value-added products, the more likely it would have thriving, sustainable companies, whether large or small.

Most value-added products require kiln-dried lumber, and few Alaska sawmills have kilns. In a study published in September 2001 by forest product technologists Dave Nicholls and Ken Kilborn, they found that statewide, operating kilns had a capacity of about 81 thousand board feet (MBF) for softwood lumber and 13 MBF for hardwood lumber. Nicholls estimates that because of this limited capacity, only a little more than 2 MMBF of Alaska-produced lumber is kiln dried per year, out of total Alaska lumber production that might currently be 60 or more MMBF per year. Most kiln-dried volume is softwood.

Kiln-dried lumber has a significant price premium (gain in market value) over green (undried) lumber, with the drying premium especially significant for hardwoods. The Wood



*For small sawmills, adding a dry kiln is one way to increase product value. Kiln-dried lumber must be grade stamped, certifying its moisture content, to get the full value premium. Wood residues at sawmills can be used as the energy source to heat kilns.*



*Grade-stamped, kiln-dried lumber can be sold in construction and retail markets and used to make other secondary products.*



Utilization Center study established that in Alaska, the lumber drying premium is estimated at \$924 per MBF for hardwoods, and \$247 for softwoods. Although the per-unit drying premium is less for softwoods, the total economic effect for Alaska could be greater owing to the larger volumes of softwood lumber dried.

Nicholls and Kilborn found that kiln-dried lumber and secondary products are keys to supplying the domestic Alaska market for wood products. They concluded that “strong potential exists for further development of the dry-kiln industry in Alaska to meet domestic demand, and for further opportunities for value-added processing of lumber products.”

The team has found that Alaska mill owners are highly interested in kiln drying and want technical information. Response has been very positive to several workshops on kiln technology held in communities around the state; workshops were sponsored by the Juneau Economic Development Council under the leadership of Dan Parrent, a wood utilization specialist. Some improvements can be as simple as getting everyone to calculate moisture content in accordance with standard procedures used by wood technologists. “Some businesses need a specific moisture content,” Pavia explains. “If all parties don’t use the same standards, there’s a problem.”

Installation costs for kilns also are a problem for many Alaska sawmill operators. The USDA Forest Service Alaska Region, State and Private Forestry, administered a 2-year grant program to help small operators purchase kilns, with assistance from the Alaska Wood Utilization Center in selecting the awards. The program resulted in 18 grants awarded to help companies build kilns or storage facilities for kiln-dried lumber.

To get premium prices and to sell into retail markets, kiln-dried lumber must be graded and stamped according to standardized criteria and rules by a certified grading agency. Grade stamps certify the lumber quality, including strength, lack of defect, and moisture content, and are accepted by the construction industry and all major building codes. Thus the grade stamp program is critical for dry lumber to get full value and to be used in the construction industry, which must adhere to building codes, and in retail markets, where managers have an obligation to sell graded lumber products.

Western Wood Products Association (WWPA) is one of the agencies accredited to develop and monitor the use of grading rules in Western States, and is the agency supplying grading services in Alaska. The Alaska Wood Utilization Center team

found that there were few trained graders working full time in Alaska because so little finished lumber was produced. The Alaska Manufacturers Association is assisting WWPA in training graders for Alaska sawmills.

People at the Alaska Wood Utilization Center, other Alaska organizations, and the WWPA are working on behalf of Alaska producers through the Ketchikan Wood Technology Center, to create the data that will allow the American Lumber Standards Committee to modify existing grading rules for native Alaska species. In lumber grading, strength values are assigned based on the weakest species in a tree species group. Under current rules, many tree species that grow in Alaska



*Sawmill owners in Alaska face tremendous challenges in running profitable, sustainable businesses. This mill is located in Ketchikan.*

Bob Szaro

are grouped with weaker species in the lower 48 States, an arrangement that results in Alaska species being assigned strength values 20 to 30 percent lower than they would get on their own merits. Trees from Alaska are often stronger than trees from farther south, because slow growth rates and narrow growth rings produce wood with higher densities and stronger mechanical properties. Grading rules that differentiate Alaska species as independent marketing groups could



*Mobile sawmills can cut dimension lumber on site.*



*The large volumes of wood residues created by sawmills can be seen as wastes to be disposed of—or as resources for new, value-added manufacturing products.*

result in increased strength values for design purposes and improved markets for Alaska spruces, hemlock, and yellow-cedar.

“Lumber drying, planing, and grading would be key steps in marketing locally manufactured lumber for retail sale,” comments Kilborn. “Dried and planed lumber could be manufactured further into products such as trusses, laminated beams, flooring, kitchen cabinets, paneling, and siding.”

The team believes that a special grading rule would be appropriate for birch lumber used for cabinetry. The suggested rule would recognize that character markings that are defects in framing lumber could be a desirable feature in certain products such as kitchen cabinets.

### ***When wood chips, sawdust, and other wood residues are seen as raw material, then they become an added resource.***

Alaska yellow-cedar is stronger than most other species in the cedar group, and the wood also has the natural decay resistance typical of cedars. Geoffrey Donovan, a team member who has since transferred to a PNW Station team in Portland, studied the feasibility of using yellow-cedar for building playground equipment. Its natural decay resistance is such that wood preservative is usually not needed, an important safety consideration as uses of some wood preservatives are being limited by health concerns. Researchers collected data from manufacturers of playground equipment and then conducted a national survey to find if consumers were willing to pay a premium for naturally decay-resistant wood. A separate survey of municipal agencies will assess what factors influence their

choice of playground equipment. If this use of yellow-cedar looks promising, researchers will evaluate which segments of the playground equipment market would be the best targets for Alaska manufacturers.

### **Can wood chips, sawdust, and other mill residues be seen as raw material for new products, rather than as wastes?**

Yes, all wood fiber can be seen as a usable resource. Even with highly efficient recovery, sawmills inevitably create wood chips, sawdust, and other wood residues. When these residues are seen as wastes, they become a disposal problem and an additional cost. If the wood residues are seen as raw material, then they become an added resource.

Dealing with wood residues then becomes an integral part of the manufacturing process, not a waste disposal problem. Manufacturers can create new value-added products, get even more complete use of the total log volume, and generate more money from the same volume of logs.

Wood burns, and the most obvious use of residues is to burn them to generate energy. Wood chips have long been used as “hog fuel” to supply power for mills, but more sophisticated wood energy systems for a wider variety of uses are possible. With other energy prices rising, the wood energy field is getting a new surge of interest.

Kilns are an especially effective use for wood energy. “The energy demands would be fairly constant and predictable throughout the year,” explains Nicholls, an advantage for wood energy systems, which are most efficient if run continuously. Other advantages are that if the mill uses the residues onsite, the dry kiln energy need is stable throughout the 24-hour day without the daily peaks and ebbs of domestic energy usage, and also the mill turns a disposal problem into a resource that helps produce dried lumber. Kiln-dried lumber sells for premium values, especially if a grade stamp certifies the finished moisture content (see earlier discussion on grading).

The Alaska Wood Utilization Center team, in cooperation with the Alaska Energy Authority, studied the feasibility of wood-fired heating systems for buildings. The feasibility study was done for sites on the Kenai Peninsula, where a spruce bark beetle epidemic has killed many spruce trees.

A site in the Kenai-Soldotna area was chosen for the study. “We studied 36 scenarios,” says Nicholls, “looking at a small industrial-scale, wood-fired water heating system.” The centralized boiler system would heat water for distribution



through pipes to heat adjacent buildings. Scenarios included different wood fuel prices, wood moisture contents, and alternative fuel costs, among other factors.

“We found that a small wood-fired thermal system is economically and technically feasible,” says Nicholls. A steady wood fuel supply is vital. The best scenarios were those with low costs for wood fuel, low moisture content in the wood, and high costs for alternative fuels. These scenarios had estimated project payback periods as short as 4 years; least favorable scenarios had payback periods as long as 20 or more years.

“Some Alaska villages are looking at alternative energy resources, such as wood fuel,” comments Nicholls. “In Hoonah, a town in southeast Alaska, sawdust and trimmings from the local sawmill have the potential to heat up to six public buildings. Wood wastes could be used in Hoonah to replace about 50,000 gallons of heating oil per year.” Mill residues not needed for the village heating system could be used to run a dry kiln at the mill site.

Wood residues also can be used in other ways besides energy (see story below).

## Fish and Chips: Turning Waste Products Into Resources

“Aged wood wastes such as sawdust, chips, and bark can be marketed as a landscape cover, mulch, or higher value potting soil,” says Nicholls. Within Alaska, the main market for these types of products is the Anchorage metropolitan area.

Alaska also has excellent potential for a composting industry. In partnership with researchers at Iowa State University, the Alaska Wood Utilization Center scientists are developing ways to compost wood and fish wastes together—a “fish and chips” for gardens. The state has clean and abundant feedstocks of both wood residues and fish wastes. (In this context, “clean” means not contaminated with chemicals unsuitable for compost.)

Successful composting requires a certain carbon-nitrogen ratio, moisture, and temperature. Types and ratios of raw materials, size and shape of compost piles, and management of piles are all factors that affect the outcome of the composting process. Three types of systems can be used: in-vessel (most expensive); windrows (low tech, least expensive); or aerated static piles (ventilation pipes in windrow piles, mid-range system). Currently the team is examining the effects of moisture conditions, wood size, and wood porosity on the composting process.

Wood wastes and fish wastes complement each other well in composting, because wood is high in carbon and low in moisture, and fish is high in nitrogen and moisture. Final compost is a high-quality product, loaded with nutrients and a good soil conditioner.

Kake Foods Inc., a subsidiary of the Kake Tribal Corporation, has a successful compost project in operation already, independent of the Alaska Wood Utilization Center. Kake



*Alaska has a lot of both wood residues and fish wastes—and the two can be composted together to make a high-quality garden compost sold to consumers.*

is a village of about 800 people on Kupreanof Island in southeast Alaska. The wood-and-fish compost project uses salmon gurry, seafood processing waste, sawdust, and other wood residues as inputs. Materials are mixed in windrows and turned regularly throughout the 75-day composting to aerate the piles and keep them moist. Some odor is created, so the project site is out of town and fenced to keep out bears.

The final product is packaged in 25- and 50-pound bags for home gardeners, and marketed either as “Alaska Thunder Dirt” or under the private labels of some big chain stores. The enterprise creates jobs and strengthens the town’s existing businesses: salmon fishing, cannery, and sawmill. Kake Foods won a “showcase business” award for the compost project in 2002, received at the National Summit on Emerging Tribal Economies.





*Birch logs. Alaska paper birch is widespread in interior and south-central Alaska.*

## Can Alaska hardwood species such as paper birch and red alder be used for value-added wood products?

Yes, paper birch and red alder can be used for specialty lumber, furniture, and craft products. Almost all birch lumber produced in Alaska is used within the state. But because a limited quantity of domestic birch lumber is available, much birch lumber sold at the retail level in Alaska is actually imported from the Eastern United States.



*Birch paneling.*

The birch products industry in Alaska is limited by some of the same factors as the softwoods timber industry, such as a scarcity of kiln-dried, graded lumber. The quantity and quality of birch saw logs available to mills also has been limited, and without a dependable supply, mills cannot equip for making birch products. As a result, birch craft items from producers outside Alaska are common in Alaska's markets, and

these imported birch crafts often are lower priced than made-in-Alaska birch craft.

For birch lumber to be commercially successful, log supplies must be dependable, and moisture content of the product must be controlled consistently. For birch lumber used to produce specialty items, appearance variations from small knots and heartwood-sapwood color contrasts are desirable.

The Alaska Wood Utilization Center will complete a study of lumber recovery in birch mills that will be a companion study to the softwood lumber recovery studies.

Red alder is abundant in southeast Alaska. It has grown in second-growth forests after timber harvest or natural disturbances and also grows prolifically along roadsides and in old roadbeds. The wood has a uniform grain, good strength, and stains easily, so it has good potential for furniture. There are many forest management reasons for cutting red alder, and the tree grows back quickly, so a red alder industry would seem to have many advantages for sustainable community-level enterprises in southeast Alaska.

Yet little commercial harvest of red alder occurs. The Alaska Wood Utilization Center team is researching marketing strategies to use alder wood for high-value wood products. If red alder can be used for furniture instead of firewood, it becomes much more valuable. Alder is the major species used for manufacturing furniture in California and Oregon.

Nicholls and Donovan began a study on consumer preferences related to red alder, as a first step in developing marketing strategies. Joe Roos, research marketing specialist, has now joined the project. The team set up a booth at home shows in Seattle and Anchorage where they conducted a survey to determine consumer preferences for various woods. They found that out of the eight woods displayed in the booth, red alder

ranked lowest for consumer willingness to pay extra for it. Red alder was most popular with younger, high-income people. People liked red alder more when they **didn't** know its name. "The survey shows that red alder needs to be marketed on its visual qualities, not its name," comments Roos, "until people get more familiar with it."



*Birch syrup is an unusual gourmet food product made from birch sap.*





*Alaska birch craft products. Counterclockwise: birch bowl, salad utensil, birch-bark basket, cabinet made from character-marked birch lumber.*

## Birch Craft and Art Furniture

Sales of Alaska-made birch craft products increased 56 percent over the 3-year period from 1999 to 2001. These sales are primarily domestic (within Alaska), to both tourists and residents.

Over 100 companies in Alaska make birch craft products of some type. The birch craft industry should benefit from trends to kiln dry more Alaska birch lumber and do more secondary wood processing within the state. Tourism is increasing in Alaska, also a positive trend for the birch craft industry.



*For specialty products from birch lumber, appearance variations from small knots and color contrasts can be desirable.*

The consumer preference survey also showed that although a made-in-Alaska brand is a strong marketing advantage for birch products, currently it is not an advantage for red alder products. The reasons for this are not clear yet.



*In birch logs, heartwood-sapwood color variations can be a positive value.*



*Marketing specialists surveyed consumer preferences for cabinetry of different woods at home shows in Seattle, Washington, and Anchorage, Alaska.*





*Southeast coastal forests. In southeast Alaska, challenges include changing forest management, no highway access, and long distances to both mainland Alaska and the Pacific Northwest.*

## Is the Alaska Wood Utilization Center working with other people on these problems?

Yes. The Alaska Wood Utilization Center's mission includes "working with community partners." Those partners include people in the wood products industry, small town governments, resource development councils, Chambers of Commerce, extension programs, universities both in Alaska and the lower 48 States, and other federal and state agencies.

"Part of our goal with forest products research is both to meet needs for wood resources sustainably, and help sustain communities," comments Cindi West, assistant director for the PNW Research Station.

*The center's partners include people in the wood products industry, small town governments, resource development councils, Chambers of Commerce, extension programs, universities both in Alaska and the lower 48 States, and other federal and state agencies.*

"We've got interagency cooperation as good as I've ever seen," says Kilborn. "We work closely with the Wood Technology Center in Ketchikan, the Juneau Economic Development Council, and the University of Alaska Southeast forest products program, to make sure we're not duplicating each other's work. Part of the key to our success is to make sure everybody else working on these issues knows what we're doing."

Communities such as Hoonah are working with the center because they have a strong interest in wood energy projects. In many cases, people understood the problems in the wood products industry but had no resources to research problems or try pilot projects.

The Alaska Wood Utilization Center has a strong emphasis on technology transfer—in other words, getting the research findings to people who can use them. Peer-reviewed articles in wood products technology journals are still the foundation of the center's portfolio. Staff also organize workshops and conferences, publish in trade journals, and make presentations to as many groups as possible about their findings. Workshops are designed for people involved with sawmilling, harvesting,

and marketing wood products and are held where these people live. In early 2003, for example, 8-hour workshops on uses and markets for yellow-cedar and red alder were held in small towns such as Ketchikan and Craig.

Bridget Kauffman, technical information specialist, has started a newsletter called "Alaska Wood Tides" that sends the latest news to interested people all over Alaska. She also set up, writes material for, and maintains the center's Web site (see "Resources on the Web"). "Each newsletter features several stories on one topic, such as birch or wood waste," says Kauffman, "and includes other information as well, such as our latest publications." Responses have been overwhelmingly positive to the newsletter and other communications.

## What role will Forest Service research have with Alaska wood utilization in the future?

Education and change are as important for survival in the Alaska forest products industry as they are in any other 21<sup>st</sup>-century industry. "The Alaska timber industry is in flux," comments Roos. "We're producing information that's useful for small as well as larger operations."

Kilborn notes, "Engineered wood products such as oriented strandboard are the big growth market in wood products right now. Making these products requires multimillion-dollar investments, and companies need a reliable long-term wood supply to do that. For a product like laminated beams, an operation can start out small and grow, but this is not the case for oriented strandboard."





Tom Iraci

*The Alaska Wood Utilization Research and Development Center is located near the waterfront (left) in Sitka, Alaska. At the center, forest product technologists, research economists, and research marketing specialists look for ways to make the best possible uses of Alaska forest resources that are available for harvest. Front row, left to right: Joe Roos, Bridget Kauffman. Back row, left to right: Dave Nicholls, K. Joey Pavia, Ken Kilborn.*

“Some Alaska mills might get into producing the dimension lumber that goes into glu-lam beams,” Roos remarks. These structurally glued, laminated beams also are a growing market.

The Alaska Wood Utilization Research and Development Center has its core mission in its name—research and development. “In wood products,” Cindi West says, “Forest Service research will carry out feasibility studies and pilot projects, solving problems in technology, manufacturing, and marketing.”

“Forest Service research creates knowledge for others to use.”

## Contacts

All contacts below are at the Alaska Wood Utilization Research and Development Center, PNW Research Station.

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K. Joey Pavia, kpavia@fs.fed.us

## For Further Reading

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## Resources on the Web

Alaska Wood Utilization Research and Development Center:

<http://www.fs.fed.us/pnw/sitka>

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### **Publications from Pacific Northwest Research Station**

- ***2002 Science Accomplishments of the Pacific Northwest Research Station*** (March 2003)
- Quarterly list of new publications (ask for the most recent one)
- ***PNW Science Findings*** (monthly publication)