



United States
Department of
Agriculture
Forest Service
Pacific Northwest
Research Station
Research Note
PNW-RN-545
May 2004



Estimating Sawmill Processing Capacity for Tongass Timber

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Abstract

In spring 2001 and 2003, sawmill capacity and utilization information was collected directly from 20 producers (usually the largest and most active) in southeast Alaska. The estimated mill capacity in southeast Alaska for calendar year (CY) 2000 was 501,850 thousand board feet (MBF) (log scale) and for CY 2002 was 453,850 MBF (log scale). The actual production by these mills for CY 2000 was 87,117 MBF (log scale) and for CY 2002 was 39,701.6 MBF (log scale).

Keywords: Alaskan sawmills, lumber capacity.

Preface

Section 101 of the Tongass Timber Reform Act (TTRA 1990) amended the Alaska National Interest Lands Conservation Act (ANILCA 1980) by deleting Section 705 and inserting a new Section 705.

(a) Subject to appropriations, other applicable law, and the requirements of the National Forest Management Act (NFMA 1976); except as provided in subsection 9d of this section, the Secretary shall, to the extent consistent with providing for the multiple use and sustained yield of all renewable forest resources, seek 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.

Introduction

The May 1997 Record of Decision for the Tongass Land and Resource Management Plan Revision included a commitment to “develop procedures to ensure that

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annual timber sale offerings are consistent with market demand” as required by the Tongass Timber Reform Act (USDA Forest Service 1997). These procedures are designed to be flexible given the uncertainty associated with forecasting market conditions. This is especially difficult in southeast Alaska because of the structural transformation underway there in the timber industry. The procedures also account for the fact that the USDA Forest Service’s timber sale program cannot quickly respond to market fluctuations and allow the industry to accumulate an adequate “volume under contract” (a supply of uncut timber).² The procedure that is used includes provisions to monitor industry behavior and ways to adjust timber sale program levels to reflect harvest activity.

One of the key assumptions in this procedure is an estimate of the capacity of the softwood lumber industry in Alaska. In the procedure, industry capacity is assumed to reflect an upper limit to the annual market demand for timber and depends on the short-run performance of the various firms owning the mills. This approach acknowledges that the short-term objective for most manufacturers is to use their existing capital to maximize profits or minimize losses. For example, a sawmill owner may change the amount of wood processed or the number of shifts employed, but will generally not invest large sums of money or enter or exit a market on the basis of short-run performance. In the short run, a firm may even continue to operate at a loss as long as the variable costs of production can be covered. Under these conditions, resource demand tends to be fairly inelastic. That is, the existing mills will absorb a relatively wide range of prices before making significant changes in the volume of timber purchased.

The purpose of this report is to document the development of the capacity and capacity utilization estimates for the major softwood sawmills in southeast Alaska. Various definition issues will be discussed as well as some limitations of the estimates.

Defining What Is Needed

The equation below shows how the relationship between manufacturing capability and raw material supply can be used to estimate theoretical timber consumption levels for the industry.

Timber consumption:

$$e = (a \times b/c) d,$$

²There are three definitions of volumes used with Forest Service sales. First, there is the volume appraised and offered for sale. Once sold, this is referred to as the sold volume. When this timber is harvested, it is referred to as the cut volume. Forest Service timber sale contracts are typically multiyear so that volume sold but not yet harvested is referred to as uncut volume under contract.

where

a = installed and operable processing capacity,

b = industry rate of capacity utilization,

c = percentage of usable wood in average timber sale,

d = share of industry raw material provided by the Tongass, and

e = timber consumption.

The following sections provide more detail on the data and assumptions used to determine the initial values for each of these parameters.

Installed and Operable Sawmill Capacity

Processing capacity can be measured and reported in various ways, including:

- Design capacity. This is the maximum output that can possibly be attained.
- Actual output. This is the output actually achieved. It cannot exceed design capacity and is often less than design capacity because of machinery breakdowns, employee absenteeism, defective output, shortage of materials, and other problems outside the control of management (Stevenson 1986).

By referring to various industry and government sources, one can get a general sense of mill capacity in southeast Alaska; however, it is not always clear what the available data represent. Some mills report end-product output vs. log input; others report design capacity vs. effective capacity. Consequently, there is a need for the systematic collection of information on the effective capacity of the wood product manufacturers in the region.

Industry experts estimate the design capacity of a sawmill or other wood processing facility by looking at the installed equipment. The industry standard is to estimate log volume consumption during 500 eight-hour shifts per year. Double shifts do not necessarily double the design mill capacity as the evening shift may resaw material rejected by the day shift. Given this precise standardization of capacity, most operators, in consultation with knowledgeable specialists, can come up with a reasonable figure for design mill capacity.

Because the emphasis here is on the short-run operating decisions of existing firms, capacity estimates for inoperable or incomplete facilities are not included. When evidence suggests that new wood processing facilities (or expansions to existing mills) are moving past the planning stage to become viable wood processing entities (e.g., demonstrated financial commitment, lease or purchase of mill site, environmental permits approved, etc.) then capacity figures will be increased accordingly. Conversely, permanent mill closures with dismantling of equipment will trigger a downward adjustment in the reported industry capacity.

Table 1 presents a summary of basic mill information for the established 20

Table 1—Basic mill information

Mill name	Location	Description	Status	Number of employees
Icy Straits Lumber Co.	Hoonah	Conventional carriage, circle saw headrig, edger, trim saw, log debarker and merchandizer	2000—active	18
			2001—active	18
			2002—active	3
Viking Lumber Co.	Craig	Conventional carriage, band saw headrig, linebar and gang resaws, edgers, trim saw, log debarker and merchandizer, end-dogging circle saw scragg	2000—active	33
			2001—active	33
			2002—active	45
D&L Woodworks	Hoonah	Portable band saw mill and portable circle saw mill	2000—active	2
			2001—active	2.5
			2002—active	2
Gateway Forest Products (lumber)	Ketchikan		2000—active	74
			2001—idle	0
			2002—closed	
Gateway Forest Products (veneer)	Ketchikan	Rotary veneer mill, log debarker and merchandizer	2000—under construction	
			2001—active	34
			2002—idle	0
Northern Star Cedar	Thorne Bay	Portable circle saw mill and shake/shingle mills; additional heavy duty portable circle mill	2000—active	8
			2001—active	8
			2002—active	8
Herring Bay Lumber	Ketchikan	Conventional carriage, circle saw headrig, resaw edger, trim saw	2000—active	9
			2001—idle	0
			2002—idle	0
Alaska Fibre	Petersburg	Portable circle saw mill, horizontal band resaw, edger	2000—active	2
			2001—active	2
			2002—active	2
Southeast Alaska Wood Products	Petersburg	Two portable circle saw mills, trim saw	2000—active	4
			2001—active	3
			2002—active	3
Thorne Bay Wood Products	Thorne Bay	Portable circle saw mill, trim saw	2000—active	4.5
			2001—active	4.5
			2002—active	5
Annette Island Sawmill (KPC)	Metlakatla	Conventional carriage, single cut band saw headrig, linebar resaw, gang edger/resaw, edger, trim saw, log debarker and merchandizer	2000—idle	0
			2001—idle	0
			2002—idle	0
Metlakatla Forest Products	Metlakatla		2000—active	25 sgl. ^a
			2001—idle	0
			2002—closed	0
Thuja Plicata Lumber	Thorne Bay	Portable circle saw mill and shake/shingle mill	2000—active	7
			2001—active	7
			2002—idle	0

Table 1—Basic mill information (continued)

Mill name	Location	Description	Status	Number of employees
Porter Lumber Co.	Thorne Bay	Conventional carriage, circle saw headrig, gang resaw edger, trim saw and portable circle saw mill	2000–active	9
			2001–active	9
			2002–active	3
Silver Bay, Inc.	Wrangell	Conventional carriages, band saw headrigs, linebar resaw edgers, trim saw, log debarker and merchandizer, planer mill	2000–active	55
			2001–active	55
			2002–active	38–45
W.R. Jones and Son Lumber Co.	Craig	Portable circle saw mill, dry kiln, planer mill	2000–active	2
			2001–active	2
			2002–active	2.5
Kasaan Mountain Lumber and Log	Kasaan	Conventional carriage, circle saw headrig, circle saw linebar resaw, edger, debarker	2000–active	15
			2001–idle	0
			2002–idle	0
The Mill	Petersburg	Four portable circle saw mills	2000–idle	0
			2001–active	6
			2002–idle	0
Pacific Log and Lumber	Ketchikan	Two conventional carriage mills with circle saw headrigs, horizontal band resaw, edger, trim saw, log debarker and merchandizer	2000–active	43
			2001–active	43
			2002–active	43
Chilkoot Lumber Co.	Haines	Conventional carriage, 8-ft band headrig, 6-ft and 7-ft band resaws, debarker, chipper, edger, etc.	2000–idle	0
			2001–idle	0
			2002–idle	0

^asgl. = single shift.

mills operating during the 2000–2002 period. These data were obtained from a variety of sources including directories, interviews with mill owners and managers, and onsite examination.

Industry Rate of Capacity Utilization

In theory, with complete knowledge of the production functions, markets, and profit objectives for the sawmills listed in table 1, the rate of capacity utilization could be estimated by dividing the actual production by the estimate of design capacity.

Mill Capacity and Utilization Study

During spring 2001 and 2003, information was gathered on sawmill capacity and utilization directly from producers in southeast Alaska. Sampling was conducted onsite in 80 percent of cases with the remainder conducted via telephone interviews. In all, 20 producers, usually the largest and most active, were surveyed.

The best available information (documented in table 2) was used to arrive at design capacity for CY 2000 and CY 2002.

Data collected consisted of the following items:

- Mill name
- Owner's name(s)
- Mill location
- Mill description
- Estimated mill capacity
- Actual mill production
- Mill employment
- Mill classification
- Percentage over- or under-run
- Source(s) of logs processed by the mill
- Products produced
- Market information

Additional tables were established to display mill production by species (table 3), mill production by product (table 4), sources of logs processed (table 5), and destination of products manufactured (table 6).

Discussion

The estimated mill capacity in southeast Alaska for CY 2000 was 501,850 thousand board feet (MBF) (log scale) and for CY 2002 was 453,850 MBF (log scale). The actual production by these mills for CY 2000 was 87,117 MBF (log scale) and for CY 2002 was 39,801 MBF (log scale). The capacity was determined by interviews with the managers of 15 active sawmills, 4 idle mills, and 1 mill under construction in CY 2000. In CY 2002, there were 11 active mills and 7 idle mills (table 1). The mill that was under construction in CY 2000 was idle in CY 2002.

Before this report could be published, there were major changes in the established sawmill industry in Alaska that affected how these industries responded to willingness and ability to purchase and utilize the quality and quantity of timber being offered for sale. One of the larger sawmills has been sold, a medium-size mill has been sold and removed from Alaska, and a second large mill will not be operating again unless there is great improvement in the economics of either the processing or markets of products. The markets, both domestic and export, for softwood logs and sawn products from Alaska have been depressed for several years.

Conclusion

The recent changes in capacity and production information gathered from the southeast Alaska industry demonstrate the need to monitor annual changes. This is consistent with the direction in the Tongass Land Management Plan. Such a plan would serve as a monitor if the volume of timber offered each year (1) allows existing mills to operate at a level consistent with market conditions, (2) provides for the opening of new timber processing facilities or expansion of existing facilities, and (3) will be purchased when offered.

Table 2—Estimated mill capacity and actual mill production for southeast Alaska, calendar years (CYs) 2000 and 2002

Mill name	Estimated mill capacity ^a		Actual mill production ^b		Utilization of installed capacity		
	CY 2000	CY 2002	CY 2000	CY 2002	CY 2000	CY 2002	
	----- Thousand board feet, log scale -----						----- Percent -----
Icy Straits Lumber Co.	20,000	20,000	5,000	450	25.00	2.25	
Viking Lumber Co.	60,000	80,000	13,000	17,000	21.67	21.25	
D&L Woodworks	1,750	1,750	625	250	35.71	14.29	
Gateway Forest Products (lumber)	50,000	—	19,000	—	38.00	—	
Gateway Forest Products (veneer)	30,000	30,000	0	0	0	0	
Northern Star Cedar	7,500	14,500	2,500	2,000	33.33	13.79	
Herring Bay Lumber	10,000	10,000	0	0	0	0	
Alaska Fibre	1,500	1,500	200	80	13.33	5.33	
Southeast Alaska Wood Products	4,500	4,500	1,000	350	22.22	7.78	
Thorne Bay Wood Products	5,000	5,000	750	800	15.00	16.00	
Annette Island Sawmill (KPC)	70,000	70,000	0	0	0	0	
Metlakatla Forest Products	25,000	—	0	—	0	—	
Thuja Plicata Lumber	7,500	7,500	3,000	0	40.00	0	
Porter Lumber Co.	11,000	11,000	4,200	250	38.18	2.27	
Silver Bay, Inc.	65,000	65,000	13,642	12,530	20.99	19.28	
W.R. Jones and Son Lumber Co.	1,000	1,000	600	400	60.00	40.00	
Kasaan Mountain Lumber and Log	15,000	15,000	7,000	0	46.67	0	
The Mill	8,500	8,500	7,200	0	84.71	0	
Pacific Log and Lumber	33,600	33,600	9,400	5,591.6	27.98	16.64	
Chilkoot Lumber Co.	75,000	75,000	0	0	0	0	
Total	501,850	453,850	87,117	39,701.6	Average 17.36	Average 8.75	

— = mill closed.

^a Estimated mill capacity is an estimate of the processing capability of the mill based on the amount of net saw-log volume (Scribner log scale) that could be processed by the mill, as currently configured, during a standard 250-day year, two shifts per day operating schedule, not limited by availability of employment, raw materials, or market.

^b Actual mill production is the net saw-log volume (Scribner log scale) that received primary manufacture during the CY 2000. This is the actual net saw-log volume used during the year to manufacture sawn products.

Table 3—Mill production by species

Mill name	Actual mill production		Sitka spruce ^a		Western hemlock ^b		Western redcedar ^c		Alaska yellow-cedar ^d		Other	
	CY 2000	CY 2002	CY 2000	CY 2002	CY 2000	CY 2002	CY 2000	CY 2002	CY 2000	CY 2002	CY 2000	CY 2002
Icy Straits Lumber Co.	5,000	450.0	1,500.0	225.0	3,250.00	225.0	0	0	250.00	0	0	0
Viking Lumber Co.	13,000	17,000.0	4,964.0	5,000.0	7,248.00	10,000.0	788.0	2,000.0	0	0	0	0
D&L Woodworks	625	250.0	312.5	150.0	156.25	25.0	0	0	156.25	75.0	0	0
Gateway Forest Products (lumber)	19,000	—	5,214.0	—	13,000.00	—	786.0	—	0	—	0	—
Gateway Forest Products (veneer)	0	0	0	0	0	0	0	0	0	0	0	0
Northern Star Cedar	2,500	2,000.0	50.0	110.0	80.00	110.0	2,320.0	1,780.0	50.00	0	0	0
Herring Bay Lumber	0	0	0	0	0	0	0	0	0	0	0	0
Alaska Fibre	200	80.0	45.0	40.0	45.00	17.6	0	6.4	100.00	16.0	10.0	0
Southeast Alaska Wood Products	1,000	350.0	200.0	168.0	750.00	168.0	0	0	50.00	14.0	0	0
Thorne Bay Wood Products	750	800.0	520.0	240.0	100.00	80.0	80.0	40.0	50.00	440.0	0	0
Annette Island Sawmill (KPC)	0	0	0	0	0	0	0	0	0	0	0	0
Metlakatla Forest Products	0	—	0	—	0	—	0	—	0	—	0	—
Thuja Plicata Lumber	3,000	0	0	0	0	0	2,000.0	0	1,000.00	0	0	0
Porter Lumber Co.	4,200	250.0	1,050.0	125.0	2,940.00	0	126.0	100.0	84.00	25.0	0	0
Silver Bay, Inc.	13,642	12,530.0	4,776.0	4,860.0	6,830.60	6,357.4	1,346.9	730.5	688.40	582.1	0	0
W.R. Jones and Son Lumber Co.	600	400.0	30.0	20.0	150.00	100.0	360.0	240.0	60.00	40.0	0	0
Kasaan Mountain Lumber and Log	7,000	0	1,750.0	0	4,550.00	0	350.0	0	350.00	0	0	0
The Mill	7,200	0	1,920.0	0	5,280.00	0	0	0	0	0	0	0
Pacific Log and Lumber	9,400	5,591.6	3,126.0	616.6	5,622.00	4,332.7	652.0	456.5	0	0	0	185.8
Chilkoot Lumber Co.	0	0	0	0	0	0	0	0	0	0	0	0
Total	87,117	39,701.6	25,457.5	11,554.6	50,001.85	21,415.7	8,808.9	5,353.4	2,838.65	1,192.1	10.0	185.8

— = mill closed.

^a Sitka spruce (*Picea sitchensis* (Bong.) Carr.).

^b Western hemlock (*Tsuga heterophylla* (Raf.) Sarg.).

^c Western redcedar (*Thuja plicata* Donn. ex D. Don)

^d Alaska yellow-cedar (*Chamaecyparis nootkatensis* (D. Don) Spach).

----- Thousand board feet, log scale -----

Table 4—Mill production by product, calendar years (CYs) 2000 and 2002

Mill name	Actual mill production		Lumber		Cants		Other	
	CY 2000	CY 2002	CY 2000	CY 2002	CY 2000	CY 2002	CY 2000	CY 2002
----- Thousand board feet -----								
Icy Straits Lumber Co.	5,000	450	0	450	0	0	5,000	0
Viking Lumber Co.	13,000	17,000	8,430.0	17,000	4,570.0	0	0	0
D&L Woodworks	625	250	625.0	250	0	0	0	0
Gateway Forest Products (lumber)	19,000	—	19,000.0	—	0	—	0	—
Gateway Forest Products (veneer)	0	0	0	0	0	0	0	0
Northern Star Cedar	2,500	2000	180.0	220	0	0	2,320	1,780
Herring Bay Lumber	0	0	0	0	0	0	0	0
Alaska Fibre	200	80	200.0	80	0	0	0	0
Southeast Alaska Wood Products	1,000	350	1,000.0	350	0	0	0	0
Thorne Bay Wood Products	750	800	750.0	800	0	0	0	0
Annette Island Sawmill (KPC)	0	0	0	0	0	0	0	0
Metlakatla Forest Products	0	—	0	—	0	—	0	—
Thuja Plicata Lumber	3,000	0	3,000.0	0	0	0	0	0
Porter Lumber Co.	4,200	250	4,200.0	250	0	0	0	0
Silver Bay, Inc.	13,642	12,530	6,777.5	12,530	6,864.5	0	0	0
W.R. Jones and Son Lumber Co.	600	400	600.0	400	0	0	0	0
Kasaan Mountain Lumber and Log	7,000	0	2,100.0	0	4,900.0	0	0	0
The Mill	7,200	0	1,704.0	0	5,496.0	0	0	0
Pacific Log and Lumber	9,400	5,591.6	9,400.0	5,041.6	0	550	0	0
Chilkoot Lumber Co.	0	0	0	0	0	0	0	0
Total	87,117	39,701.6	57,966.5	37,371.6	21,830.5	550	7,320	1,780

— = mill closed.

Table 5—Sources of logs processed (source of logs included in actual mill production), calendar years (CYs) 2000 and 2002

Mill name	National forest		Other federal		State of Alaska		Private Native		Private other		Import		Total	
	CY 2000	CY 2002	CY 2000	CY 2002	CY 2000	CY 2002	CY 2000	CY 2002	CY 2000	CY 2002	CY 2000	CY 2002	CY 2000	CY 2002
Icy Straits Lumber Co.	4,900	351	0	0	0	0	0	0	100	99	0	0	5,000	450
Viking Lumber Co.	13,000	14,501	0	0	2,499	0	0	0	0	0	0	0	13,000	17,000
D&L Woodworks	625	250	0	0	0	0	0	0	0	0	0	0	625	250
Gateway Forest Products (lumber)	18,430	—	0	—	570	—	0	—	0	—	0	—	19,000	—
Gateway Forest Products (veneer)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Northern Star Cedar	1,875	40	0	0	500	1,960	125	0	0	0	0	0	2,500	2,000
Herring Bay Lumber	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Alaska Fibre	40	80	0	0	150	0	0	0	10	0	0	0	200	80
Southeast Alaska Wood Products	500	0	0	0	500	350	0	0	0	0	0	0	1,000	350
Thorne Bay Wood Products	225	480	0	0	5178	240	0	0	7	80	0	0	750	800
Annette Island Sawmill (KPC)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Metlakatla Forest Products	0	—	0	—	0	—	0	—	0	—	0	—	0	—
Thuja Plicata Lumber	3,000	0	0	0	0	0	0	0	0	0	0	0	3,000	0
Porter Lumber Co.	3,700	225	0	0	449	0	0	0	50	25	0	0	4,200	250
Silver Bay, Inc.	12,687	12,530	0	0	941	0	0	0	14	0	0	0	13,642	12,530
W.R. Jones and Son Lumber Co.	240	100	0	60	210	20	150	0	0	220	0	0	600	400
Kasaan Mountain Lumber and Log	7,000	0	0	0	0	0	0	0	0	0	0	0	7,000	0
The Mill	6,480	0	0	0	504	0	0	0	216	0	0	0	7,200	0
Pacific Log and Lumber	7,520	559	0	0	1,880	5,032	0	0	0	0	0	0	9,400	5,592
Chilkoot Lumber Co.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	80,222	29,116	0	60	6,222	10,101	275	0	397	424	0	0	87,117	39,702

----- Thousand board feet -----

— = mill closed.

Table 6—Destination of products manufactured from volume in actual mill production, calendar years (CYs) 2000 and 2002

Mill name	Alaska		Other U.S. States		Canada		Pacific Rim		Total		
	CY 2000	CY 2002	CY 2000	CY 2002	CY 2000	CY 2002	CY 2000	CY 2002	CY 2000	CY 2002	
-----Thousand board feet-----											
Icy Straits Lumber Co.	1,500.0	450.0	3,500.0	0	0	0	0	0	0	5,000.0	450.0
Viking Lumber Co.	0	0	1,430.0	13,600.0	0	0	11,570.0	3,400.0	0	13,000.0	17,000.0
D&L Woodworks	312.5	162.5	312.5	87.5	0	0	0	0	0	625.0	250.0
Gateway Forest Products (lumber)	0	—	19,000	—	0	—	0	—	0	19,000.0	—
Gateway Forest Products (veneer)	0	0	0	0	0	0	0	0	0	0	0
Northern Star Cedar	125.0	100.0	2,375.0	1,900.0	0	0	0	0	0	2,500.0	2,000.0
Herring Bay Lumber	0	0	0	0	0	0	0	0	0	0	0
Alaska Fibre	170.0	80.0	30.0	0	0	0	0	0	0	200.0	80.0
Southeast Alaska Wood Products	200.0	320.0	800.0	30.0	0	0	0	0	0	1,000.0	350.0
Thorne Bay Wood Products	180.0	240.0	510.0	80.0	0	480.0	60.0	0	0	750.0	800.0
Annette Island Sawmill (KPC)	0	0	0	0	0	0	0	0	0	0	0
Metlakatla Forest Products	0	—	0	—	0	—	0	—	0	0	—
Thuja Plicata Lumber	600.0	0	2,370.0	0	0	0	30.0	0	0	3,000.0	0
Porter Lumber Co.	3,780.0	250.0	420.0	0	0	0	0	0	0	4,200.0	250.0
Silver Bay, Inc.	0	0	8,185.2	9,397.5	2,046.3	0	3,410.5	3,132.5	0	13,642.0	12,530.0
W.R. Jones and Son Lumber Co.	360.0	240.0	240.0	160.0	0	0	0	0	0	600.0	400.0
Kasaan Mountain Lumber and Log	0	0	3,500.0	0	0	0	3,500.0	0	0	7,000.0	0
The Mill	720.0	0	4,752.0	0	1,728.0	0	0	0	0	7,200.0	0
Pacific Log and Lumber	188.0	0	6,862.0	5,591.6	0	0	2,350.0	0	0	9,400.0	5,591.6
Chilkoot Lumber Co.	0	0	0	0	0	0	0	0	0	0	0
Total	8,135.5	1,842.5	54,286.7	30,846.6	3,774.3	480.0	20,920.5	6,532.5	0	87,117.0	39,701.6

— = mill closed.

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