The Lumber Industry Under Wartime Conditions

By Joseph L. Muller and Charles W. Slifko

GOVERNMENT control of mill lumber sales and deliveries, was partially established by the War Production Board through Limitation Order L-121 in May 1942. This was not a new experience for the lumber industry. On October 25, 1918, 18 months after the United States had entered World War I, the War Industries Board issued a similar control order on mill sales in order to assure an adequate supply of lumber for military and essential purposes.

Lumber Production Declined During World War I.

The lumber industry reached its peak in the year 1909. The output of that year, 44 billion board feet, has never since been equaled. The decade of 1910–19 was a period of decline with both production and consumption lower than in the previous decade. Residential construction followed a declining trend and the era of substitutes for lumber had begun. Nevertheless the markets for lumber were sufficiently extensive to sustain average annual output for the decade at 37 billion feet. In 1916, the business boom generated by Allied war orders lifted lumber output back to 40 billion feet.

This high rate of production assured an adequate supply when, after the entry of the United States into the war, large quantities of lumber were required for military purposes such as cantonment building, warehouse construction, and for ships and motor vehicles. It is significant to note that when it was found necessary to restrict mill sales and deliveries, it was also intended to *limit* production. While Circular 54—the restrictive order—was issued only 2 weeks before the war ended, the following provision was contained therein: "Each manufacturer . . . will, so far as is practicable, having due regard to the production of lumber for direct war uses, limit his production to the current demand therefor . . . and will limit his items of production for export to those covered by export licenses."

Certain measures had been enacted prior to the promulgation of Circular 54 for the purpose of reducing lumber consumption in such established outlets as the construction and furniture industries. From 1917 to 1918 lumber consumption recorded a decline of 4 billion feet and in 1918 was at the lowest level of that decade. As the data in table 1 show, production followed the trend in consumption and was correspondingly reduced.

The various official measures which reduced the nonessential uses of lumber during World War I were not based entirely on a lumber shortage. Important other considerations were the conservation of equipment both in the lumber producing and consuming industries and the diversion of manpower to the armed forces or to other essential industries. An equally important necessity for restricting lumber movement in nonmilitary outlets was created by the transportation problem. It was chiefly on the above grounds that the War Industries Board in 1918, intended, through Circular 54, to impose further limitations on the production and use of all lumber, both softwoods and hardwoods, except for war and essential purposes. In addition, this step was a corollary of the price policy. Maximum prices had been set on principal species and one objective of sales control was to diminish the force of competitive factors in the price field.

Table 1.—Estimated Lumber Production and Consumption 1910–19

[Millions of board feet]

Year	Production	Consumption	Year	Production	Consumption
1910	40,018	42,965	1915	37,012	37,570
1911	37,003	40,916	1916	39,807	39,694
1912	39,158	43,047	1917	35,831	35,888
1913	38,387	41,738	1918	31,890	32,013
1914	37,346	39,155	1919	34,552	34,065

Source: U. S. Department of Commerce.

Lumber Shortages Exist Today.

In May 1942, about 6 months after this Nation's formal entrance into war, mill stocks had reached record low levels and difficulties in procuring lumber for military purposes had reached a serious stage. Industry was officially requested to expend every effort to increase production and Order L-121 was issued restricting mill shipments of those grades of softwood construction lumber essential to the war program.

In the years of depression which preceded the present conflict, lumber production and consumption had declined to comparatively low levels. Lumber demand during that period was further adversely affected by strong competition from newly developed construction and fabricating materials. The 3-year plunge of national income from $83 billion in 1929 to $40 billion in 1932, was accompanied by a drop of 70 percent in lumber production (see table 2) and a 63 percent slump in lumber consumption. In 1932 consumption was more than 2 billion feet in excess of production, but mill stocks, totaling nearly 9 billion feet at the beginning of that year, were entirely adequate to bridge the excess of demand over output.

Table 2.—Lumber Supply and Demand, 1929–41

[Millions of board feet]

Year	Lumber supply			Lumber demand		
	Production	Imports	Total	Consumption	Exports	Total
1929	36,886	1,543	38,429	32,713	3,094	35,807
1930	26,051	1,219	27,270	24,227	2,271	26,498
1931	16,523	749	17,272	17,410	1,660	19,070
1932	10,829	381	11,210	11,968	1,137	13,105
1933	14,696	359	15,055	13,873	1,275	15,148
1934	15,494	287	15,781	14,130	1,337	15,467
1935	19,539	438	19,977	18,005	1,301	19,306
1936	24,355	662	25,017	22,351	1,272	23,623
1937	25,997	687	26,684	23,679	1,414	25,093
1938	21,646	529	22,175	21,546	947	22,493
1939	24,975	707	25,682	25,377	1,050	26,427
1940	28,934	724	29,658	28,192	853	29,045
1941	32,965	(1)		33,683	(1)	

[1] Not available for publication.

Source: U. S. Department of Commerce and the National Lumber Manufacturers' Association.

Consumption exceeded production every year beginning with 1930 through 1933 but was less than output from 1934 through 1937. Beginning with 1938 up to the present time, consumption again has been in excess of production, resulting in decreased stocks on hand, until in 1942, as a result of war demands they have reached exceptionally low levels. See table 6.

In recent years, as shown in table 3, there have been striking changes in lumber consumption. During the years 1929 through 1934, only 52 percent of all lumber was consumed in building construction. Beginning in 1935, increasingly active construction has absorbed an increasing proportion of all lumber consumed, reaching nearly 70 percent in 1940. Preliminary estimates for 1941 and 1942 indicate at least 70 percent for both years.

Exports which had remained constant around 8 to 9 percent of total demand from 1929 to 1934 (as shown in table 3) were around 3 percent in 1941 and are running less than 2 percent in 1942.

Table 3.—Estimated Apportionment of Lumber Consumption, 1929–40

[Millions of board feet]

Year	Total (100 percent)	Building and construction		Boxes and crating		Industrial		Railroad purchasing		Export	
		Quantity	Percent of total	Quantity	Percent of total	Quantity	Percent of total	Quantity	Percent of total	Quantity	Percent of total
1929	35,807	18,799	52.50	4,645	12.97	6,035	16.86	3,234	9.03	3,094	8.64
1930	26,498	12,600	47.55	4,038	15.24	4,793	18.09	2,796	10.55	2,271	8.57
1931	19,070	10,058	52.74	3,358	17.61	2,290	12.01	1,704	8.94	1,660	8.70
1932	13,105	6,588	50.27	2,578	19.67	1,425	10.87	1,377	10.51	1,137	8.68
1933	15,148	8,412	55.53	2,549	16.83	1,613	10.65	1,299	8.57	1,275	8.42
1934	15,467	8,133	52.58	2,661	17.21	1,670	10.80	1,666	10.77	1,337	8.64
1935	19,306	11,427	59.19	2,928	15.17	2,070	10.72	1,580	8.18	1,301	6.74
1936	23,623	14,830	62.78	3,193	13.52	2,312	9.79	2,016	8.53	1,272	5.38
1937	25,093	15,587	62.02	3,288	13.10	2,356	9.48	2,448	9.76	1,414	5.64
1938	22,493	15,551	69.13	2,845	12.65	1,893	8.42	1,257	5.59	947	4.21
1939	26,427	18,227	68.97	3,137	11.87	2,335	8.84	1,678	6.35	1,050	3.97
1940	29,045	20,283	69.83	3,381	11.64	2,659	9.16	1,869	6.43	853	2.94
1941 [1]		23,991		3,868		3,426		2,398			

[1] Preliminary estimate by U. S. Department of Commerce.

Source: Lumber Survey Committee Reports to U. S. Department of Commerce.

An average annual output of 20 billion feet during 1930 to 1939 (as shown in table 2) sufficed to meet the total lumber demand. Production schedules therefore had to be adjusted rapidly upward after the defense program got under way in 1940. For on top of military requirements and contrary to the World War I pattern, industrial and construction demand for lumber expanded with war preparations during 1940–42 and lumber was also called upon to compensate for shortages which rapidly developed in other materials.

Although lumber production steadily increased during the years 1939, 1940, and 1941, orders, nevertheless, were in excess of output. The disparity between production and orders which existed during those years was bridged by withdrawals from stocks, and mills were therefore able to maintain shipments approximately at the rate of orders. But the demand was heavily concentrated on a small number of species and special sizes and grades. As a result, mill inventories at the end of 1941 were the lowest on record and badly assorted in relation to the prevailing demand.

Continued complete dependence upon inventories to fill the gap between output and orders has not been possible during 1942. Consequently, shortages in certain items have developed. Lumber is now termed "critical."

Nevertheless, the lumber industry has the machine capacity and timber resources through which the requirements of the war program can be supplied. Production can be increased to a point equal with demand by the removal of production handicaps and through efficient procurement and use of the industry's output. Labor must keep on the job, maintenance and repair parts supplied, specifications liberalized, orders broadly distributed, and buying coordinated.

The timber resources of this country are noted for their abundance and variety of species suitable for diverse uses. But timber stands cannot be logged to obtain only those species in greatest demand. Likewise in sawing lumber, all logs do not yield preferred grades and sizes. As an economic necessity and as a factor in efficient mill operation, alternate species, grades, and sizes which satisfactorily serve the purpose must be used, although they may not be the most desirable.

War Has Created Heavy Lumber Demand.

The outbreak of war in Europe in September 1939, as previously indicated, brought a sharp acceleration in lumber demand. A buying movement on the part of lumber dealers was set off immediately but, as it proved to be chiefly in anticipation of a large export demand, it subsided within two months. The demand, however, was sufficiently strong to effect an advance for the industry. Lumber production in 1939 totaled 24,975 million feet, a 15 percent increase over 1938. Demand totaled 26,427 million feet as compared with 22,943 million feet in 1938.

While orders placed at mills in 1939 reached the peak of the year as a result of forward buying, lumber demand was basically strengthened by increased construction activity. The Department of Labor's building indexes, based on permit valuations, were the

highest since 1930 for total building and for new residential construction. Similarly, the F. W. Dodge Corporation reported a 10-year high valuation in contracts awarded for residential building and for total construction. It is significant that the construction industry accounted for 68 percent of the nearly 4 billion feet gain in lumber consumption in 1939 over the previous year.

Lumber demand was further expanded in the following year under the impetus of this Nation's war-preparedness program. Construction of Army cantonments and camps was superimposed upon an accelerated program of defense housing and highly active residential building. Special defense requirements such as shipyard lumber and timbers and increased industrial demand contributed to the rise in the volume of orders placed with mills. As a result, orders in 1940 exceeded 30 billion feet for the first time in a decade. (The extent to which expanded construction activity contributed to the increased lumber demand is shown in table 3.) While total lumber consumption was 2.6 billion feet higher than in 1939, 94 percent of the increase was the result of construction demands.

At the same time, the recovery of durable goods industries was an important factor in the lumber demand. Wood-using industries shared in the recovery to the extent that in 1940 lumber used in the manufacture of various products increased nearly 100 percent since the depression years. (The data showing the break-down of industrial consumption for 1940 are the latest available, and are shown in table 4.)

The flow of orders to the mills increased rapidly during 1941 with the intensification of this country's military preparedness program. Lumber purchases by the important wood-using industries such as millwork, flooring, and furniture continued to increase in line with the record construction activity. Other industrial purchasing, principally by the railroads and the container industries, was expanding. But the lumber requirements for direct war purposes—cantonments, shipbuilding, airdromes, defense housing—reached such proportions by the middle of the year that in most instances 90 percent of orders placed with mills were connected with war projects.

Shortages in certain lumber items were already evident in the late months of 1941 when the Supplies Priorities and Allocations Board issued the L-41 order curtailing "nonessential" construction. Lumber demand eased noticeably following this action, but since its character was largely determined by military requirements, mill orders remained above 2 billion feet per month. The total volume of new business booked during the year exceeded 34 billion feet, which was only slightly below the levels of 1929.

The current phase of heavy lumber demand was initiated with our active entrance into the war and it can be fairly said that this phase is without parallel in the history of the industry. Lumber requirements for military construction were made forcefully apparent with the purchase during January by the Army alone of nearly 1 billion feet solely for the construction of cantonments.

In addition to the billions of board feet needed for housing the Army and for numerous other projects such as housing for industrial workers, off-shore bases, airdromes, and warehouses, there were added the requirements for trucks, bunks, boats, ships, and other essential items as boxes and crates. A series of War Production Board orders have been issued which halted or drastically curtailed the use of metals in many fields. These orders affect a long list of articles for homes, farms, factories, and offices including domestic refrigerators and furniture, implement handles, window frames, and office furniture. For the manufacture of those and many other products wood is the prime replacement material. In May when mill sales of softwood construction lumber were restricted, the monthly rate of orders indicated a demand of about 38 billion feet for the year 1942.

Table 4.—Lumber Used for Selected Products and Total Lumber Used in Manufacture, 1928, 1933, 1940 [1]

[Millions of board feet]

Products	1928	1933	1940
Boxes, baskets, crates [2]	4,981	2,356	3,206
Car construction and repairs	1,009	332	548
Furniture	1,364	747	1,422
Millwork	3,317	573	1,823
Total of principal comparable products	10,672	4,007	6,998
Agricultural implements	143	18	42
Airplanes	9	(3)	9
Boot and shoe findings	49	37	89
Boxes, cigar and tobacco	38	29	13
Caskets and burial boxes	156	126	159
Dairy, poultry, apiarists' supplies	41	30	60
Firearms	2	4	2
Handles	125	116	226
Laundry appliances	39	24	46
Matches	116	85	82
Musical instruments	108	9	30
Pencils and penholders	40	14	30
Playground equipment	5	2	8
Plumbers' woodwork	16	5	8
Professional and scientific instruments	16	4	9
Rollers, map and shade	24	7	23
Sewing machines	13	5	13
Ship and boat building	128	36	90
Shuttles, spools, bobbins	44	30	57
Sporting and athletic goods	30	8	34
Toys	39	21	58
Vehicles, motor	868	202	125
Vehicles, nonmotor	81	15	22
Woodenware and novelties	142	60	127
Other comparable products	692	248	565
Total of minor comparable products	2,963	1,126	1,925
Total comparable products [4]	13,635	5,133	8,923
Total used in manufacture	18,698	6,112	12,005

[1] Includes lumber, veneer and plywood, and logs and bolts.
[2] The figures for boxes include wood used by commercial box, basket and crate factories and by the wood-using industries for boxing, crating, and dunnage.
[3] Less than 500,000 board feet.
[4] The comparable total includes all products except planing mill products for 1928, and flooring and lumber for shipping by non-wood-using industries for 1933 and 1940.

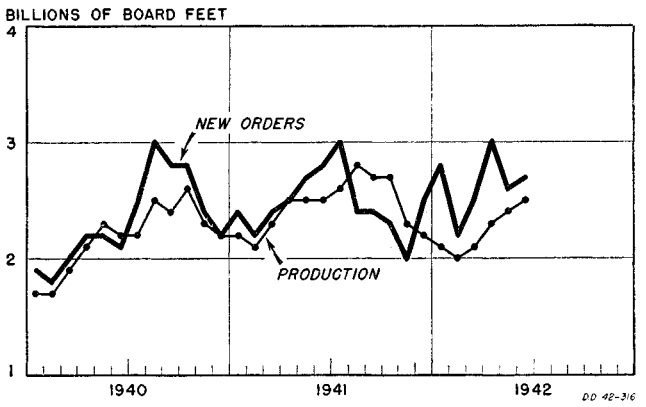
Handicaps Retarding Production.

Lumber production has been substantially increased under the impact of the consistently heavy demand. In

1941 the total volume of reported output was slightly under 33 billion board feet. This was the largest volume since 1929 and a 32 percent increase in comparison with 1939 production.

All major producing regions, both softwoods and hardwoods, contributed to the advance. It is significant to note, however, that more than half of the production was accounted for by about one-fourth of the mills in operation. Production also has been augmented by a large number of small mills which came into operation, especially in the South, as a result of expanded market opportunities. The combined 1941 volume produced in the Southern pine and in the West Coast (principally Douglas fir) regions showed a 35 percent increase since 1939. These two regions are the principal sources of softwood "construction" lumber

Figure 6.—Lumber Production and New Orders [1]



[1] Includes only principal regions for which data are available for both production and new orders.

Source: National Lumber Manufacturers' Association.

and their combined output represented 69 percent of the 1941 softwood total.

Production in the first 6 months of 1942 was 5 percent less than in the comparable period of 1941. The disparity increased between production and new orders. (The relationship since 1940 of production to orders is shown in figure 6.)

Prolonged periods of unfavorable weather in the Pacific Northwest and in the South have been partly responsible for this reduced production, but other problems have developed which accentuated the production-demand disparity. The diversion of workers to the armed forces and to other war industries interfered with sustained operations. Labor turn-over in the logging camps and sawmills has been much higher than in most manufacturing industries. (The rate of turn-over is shown in table 5.) While replacements have been generally obtained, loss of productivity has nevertheless resulted. New help lacks the "know how," not easily acquired, of experienced woods and mill workers.

At the same time, equipment problems have become more serious. The A–10 priority which has been accorded to the industry for the procurement of maintenance and repair parts has not been sufficiently effective. Tires, tractors, cables, saws, and other equipment are vitally necessary.

Table 5.—Monthly Turn-Over of Workers in Sawmills

[Rates are per 100 employees]

Date	Separation rates		Accession rates	
	Quit	Total separation	New hire	Total accession
February 1942	4.31	7.53	5.36	7.21
March 1942	5.60	8.86	6.47	8.36
April 1942	7.46	10.39	8.54	10.48

Source: U. S. Department of Labor.

As the importance of attaining maximum production became patent, the War Production Board announced in June that a liberalized policy of priority assistance would be instituted and steps taken to stabilize labor supply. The extent to which these current problems can be resolved will determine, to a large degree, the ability of the industry to achieve maximum production. The productive machine capacity is close to 40 billion board feet annually. The number of mills in operation according to the most recent (1940) Bureau of Census report was 19,591. In 1926, when 36.9 billion feet of lumber production was recorded, there were 15,241 mills. Timber resources are adequate. Although they are not as readily accessible as formerly, modern equipment such as tractors and huge logging trucks reduce the difficulties.

It may be noted that in 1941 when lumber production reached 33 billion feet, there were 286 strikes in the lumber and allied products industries (includes furniture and planing mills) which accounted for a loss of over 1 million man-days of operation. On the other hand, at the peak of 1941 lumber production, a monthly output of over 3 billion feet was attained when extensive overtime operations were instituted, principally on the West Coast. However, it is not possible to produce 38 billion feet of lumber to match estimated requirements this year. Barring labor troubles and given adequate assistance in securing repair parts and equipment, production in the last 6 months of this year can be increased. But to reach 38 billion feet for the entire year would require more than a 50 percent gain over the volume produced in the first half.

Mill Stock Reduced to Meet Demand.

Though the increase in production since 1939 has not been achieved as rapidly as the expansion in the lumber demand, mills have until this year maintained shipments nearly at the levels of incoming orders by withdrawals from stocks. At the end of 1938, mill stocks totaled 8.6 billion feet. With almost steady reductions in the following years, the volume of inventories declined 2.3 billion feet by the end of 1941.

The 6.3 billion feet of mill stocks available at the beginning of this year were equal to better than a 2 months' supply. But it must be kept in mind that the prevailing demand is running heavily to certain species, sizes, and grades. Shipments continued in excess of production during the first six months but averaged 8 percent less than new orders. Consequently, stocks declined further and unfilled orders increased. On July 1, mill stocks totaled 4.9 billion feet of which 69 percent was covered by unfilled orders; unsold stocks totaled 1.5 billion feet. (The trend of production, shipments, and stocks since 1940 is indicated in table 6.)

Table 6.—Total Reported Lumber Production, Shipments, and Mill Stocks, by Quarters, 1940–42

[Millions of board feet]

Date	Production			Shipments			Stocks (end of quarter)		
	1942	1941	1940	1942	1941	1940	1942	1941	1940
First quarter	6,966	7,521	6,101	7,737	7,729	6,149	5,595	6,557	7,616
Second quarter	8,138	8,441	7,269	9,088	8,456	7,255	4,900	6,650	7,666
Third quarter	9,400	9,015	7,765	9,500	9,367	8,243	4,800	6,294	7,253
Fourth quarter	7,500	7,988	7,799	8,000	7,967	8,448	4,300	6,348	6,753
Year	32,004	32,965	28,934	34,325	33,519	30,095	-----	-----	-----

NOTE.—Second Quarter 1942 preliminary.

Source: Reports of regional associations to the National Lumber Manufacturers' Association. Third and fourth quarter 1942 estimates by U. S. Department of Commerce.

Lumber Prices Increase.

Lumber prices have increased sharply since the beginning of this war. From 1939 up to the time that the first of the price ceilings was established in September 1941, an advance of 31 percent had been recorded in the Department of Labor's wholesale price index of construction lumber. In general, the upward trend of lumber prices was most pronounced in the periods of greatest inventory declines. But prices were also affected by competitive buying and by increased production costs.

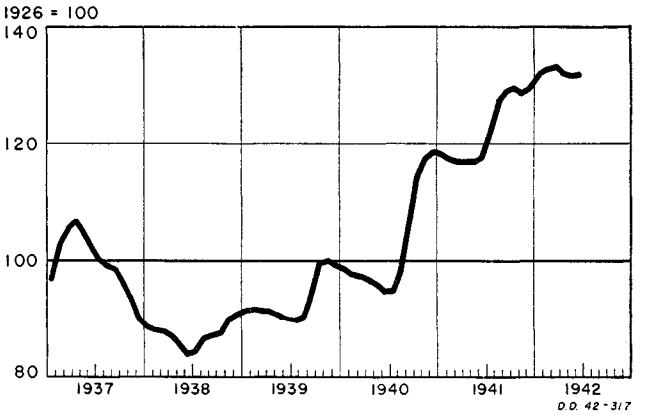
The steepest price advance was initiated in September 1940, when the defense construction program was superimposed upon an already strong lumber market. Correction of Government buying methods, the creation by the Army of a lumber "stock pile," admonitions by the Price Stabilization Division of the Office of Production Management, and the prospects of a weakened construction demand through official restrictions on "nonessential" construction brought about a stabilization of prices at the close of 1940 and for several months of 1941. In the middle of 1941 the forward price movement was resumed and currently the price index is at the highest level since 1920 and above that which prevailed during World War I.

The demand for special grades and sizes for direct military purposes created a problem with a direct bearing on production cost. In cutting such items, sawmills unavoidably accumulated stocks of other cuts from the balance of the log. Disposal of such stock was noticeably difficult as more stringent curbs were imposed on residential housing. This problem was at one time particularly acute on the west coast when as a result of the lack of intercoastal water transportation, the usual outlets for this lumber could be reached only by the more expensive rail facilities.

Lumber prices also reflected the increased cost of stumpage (logs). In some instances these increases were reported to be as high as 100 percent. On the west coast, one of the major softwood regions, log prices noticeably increased as a result of a tight supply position and the intense competition between the major log consumers.

A further important factor in the price picture was the increased cost of labor. In July 1941 labor in the Northwest region was granted wage increases. Minimum wage rates were also established for the entire lumber industry on November 3, 1941; these rates directly increased the wages of over 200,000 workers employed principally in the Southern States.

Figure 7.—Index of Wholesale Prices of Construction Lumber



Source: U. S. Department of Labor.

The almost steady rise in lumber prices resulted in the establishment of maximum or "ceiling" prices by the Office of Price Administration. A schedule for southern pine lumber, one of the principal softwoods, was the first to be issued (September 5, 1941). Shortly thereafter a maximum price was established for Douglas fir, and subsequently on additional species including hardwoods. While the general trend of prices continued upward after the ceilings were set, this was due to the rise in items not then covered. The increase in the price index since the ceilings were established has been about 2 percent.

(The course of the lumber price movement immediately preceding and since the war is shown in fig. 7.)

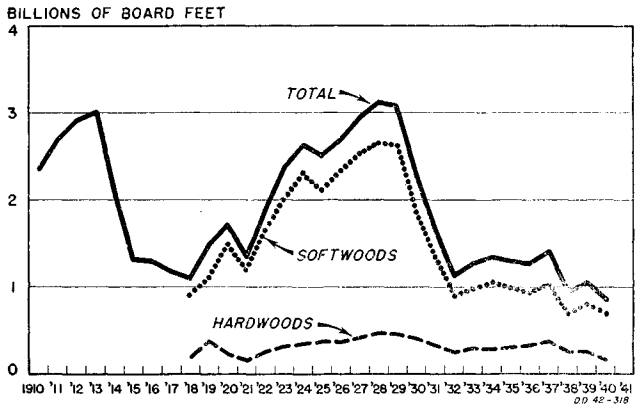
Exports Decline Sharply, Imports Increase.

War conditions have caused a sharp decline in lumber exports. Thus the pattern of export movement during World War I has been repeated. As can be seen in figure 3, the 1941 export volume was the lowest in more than forty years. The rate of exports in the first four months of 1942 indicate a further reduction of about 30 percent in the present year. Lend-

Lease shipments remain as the only important factor in the current trade. And it is certain that the recovery of export markets will have to wait on a future period of reconstruction.

The expanded wartime markets in the United States are reflected in the steady, and substantial, increase in lumber imports. The increase in 1941 as compared with 1938 was over 150 percent. Moreover, the volume of imports exceeded the export volume by 134 percent, recording for the first time in this Nation's lumber history, an import volume greater than exports.

Figure 8.—Domestic Exports of Lumber [1]



[1] Data include sawed timber and boards, planks, and scantlings; data for 1941 are not available for publication.

Source: U. S. Department of Commerce.

Outlook for Remainder of 1942

War construction plans and programs are being expanded and accelerated in order to satisfy both military and civilian needs. Military requirements can be met and civilian needs partially filled by sustained production, if procurement difficulties can be overcome and if sufficient information is given in advance to the lumber industry so that cutting schedules can be adjusted.

Lumber production in recent months has been trending upward and it is possible that the output of last year can be equaled. Production, however, cannot be increased sufficiently during the remaining months of 1942 to meet both military and civilian requirements estimated at 38 billion board feet. The deficit will require additional withdrawals from stocks.

The lumber industry is very seasonal. Winter months are unfavorable to logging and saw mill operations. Production, therefore, during the third quarter of the year, will probably increase but will unavoidably decline during the fourth quarter as snow and rain hamper operations and mills shut down for repairs.

Disregarding seasonal influences, other factors, cited above—the loss of workers to the armed forces, the growing scarcity of manpower, and increasing difficulties in getting replacement parts—are also operating effectively to reduce output. The Government is assisting, as far as possible, to reduce these difficulties by granting deferment to key men, disapproval of labor "pirating," and by higher priority ratings for urgently needed operating equipment. Constructive action of this type, however, is definitely limited. It seems most likely, in view of current developments, that lumber production, after the third quarter, will continue for the balance of the year and during 1943 at lower levels than in comparative periods of 1941 and 1942.

Although approximately a 10 percent decline is expected in 1943 production, it will be accompanied by an estimated reduction of almost 7 percent in lumber requirements. Clearly the supply-demand position of the lumber industry shows no prospect of improvement in the near future. Efficient and conservative use of lumber is essential. Increased use of alternative species, grades and sizes, and advance notice of orders and specifications will materially assist mills in meeting wartime needs.