

Contribution of Working Forests to the Washington State Economy: 2017

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Prepared for:



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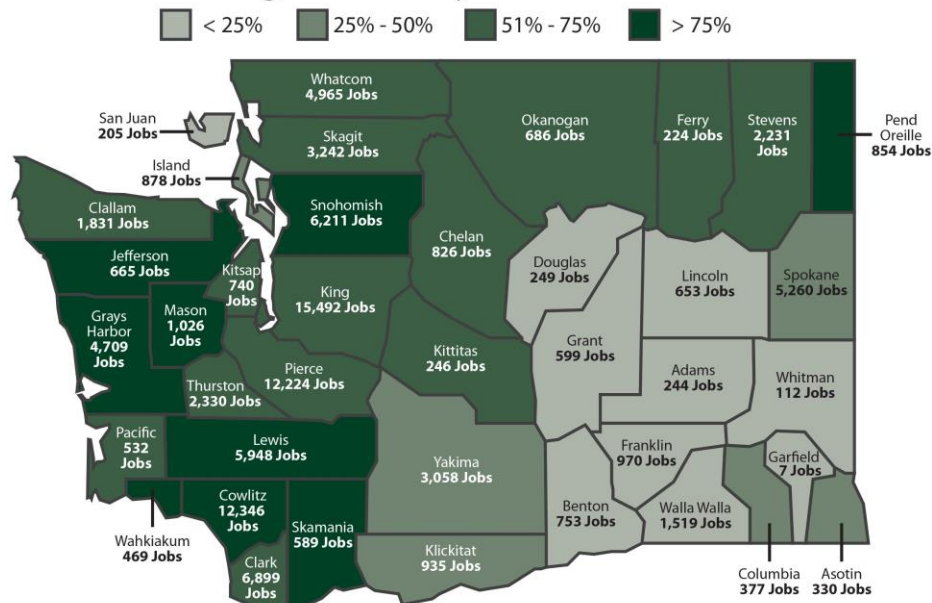
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Percentage of County that is Forestland





1.0 INTRODUCTION

Forestland in Washington State covers approximately 23 million acres¹, with 11 million acres of working forest². Private forestland accounts for 8.4 million acres. Forests on State and County land cover 2.3 million acres, and tribal land accounts for 1.6 million acres, producing 20% and 9% of the total timber harvest in 2017. In total, about 47% can be classified as working forest, which are actively managed, producing revenue, jobs and wood products from sustainably managed forests, and are not converted to other land uses. Although Federal land holdings represent 10.2 million acres or 44.4% of the forest land base, it produced just 3.5% of total timber harvest in 2017. Private land produced 73.3% of the timber harvest in 2014², and 67.5% of the total in 2017³.

Working forests contribute to Washington’s economy directly and indirectly. Direct impacts of the timber industry include sale of harvested timber, wood products manufacturing, transport, and tax revenues on harvested timber and timberland property. Indirect impacts include spending by the forest products industry on materials and support services. Both direct and indirect activity support an induced economic impact in the form of service jobs.

The current report estimates economic impacts (Table 1) of the Washington forest products industry in 2017, which is the most recent year for which sufficient data are available for all necessary components, including timber harvest volume and stumpage value data, job and wage reports, gross business income, tax revenues, and export figures. Multiplication factors necessary to calculate indirect and induced jobs and wages are available on a two-year cycle with 2016 as the latest complete year. This report follows a methodology consistent with a prior report that WFPA commissioned to calculate forest products industry impacts for 2014 (see §2.2).

Table 1. Direct and estimated jobs, wages, and revenues from forest products industry activities in Washington, providing for comparison of 2017 to 2014².

Impact Component	2014	2017
Stumpage sales	\$ 1,023,131,964	\$ 897,705,614
Direct jobs	41,912	40,359
Total jobs†	105,848	101,435
Direct wages	\$ 2,366,515,170	\$ 2,453,176,434
Total wages†	\$ 5,244,586,540	\$ 5,488,652,644
Total revenue	\$ 28,612,695,904	\$ 28,590,532,029
Total taxes	\$ 213,580,489	\$ 231,552,544

† Includes direct, indirect, induced jobs or wages; avoids double-counting industry activity

Direct stumpage sales decreased from \$1.02 billion in 2014 to \$897.7 million by 2017. Direct and total (direct, indirect, induced) employment declined modestly, yet wages increased in both direct and total categories. Gross Business Income (GBI), the total revenue from forest products

¹ <https://www.fs.fed.us/pnw/rma/fia-topics/inventory-data/>

² WFPA internal technical report, Forest2Market.

³ Washington Department of Revenue. <https://dor.wa.gov/find-taxes-rates/other-taxes/forest-tax/harvest-statistics>



industry sectors, declined by only 0.08% from 2014 to 2017. Total tax revenues increased by \$18 million, although \$3 million of this increase derives from a methodological change.

Washington's working forests produced 2,871 million board feet (MMbf) of logs in 2017, down 13% compared to 2014, when the annual harvest was 3,251 MMbf. Each million board feet of timber harvested in 2017 supported 14 direct jobs (up one job from 2014), 35 total jobs (up two jobs from 2014) and yielded \$80,649 in total tax revenues for the State of Washington (\$6.0).

2.0 DATA AND METHODS

2.1 Data Sources

Data to prepare this impact assessment were publicly available from Federal agencies and State of Washington sources:

1. Census Bureau (quarterly jobs and wages; exports)
2. Bureau of Labor Statistics (BLS) Quarterly Census of Employment and Wages (QCEW)
3. Washington Employment Security Department (ESD) QCEW
4. Washington Department of Revenue (DOR) Gross Business Income (GBI)
5. Washington DOR stumpage revenues, property tax, business taxes and fees
6. Bureau of Economic Analysis (BEA) Regional Input-Output Modeling System (RIMS II)

Direct employment and wages were calculated chiefly from BLS QCEW and WA ESD QCEW. Census Bureau information was used in select cases where QCEW data were suppressed to maintain confidentiality. The ratio of forest products export tonnage relative to total export tonnage was used to infer the fraction of port activity represented by the forest products industry by county. Total revenues (term interchangeable with GBI) from the forest products industry were extracted from WA DOR sources, and taxes were attributed to counties in proportion to forest products industry direct wages. Multiplication factors from the BEA RIMS II model were used to compute indirect, induced, and total jobs and wages for the forest products industry.

2.2 Methods

Detailed methodology is provided to WFPA in a separate technical memo.

2.2.1 Direct jobs and wages

Jobs and wages for 2017 were estimated from BLS QCEW and WA ESD QCEW, organized by county and industry code. This report uses the same set of forest products industry North American Industry Classification System (NAICS) codes that were used in the WFPA 2014 impact assessment (Table 2), standardizing NAICS categories to three-digit groups. Data BLS QCEW and from WA ESD QCEW were used in a complementary capacity to compute direct employment and wages for each target NAICS category. Both datasets must not report jobs and wages in certain cases to maintain confidentiality; to infer these quantities, we relied on categories reported in the Census Bureau annual summary. Checking county-level summaries from the WA ESD QCEW



against the county jobs and wages from BLS QCEW provides a way to infer employees per entity and wages per employee in cases where data have been intentionally set to zero by the agencies.

Table 2. NAICS codes with crosswalk to RIMS industry groups. NAICS codes with more than three digits were aggregated into three-digit groups for the remainder of this analysis.

NAICS	Description	Category	RIMS II Group
113	Forestry and logging	Forestry logging support	2
1153	Support activities for forestry	Forestry logging support	2
321	Wood product manufacturing	Wood product mfg.	8
322	Paper manufacturing	Paper manufacturing	22
33711	Wood kitchen cabinet, counter mfg.	Wood furniture mfg.	17
337122	Nonupholstered wood furniture mfg.	Wood furniture mfg.	17
337211	Wood office furniture manufacturing	Wood furniture mfg.	17
337212	Custom architectural woodwork	Wood furniture mfg.	17
4241	Paper product merchant wholesalers	Paper lumber wholesale	27
42331	Lumber, plywood, etc. wholesalers	Paper lumber wholesale	27
4883	Support activities for water transport	Forestry port activity	34
483111	Deep sea freight transportation	Forestry port activity	34

Washington State is the single most important state in the nation for exporting forest products. A total of \$2.59 billion in forest products were exported via Washington’s ports in 2017, corresponding to 6.5 billion tons of material. Washington exports 22% of national log and lumber products and 10% of paper products (Table 3), collectively 13% of the national total by weight. Port-related NAICS reported by BLS and WA ESD include all support activities and deep-sea freight transport jobs and wages, but only a fraction of these are related to the forest product industry. We collected port-level and regional import-export data from USA Trade to estimate the fraction of port activities attributable to the forest products industry. We acquired vessel tonnage and dollar value for all forest products commodity groups for Washington ports, as well as total vessel tonnage and dollar value for those ports. We calculated the ratio between forest products tonnage and total tonnage for ports at the county level and computed an average value counties with port-related activities but no physical port locations. We multiplied NAICS 4883 and NAICS 483111 jobs and wages by commodity ratios for 2017 from the appropriate county to estimate forestry-related port activities. At a state-wide level, forest products represented 14.5% of the total port traffic by weight.

Table 3. Forest products export through Washington State constitutes 14% of total national forest products exports in terms of dollar value, and 22% of forest exports by weight measure.



Commodity	Export Value (2017 \$)			Export Tonnage		
	USA Total	Washington		USA Total	Washington	
	(\$ million)	\$ million	%	(million tons)	million tons	%
Wood products	\$ 9,776	\$ 1,346	14%	22,236	4,827	22%
Wood pulp	\$ 8,766	\$ 335	4%	22,943	1,023	4%
Paper products	\$ 15,768	\$ 908	6%	7,080	688	10%
Total:	\$ 34,310	\$ 2,590	8%	52,259	6,538	13%

2.2.2 Indirect, induced jobs and wages

Direct impacts of the forest products industry include jobs and wages from the combined QCEW data. Indirect impacts measure the jobs and wages that result from supplying or servicing industries outside the target NAICS set. For example, a sawmill would purchase logs (direct), but also machinery (indirect). Further induced impacts of the forest products industry result when persons employed by the industry spend their income in the larger community, e.g. a logging contractor purchasing groceries. Multipliers to calculate indirect and induced jobs and wages were purchased from the Bureau of Economic Assessment RIMS I/O model. Multipliers must be aggregated by regions that share economic ties. Following the WFPA 2014 report, we used six regions in Washington, Kennewick-Richland-Pasco, Lewiston (includes some Idaho Counties), Portland-Vancouver-Beaverton (includes some Oregon Counties), Seattle-Tacoma-Olympia, Spokane (includes some Idaho Counties), and Wenatchee. Counties in each RIMS region are listed in Table 13 (§6.0); each county within a region was assigned the same RIMS multiplier set.

To calculate indirect and induced jobs and wages, for each unique combination of WA county and NAICS code, we multiplied direct jobs and wages (combined from WA ESD and BLS QCEW, §2.2.1) by the RIMS II multiplier set for the region featuring the county in question, assigning the RIMS II industry group to the appropriate NAICS code (Table 2). Inter-industry economic activity should not be double-counted. Indirect and induced jobs and wages should derive from final industries in a sector (Figure 1), which are defined as those that export value outside the region of analysis or those that provide a final good or service within the region.

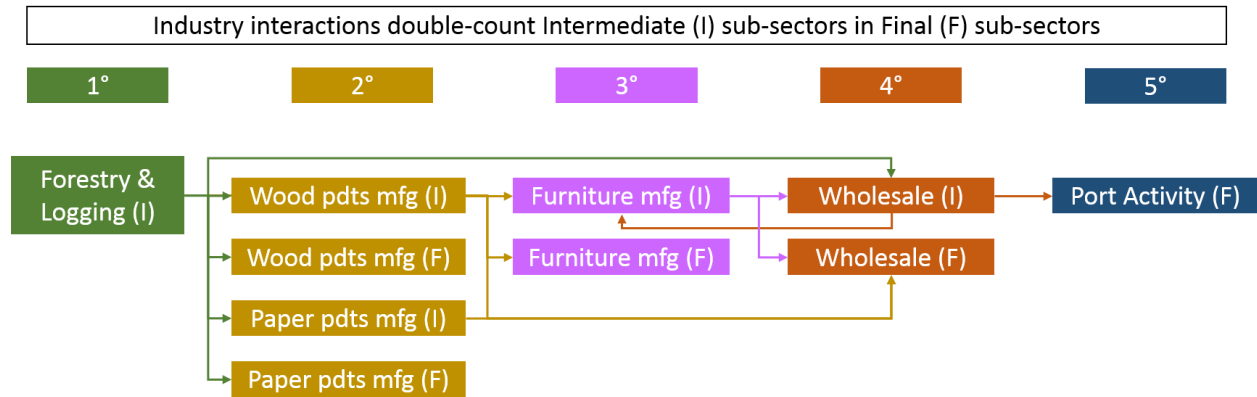


Figure 1. Intermediate (I) industries contribute to downstream production in final (F) industries, defined as exporting economic output beyond the region of analysis, or consumed as final products in the region. The most basic industry (1°) is forestry and logging, serving as intermediate to higher-degree (2° through 5°) sub-sectors.

Economic activity in final industries is a combination of final activities (export, sales) as well as contributions from intermediate industries (Figure 1). Intermediate industry contributions are counted in RIMS II multipliers for both final and intermediate industries because the multipliers enable use within a single RIMS II code. When aggregating the effects of multiple industries within a sector, intermediate impacts are likely to be counted twice.

Avoiding double-counting intermediate industry impacts is important, otherwise the combined sector impact will be overestimated. For this report, we consider forestry, logging, and their support activities (NAICS codes 113 and 115) to be intermediate industries, because their downstream products—logs—are entirely accounted for in downstream industries. The impact of double-counting forestry and logging is deducted from the forestry and logging contribution in the form of a double-count reduction factor (Table 4), which is applied against the Type 2 RIMS II multiplier (for calculation details, please refer to WFPA technical methods memo made available with this report). Some final industries are also partially intermediate, for example wood products manufacturing (Figure 1) is final relative to logging but intermediate relative to wholesale and port activities. In these industries, we accrue to the double-count reduction factor for industry interactions that are duplicated, e.g. wholesale and port activities are deducted from the impact of wood products manufacturing (Table 4).

Table 4. Double-count reduction factors derived from WA I-O model and from the WFPA 2014 report. Note that NAICS group 113 includes the contributions from 115, support activities for forestry.



WA I-O designation		NAICS	Inter-Industry Output		Total Output		Double-Count	
ID	Description	group	Sum	I-I DC	PCE output	Industry Sum	Sum	Factor
3	Forestry and Logging	113	1,259.8	1,239.4	79.0	2,554.6	1,318.4	0.516
13	Wood Product Mfg.	321	2,765.4	983.7	35.4	6,489.1	1,019.1	0.157
14	Paper Manufacturing	322	1,203.3	413.8	256.8	7,503.8	670.7	0.089
27	Furniture	337	463.3	13.2	20.2	1,676.1	33.4	0.020
29	Wholesale	423	12,096.1	1,727.1	8,205.4	32,259.8	9,932.5	0.308
99	Ports Related	483	449.1	0.1	797.3	1,993.2	797.4	0.400

2.2.3 Direct and estimated taxes

The timber industry produces tax revenues in several forms. Sales of timber (stumpage) are subject to a direct tax, and designated forest land (DFL) is also taxed at state rates. Businesses in the forest products industry are also taxed with Business and Occupation (B&O) tax, retail sales tax, Public Utility Tax (PUT), other assorted fees, and fire protection tax. These latter taxes are leveled with slight variation across counties. Combined tax revenues from the forest products industry therefore include stumpage and land tax, and business operations taxes. Taxes are grouped into Primary Taxes (stumpage, land fees), for which values are directly reported by WA DOR, and Estimated Taxes (B&O, PUT, etc.). The state-level B&O, PUT, etc. taxes are known quantities by NAICS code, but we estimate county-level tax using the fraction of total GBI per county, and in this sense these taxes are estimated for the county level.



3.0 EMPLOYMENT AND WAGES

Direct and total jobs and wages were summarized by industry sector (RIMS II group, §3.1) and by county (§3.2). Methods were developed to compute direct jobs and wages from a complementary set of WA ESD QCEW and BLS QCEW data, using the WA ESD state-level sum by six-digit NAICS code to infer county-level employment and wages for three-digit NAICS codes. All direct jobs and wages reflect data downloaded June 2018; tax data downloaded at the same reflect 2017 revenues for all categories except property tax rate, for which the latest available data are from 2016.

3.1 Industry Sectors

We group NAICS codes into the six industries corresponding to RIMS II multiplier categories (Table 2, Table 5). For 2017, we the forest products industry accounted for 40,359 direct jobs, paying \$2.45 billion in wages (Table 5). With indirect and induced economic impacts, the forest products industry contributes to 101,435 total jobs and \$5.49 billion total wages paid (Table 5). Although direct and total jobs were marginally lower than in 2014, both direct and total wages increased over 2014 (Table 1, Table 5). There is some evidence that the underlying 2014 QCEW data have been revised, so the past figure is subject to modification.

Table 5. Direct and total jobs in the Washington forest products industry for 2017.

Industry Sector	Direct Jobs	Total Jobs	Direct Wages	Total Wages
Forestry and Logging	5,053	7,550	\$ 280,323,696	\$ 438,478,425
Wood Product Manufacturing	13,226	39,010	\$ 702,689,105	\$ 1,975,794,006
Paper Manufacturing	9,246	28,971	\$ 711,991,837	\$ 1,699,090,944
Furniture	5,419	9,960	\$ 235,612,700	\$ 464,072,230
Wholesale	6,556	13,171	\$ 441,410,489	\$ 717,363,511
Ports Related	860	2,773	\$ 81,148,606	\$ 193,853,529
Total	40,359	101,435	\$ 2,453,176,434	\$ 5,488,652,644

County direct jobs and wages figures are available from the composite QCEW dataset (§2.2.1), from which we computed total jobs and wages using the RIMS II multipliers and double-count avoidance factors (Table 6). Counties with substantial forest products industry activity may be home to either basic forestry activity (e.g. Lewis County, with 2,354 direct jobs) or some combination of logging, processing, and manufacture or export (e.g. Cowlitz County, with 3,706 direct jobs). For further details pertaining to RIMS II multiplier calculations, please refer to supplemental materials provided to WFPA with this report.



3.2 Counties

Table 6. Direct and total jobs and wages in the Washington forest products industry comparing for 2017. Each county quantity represents the sum across NAICS categories.

County	Direct Jobs	Total Jobs	Direct Wages	Total Wages
Adams	144	361	\$ 8,739,076	\$ 19,552,507
Asotin	156	392	\$ 9,468,324	\$ 21,184,103
Benton	358	899	\$ 21,735,267	\$ 48,629,739
Chelan	484	1,217	\$ 29,433,877	\$ 65,854,345
Clallam	790	1,986	\$ 48,039,282	\$ 107,481,439
Clark	2,300	5,782	\$ 139,825,154	\$ 312,839,995
Columbia	145	363	\$ 8,790,697	\$ 19,668,004
Cowlitz	3,706	9,314	\$ 225,263,239	\$ 503,996,230
Douglas	140	353	\$ 8,531,460	\$ 19,087,995
Ferry	83	208	\$ 5,040,042	\$ 11,276,416
Franklin	461	1,159	\$ 28,037,638	\$ 62,730,448
Garfield	5	13	\$ 303,920	\$ 679,979
Grant	349	877	\$ 21,218,672	\$ 47,473,928
Grays Harbor	1,750	4,398	\$ 106,367,871	\$ 237,983,820
Island	335	842	\$ 20,353,122	\$ 45,537,377
Jefferson	271	682	\$ 16,485,577	\$ 36,884,265
King	6,534	16,423	\$ 397,191,857	\$ 888,663,410
Kitsap	374	940	\$ 22,742,290	\$ 50,882,819
Kittitas	117	295	\$ 7,122,786	\$ 15,936,277
Klickitat	347	872	\$ 21,081,171	\$ 47,166,289
Lewis	2,354	5,917	\$ 143,101,784	\$ 320,171,014
Lincoln	223	559	\$ 13,528,455	\$ 30,268,100
Mason	454	1,142	\$ 27,611,590	\$ 61,777,223
Okanogan	382	961	\$ 23,234,009	\$ 51,982,973
Pacific	278	700	\$ 16,925,978	\$ 37,869,602
Pend Oreille	310	779	\$ 18,836,922	\$ 42,145,081
Pierce	4,886	12,281	\$ 297,020,575	\$ 664,543,627
San Juan	84	212	\$ 5,124,208	\$ 11,464,728
Skagit	1,190	2,991	\$ 72,332,259	\$ 161,833,709
Skamania	201	506	\$ 12,228,475	\$ 27,359,570
Snohomish	2,649	6,659	\$ 161,035,041	\$ 360,294,266
Spokane	2,369	5,953	\$ 143,966,912	\$ 322,106,622
Stevens	782	1,966	\$ 47,550,673	\$ 106,388,241
Thurston	1,067	2,681	\$ 64,830,013	\$ 145,048,443
Wahkiakum	197	494	\$ 11,951,809	\$ 26,740,566
Walla Walla	612	1,537	\$ 37,180,307	\$ 83,185,941
Whatcom	1,889	4,748	\$ 114,830,967	\$ 256,918,859
Whitman	61	153	\$ 3,697,190	\$ 8,271,965
Yakima	1,520	3,821	\$ 92,417,944	\$ 206,772,732
Total	40,359	101,435	\$ 2,453,176,434	\$ 5,488,652,644



4.0 REVENUE AND TAXES

4.1 Direct Revenues

Annual forest products industry total revenues (Table 7) for each county are calculated as the product of the quotient of county wages to statewide wages and annual revenue. Primary taxes are extracted from WA DOR reported stumpage taxes and DFL property taxes (Table 7).

Table 7. Primary forest products industry tax revenues from stumpage and DFL property taxes.

County	Annual Revenues	Stumpage Sales	Stumpage Taxes	Property Taxes	Total Primary Taxes
Adams	\$ 101,849,511	\$ -	\$ -	\$ -	\$ -
Asotin	\$ 110,348,533	\$ 163,094	\$ 8,155	\$ -	\$ 8,155
Benton	\$ 253,313,557	\$ -	\$ -	\$ -	\$ -
Chelan	\$ 343,036,968	\$ 2,366,907	\$ 118,345	\$ 21,143	\$ 139,488
Clallam	\$ 559,873,563	\$ 39,960,716	\$ 1,998,035	\$ 325,529	\$ 2,323,564
Clark	\$ 1,629,591,536	\$ 28,949,634	\$ 1,447,480	\$ 122,090	\$ 1,569,571
Columbia	\$ 102,451,138	\$ 166,161	\$ 8,308	\$ 11,093	\$ 19,401
Cowlitz	\$ 2,625,329,253	\$ 99,736,924	\$ 4,986,845	\$ 772,975	\$ 5,759,820
Douglas	\$ 99,429,854	\$ -	\$ -	\$ 352	\$ 352
Ferry	\$ 58,739,139	\$ 5,531,090	\$ 276,554	\$ 29,309	\$ 305,863
Franklin	\$ 326,764,507	\$ -	\$ -	\$ -	\$ -
Garfield	\$ 3,542,030	\$ 651,748	\$ 32,587	\$ 520	\$ 33,107
Grant	\$ 247,292,905	\$ -	\$ -	\$ -	\$ -
Grays Harbor	\$ 1,239,663,804	\$ 100,738,196	\$ 5,036,909	\$ 1,452,021	\$ 6,488,930
Island	\$ 237,205,360	\$ 3,542,962	\$ 177,148	\$ 7,955	\$ 185,102
Jefferson	\$ 192,131,077	\$ 35,200,547	\$ 1,760,027	\$ 177,421	\$ 1,937,448
King	\$ 4,629,070,438	\$ 22,171,316	\$ 1,108,565	\$ 253,488	\$ 1,362,054
Kitsap	\$ 265,049,904	\$ 10,803,393	\$ 540,169	\$ 63,559	\$ 603,728
Kittitas	\$ 83,012,476	\$ 1,187,668	\$ 59,383	\$ 25,592	\$ 84,975
Klickitat	\$ 245,690,404	\$ 23,544,568	\$ 1,177,228	\$ 138,765	\$ 1,315,994
Lewis	\$ 1,667,779,000	\$ 142,784,361	\$ 7,139,217	\$ 1,050,277	\$ 8,189,494
Lincoln	\$ 157,667,307	\$ 266,250	\$ 13,312	\$ -	\$ 13,312
Mason	\$ 321,799,135	\$ 37,252,229	\$ 1,862,611	\$ 406,554	\$ 2,269,165
Okanogan	\$ 270,780,635	\$ 4,336,829	\$ 216,841	\$ 17,336	\$ 234,177
Pacific	\$ 197,263,725	\$ 53,288,785	\$ 2,664,439	\$ 807,139	\$ 3,471,578
Pend Oreille	\$ 219,534,807	\$ 14,601,233	\$ 730,061	\$ 87,652	\$ 817,713
Pierce	\$ 3,461,624,752	\$ 39,246,772	\$ 1,962,338	\$ 943,688	\$ 2,906,026
San Juan	\$ 59,720,060	\$ 107,121	\$ 5,356	\$ 7,773	\$ 13,129
Skagit	\$ 842,995,933	\$ 48,481,961	\$ 2,424,097	\$ 277,683	\$ 2,701,781
Skamania	\$ 142,516,699	\$ 25,397,437	\$ 1,269,872	\$ 97,677	\$ 1,367,549
Snohomish	\$ 1,876,782,049	\$ 38,944,930	\$ 1,947,246	\$ 149,898	\$ 2,097,143
Spokane	\$ 1,677,861,634	\$ 7,242,208	\$ 362,110	\$ 74,179	\$ 436,288
Stevens	\$ 554,179,066	\$ 37,411,026	\$ 1,870,550	\$ 192,740	\$ 2,063,290
Thurston	\$ 755,561,048	\$ 34,233,237	\$ 1,711,661	\$ 206,769	\$ 1,918,430
Wahkiakum	\$ 139,292,291	\$ 18,197,093	\$ 909,854	\$ 138,758	\$ 1,048,613
Walla Walla	\$ 433,317,693	\$ 413,367	\$ 20,668	\$ 3,327	\$ 23,996
Whatcom	\$ 1,338,296,910	\$ 19,962,311	\$ 998,115	\$ 143,347	\$ 1,141,462
Whitman	\$ 43,088,876	\$ 97,848	\$ 4,892	\$ -	\$ 4,892
Yakima	\$ 1,077,084,452	\$ 725,690	\$ 36,284	\$ 16,893	\$ 53,177
Total	\$ 28,590,532,029	\$ 897,705,614	\$ 44,885,265	\$ 8,023,501	\$ 52,908,765



4.2 Estimated Tax Revenues

The forest products industry contributes additional taxes to state revenues in the form of business and occupation tax (B&O), public utility tax (PUT), retail sales tax, assorted other fees, and fire protection dues paid to WA DNR (Table 8).

Table 8. Estimated revenues for taxes from Business and Occupation (B&O), retail sales, Public Utility Tax (PUT), other fees, and fire protection as relative fractions of county-level Gross Business Income (GBI), distributed to counties in accordance with the fraction of forest economic activity represented by the county (Table 7).

County	B&O	Retail Sales	Public Utility	Other Fees	Fire Protection	Total Estimated Tax
Adams	\$ 273,081	\$ 311,868	\$ 6,363	\$ 5,498	\$ 39,582	\$ 636,392
Asotin	\$ 295,868	\$ 337,893	\$ 6,894	\$ 5,957	\$ 42,885	\$ 689,497
Benton	\$ 679,188	\$ 775,659	\$ 15,826	\$ 13,675	\$ 98,445	\$ 1,582,793
Chelan	\$ 919,756	\$ 1,050,397	\$ 21,431	\$ 18,519	\$ 133,314	\$ 2,143,417
Clallam	\$ 1,501,142	\$ 1,714,361	\$ 34,978	\$ 30,225	\$ 217,583	\$ 3,498,288
Clark	\$ 4,369,287	\$ 4,989,892	\$ 101,808	\$ 87,974	\$ 633,305	\$ 10,182,266
Columbia	\$ 274,694	\$ 313,711	\$ 6,401	\$ 5,531	\$ 39,815	\$ 640,151
Cowlitz	\$ 7,039,074	\$ 8,038,892	\$ 164,016	\$ 141,729	\$ 1,020,277	\$ 16,403,988
Douglas	\$ 266,593	\$ 304,459	\$ 6,212	\$ 5,368	\$ 38,641	\$ 621,273
Ferry	\$ 157,492	\$ 179,862	\$ 3,670	\$ 3,171	\$ 22,828	\$ 367,023
Franklin	\$ 876,126	\$ 1,000,570	\$ 20,414	\$ 17,640	\$ 126,990	\$ 2,041,740
Garfield	\$ 9,497	\$ 10,846	\$ 221	\$ 191	\$ 1,377	\$ 22,132
Grant	\$ 663,046	\$ 757,223	\$ 15,449	\$ 13,350	\$ 96,105	\$ 1,545,174
Grays Harbor	\$ 3,323,806	\$ 3,795,914	\$ 77,447	\$ 66,924	\$ 481,768	\$ 7,745,859
Island	\$ 635,999	\$ 726,335	\$ 14,819	\$ 12,806	\$ 92,185	\$ 1,482,143
Jefferson	\$ 515,145	\$ 588,315	\$ 12,003	\$ 10,372	\$ 74,668	\$ 1,200,503
King	\$ 12,411,537	\$ 14,174,450	\$ 289,198	\$ 249,901	\$ 1,798,987	\$ 28,924,073
Kitsap	\$ 710,656	\$ 811,596	\$ 16,559	\$ 14,309	\$ 103,006	\$ 1,656,126
Kittitas	\$ 222,574	\$ 254,188	\$ 5,186	\$ 4,481	\$ 32,261	\$ 518,691
Klickitat	\$ 658,749	\$ 752,317	\$ 15,349	\$ 13,264	\$ 95,482	\$ 1,535,161
Lewis	\$ 4,471,675	\$ 5,106,824	\$ 104,193	\$ 90,035	\$ 648,146	\$ 10,420,874
Lincoln	\$ 422,740	\$ 482,785	\$ 9,850	\$ 8,512	\$ 61,274	\$ 985,161
Mason	\$ 862,813	\$ 985,365	\$ 20,104	\$ 17,372	\$ 125,060	\$ 2,010,715
Okanogan	\$ 726,021	\$ 829,144	\$ 16,917	\$ 14,618	\$ 105,233	\$ 1,691,933
Pacific	\$ 528,907	\$ 604,032	\$ 12,324	\$ 10,649	\$ 76,662	\$ 1,232,574
Pend Oreille	\$ 588,620	\$ 672,227	\$ 13,715	\$ 11,852	\$ 85,317	\$ 1,371,731
Pierce	\$ 9,281,363	\$ 10,599,672	\$ 216,263	\$ 186,877	\$ 1,345,285	\$ 21,629,458
San Juan	\$ 160,122	\$ 182,866	\$ 3,731	\$ 3,224	\$ 23,209	\$ 373,152
Skagit	\$ 2,260,254	\$ 2,581,297	\$ 52,666	\$ 45,509	\$ 327,612	\$ 5,267,337
Skamania	\$ 382,118	\$ 436,393	\$ 8,904	\$ 7,694	\$ 55,386	\$ 890,495
Snohomish	\$ 5,032,058	\$ 5,746,802	\$ 117,251	\$ 101,318	\$ 729,370	\$ 11,726,800
Spokane	\$ 4,498,709	\$ 5,137,698	\$ 104,823	\$ 90,580	\$ 652,064	\$ 10,483,874
Stevens	\$ 1,485,874	\$ 1,696,925	\$ 34,622	\$ 29,917	\$ 215,370	\$ 3,462,707
Thurston	\$ 2,025,822	\$ 2,313,566	\$ 47,203	\$ 40,789	\$ 293,632	\$ 4,721,013
Wahkiakum	\$ 373,473	\$ 426,520	\$ 8,702	\$ 7,520	\$ 54,133	\$ 870,348
Walla Walla	\$ 1,161,818	\$ 1,326,841	\$ 27,071	\$ 23,393	\$ 168,399	\$ 2,707,523
Whatcom	\$ 3,588,263	\$ 4,097,933	\$ 83,609	\$ 72,248	\$ 520,100	\$ 8,362,153
Whitman	\$ 115,531	\$ 131,940	\$ 2,692	\$ 2,326	\$ 16,746	\$ 269,235
Yakima	\$ 2,887,896	\$ 3,298,088	\$ 67,290	\$ 58,147	\$ 418,585	\$ 6,730,005
Total	\$ 76,657,388	\$ 87,545,667	\$ 1,786,175	\$ 1,543,466	\$ 11,111,083	\$ 178,643,779



Total combined tax revenue from the forest products industry includes primary taxes directly from forestry activities (stumpage, DFL property tax) and taxes from business activity apportioned to counties by the ratio of forest products industry activity in each county. Total 2017 tax revenue from forest products industry activity summed to \$231.55 million (Table 9).

Table 9. Direct and estimated tax revenues by county for 2017.

County	Total Primary Taxes	Total Estimated Taxes	Combined Taxes
Adams	\$ -	\$ 636,392	\$ 636,392
Asotin	\$ 8,155	\$ 689,497	\$ 697,651
Benton	\$ -	\$ 1,582,793	\$ 1,582,793
Chelan	\$ 139,488	\$ 2,143,417	\$ 2,282,905
Clallam	\$ 2,323,564	\$ 3,498,288	\$ 5,821,852
Clark	\$ 1,569,571	\$ 10,182,266	\$ 11,751,836
Columbia	\$ 19,401	\$ 640,151	\$ 659,552
Cowlitz	\$ 5,759,820	\$ 16,403,988	\$ 22,163,808
Douglas	\$ 352	\$ 621,273	\$ 621,625
Ferry	\$ 305,863	\$ 367,023	\$ 672,886
Franklin	\$ -	\$ 2,041,740	\$ 2,041,740
Garfield	\$ 33,107	\$ 22,132	\$ 55,239
Grant	\$ -	\$ 1,545,174	\$ 1,545,174
Grays Harbor	\$ 6,488,930	\$ 7,745,859	\$ 14,234,789
Island	\$ 185,102	\$ 1,482,143	\$ 1,667,246
Jefferson	\$ 1,937,448	\$ 1,200,503	\$ 3,137,951
King	\$ 1,362,054	\$ 28,924,073	\$ 30,286,127
Kitsap	\$ 603,728	\$ 1,656,126	\$ 2,259,854
Kittitas	\$ 84,975	\$ 518,691	\$ 603,667
Klickitat	\$ 1,315,994	\$ 1,535,161	\$ 2,851,154
Lewis	\$ 8,189,494	\$ 10,420,874	\$ 18,610,368
Lincoln	\$ 13,312	\$ 985,161	\$ 998,474
Mason	\$ 2,269,165	\$ 2,010,715	\$ 4,279,880
Okanogan	\$ 234,177	\$ 1,691,933	\$ 1,926,110
Pacific	\$ 3,471,578	\$ 1,232,574	\$ 4,704,151
Pend Oreille	\$ 817,713	\$ 1,371,731	\$ 2,189,444
Pierce	\$ 2,906,026	\$ 21,629,458	\$ 24,535,485
San Juan	\$ 13,129	\$ 373,152	\$ 386,281
Skagit	\$ 2,701,781	\$ 5,267,337	\$ 7,969,118
Skamania	\$ 1,367,549	\$ 890,495	\$ 2,258,044
Snohomish	\$ 2,097,143	\$ 11,726,800	\$ 13,823,943
Spokane	\$ 436,288	\$ 10,483,874	\$ 10,920,163
Stevens	\$ 2,063,290	\$ 3,462,707	\$ 5,525,997
Thurston	\$ 1,918,430	\$ 4,721,013	\$ 6,639,444
Wahkiakum	\$ 1,048,613	\$ 870,348	\$ 1,918,960
Walla Walla	\$ 23,996	\$ 2,707,523	\$ 2,731,518
Whatcom	\$ 1,141,462	\$ 8,362,153	\$ 9,503,615
Whitman	\$ 4,892	\$ 269,235	\$ 274,127
Yakima	\$ 53,177	\$ 6,730,005	\$ 6,783,183
Total	\$ 52,908,765	\$ 178,643,779	\$ 231,552,544



5.0 REFERENCES

5.1 Data

Beyers, W.B., Lin, T. 2007. The 2007 Washington Input-Output Study. Washington State Office of Financial Management.

Thompson, J. 2018. The Pacific Northwest Forest Inventory and Analysis Database. Forest Inventory and Analysis Program (USFS), 2018. <https://www.fs.fed.us/pnw/rma/fia-topics/inventory-data/>

Table 10. Agency, abbreviation, and URL for data sources that remain fixed once initially posted. †Data source requires establishing a user account and is subject to surcharge.

Data type	Agency Source	URL
Regional Input-Output Modeling System†	BEA	https://bea.gov/regional/rims/rimsii/
Washington Input-Output Model	WA OFM	https://www.ofm.wa.gov/sites/default/files/public/le-gacy/economy/io/2007/I-O_2007_report.pdf
Private / public harvest statistics	WA DoR	https://dor.wa.gov/find-taxes-rates/other-taxes/forest-tax/harvest-statistics
Gross business income (GBI)	WA DoR	http://apps.dor.wa.gov/ResearchStats/Content/GrossBusinessIncome/Report.aspx
Designated Forestland Valuation	WA DoR	https://dor.wa.gov/find-taxes-rates/other-taxes/forest-tax/forest-land-values
Tax levy rates by industry	WA DoR	https://dor.wa.gov/about/statistics-reports/detailed-tax-data-industry-and-tax-classification

Table 11. Agency, abbreviation, and URL for data sources that may be subject to retroactive revision. †Data source is freely available but requires establishing a user account to access.

Data type	Agency Source	URL
Port-level import-export†	Census Bureau	https://usatrade.census.gov/
Quarterly Census of Employment and Wages (QCEW)	BLS	https://www.bls.gov/cew/datatoc.htm
WA Employment Security Department (ESD) Quarterly Census of Employment and Wages (QCEW)	WA ESD QCEW	https://fortress.wa.gov/esd/employmentdata/report-s-publications/industry-reports/quarterly-census-of-employment-and-wages

5.2 Methods

Ehrlich, E.M., Landefeld, J.S., Barker, B.L. 1997. Regional Multipliers: A user Handbook for the Regional Input-Output Modeling System (RIMS II). Bureau of Economic Analysis.

The Contribution of Working Forests to the Economy of the State of Washington. 2014. Washington Forest Protection Association.



6.0 APPENDIX

Table 12. Jobs, wages, and tax revenues expressed on a per-MMbf (million board feet) harvest scale for 2017.

County	Harvest (MMbf)	Quantity / MMbf				
		Direct Jobs	Total Jobs	Direct Wage	Total Wage	Total Tax
Adams	-	-	-	-	-	\$ -
Asotin	1.2	135	340	\$ 8,211,903	\$ 18,373,029	\$ 605,075
Benton	-	-	-	\$ -	\$ -	\$ -
Chelan	16.1	30	76	\$ 1,832,973	\$ 4,101,030	\$ 142,166
Clallam	184.5	4	11	\$ 260,408	\$ 582,628	\$ 31,559
Clark	82.3	28	70	\$ 1,698,144	\$ 3,799,368	\$ 142,723
Columbia	1.2	121	305	\$ 7,374,746	\$ 16,500,004	\$ 553,315
Cowlitz	277.4	13	34	\$ 811,944	\$ 1,816,615	\$ 79,888
Douglas	-	-	-	\$ -	\$ -	\$ -
Ferry	31.9	3	7	\$ 157,926	\$ 353,338	\$ 21,084
Franklin	-	-	-	\$ -	\$ -	\$ -
Garfield	4.4	1	3	\$ 68,791	\$ 153,911	\$ 12,503
Grant	-	-	-	\$ -	\$ -	\$ -
Grays Harbor	319.6	5	14	\$ 332,852	\$ 744,712	\$ 44,544
Island	10.4	32	81	\$ 1,965,536	\$ 4,397,622	\$ 161,009
Jefferson	139.9	2	5	\$ 117,851	\$ 263,676	\$ 22,432
King	72.0	91	228	\$ 5,519,773	\$ 12,349,751	\$ 420,886
Kitsap	26.0	14	36	\$ 873,897	\$ 1,955,227	\$ 86,837
Kittitas	7.9	15	37	\$ 899,569	\$ 2,012,664	\$ 76,240
Klickitat	74.5	5	12	\$ 283,117	\$ 633,436	\$ 38,291
Lewis	384.7	6	15	\$ 371,963	\$ 832,218	\$ 48,374
Lincoln	2.2	102	255	\$ 6,174,557	\$ 13,814,742	\$ 455,716
Mason	88.1	5	13	\$ 313,255	\$ 700,867	\$ 48,556
Okanogan	29.0	13	33	\$ 802,224	\$ 1,794,868	\$ 66,505
Pacific	187.6	1	4	\$ 90,214	\$ 201,841	\$ 25,073
Pend Oreille	55.4	6	14	\$ 340,256	\$ 761,277	\$ 39,548
Pierce	122.9	40	100	\$ 2,417,533	\$ 5,408,906	\$ 199,701
San Juan	1.2	72	180	\$ 4,364,743	\$ 9,765,526	\$ 329,030
Skagit	146.2	8	20	\$ 494,772	\$ 1,106,987	\$ 54,511
Skamania	78.9	3	6	\$ 154,938	\$ 346,653	\$ 28,610
Snohomish	117.1	23	57	\$ 1,375,486	\$ 3,077,465	\$ 118,078
Spokane	34.4	69	173	\$ 4,186,545	\$ 9,366,832	\$ 317,557
Stevens	159.5	5	12	\$ 298,056	\$ 666,860	\$ 34,638
Thurston	86.8	12	31	\$ 747,303	\$ 1,671,990	\$ 76,534
Wahkiakum	68.7	3	7	\$ 174,075	\$ 389,469	\$ 27,949
Walla Walla	2.3	261	656	\$ 15,875,451	\$ 35,519,189	\$ 1,166,319
Whatcom	54.0	35	88	\$ 2,128,234	\$ 4,761,637	\$ 176,136
Whitman	0.4	137	344	\$ 8,327,003	\$ 18,630,551	\$ 617,403
Yakima	2.7	571	1,436	\$ 34,730,531	\$ 77,704,897	\$ 2,549,110
Total	2,871.1	14.1	35.3	\$ 854,432	\$ 1,911,677	\$ 80,649



Table 13. Interrelated economic regions in Washington, organized by RIMS II multiplier regions.

RIMS Abbr.	Region	County	State
KRP	Kennewick-Richland-Pasco	Benton	WA
KRP	Kennewick-Richland-Pasco	Columbia	WA
KRP	Kennewick-Richland-Pasco	Franklin	WA
KRP	Kennewick-Richland-Pasco	Walla Walla	WA
KRP	Kennewick-Richland-Pasco	Yakima	WA
LEW	Lewiston	Asotin	WA
LEW	Lewiston	Garfield	WA
PVB	Portland-Vancouver-Beaverton	Clark	WA
PVB	Portland-Vancouver-Beaverton	Cowlitz	WA
PVB	Portland-Vancouver-Beaverton	Klickitat	WA
PVB	Portland-Vancouver-Beaverton	Skamania	WA
PVB	Portland-Vancouver-Beaverton	Wahkiakum	WA
STO	Seattle-Tacoma-Olympia	Clallam	WA
STO	Seattle-Tacoma-Olympia	Grays Harbor	WA
STO	Seattle-Tacoma-Olympia	Island	WA
STO	Seattle-Tacoma-Olympia	Jefferson	WA
STO	Seattle-Tacoma-Olympia	King	WA
STO	Seattle-Tacoma-Olympia	Kitsap	WA
STO	Seattle-Tacoma-Olympia	Kittitas	WA
STO	Seattle-Tacoma-Olympia	Lewis	WA
STO	Seattle-Tacoma-Olympia	Mason	WA
STO	Seattle-Tacoma-Olympia	Pacific	WA
STO	Seattle-Tacoma-Olympia	Pierce	WA
STO	Seattle-Tacoma-Olympia	San Juan	WA
STO	Seattle-Tacoma-Olympia	Skagit	WA
STO	Seattle-Tacoma-Olympia	Snohomish	WA
STO	Seattle-Tacoma-Olympia	Thurston	WA
STO	Seattle-Tacoma-Olympia	Whatcom	WA
SPK	Spokane	Ferry	WA
SPK	Spokane	Lincoln	WA
SPK	Spokane	Pend Oreille	WA
SPK	Spokane	Spokane	WA
SPK	Spokane	Stevens	WA
SPK	Spokane	Whitman	WA
WEN	Wenatchee	Adams	WA
WEN	Wenatchee	Chelan	WA
WEN	Wenatchee	Douglas	WA
WEN	Wenatchee	Grant	WA
WEN	Wenatchee	Okanogan	WA



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