



United States
Department of
Agriculture
Forest Service
Pacific Northwest
Research Station
Research Note
PNW-RN-553
July 2006



Estimating Sawmill Processing Capacity for Tongass Timber: 2003 and 2004 Update

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Abstract

In spring 2004 and 2005, sawmill capacity and wood utilization information was collected for selected mills in southeast Alaska. The collected information is required to prepare information for compliance with Section 705(a) of the Tongass Timber Reform Act. The total capacity in the region (active and inactive mills) was 370,350 thousand board feet (mbf) Scribner log scale during both calendar years (CYs) 2003 and 2004. The capacity of active mills for the same periods was 255,350 mbf. This is a 7.4-percent increase in active capacity from CY 2002 (237,850 mbf) to CY 2004. The actual volume of material processed during CY 2004 was 31,027 mbf Scribner log scale. This is a 21.9-percent reduction over CY 2002 (39,702 mbf Scribner log scale).

Keywords: Alaska sawmills, mill capacity, timber usage.

Introduction

The Alaska National Interest Lands Conservation Act (ANILCA 1980) provided funds to maintain the supply of timber from the Tongass National Forest at a rate of 4,500 million board feet (mmbf) per decade. Ten years later, the Tongass Timber Reform Act (TTRA 1990) amended ANILCA and directed the Secretary of Agriculture to “provide a supply of timber from the Tongass National Forest which (1) meets the annual market demand for timber from such forest and (2) meets the market demand from such forest for each planning cycle.” The reference to planning cycle demand and the National Forest Management Act (NFMA 1976) places an additional limitation on demand. Demand cannot exceed the sustainable yield and other planning requirements imposed by National Forest Service Regulations.

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The record of decision (ROD) for the 1997 Tongass Land and Resource Management Plan (USDA FS 1997) stated, “The Forest Service will develop procedures to ensure that annual timber sale offerings are consistent with market demand.” The Morse methodology (Morse 2000; USDA FS 2000, 2005) outlined procedures to satisfy the ROD commitment. Although a complete description of the process defined by Morse (2000) is beyond the scope of this report, one of the key assumptions of the procedure is that mill capacity is the upper limit to the annual market demand for timber from the Tongass. The objective of this report is to supply the information required by the Morse methodology. This is done by presenting results of the calendar year (CY) 2003 and 2004 surveys that were conducted to determine characteristics of the southeast Alaska sawmill industry that depends on timber from the Tongass National Forest.

Methods

Since 2000, updated estimates of sawmill capacity and timber usage in southeast Alaska have been obtained through surveys. To assure a degree of consistency, the same list of active and inactive mills in southeast Alaska has been used since the CY 2000 survey. That list reflected the region’s largest and most active mills at that time; they constituted the majority (estimated 80 percent) of the total capacity of all mills in the region. There have been no large new mill installations since 2000. Thus, that same list was used as the basis for defining the population for the CYs 2003 and 2004 surveys in this report. However, firms have been dropped from consideration when equipment and log inventory were removed from the plant site. For purposes of future capacity reports, firms will be added to the industry capacity estimates when equipment is installed onsite, an inventory of logs is onsite, and product is produced.

In spring 2004 and 2005, data for the previous calendar years were collected directly from producers. Sampling was conducted onsite when possible. If onsite visits were not possible, surveys were conducted via telephone interviews. Respondents were asked to supply information relative to any equipment purchases or modifications that would affect sawmill capacity and the volumes of logs that were processed (primary manufacture) during the respective periods. A summary of the basic information (mill name, location, description, status, and number of employees) for the established mills at the time of the survey is presented in table 1.

In spring 2004 and 2005, data for the previous calendar years were collected directly from producers.

Table 1—Basic sawmill information, 2003 and 2004 capacity survey

Mill name	Location	Description	Status 2004	Number of employees
Alaska Fibre	Petersburg	Mobile Dimension mill, Baker resaw, edger, planers (2)	Active	2
Chilkoot Lumber Co.	Haines	Equipment removed	Uninstalled	0
D&L Woodworks	Hoonah	Woodmizer band mill and Mobile Dimension mill	Active	2
GFP Sawmill	Ketchikan	Equipment removed	Uninstalled	0
GFP Veneer Mill	Ketchikan	Rotary Veneer Mill	Inactive	0
Herring Bay Lumber Co.	Ketchikan	Equipment removed	Uninstalled	0
Icy Straits Lumber Co., Inc.	Hoonah	Conv. circle saw headrig, carriage, edger, trimmer, debarker	Active	10
Kasaan Mountain Lumber and Log	Kasaan	Conv. circle mill, carriage, debarker, edger, circlesaw linebar resaw	Inactive	0
KPC/Annette Island Hemlock Mill	Metlakatla	Single-cut band mill/Salem carriage, edger, trimmer, gang edger/resaw, linebar resaw	Inactive	0
Metlakatla Forest Products	Metlakatla	Equipment removed	Uninstalled	0
Northern Star Cedar Products	Thorne Bay	Mobile Dimension mill and shake/shingle mills	Active	13
Pacific Log and Lumber	Ketchikan	(2) Conv. circle mills, bandmill, edger, horizontal band resaw	Active	30
Porter Lumber Co.	Thorne Bay	Conv. circle mill, edger, gang resaw, trim saw, Mighty Mite mill	Active	3.5
Silver Bay, Inc.	Wrangell	Bandsaw mill, edgers, resaws, trimmers	Active	35
Southeast Alaska Wood Products	Petersburg	Mobile Dimension mill, 4-head moulder, dry kiln, trim saw, Mighty Mite	Active	1
The Mill	Petersburg	(3) Mighty Mite mills and (1) Mobile Dimension	Active	1
Thorne Bay Wood Products	Thorne Bay	Mobile Dimension mill, trim saw	Active	4
Thuja Plicata Lumber Co.	Thorne Bay	Mobile Dimension, Frick carriage mill and shake/shingle	Active	1.5
Viking Lumber Co.	Craig	Bandsaw headrig, linebar and gang edgers, end-dogging scragg	Active	41
W.R. Jones and Son Lumber Co.	Craig	Mobile Dimension mill, dry kiln, moulder	Active	4
Total				148

Information collected during the survey was as follows:

- Mill name
- Owner's name(s)
- Mill location
- Mill description (equipment)
- Estimated mill capacity
- Actual mill output in calendar year
- Number of employees
- Mill status (active, inactive, or uninstalled)
- Percentage over or underrun
- Sources of logs processed by the mill
- Products produced
- Market information (where sold)

Mill Capacity Conventions

Terms of the Trade, 4th edition (Random Lengths 2000) contains the following definition of sawmill capacity: "1. The maximum production capability of a mill under optimum conditions. Usually expressed in board or square feet per shift or year..." Estimates of annual capacity are most commonly based on 500 eight-hour shifts per year (Stevenson 1999). Depending on the situation, capacity estimates may be in terms of raw material input or product output. In this report, all capacity values and reported board foot volumes are presented in terms of raw material input (board feet, Scribner decimal C log scale). Given this fact, sawmill output will differ depending on equipment used to produce lumber, sawing methods, and product line. The relationship between input and output will differ and is referred to as mill overrun or underrun (Random Lengths 2000).

Sawmills and other forest products manufacturing plants are composed of various machines and processing steps. In a well-designed mill, the processing speeds of individual machines and production steps have been taken into consideration (balanced) to generate a product at a desired rate. Total production capacity, however, is a function of the slowest machine or step in the production process. The capacity of a facility may also be limited or vary at different stages, depending on the raw material being processed or products being produced during a specific period (i.e., lumber for export versus domestic markets). Regardless, operators and consultants with knowledge of equipment and products can develop reasonable capacity estimates for existing and new mills. By definition, design capacity is the maximum output that can possibly be attained (Stevenson 1999).

Textbooks concerned with production and operations management of the firm define capacity as follows:

Design capacity—The maximum rate of output achieved under ideal conditions. **Effective capacity** is usually less than design capacity (it cannot exceed design capacity) owing to

realities of changing product mix, the need for periodic maintenance of equipment, lunch breaks, coffee breaks, problems in scheduling and balancing operations, and similar circumstances. **Actual output** cannot exceed effective capacity and is often less because of machine breakdowns, absenteeism, shortages of materials, and quality problems, as well as factors that are outside the control of the operations managers.

(Stevenson 1999)

In this report, several other definitions of capacity are used because we are concerned with the total capacity of firms in the region. **Total design capacity** of the firm is defined in the conventional manner. In the context of the industry, it is the total of all active and inactive firms in the region. **Active capacity** is the design capacity of all firms that manufactured products during the period. **Actual mill output** is the level of production truly achieved. Actual output cannot exceed active design capacity. Factors and conditions that may reduce design capacity include machine breakdown, employee absenteeism, shortage of raw material, defective output, product line, and other problems that cannot be controlled by management.

The industry standard for estimating capacity, based on volume of material used during 500 eight-hour shifts per year, has been used in this publication. When considering the sawmill industry, double shifts do not necessarily double the mill design capacity. In many mills, the evening shift may resaw material rejected by the day shift.

Results and Discussion

Of the 20 original sawmills selected for inclusion in the TTRA timber demand survey in 2001, the CY 2004 survey determined that equipment had been removed from four mill sites (uninstalled). Of the remaining 16 mills, 13 were active and 3 were inactive in CYs 2003 and 2004. Total estimated design capacity and usage for CYs 2003 and 2004 are presented in table 2. Additional tables have been prepared to summarize mill production by species (table 3), mill production by product (table 4), sources of logs processed (table 5), and destinations of manufactured products (table 6). Mill information has been aggregated to provide industry-level information for all firms in southeast Alaska.

The listed tables present information for CYs 2003 and 2004. Tables summarizing specific data for CYs 2000 and 2002 are available in Kilborn et al. (2004). Data from all four calendar years are presented graphically in figures 1 through 6. The total capacity of active mills and volume of logs sawn were

Text continues on page 14

Table 2—Estimated sawmill capacity and actual sawmill production for southeast Alaska

Mill name	Status CYs 2003 and 2004	Estimated mill capacity		Actual mill output		Utilization of installed capacity	
		CY 2003	CY 2004	CY 2003	CY 2004	CY 2003	CY 2004
		<i>Thousand board feet (Scribner C log scale)</i>				<i>--- Percent ---</i>	
Alaska Fibre	Active	1,500	1,500	10	5	0.67	0.33
Chilkoot Lumber Co.	Uninstalled	0	0	0	0	0	0
D&L Woodworks	Active	1,750	1,750	250	150	14.29	8.57
GFP Sawmill	Uninstalled	0	0	0	0	0	0
GFP Veneer Mill	Inactive	30,000	30,000	0	0	0	0
Herring Bay Lumber Co.	Uninstalled	0	0	0	0	0	0
Icy Straits Lumber Co., Inc.	Active	20,000	20,000	500	550	2.50	2.75
Kasaan Mountain Lumber and Log	Inactive	15,000	15,000	0	0	0	0
KPC/Annette Island Hemlock Mill	Inactive	70,000	70,000	0	0	0	0
Metlakatla Forest Products	Uninstalled	0	0	0	0	0	0
Northern Star Cedar Products	Active	14,500	14,500	863	1,000	5.95	6.90
Pacific Log and Lumber	Active	33,600	33,600	5,857	5,965	17.43	17.75
Porter Lumber Co.	Active	12,500 ^a	12,500	280	315	2.33	2.52
Silver Bay, Inc.	Active	65,000	65,000	4,126	3,368	6.35	5.18
Southeast Alaska Wood Products	Active	4,500	4,500	250	200	5.56	4.44
The Mill	Active	8,500	8,500	15	19	.18	.23
Thorne Bay Wood Products	Active	5,000	5,000	538	1,000	10.76	20.00
Thuja Plicata Lumber Co.	Active	7,500	7,500	250	75	3.33	1.00
Viking Lumber Co.	Active	80,000	80,000	18,686	18,000	23.36	22.50
W.R. Jones and Son Lumber Co.	Active	1,000	1,000	380	380	38.00	38.00
Total		370,350	370,350	32,005	31,027	8.65	8.38
Total capacity of active mills		255,350	255,350				

Note: CY = calendar year.

^aReported as 12,000 in original report.

Table 3—Sawmill production by species

Mill name	Actual mill output		Sitka spruce		Western hemlock		Redcedar		Yellow-cedar		Other	
	CY 2003	CY 2004	CY 2003	CY 2004	CY 2003	CY 2004	CY 2003	CY 2004	CY 2003	CY 2004	CY 2003	CY 2004
<i>Thousand board feet (Scribner C log scale)</i>												
Alaska Fibre	10	5	0	0	0	5	0	0	10	0	0	0
D&L Woodworks	250	150	63	60	63	30	0	0	125	60	0	0
Icy Straits Lumber Co., Inc.	500	550	100	110	395	400	0	0	5	34	0	6
Northern Star Cedar Products	863	1,000	160	100	180	0	523	900	0	0	0	0
Pacific Log and Lumber	5,857	5,965	889	1,203	4,184	1,879	736	2,870	48	13	0	0
Porter Lumber Co.	280	315	110	126	30	32	110	126	30	32	0	0
Silver Bay, Inc.	4,126	3,368	1,595	741	2,214	2,021	0	0	317	606	0	0
Southeast Alaska Wood Products	250	200	140	40	80	140	0	0	30	20	0	0
The Mill	15	19	15	14	0	2	0	3	0	0	0	0
Thorne Bay Wood Products	538	1,000	307	250	77	600	0	50	154	100	0	0
Thuja Plicata Lumber Co.	250	75	0	5	0	0	250	70	0	0	0	0
Viking Lumber Co.	18,686	18,000	5,606	4,941	11,212	10,941	1,868	2,118	0	0	0	0
W.R. Jones and Son Lumber Co.	380	380	50	120	150	60	180	200	0	0	0	0
Total	32,005	31,027	9,035	7,711	18,585	16,109	3,667	6,337	719	865	0	6
Percentage of total	100	100	28	25	58	52	11	20	2	3	0	0

Note: CY = calendar year.

Table 4—Sawmill production by product

Mill name	Actual mill output		Lumber		Cants		Other ^a	
	CY 2003	CY 2004	CY 2003	CY 2004	CY 2003	CY 2004	CY 2003	CY 2004
	<i>Thousand board feet (Scribner C log scale)</i>							
Alaska Fibre	10	5	10	5	0	0	0	0
D&L Woodworks	250	150	250	150	0	0	0	0
Icy Straits Lumber Co., Inc.	500	550	500	550	0	0	0	0
Northern Star Cedar Products	863	1,000	530	200	0	0	333	800
Pacific Log and Lumber	5,857	5,965	4,979	5,539	878	426	0	0
Porter Lumber Co.	280	315	230	252	50	63	0	0
Silver Bay, Inc.	4,126	3,368	3,984	3,368	142	0	0	0
Southeast Alaska Wood Products	250	200	250	200	0	0	0	0
The Mill	15	19	15	19	0	0	0	0
Thorne Bay Wood Products	538	1,000	538	1,000	0	0	0	0
Thuja Plicata Lumber Co.	250	75	250	75	0	0	0	0
Viking Lumber Co.	18,686	18,000	17,191	14,471	1,495	3,529	0	0
W.R. Jones and Son Lumber Co.	380	380	380	380	0	0	0	0
Total	32,005	31,027	29,107	26,209	2,565	4,018	333	800
Percentage of total	100	100	91	84	8	13	1	3

Note: CY = calendar year.

^aOther forest products includes shingles.

Table 5—Sources of logs to produce lumber and chips by southeast Alaska sawmills

Mill name	National forest		Other federal		State of Alaska		Private Native		Private other		Imported		Total		
	CY	CY	CY	CY	CY	CY	CY	CY	CY	CY	CY	CY	CY	CY	
	2003	2004	2003	2004	2003	2004	2003	2004	2003	2004	2003	2004	2003	2004	
	<i>Thousand board feet (Scribner C log scale)</i>														
Alaska Fibre	10	0	0	0	0	0	0	0	0	5	0	0	0	10	5
D&L Woodworks	250	150	0	0	0	0	0	0	0	0	0	0	0	250	150
Icy Straits Lumber Co., Inc.	5	0	0	0	0	0	0	402	495	149	0	0	0	500	550
Northern Star Cedar Products Pacific Log and Lumber	0	300	0	0	863	700	0	0	0	0	0	0	0	863	1,000
Porter Lumber Co.	586	2,326	0	0	5,271	3,639	0	0	0	0	0	0	0	5,857	5,965
Silver Bay, Inc.	280	315	0	0	0	0	0	0	0	0	0	0	0	280	315
Southeast Alaska Wood Products	2,661	1,718	0	0	0	1,650	1,465	0	0	0	0	0	0	4,126	3,368
The Mill	25	40	0	0	200	0	0	0	25	160	0	0	0	250	200
Thorne Bay Wood Products	15	0	0	0	0	16	0	0	0	3	0	0	0	15	19
Thuja Plicata Lumber Co.	161	200	0	0	323	600	0	0	54	200	0	0	0	538	1,000
Viking Lumber Co.	0	38	0	0	250	19	0	0	0	19	0	0	0	250	75
W.R. Jones and Son Lumber Co.	14,949	14,819	0	0	3,737	3,001	0	90	0	90	0	0	0	18,686	18,000
	0	60	0	0	266	250	0	0	114	70	0	0	0	380	380
Total	18,942	19,966	0	0	10,910	9,874	1,465	492	688	695	0	0	0	32,005	31,027
Percentage of total	59	64	0	0	34	32	5	2	2	2	0	0	0	100	100

Note: CY = calendar year.

Table 6—Destination of products manufactured from logs processed by southeast Alaska sawmills

Mill name	Alaska		Other U.S. States		Canada		Pacific Rim		Total	
	CY 2003	CY 2004	CY 2003	CY 2004	CY 2003	CY 2004	CY 2003	CY 2004	CY 2003	CY 2004
	<i>Thousand board feet (Scribner C log scale)</i>									
Alaska Fibre	10	5	0	0	0	0	0	0	10	5
D&L Woodworks	225	149	25	0	0	0	0	2	250	150
Icy Straits Lumber Co., Inc.	500	506	0	44	0	0	0	0	500	550
Northern Star Cedar Products	43	0	820	200	0	800	0	0	863	1,000
Pacific Log and Lumber	176	0	5,681	1,014	0	4,951	0	0	5,857	5,965
Porter Lumber Co.	200	158	80	158	0	0	0	0	280	315
Silver Bay, Inc.	0	0	3,012	2,863	83	0	1,032	505	4,126	3,368
Southeast Alaska Wood Products	200	200	50	0	0	0	0	0	250	200
The Mill	15	19	0	0	0	0	0	0	15	19
Thorne Bay Wood Products	161	200	77	600	300	200	0	0	538	1,000
Thuja Plicata Lumber Co.	0	4	250	71	0	0	0	0	250	75
Viking Lumber Co.	0	0	14,482	14,470	0	0	4,204	3,530	18,686	18,000
W.R. Jones and Son Lumber Co.	228	228	114	133	0	0	38	19	380	380
Total	1,758	1,468	24,591	19,553	382	5,951	5,274	4,056	32,005	31,027
Percentage of total	5	5	77	63	1	19	16	13	100	100

Note: CY = calendar year.

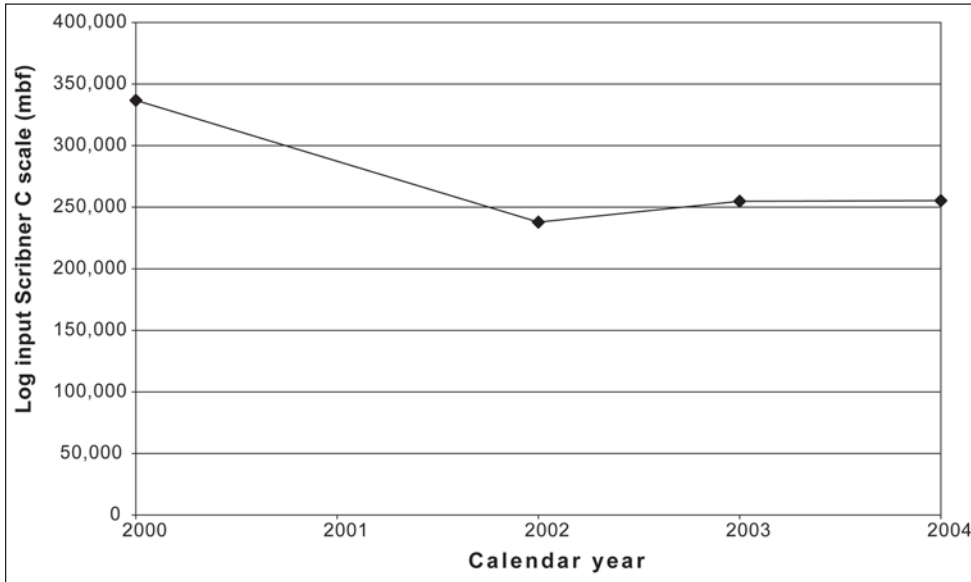


Figure 1—Capacity of active southeast Alaska sawmills, 2000-2004.

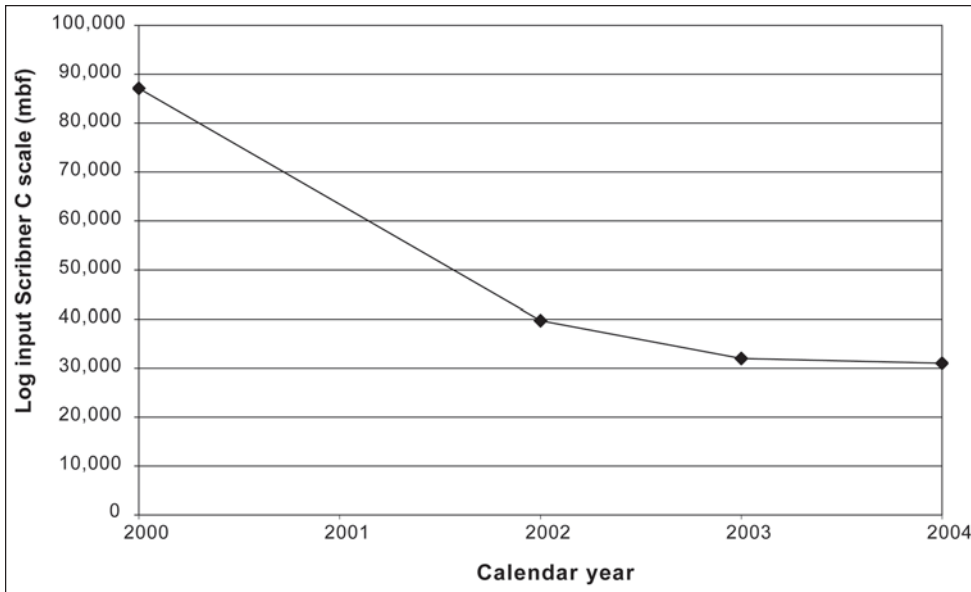


Figure 2—Volume of logs processed by southeast Alaska sawmills, 2000-2004.

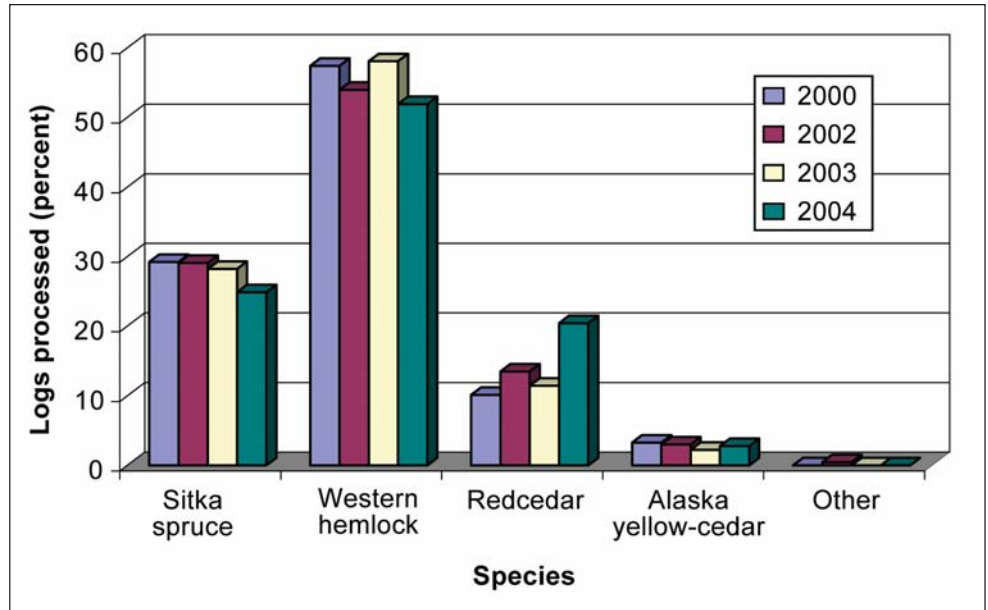


Figure 3—Species composition of logs processed by southeast Alaska sawmills, 2000-2004.

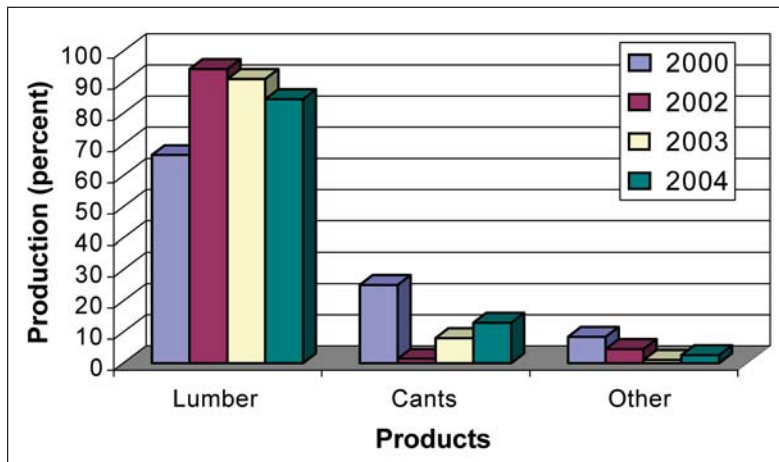


Figure 4—Products produced by southeast Alaska sawmills, 2000-2004.

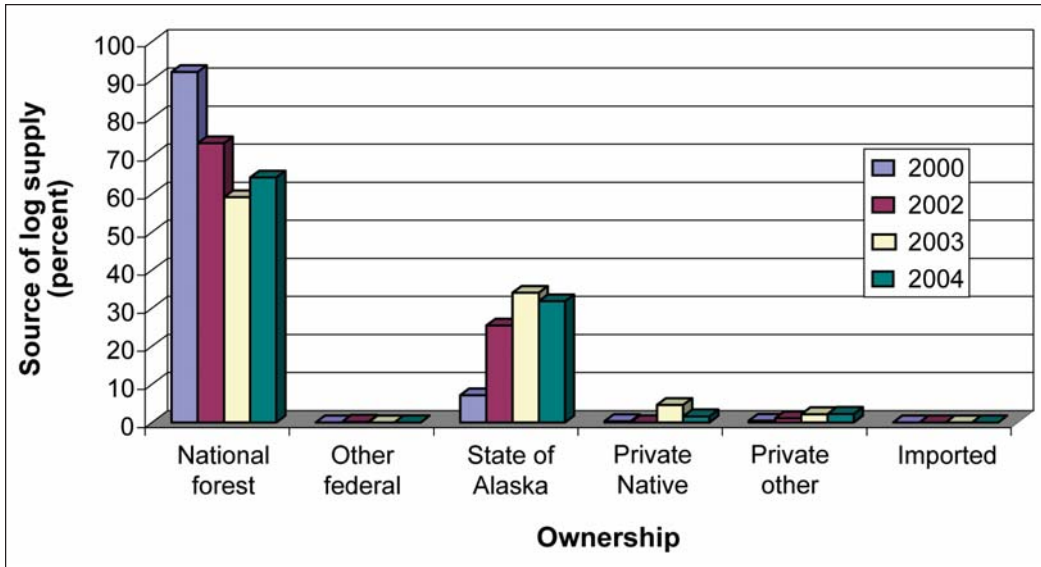


Figure 5—Source of logs processed by southeast Alaska sawmills, 2000-2004.

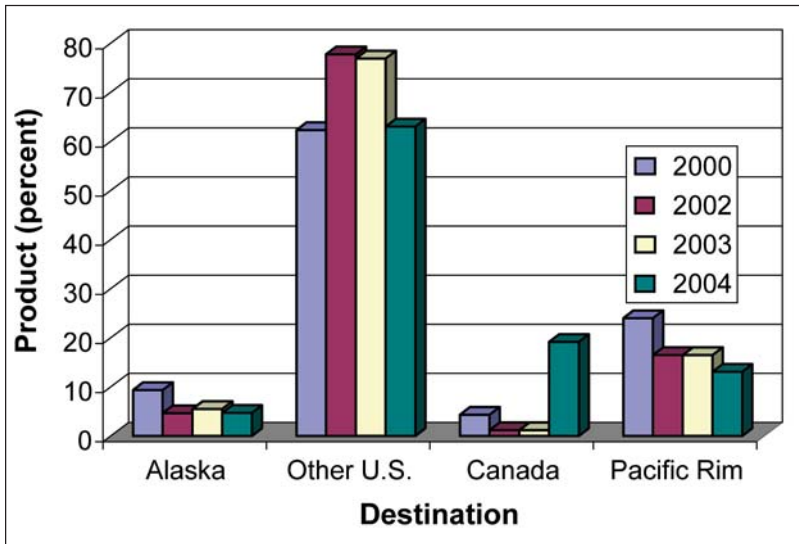


Figure 6—Shipping destination of southeast Alaska forest products, 2000-2004.

Since CY 2000, the percentage of processed logs coming from national forest sources has decreased, whereas there has been an increase in logs from the state lands.

both greatly reduced from CY 2000 to CY 2002; however, since CY 2003, these figures have maintained steady levels (fig. 1 and 2). Western hemlock (*Tsuga heterophylla* (Raf.) Sarg.) remains the primary species of logs processed by southeast Alaska mills (fig. 3). As shown in figure 4, lumber continues to be the product with the greatest volume manufactured by these mills; although, in the past 2 years the percentage of cants production has increased. Since CY 2000, the percentage of processed logs coming from national forest sources has decreased, whereas there has been an increase in logs from the state lands (fig. 5). Figure 6 shows that the main shipping destination of southeast Alaska forest products continues to be other states within the United States.

There were few changes in design capacity or actual production from CY 2003 to CY 2004. The estimated industry design capacity for both calendar years was 370,350 thousand board feet (mbf) Scribner log scale. When compared with CY 2002 (453,850 mbf), this is a reduction of 18.4 percent. However, the CY 2004 active capacity was 255,350 mbf, an increase of 7.4 percent over CY 2002. Actual mill output during CY 2003 was 32,005 mbf and during CY 2004 was 31,027 mbf. This is a 21.9 percent reduction between CYs 2002 and 2004.

Conclusions

During the past 10 years, the forest products industry in southeast Alaska has been exposed to tremendous change. The integrated industry that provided all grades of timber became outdated. At this time there are limited markets for chips produced from low-grade logs. The traditional foreign markets that were served by the industry underwent major changes, including depressed economic conditions and a major reduction in housing construction in Japan. Substantial shifting of production operations from nations with high-cost labor to countries with lower labor costs has also been changing the markets throughout the world. However, it appears that in CYs 2003 and 2004 the rate of decline in timber usage by southeast mills has diminished considerably.

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