



REPORT TO THE ALASKA TIMBER JOBS TASK FORCE DIVISION OF ECONOMIC DEVELOPMENT

ADMINISTRATIVE ORDER 258, TASK 8: ALASKA'S TIMBER RESOURCE AND WOOD PRODUCTS

PURPOSE

During May 2011, Governor Sean Parnell established the Alaska Timber Jobs Task Force (hereafter Task Force) to review and recommend actions related to:

- management of state-owned forest land, establishment and expansion of legislatively-designated state forests, and state timber harvesting statutes and regulations; and
- Tongass National Forest management, Southeast Alaska land ownership, timber supply and demand, current and potential wood products, and additional research needs.

The purpose of this report is to provide information related to Administrative Order 258, Task Eight objectives including: 1) reviewing current wood products; and 2) identifying potential new products and uses that could be developed pending an increase in timber supply. Notably, while the Administrative Order notes a focus on the Tongass National Forest (hereafter Tongass), the Task Force agreed to adopt a wider scope and explore wood products across Alaska, with particular focus on Southeast. Furthermore, additional background is provided regarding the status of Alaska's timber industry across various regions and Alaska's timber resource.

BACKGROUND

Alaska's forests have supported families, businesses, and communities for generations. Alaska Natives harvested wood products for subsistence uses. Homesteaders utilized wood products as they built homes, infrastructure, and communities. Eventually Alaska's timber resource, particularly in Southeast, became heavily commercialized. The commercial timber industry became a major regional economic driver as a pulp industry grew, supported by ample Tongass timber supply. Pulp mill companies thrived, sawmills kept busy, and small businesses flourished across Southeast Alaska. In short, the timber industry and associated wood product businesses drove a population and economic boom across Southeast Alaska that lasted for decades.

The commercial timber industry peaked in Southeast during 1989 with more than one billion board feet harvested. In contrast, the past ten years have yielded harvests measured only in million board feet (mmbf); only 31 mmbf were harvested during 2011. Implementation of federal policy regarding the Tongass National

Forest continues to evolve through the varied and inconsistent execution of the 2008 *Tongass Land Management Plan* (TLMP). The timber industry and wood products businesses operate in an uncertain business climate and without sufficient timber supply. The industry that once drove an economic boom is a shadow of its former self. An overwhelming majority of Southeast communities have experienced significant population decline over the past ten years as families migrate out of the region in search of economic security elsewhere. Secondary impacts of population loss have had far reaching consequences in many communities including declining school enrollments, decreasing municipal tax bases, and difficulty in transitioning to alternative local economic drivers.

In contrast to Southeast, Southcentral and Interior are absent a history of heavily-commercialized wood product industries, but rather have significantly smaller businesses primarily supported by State of Alaska timber sales. Through changing times and as the cost of energy continues to escalate, the Interior has experienced increased demand for small diameter and waste raw material for woody biomass fuel development. Over the past decade, there has been a slow decline of small family-owned mills in the Interior, but an overall increase and focus on value-added wood product development. White spruce is the Interior's primary softwood, but only a handful of mills produce graded lumber. Although the large majority of the Tanana Valley State Forest is located within 20 miles of the state highway system, the high cost of fuel makes harvesting and transporting timber an economic challenge.

Southcentral and Gulf Coast regions have experienced significant declines in the quality of timber as both regions suffer from widespread bark beetle infestations. In the Anchorage and Matanuska-Susitna (Mat-Su) metropolitan areas, the State of Alaska continues to provide commercial timber sales as the Mat-Su Borough has not posted timber sales in over five years. Decreased housing starts have resulted in less land clearing and increased demand on the state to provide firewood sales for both personal and commercial markets. Much of the Southcentral industry focuses on value-added product development including log cabin kits, dimensional limber, custom beams, and other building materials.

ALASKA'S TIMBER RESOURCE

Alaska's timber resource is composed of boreal and coastal forest species primarily located in Southeast, Southcentral, and the Interior. The forests of Interior and Southcentral are generally referred to as boreal forests. South to north, these forests stretch from Kenai Peninsula to the Tanana Valley to the foothills of the Brooks Range. East to west, they extend from the Porcupine River near the Canadian border to the Kuskokwim River Valley. The nation's second largest national forest, the Chugach National Forest, is located in Southcentral Alaska and encompasses approximately five million acres, including Prince William Sound and much of the Kenai Peninsula.

Boreal forests are home to white spruce, quaking aspen, paper birch, black spruce, balsam poplar, and larch. Extreme climatological variation and short growing seasons cause most of the trees to have tight growth

rings, making the wood prized for strength and beauty. The timber industry in Southcentral and the Interior are largely limited to small mills and cottage manufacturing industries.

Alaska's coastal forests range from the Southeast panhandle to Kodiak Island. Southeast, in particular, is the most densely-forested region in Alaska and home to the nation's largest national forest – the Tongass National Forest. The Tongass encompasses nearly 17 million acres and covers 80 percent of Southeast Alaska. As a coastal rainforest, primary species include Sitka spruce, western hemlock, mountain hemlock, western red cedar, and yellow cedar. Mountain hemlock dominates the upper slopes. Sitka spruce, both cedars, and western hemlock dominate the lower slopes. All species of the coastal rainforest are valued for durability, versatility, and beauty. Southeast's timber industry ranges from exporting unprocessed logs, to sawmills, to value-added wood product cottage industries.

ALASKA TIMBER, PROPERTIES, AND PRODUCTS

Although virtually any wood can be adapted to accommodate a particular use, certain species are far superior for certain applications. Notably, the critical factor is linking unique wood properties to their highest and best use. The properties of the wood materials will drive market values; a successful match between properties and highest use will yield the greatest market value. In total, there are approximately eight wood species, located primarily across three Alaska regions, with a strong market value based on properties and uses.

Table 1. Alaska Timber, Properties, and Products

Select Species	Location	Characteristics and Properties	Example Products	Grading Available
Alaska Hemlock - Western - Mountain	Western - Southcentral and Southeast Mountain - Southcentral, from the Kenai Peninsula to Southeast	<ul style="list-style-type: none"> - takes paint, glue, and varnish well - moderately hard, strong, and light weight - very wet - low decay resistance - Machines well 	<ul style="list-style-type: none"> - framing lumber - posts and beams - laminated beams - plywood - pulping - molding and trim 	Yes
Sitka Spruce	Southeast, Prince William Sound, Kodiak Island, Kenai Peninsula, and just north of Girdwood	<ul style="list-style-type: none"> - takes glue, paint, and varnish well - high strength to weight ratio - moderately soft and light weight - long and high density fibers - good resonance quality - clear and straight grain in higher grade spruce 	<ul style="list-style-type: none"> - airplanes and boats - veneers - millwork - pulping - musical instruments - light framing - ladders/scaffolding 	Yes
Western Red Cedar	Southeast	<ul style="list-style-type: none"> - takes paint, glue, and varnish well - low thermal conductivity - very light weight - dimensional stability - high resistance to decay 	<ul style="list-style-type: none"> - siding - sheathing and subflooring - shingles / shakes - decking - furniture - posts and poles - outdoor uses 	

Alaska (Yellow) Cedar	Southeast	<ul style="list-style-type: none"> - extreme durability - resistance to acid and fire - very workable - uniform texture - strong odor - dimensional stability - easy to kiln dry - low nail-holding capacity - heavy 	<ul style="list-style-type: none"> - boat building - carving - window frames - storage tanks - canoes and paddles - bridge and dock decking - doors - molding and trim 	Yes
Red Alder	Southeast	<ul style="list-style-type: none"> - uniform texture - moderately strong and lightweight - excellent for machining - takes glue, paint, and varnish well 	<ul style="list-style-type: none"> - fine furniture - cabinets - pulpwood 	
Black Cottonwood	Southcentral and Southeast	<ul style="list-style-type: none"> - lightweight - uniform texture - soft and moderately weak - takes nails well, but low nail-holding capacity 	<ul style="list-style-type: none"> - plywood core - boxes and crates - pulpwood - excelsior 	
White Spruce	Throughout most of Alaska, but absent from the Northern, Western, and Southwest Regions	<ul style="list-style-type: none"> - good for machining - excellent resistance to nail splitting - good nail and screw holding ability - very good for gluing 	<ul style="list-style-type: none"> - pulpwood - lumber - insulating board - particle board 	Yes
Paper Birch	Throughout most of Alaska	<ul style="list-style-type: none"> - excellent for machining - good resistance to nail splitting - very good nail and screw holding - good for gluing 	<ul style="list-style-type: none"> - pulpwood - utensils - flooring 	

Source: Southeast Timber Task Force Report (1997)

STATEWIDE WOOD PRODUCTS

The federally-recognized North American Industry Classification System (NAICS) contains 34 forestry-related business types including timber harvesting, timber processing, direct and indirect forestry support, and manufacturing activities (Appendix A). In total, the Alaska Department of Commerce, Community, and Economic Development's (DCCED) Business License database contains 472 current licenses for wood product businesses spanning 24 distinct business activities across three NAICS lines of business including: 1) agriculture, forestry, fishing, and hunting; 2) manufacturing; and 3) trade. These 472 businesses can be further aggregated into 17 similar business activities (Table 2).

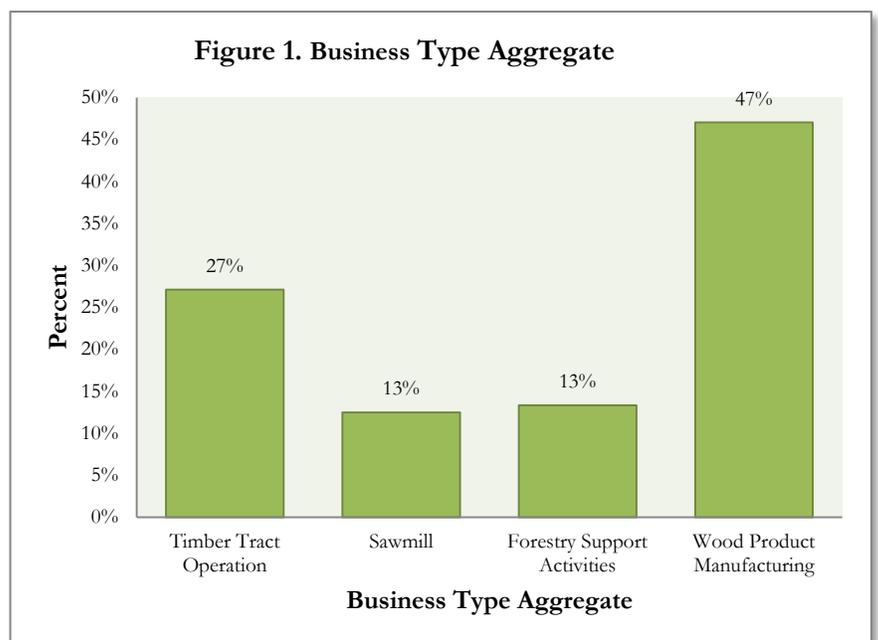
Approximately one-quarter (27%) of all licensed wood product businesses are timber tract operations (i.e., logging). Twelve percent (12%) are traditional sawmills and nine percent (9%) are forestry support activities. Notably, one-quarter (24%) are classified as "all other miscellaneous wood product manufacturing businesses", which generally represents small cottage wood product businesses that are not adequately described using traditional wood product terminology. The remaining 28 percent (28%) of Alaska's forest

products industry includes a wide array of business types including building material manufacturing, household products, wholesale activities, and shipping material construction.

Table 2. 2012 Statewide Wood Product Businesses

Business Type	Statewide	Percent
Timber Tract Operations	128	27%
Other Wood Product Manufacturing	116	24%
Sawmill	56	12%
Forestry Support Activities	41	9%
Kitchen Cabinet/Countertop Manufacturing	43	9%
Furniture Manufacturing	23	5%
Wholesale	19	4%
Veneer/Plywood Manufacturing	9	2%
Custom Woodwork and Millwork Manufacturing	9	2%
Prefabricated Wood Building Manufacturing	7	1%
Woodworking/Sawmill Equipment	3	1%
Container/Pallet Manufacturing	5	1%
Window/Door Manufacturing	4	1%
Cut Stock, Resawing, Lumber, and Planning	3	1%
Other Millwork	4	1%
Reconstituted Wood Product Manufacturing	1	0%
Truss Manufacturing	1	0%
Total	472	100%

Considered more broadly, the 24 NAICS-based categories depicting Alaska wood product businesses can be further aggregated by general business type (Figure 1) ranging from timber harvesting activities (i.e., timber tract operation), to processing (i.e., sawmill), to value-added manufacturing (i.e., wood product manufacturing). Additional wood product businesses include a wide array of forest support activities that occur along the harvest to manufacturing industry continuum. Notably, timber tract operations are approximately one-quarter (27%) of all wood product



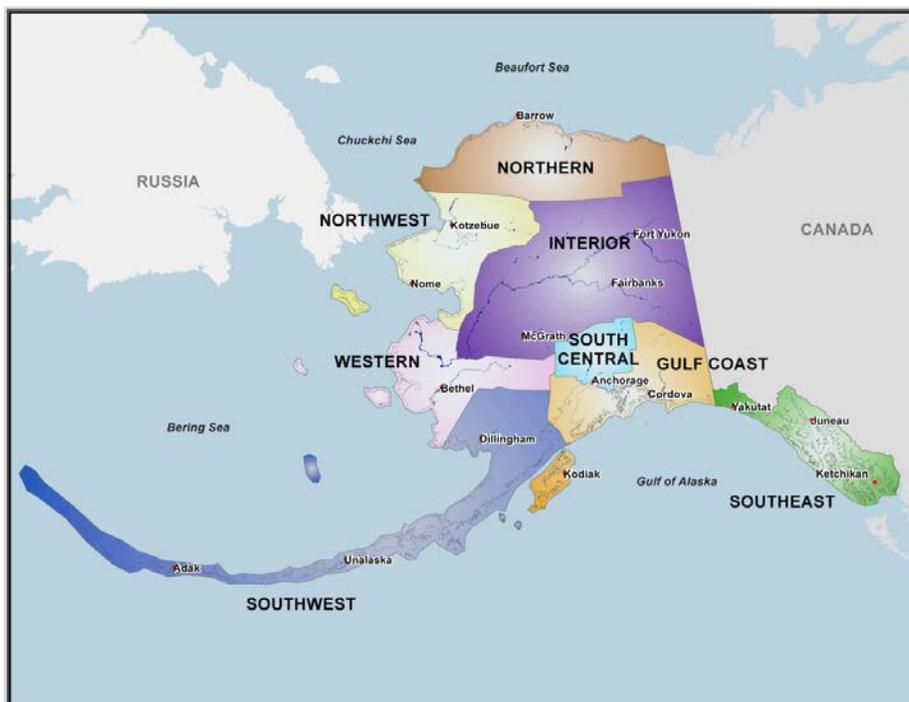
businesses, followed by sawmills (13%) and forestry support (13%). All types of product manufacturing, from household goods to packing materials, comprise 47 percent (47%) of all Alaska wood product businesses.

This brief analysis focuses on total businesses and does not address total jobs created by type of businesses nor does it account for the change in total wood products over time. Determining total business activity across all wood products and timber industry business types is a challenging task as it requires collecting and verifying data across multiple sources including federal data, state data, and on-the-ground research. Furthermore, there are many forest product businesses operating in Alaska that may not be adequately reflected in government data sources because business owners and/or operators may not fully-disclose or accurately self-report current enterprises or business activity. This brief synopsis is a point in time analysis of the DCCED business license database of current licenses.

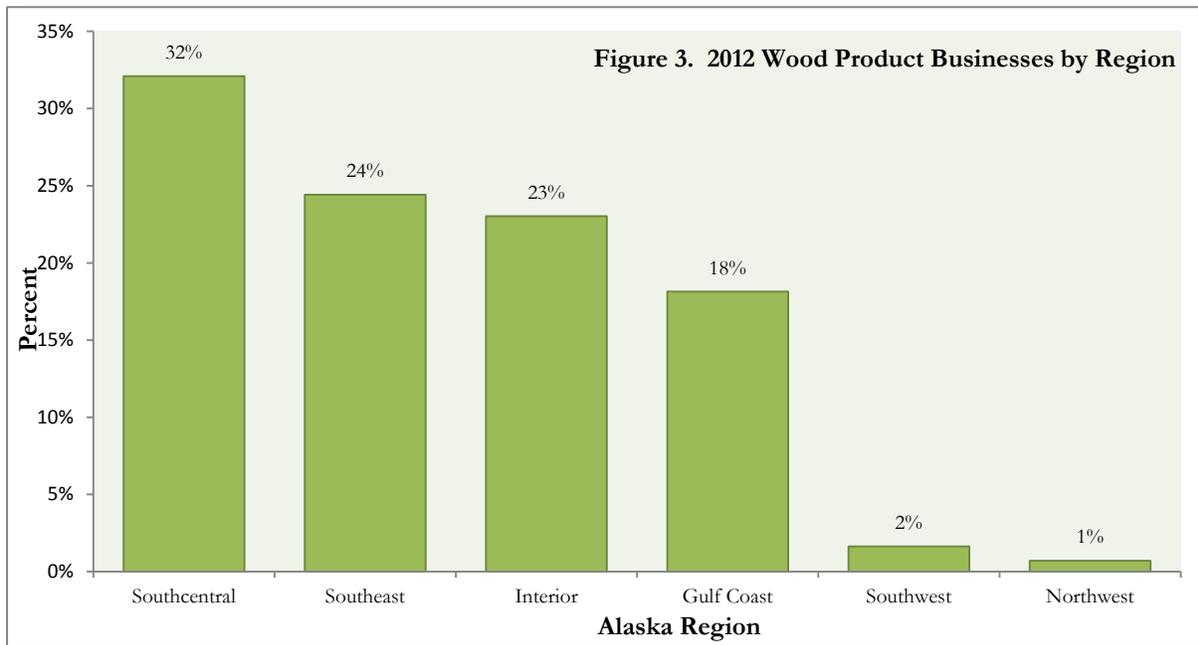
WOOD PRODUCT BUSINESSES BY REGION

Ninety-one percent (91%) of all currently-licensed Alaska forest products businesses (N = 472) are Alaska owned and operated businesses. Out-of-state businesses encompass nine percent (9%), or 42 businesses, of the entire wood products industry. Considering only Alaska-owned businesses (N = 430), Alaska's forest product businesses are spread across all six Alaska regions including Southcentral, Southeast, Interior, Gulf Coast, Southwest, and the Northwest. The highest concentrations of forest product businesses, by community, are located in Anchorage (14%), Fairbanks (10%), and Wasilla (8%) (Appendix B).

Figure 2. Alaska Regions



Although Southeast is home to the famed Tongass National Forest with world-class cedar, hemlock, and spruce timber, the region currently contains less than one-quarter (24%) of all current Alaska-owned wood product businesses (Figure 3). Southcentral has the highest percentage (32%) of all wood product businesses; just less than one-quarter (23%) of all businesses are located in the Interior. Notably, current data to describe regional distribution does not adequately represent the significant change Southeast has undergone over the past decade. Tongass National Forest timber supply has been nearly eliminated; both pulp mills and many forest product businesses have subsequently gone out of business.



Considering four aggregated types of forest products business activity, all regions reflect similar patterns of business-type distribution (Table 3). The largest quantity of businesses are wood product manufacturing entities, followed by timber tract operations; sawmills and forestry support activities comprise the fewest businesses across Alaska.

Table 3. Alaska Wood Product Business Type by Region

Alaska Region	Total Businesses	Timber Tract Operations Percent	Sawmill Percent	Forestry Support Activities Percent	Wood Product Manufacturing Percent
Southcentral	138	13%	8%	9%	70%
Southeast	105	32%	17%	19%	32%
Interior	99	31%	17%	16%	36%
Gulf Coast	78	29%	9%	18%	44%
Southwest	7	14%	29%	0%	57%
Northwest	3	0%	0%	33%	67%
Statewide Total	430				

Note: Table excludes non-Alaska owned and operated businesses (N = 42).

POTENTIAL NEW FOREST PRODUCTS

The development of value-added forest products and product diversification are critical to revitalizing and expanding Alaska's forest product industry. An increased focus on innovative products and processes demonstrates several exciting opportunities. The State of Alaska and other partners can provide assistance in overcoming some of the challenges to commercializing opportunities. In almost all cases, increasing the amount and diversity of wood products promotes Alaska's statewide, regional, and local economic interest. Not only will expanding activity increase economic wealth, but it will also serve to compete against imported goods that currently suffer costs associated with transportation.

WOODY BIOMASS

Woody biomass offers a wide variety of alternative fuel types. Through various levels of drying and/or processing, woody biomass can be converted into fuel types including wood pellets, briquettes, cord wood, wood chips, and wood flour. Sawmill residues and hog fuels (i.e., stumps, bark, tree branches) are also woody biomass options. For woody biomass to be considered as a viable replacement the fuel must be harvested, processed, and delivered at a price lower than the reported British Thermal Unit (BTU) alternative. Primary factors affecting profitability include wood availability, collection and transportation costs, processing costs, government regulation, and the relative cost of other fuels and associated BTUs. The cost of system conversion, both residential and commercial, is also a factor for buyers looking to save on energy bills.

As the cost of fossil fuels continue to escalate, woody biomass is becoming an increasingly cost-effective heating and energy option for Alaska – especially Interior and rural Alaska. The per million BTU cost of various traditional and alternative energy products widely varies. Using 2008 prices, one million BTUs generated by hydro-electric is estimated to cost \$28.69. Only wood pellets (\$26.52) and firewood (\$27.22) air dried to 16% and with a burn efficiency of 80% can compete with hydro electric power.

Table 4. Energy Product Estimated Cost per Million BTUs Summary

Energy Product	Unit	BTUs/Unit	Burning Efficiency	Alaska Price October 2008	Estimated Cost per Million BTUs
Fuel Oil	gallon	138,690	78%	\$4.39	\$40.58
Fuel Oil	gallon	138,690	78%	\$3.00	\$27.73
Natural Gas	ccf	103,000	78%	\$0.87	\$10.83
Hydro-Generated Electricity	kwh	3,412	95%	\$0.093	\$28.69
Oil-Based Electricity	kwh	3,412	95%	\$0.200	\$61.70
Propane (not all taxes/cost included)	gallon	91,333	78%	\$2.70	\$37.90
Firewood (air dry 16%, GB 50% Efficient)	ton	13,776,000	50%	\$300	\$43.55
Firewood (air dry 16%, GB 80% Efficient)	ton	13,776,000	80%	\$300	\$27.22
Pellets	ton	16,500,000	80%	\$350	\$26.52
Kerosene (not all taxes/cost included)	gallon	135,000	75%	\$3.55	\$35.06

Source: Dr. Allen Brackley, USDA Forest Service, Pacific Northwest Research Station, Sitka Wood Utilization Center (Sitka, AK)

Sealaska Corporation, the United States Coast Guard, the Alaska Energy Authority, and other organizations are implementing woody biomass energy projects in Southeast Alaska. Each woody biomass project must be evaluated in terms of overall efficiency and cost effectiveness. Location, access, and the Southeast climate presents a variety of challenge not present in the Interior or rural Alaska. For example, air drying requires significant time in Southeast with high annual precipitation levels and a consistently humid environment. Furthermore, kiln drying and drum drying can greatly increase costs due the energy needed to reach desired moisture levels. As energy demand and fossil fuel costs increase, the use of woody biomass for energy is becoming increasingly cost effective, but overall economic viability on a large-scale basis remains elusive and small-scale determinations are made on a project-by-project basis.

In comparison to wood-based cellulosic ethanol, alternative wood energy products such as pellets and bricks display a higher degree of potential. Wood pellet processing requires low-quality wood waste and small-diameter timber to create a dense fuel with high BTU levels. Low-value material unsuitable for lumber is cost-effective raw material for wood pellets and wood chips. Other processed woody fuels, including bio-bricks and industrial or commercial grade wood pellets, are also potentially viable for production and utilization in Alaska. Notably, wood pellets and other wood byproducts also serve an important disposal tool for dealing with wood waste that would otherwise accumulate and require costly removal.

A development program that funds focused research in manufacturing techniques and alternative uses is one tool to expedite the success of these wood byproducts. Greater attention to market development may also open new avenues for businesses to create side products. Allowing for experimentation and consistent wood supply to foster a supportive environment for greater product diversification may be the most important step. Challenges related to improving access to foster growth, matching species to products and products to markets, and cultivating the right mix of research and development with innovation and productivity remains the primary role of development efforts.

CELLULOSIC ETHANOL

During the past decade, research and development has addressed significant technical challenges surrounding cellulosic ethanol production. In particular, research conducted by the National Renewable Energy Laboratory (NREL) yielded significant improvements in cellulosic ethanol per gallon production costs (2001 = \$6.50 per gallon; 2010 = \$2.00 per gallon). However, even with significantly reduced per gallon cost, there are several factors that must be applied regarding the Southeast Alaska operating environment that largely render cellulosic ethanol uncompetitive with gasoline.

Crop density is a significant consideration when evaluating woody biomass cellulosic ethanol production in Alaska. Specifically, most crops used for ethanol and cellulosic ethanol production are dense agricultural crops (i.e., Iowa-harvested corn). These types of biomass grow in a dense form with high per acre volume and yield. In contrast, using woody fiber requires harvesting over significantly larger geographic areas, resulting in increased harvest, collection, and transportation costs. Increase in production expense can be minimized by increased utilization of saw dust, bark, and other woody residue currently generated by the

timber industry; however, it is unclear if waste can completely overcome challenges presented by limited per acre density.

A 2000 Sealaska Corporation and NREL study titled *Oregon Cellulose-Ethanol Study: An Evaluation of the Potential for Ethanol Production in Oregon using Cellulose-Based Feedstocks* determined 96,000 dry tons of Tongass woody biomass could be converted into six million gallons per year (MGPY) of ethanol. Of greater importance, the study also indicates a significant government subsidy is required to make Tongass ethanol competitive to wholesale gasoline prices nationwide. Under present manufacturing cost and market conditions, Tongass-generated ethanol cannot independently compete with gasoline prices.

Information gleaned from Alaska refineries and fuel suppliers indicate ethanol is not used as an additive due to its poor performance in extreme winter temperatures. Considering high production costs, limited local market, low per acre density, and climatological challenges, Alaska-woody fiber cellulosic ethanol is likely only viable for export markets when and if the production process is ever deemed economical.

In short, the economic viability of ethanol from Southeast woody biomass is remote at this time. Even in mega-agriculture environments where economies of scale can be quickly realized, ethanol production remains a subsidized venture. Like other forms of renewable energy, much of its success depends on the cost of available substitutes and the cost incentives are not currently at play to move this product form. While wood-derived ethanol is an important product form to continue exploring and one where the industry's "best thinking" should be encouraged, the economic potential appears further in the distance than other viable and alternative product uses.

NEW CONSTRUCTION PRODUCTS THROUGH INCREASED GRADING

Alaska has some of the highest quality wood in the United States. Currently only three grade stamps administered by the Western Wood Product Association (WWPA) are available for Alaska hemlock, spruce, and yellow cedar species. Grading demonstrates wood quality and properties that provide architects, engineers, and builders the ability and confidence to specify Alaska wood products for architectural and construction uses.

Grading stamps for Alaska's wood products are important, but gaps remain between marketable product and available grading stamp. A stepwise grading program, grading the highest demand and appropriate wood products first, will continue to expand the field of milled wood products for Alaska companies. An increase in lumber production and local construction activity will drive the need and support for a local grading service. With current low levels of lumber production, there is not enough business to support a local grading service. Alaska may potentially develop its own cohort of graders if supply becomes more predictable and sawmills can increase production.

SPECIALTY WOOD PRODUCTS

While specialty wood product manufacturers are a quiet segment in Alaska's forest products industry, data provided in Table 2 demonstrates a significant number of businesses. Trim, doors, cabinets, musical

instruments, furniture, and other items can be produced out of local timber including birch, spruce, hemlock, and cedar. Local and regional production of these items serves a value-added niche market based on unique wood characteristics and local market sourcing.

OTHER NEW PRODUCTS

There are many new high-value products that could originate from Alaska's renewable timber resources given a consistent timber supply, motivated entrepreneurs, and ready markets. For example, Wood Wool Cement Board is widely used in Europe to build structures, but is currently unaccredited for building structures in the United States. This product is of particular interest to Alaska because it utilizes smaller diameter timber and lower-quality wood. The end product is a board used in place of standard building materials and is ideal for use in rural communities given its durability and reduced weight for shipping and transport.

Wood-Plastic Composites (WPC) is another high-value product that could be produced in Alaska. Low-grade raw material is processed through a hammer mill to create "wood flour". The wood flour is then combined with additives and run through an extruder resulting in WPC as the end product. WPC is ideal for siding, roofing, decks, outdoor furniture, fencing, patios, and playground equipment.

DEVELOPMENT CHALLENGES AND PRIORITIES

Each potential new wood product presents unique challenges to overcome. DCCED has the statutory requirement to administer the *Alaska Forest Products Research and Marketing Program* (hereafter Program). The Program was established by the Alaska State Legislature to address many of the impediments faced by Alaska's forest products industry. Through connections with other public sector developers and greater networking with businesses, the Program will assist in addressing a number of the key challenges including:

1. Access to an adequate and consistent supply of timber. Dwindling access to timber resources is an area of intense public and private litigation that is beyond the scope of research and marketing; however, new products and increased product diversity lend strength to the argument that an increase in timber supply will result in a diversified and sustainable industry.
2. Further research is needed regarding grading impacts, new product development, full resource utilization, and maximizing manufacturing efficiencies. Additional research will redirect current public sector efforts with industry guidance on the most beneficial use of scarce public funds.
3. Workforce development remains a gap for every segment of the industry and relates directly to new product development. Many new products are artisan in nature, but core logging and milling skills remain essential to the majority of the workforce. Steady industry decline over the past decade has resulted in a generational-void. The declining industry created a significant outmigration of skilled and knowledgeable industry workers. Greater focus on workforce development, through already established public sector programs, will provide the direction and modest funding required to improve the labor supply. Increased attention to

wood manufacturing as an industry, through high school and vocational technical education, will increase the innovative energy, workforce skills, and overall productivity to obtain greater timber supply and maximize current industry efficiencies.

4. Full product utilization is an important feature for the industry. Increased focus and support should be given to products that utilize all primary and secondary timber resource materials. Many timber industries, especially those involved with wood biomass, originated as a way to utilize a waste byproduct from sawmills. In this instance, lumber was the primary product and the waste material became the secondary – both offer value to ready markets.
5. Marketing for some of the nascent high-value wood products manufacturers remains a small, but persistent need. Greater access to local markets and greater marketing tools for small operators will improve this segment of the larger industry.

APPENDIX A: ALASKA FOREST PRODUCT BUSINESSES BY NAICS

NAICS Code	Description	Total Alaska Businesses
Agriculture, Forestry, Fishing, and Hunting		
113110	Timber Tract Operations	22
113210	Forest Nurseries and Gathering of Forest Products	19
113310	Logging	87
115310	Support Activities for Forestry	41
Manufacturing		
321113	Sawmills	56
321114	Wood Preservation	0
321211	Hardwood Veneer and Plywood Manufacturing	9
321212	Softwood Veneer and Plywood Manufacturing	0
321213	Engineered Wood Member (except Truss) Manufacturing	0
321214	Truss Manufacturing	1
321219	Reconstituted Wood Product Manufacturing	1
321911	Wood Window and Door Manufacturing	4
321912	Cut Stock, Resawing Lumber, and Planing	3
321918	Other Millwork (including flooring)	4
321920	Wood Container and Pallet Manufacturing	5
321991	Manufacturing Home (Mobile Home) Manufacturing	0
321992	Prefabricated Wood Building Manufacturing	7
321999	All Other Miscellaneous Wood Product Manufacturing	113
322110	Pulp Mills	0
322121	Paper (except newsprint) Mills	0
322122	Newsprint Mills	0
322130	Paperboard Mills	0
333210	Sawmill and Woodworking Machinery Manufacturing	3
337110	Wood Kitchen Cabinet and Countertop Manufacturing	43
337121	Upholstered Household Furniture Manufacturing	3
337122	Non-upholstered Wood Household Furniture Manufacturing	10
337127	Institutional Furniture Manufacturing	5
337129	Wood Television, Radio, and Sewing Machine Cabinet Manufacturing	0
337211	Wood Office Furniture Manufacturing	5
337212	Custom Architectural Woodwork and Millwork Manufacturing	9
339992	Musical Instrument Manufacturing	2
339994	Broom, Brush, and Mop Manufacturing	0
339995	Burial Casket Manufacturing	1
Trade		
423310	Lumber, Plywood, Millwork, and Wood Panel Merchant Wholesalers	19
Total Alaska Forest Products Business		472

APPENDIX B: WOOD PRODUCT BUSINESSES BY REGION AND COMMUNITY

Community	Total Businesses	Timber Tract Operation Percent	Sawmill Percent	Forestry Support Activities Percent	Wood Product Manufacturing Percent
Southcentral	138	13%	8%	9%	70%
Anchorage	63	6	3	4	50
Willow/Big Lake	6	2	0	2	2
Chugiak	6	0	0	1	5
Eagle River	8	1	0	2	5
Girdwood	3	0	2	0	1
Palmer	17	5	1	0	11
Talkeetna	3	1	2	0	0
Wasilla	32	3	3	3	23
Southeast	105	30%	17%	20%	33%
Gustavus	1	0	0	0	1
Haines	7	1	0	1	5
Juneau	13	3	0	2	8
Kake	2	0	1	1	0
Ketchikan	26	10	3	5	8
Petersburg	5	2	2	0	1
Prince of Wales	38	13	8	9	8
Sitka	7	2	1	3	1
Skagway	1	0	0	0	1
Tenakee Springs	2	0	1	0	1
Wrangell	3	0	2	0	1
Interior	99	33%	15%	15%	37%
Delta Junction	12	4	3	1	4
Fairbanks	47	10	6	8	23
Fort Yukon	1	0	0	0	1
Lake Minchumina	1	1	0	0	0
Manley Hot Springs	1	1	0	0	0
McGrath	5	2	1	1	1
Nenana	4	2	1	1	0
North Pole	17	6	4	2	5
Tok	11	7	0	2	2
Gulf Coast	78	28%	9%	19%	44%
Cooper Landing	1	0	0	0	1
Glennallen	6	4	0	1	1
Homer	20	2	3	7	8

Hope	1	0	1	0	0
Kenai	13	3	2	1	7
Kodiak	7	4	1	1	1
Seward	7	2	0	1	4
Soldotna	20	7	0	2	11
Valdez	3	0	0	2	1
Southwest	7	14%	29%	0%	57%
Aniak	2	0	2	0	0
Bethel	1	0	0	0	1
Dillingham	3	0	0	0	3
Red Devil	1	1	0	0	0
Northwest	3	0%	0%	33%	67%
Kiana	1	0	0	0	1
Nome	2	0	0	1	1
Statewide Total	430	25%	12%	15%	48%

Note: Table excludes non-Alaska owned and operated businesses (N = 42).