

# The Economic Impacts of the Port of Port Angeles Log Yard and the Forest Products Industry – An Executive Summary

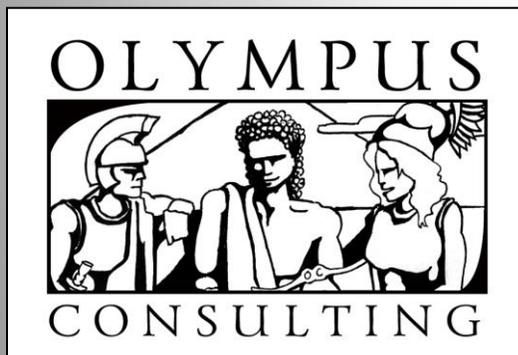


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## Abstract

The Forest Products Industry uses sustainably grown and harvested energy and material from local forests to support 665 living wage jobs at an average monthly wage of \$5,259, where the average for 2019 in Clallam County is \$3,586 (2020\$). As the largest single source of external revenues to the County, \$144 million in 2017 (2020\$), on average, every job in this sector supports an additional 1.3 jobs. Central to this industry is the Port of Port Angeles Log Yard which serves as a nexus, sorting, directing and moving wood fiber to local saw mills and exporting energy and wood products to domestic and international markets by truck, barge and ship, supporting 181 jobs in the local economy. The Forest Product Industry consists of diverse businesses that are highly integrated in terms of supply chains and access to final markets.

## Overview

The Port of Port Angeles (Port) requested that Olympus Consulting bring together economic impact analysis from three previous studies published by the Port.<sup>1</sup>

This executive summary report informs readers of how the Forest Products Industry and the Port of Port Angeles Log Yard (Port Log Yard) promote and sustain living wage employment to local families.

The sector is dynamic, with oscillations in employment and income, some driven by the business cycle, others by international markets, and others by technological change and new market opportunities. The Forest Products Industry increases the average standard of living in an economically distressed county for two primary reasons. First, with an average wage exceeding the average in Clallam County, every job *gained/lost increases/decreases* the County average. Second, employment in the Forest Products Industry provides living wage employment to local families, thus further increasing the average the standard of living. This, in contradistinction, to other sectors targeted for expansion that often pay a wage below the County average thereby reducing the average standard of living. This report summarizes the structure of the Forest Products Industry and its contribution to economic vitality in Clallam County. To help the reader better understand the importance of this economic sector relative to others targeted for expansion, a brief comparative analysis of impacts on the average standard of living is explored.

## Economic Development and Impacts on the Average Standard of Living

There are two ways that decision makers can improve the economic vitality of an economy.

One way is to promote economic development that can compensate for oscillations in the level of economic activity so that when one sector contracts another expands.

This can be accomplished by expanding the diversity of economic sectors in a community to absorb and dampen shocks to any one industry caused by market changes, or a general downturn such as a recession.

The second way to improve economic vitality through economic development is to focus on how an economic sector affects the average county wage.

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<sup>1</sup> Daniel Underwood and Jason Cross, *Analysis of the Department of Natural Resources' Sustainable Harvest Alternatives: Impacts on Employment, Wages, Business Taxes, and Timber and Harvest Excise Taxes*, March 2017; Daniel Underwood and Jason Cross, *The Economic Impacts of Private Timber Harvests: An Exploratory Investigation of Harvests, Exports, Employment, Income and Tax Remittances*, November 2017; Daniel Underwood, *The Port of Port Angeles Log Yard: A Nexus in the Forest Products Industry*, August 2018.

Not all employment is equal. Some economic sectors generally provide full-time work, or 2080 hours annually. Similarly, some economic sectors provide benefits while others do not. Table 1 presents comparative metrics for seven different industries in Clallam County. While “selective,” they do provide a wide array of the types of industries that exist and are thus useful for comparative analysis.<sup>2</sup> Economic sectors are listed using the 2-digit North American Classification System (NAICS). Jobs are total annual covered employment. Employee Income is the annual total by sector. Wage is the monthly average (mean). WP is the wage premium, the difference between the wage paid by a sector and the average in Clallam County in 2019, \$3,586 (2020\$): (WP = Wage – \$3,586). If positive, that Wage increases the County average and thus increases the average standard of living. If negative, it pulls the County average down. The Living Wage (LW) for a family consisting of 2 adults, 1 working full time or 2080 hours/year, and 2 children was \$4,287 in 2020.<sup>3</sup> The Living Wage Premium (LWP) is computed as LWP = LW - Wage. The LWP is a useful metric to assess the extent to which employment in a sector provides, or fails to provide, a family living wage. In addition, Wages with a positive LWP pull the average standard of living upward. A negative LWP can pull the County average upward if it has a positive WP. All monetary values are expressed in 2020 dollars (2020\$).<sup>4</sup>

<b>Employment and Income by Select Economic Sector, 2019 (2020\$)</b>					
<b>NAICS Economic Sector</b>	<b>Jobs</b>	<b>Employee Income</b>	<b>Wage</b>	<b>WP</b>	<b>LWP</b>
Construction (23)	1229	\$53,320,413	\$3,615	\$29	-\$672
Manufacturing (31-33)	1104	\$58,138,246	\$4,388	\$802	\$101
Retail (44-45)	3387	\$109,973,538	\$2,706	-\$880	-\$1,581
Information (51)	141	\$6,198,996	\$3,664	\$78	-\$623
Professional Services	564	\$26,470,517	\$3,911	\$325	-\$376
Arts, Entertainment, Recreation (71)	221	\$4,219,888	\$1,591	-\$1,995	-\$2,696
Accommodation and Food Services (72)	2550	\$53,027,822	\$1,733	-\$1,853	-\$2,554
<b>Totals for Select Economic Sectors</b>	<b>9196</b>	<b>\$311,349,421</b>	<b>\$2,821</b>	<b>-\$765</b>	<b>-\$1,466</b>

Table 1: A comparison of employment, employee income, average monthly wage, wage premium, and living wage premium by select economic sector in 2019 (2020\$).

While the Bureau of Labor Statistics Quarterly Census of Employment and Wages (QCEW) data does not report hours worked, Table 1 still allows direct comparison between economic sectors using the metrics discussed above. For instance, while Manufacturing (1,229 Jobs) does not provide the highest level of total employment, it is a sector that generally provides full-time employment and pays benefits. Accommodation and Food Services (2,550 Jobs), by comparison, provides more Jobs but is generally part-time and often does not provide

<sup>2</sup> There are missing values (not reported by the Bureau of Labor Statistics to protect proprietary information) for Manufacturing and Information. Source: QCEW 2019. esd.wa.gov Labor Market Info.

<sup>3</sup> <https://livingwage.mit.edu>

<sup>4</sup> To adjust 2019 values into 2020\$, a factor of 1.023 was used. [www.inflationtool.com](http://www.inflationtool.com)

benefits.<sup>5</sup> The Manufacturing Wage is \$4,388 with WP \$802 and LWP \$101. Thus, every Job in Manufacturing provides a living wage for a family of four and pulls the County average Wage upward, improving the average standard of living. The same is not true for Accommodation and Food Services with Wage \$1,733, WP **-\$1,853** and LWP **-\$2,554**. These metrics allow us to say more. Consider: every new job in Accommodation and Food Services that, on average, pays \$1,733 pulls down the County average by WP = **-\$1,853**.

How many manufacturing jobs would it take to compensate for this downward pull on the County average caused by 1 job with a negative wage premium of **\$1,853**?

As Manufacturing has a WP = \$802,  $\$1,853/\$802 = 2.3$ .

It would take 2.3 additional jobs in Manufacturing to compensate for the downward pull of a single new job in Accommodation and Food Services.

Of the select sectors, Construction, Manufacturing, Information and Professional Services have positive WPs; Retail, Arts, Entertainment, Recreation, and Accommodation and Food Services have negative WPs.<sup>6</sup> When evaluating the extent to which policy driven changes in employment will affect economic vitality in Clallam County, the use of these metrics is informative.

## Estimating Economic Impacts

Economic impacts are measured in terms of direct, indirect and induced impacts. A direct impact is driven by a change in expenditures in a sector of interest which impacts employment (Jobs) and employee compensation including benefits (Wages).<sup>7</sup> Indirect impacts result as those direct expenditures create expenditures in the supply chain. Those directly and indirectly employed make expenditures in the local economy which causes induced impacts in sectors ranging from health care to retail services. The cited studies make use of IMPLAN,<sup>8</sup> the

<sup>5</sup> We can check to determine if Accommodation and Food Services provided full-time employment for the data year 2019. Using reported wages, the annual employee income was \$20,282. We can compute average hourly Wage by dividing by 2080, annual hours worked by a full-time employee, which yields \$9.75/hour. The legally mandated minimum wage for 2019 was \$12.00/hour. As \$9.75 is 81% of \$12.00, this implies that if everyone working in Accommodation and Food Services was paid the minimum wage in 2019, they worked 81% of 2080, or 1685 hours. In reality, many people in Accommodation and Food Services earn more than the minimum wage, which means the average hours worked in that sector are less than 1685 hours. That is, part-time.

<sup>6</sup> Table 1 indicates the WP of those select sectors pulling average down (blue), and up (black).

<sup>7</sup> Taxes and Proprietor Income are not explored in this brief report though they are detailed in the cited studies. When analyzing the Forest Products Industry, it is important to keep in mind that timber sales on State Trust Lands bring much needed tax revenues to junior taxing districts. See Daniel Underwood and Jason Cross, *Analysis of the Department of Natural Resources' Sustainable Harvest Alternatives: Impacts on Employment, Wages, Business Taxes, and Timber and Harvest Excise Taxes*, March 2017.

<sup>8</sup> "IMPLAN is an acronym for IMpact analysis for PLANing. Frances Day, *Principles of Impact Analysis & IMPLAN Applications*. MIG Incorporated.

modeling system generally employed by economists conducting economic impact analysis. IMPLAN allows estimation of how many indirect and induced jobs are created by a direct impact, and does so by each economic sector impacted. These impacts are driven by economic multipliers which illustrate not only how many more Jobs are created, but where they are and what they pay. These multipliers and the Wage are greatly affected by the inflow of expenditures to Clallam County – external revenue (payments made by entities outside of the county, also known as export revenue) and the number of sequential links in the supply chain.

In 2017, the Forest Products Industry had the greatest value of external revenues of any economic sector in the County, with a value of \$144 million (2020\$).<sup>9</sup>

In addition, value added at each step in the production-distribution process generally translates into higher Wages. Thus, the Forest Product Industry pays a Wage with positive WPs and LWPs, pulling up the average standard of living. In addition, jobs in the supply chain (indirect impacts) also have positive WPs. Thus, it too is a driver of improved economic vitality.

Not all new Jobs are equal: as seen above, some pay more than average and some pay less. Some provide living wages and others do not. Both have corresponding implications for the average standard of living. This information is useful when assessing the expected outcomes of policy options. In the Forest Products Industry, the direct economic sectors – where the economic activity begins – consist of Forest Preparation, commercial logging (Logging), saw milling (Milling) and log yard activities (Port Log Yard). Economic impacts are presented in the form of Jobs, average monthly wage (Wage), and Living Wage Premium (LWP). While these sectors generally provide full-time work (2080 hours/year), induced employment, dominated by the service sector, often does not. Thus, not all service sector Jobs will be full-time which partly explains relative Wage levels. To update Wages from previous studies, IMPLAN 2017 was used for the study year 2020. The interested reader may refer to those reports for analytical detail regarding research methods, experimental design, and explanations of results.<sup>10</sup>

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<sup>9</sup> In 2017 the second largest source of export revenues to Clallam County is from Boat and Ship Building and Repair, at \$101.9 million and \$10.4 million for Aircraft Parts; contrast this with \$12 million for Performing Arts, \$9 million for Hotels and Motels, including Casino Hotels, and \$7.3 million from Full-Service Restaurants. Source IMPLAN 2017; all values in 2020\$.

<sup>10</sup> The Forest Products Industry also provides significant employment for proprietors and sources of tax income.

## The Economic Impacts of the Forest Products Industry

The total direct economic impacts associated with the Forest Products Industry begin with forest preparation, forestry and logging on both private and public forests in Clallam and Jefferson Counties. Logs are sorted for distribution to customers: local wood product manufacturers, and domestic and international export markets. Some of that sorting by customer is done at the Merrill and Ring (MR) operation at the Port Airport Industrial Site. The remainder is processed at the Port Log Yard.<sup>11</sup> In 2016 201.4 mmbf of wood fiber was harvested from private land in Clallam (140.5 mmbf) and Jefferson (60.9 mmbf) Counties, and used in Clallam County and for export (domestic-export harvest). Of the domestic-export harvests, 117.3 mmbf were manufactured in Clallam County while 84.1 mmbf were exported through the Port Log Yard. At the same time, 28.63 mmbf were obtained from State Trust Lands (DNR).<sup>12</sup> Table 2 summarizes economic impacts as Jobs, for direct, indirect, and induced impacts by wood fiber source. Of the 665.4 Jobs in the Forest Products Industry, 35.5 were supported by DNR harvests, 375.4 from the 117 mmbf of domestic-private harvests, 81.4 through Port Log Yard domestic-exports; an additional 173.1 Jobs were supported by wood fiber from other sources.<sup>13</sup> The total employment was 1,521.4, including total indirect employment of 298 and total induced employment of 558.

Source of Wood Fiber	Direct	Indirect	Induced	Totals
DNR	35.5	19	26.5	81
Private	375.4	210.8	272.8	859
Exports	81.4	19.1	80.2	180.7
Other	173.1	49.1	178.5	400.7
<b>Totals</b>	<b>665.4</b>	<b>298</b>	<b>558</b>	<b>1521.4</b>

Table 2: Employment impacts by wood fiber source, 2016.

Figure 1 helps to visualize the process whereby forests are grown, harvested, transported, scaled, sorted, debarked, transported, processed and distributed to final markets in a continuous and sustainable process. Wood fiber harvested from private and public forests moves by truck to scales operated by Pacific Rim. Scales are physically located on Highway 101, Interfor, Port Angeles Hardwoods, and the Port Log Yard. Total Jobs moving that flow of wood fiber was 383 in 2016, with 24 in Forest Preparation and 359 in Logging, which includes truck

<sup>11</sup> Daniel Underwood, *The Port of Port Angeles Log Yard: A Nexus in the Forest Products Industry*, August 2018. Since publication of that report, China Forest Products (Alcan) has moved operations to Hermann Brothers Log Yard.

<sup>12</sup> The value 28.63 mmbf was derived from the annual harvest from 2005 to 2014. Daniel Underwood and Jason Cross, *Analysis of the Department of Natural Resources' Sustainable Harvest Alternatives: Impacts on Employment, Wages, Business Taxes, and Timber and Harvest Excise Taxes*, March 2017, p. 1.

<sup>13</sup> Olympus has not analyzed the total flow of wood fiber by source used by the Forest Product Industry.

transport. Wood product manufacturing (Milling) provided 256 Jobs. Export operations supported 26.4 Jobs (Port Log Yard and Shiplside Operations). This flow is illustrated in Figure 1, by economic sector, businesses and markets. Arrows indicate directional flows.

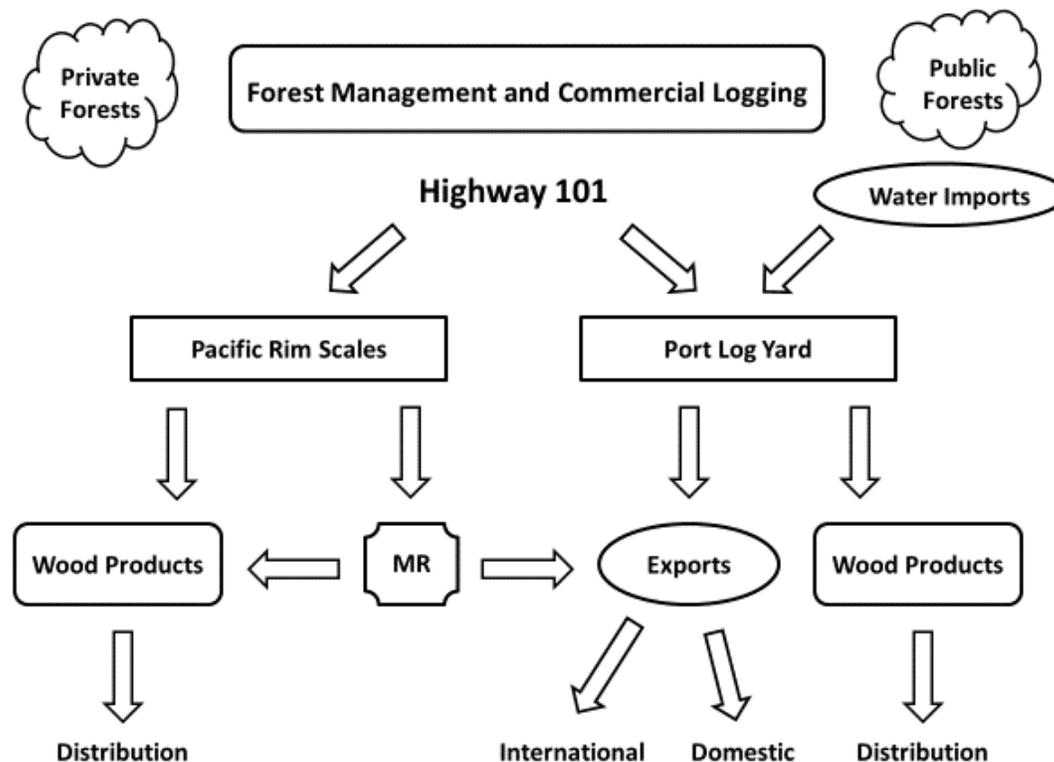


Figure 1: The flow of wood fiber through the Forest Product Industry.

As seen above, the Forest Products Industry consists of a wide array of horizontally and vertically integrated businesses that begins with forest preparation and extends to the domestic and international export of wood products. In between are linkages between commercial logging (which includes trucking, scaling, and debarking), sawmills, paper production and bioenergy.<sup>14</sup> While sawmills constitute the majority of wood product manufacture, employment in logging is 1.4 times greater. Thus, most Jobs in this dynamic and sustainable industry are found in the woods or on the road. At present, of the wood fiber harvested and used in Clallam and Jefferson Counties, about 80 percent comes from private land and 20 percent from State Trust Lands.

Harvests from State Trust Lands are often a critical additional flow to local sawmills that allows them to operate profitably during periods of peak wood fiber demand.

<sup>14</sup> While paper production and bioenergy are not analyzed in this executive summary report as it is in transition from NIPPON to McKinley, they are discussed in Concluding Observations.

Also important is that with private harvests near or at maximum sustained yields, increased wood fiber processing will require additional harvests from public lands or by water import.<sup>15 16</sup> At present, local mills have excess production capacity – they can profitably use more wood fiber and, in the process, create additional living wage Jobs for local families.<sup>17</sup> The economic impacts are presented in Table 3.

<b>Total Economic Impacts of the Forest Products Industry (2020\$)</b>				
<b>NAICS</b>	<b>Sector/Impact</b>	<b>Jobs</b>	<b>Wage</b>	<b>LWP</b>
115	Forest Preparation	24.0	\$2,939	-\$1,348
113	Logging	359.0	\$5,205	\$918
321	Milling	256.0	\$5,455	\$1,168
113	Port Log Yard Staff	8.0	\$5,210	\$923
4883	Shipside Operations	18.4	\$6,623	\$2,336
<b>Subtotals, Direct Impacts</b>		<b>665.4</b>	<b>\$5,259</b>	<b>\$972</b>
	Indirect	298.0	\$2,982	-\$1,305
	Induced	558.0	\$1,886	-\$2,401
<b>Grand Totals</b>		<b>1521.4</b>	<b>\$3,576</b>	<b>-\$711</b>

Table 3: The direct, indirect and induced economic impacts associated with the Forest Product Industry in 2016 from private and public harvests (2020\$).

When assessing the importance of the Forest Products Industry to the economic vitality of Clallam County, several comparative metrics are useful. First, the average (mean) Wage for all covered employment in 2019 was \$3,586 (2020\$). Second, the living wage for a family of 4 was \$4,287 (2020\$). In Table 3, we see that Logging, Milling, Port Log Yard Staff and Shipside Operations with respective Jobs/Wage of 359/\$5,205, 256/\$5,455, 8/\$5,210 and 18.4/\$6,623 all exceed the average county Wage, provide a positive LWP, and thus increase the average standard of living.<sup>18 19</sup> Table 3 also reveals that employment in other sectors – the supply chain and the general economy – have wages below the county average and thus pull down the general standard of living.

Thus, each new job in the Forest Products Industry and the supply chain improves the average standard of living in Clallam County.

<sup>15</sup> Daniel Underwood and Jason Cross, *Analysis of the Department of Natural Resources' Sustainable Harvest Alternatives: Impacts on Employment, Wages, Business Taxes, and Timber and Harvest Excise Taxes*, March 2017, p. 1.

<sup>16</sup> Daniel Underwood and Jason Cross, *The Economic Impacts of Private Timber Harvests: An Exploratory Investigation of Harvests, Exports, Employment, Income and Tax Remittances*, November 2017, p. 4.

<sup>17</sup> In the last five years the North Olympic Peninsula has lost four mills partly due to insufficient wood fiber.

<sup>18</sup> The weighted mean wage for the Forests Products Industry is \$5,259 with LWP = \$972.

<sup>19</sup> Shipside operations includes all occupations involved loading a ship, which includes maritime union employees (\$9,157/month) and those employed in commercial logging (\$5,205/month).

Induced impacts primarily affecting the service sector. That sector, with part-time and/or seasonal employment, pay Wages below the county average Wage, have large negative LWPs, and reduce the average standard of living.

## The Port of Port Angeles Log Yard – Nexus for Sustainable Economic Development

In its 2018 report, Olympus Consulting detailed the complex and integrative role of the Port of Port Angeles Log Yard (Port Log Yard) in the Forest Products Industry. Figure 2 illustrates the associated economic activities of forestry, logging, truck transport, scaling, destination sorting, de-barking, and transport by truck, barge and ship to the next destination.

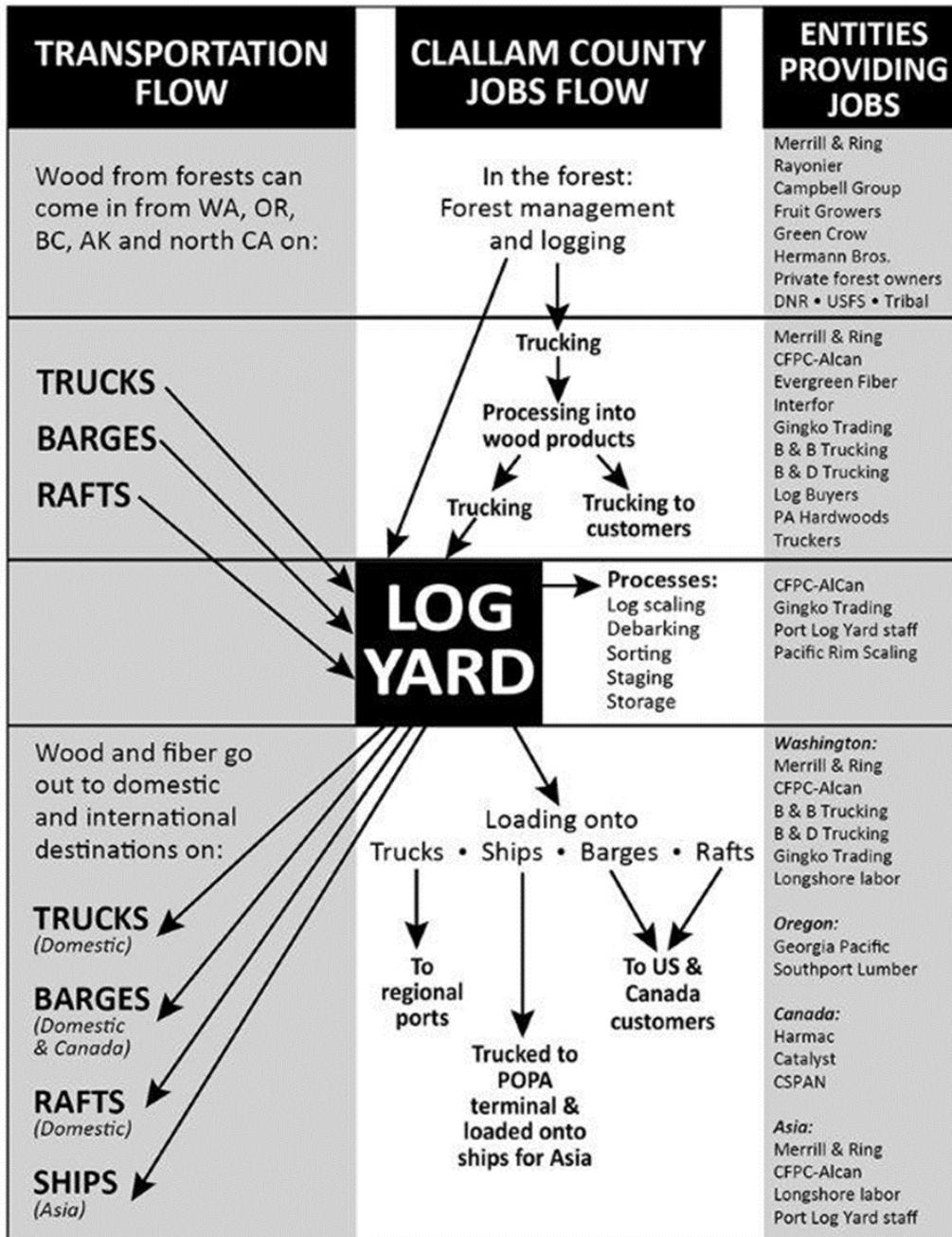


Figure 2: The Port of Port Angeles Log Yard as a nexus for the Forest Products Industry.

All wood fiber moving to and from the Port Log Yard constitutes a direct economic impact that begin with forest preparation and management, commercial logging and truck transport of wood fiber to the Port Log Yard. Direct impacts also include activities associated with moving wood through Port Log Yard facilities: scaling, sorting and stacking. Lastly, direct impacts include movement out of the Port Log Yard for local wood product manufacturing or export by water or truck transport. While these are the direct impacts associated with the Port Log Yard, there are also *directly dependent employment impacts*.

Wood fiber imported through the Port Log yard by barge or raft transport is utilized by local wood product manufacturers, and are a critical source of wood fiber in addition to harvests from private and public lands on the North Olympic Peninsula.

Some of that imported wood fiber moves toward domestic or international export, after processing at the Port Log Yard or off-site by local businesses. In addition, some wood harvested from the peninsula moves through the Port Log Yard for scaling, sorting and stacking until sufficient quantities are accumulated for use by local wood product manufacturers, or transported by water or truck to more distant markets.

### The Economic Impact of the Port Log Yard

The economic impacts associated with the integrative flows explored above are summarized in Table 4. 4 Jobs in Forest Preparation are supported at a Wage of \$2,939 with LWP = **-\$1,348**. 51 Jobs are supported in Logging (includes trucking) at Wage \$5,205 with LWP = \$918. 26.4 total Jobs at the Log Yard are supported (Port employees, private sector employees in wood handling, and union maritime workers), at Wage \$6,195 with LWP = \$1,908. The indirect impacts in the supply chain are 19.1 Jobs at Wage \$2,982 with LWP = **-\$1,305**. Induced impacts supported by expenditures of those directly and indirectly employed are 80.2 Jobs at Wage \$1,886 with LWP = **-\$2,401**. The overall impact is 180.7 Jobs at Wage \$3,883 and LWP = **-\$404**, and a positive WP = **\$335** (\$3,883 - \$3548).

<b>Log Exports 2016, 84.1 MMBF</b>			
<b>Sector/Impact</b>	<b>Jobs</b>	<b>Wage</b>	<b>LWP</b>
Forest Preparation	4	\$2,939	<b>-\$1,348</b>
Logging	51	\$5,205	\$918
Port Log Yard, All Activities	26.4	\$6,195	\$1,908
<b>Subtotals, Direct Impacts</b>	<b>81.4</b>	<b>\$5,415</b>	\$1,128
Indirect	19.1	\$2,982	<b>-\$1,305</b>
Induced	80.2	\$1,886	<b>-\$2,401</b>
<b>Total</b>	<b>180.7</b>	<b>\$3,883</b>	<b>-\$404</b>

Table 4: The direct, indirect and induced economic impacts of the Port Log Yard, 2016 (2020\$)<sup>20</sup>

<sup>20</sup> Daniel Underwood, *The Port of Port Angeles Log Yard: A Nexus in the Forest Products Industry*, August 2018, p. 20.

## The Economic Impacts of Businesses Directly Dependent on the Port Log Yard

Local sawmills are directly dependent on the flow of wood fiber moving through the Port Log Yard.

Those mills also utilize the Port Log Yard to export, by barge and ship, finished energy and material products. The primary businesses affected include Evergreen, a subsidiary of Hermann Brothers, Interfor, and Port Angeles Hardwoods, a subsidiary of Cascadia Hardwood Group.<sup>21</sup> The directly dependent employment impacts are summarized in Table 5.

<b>Directly Dependent Business</b>	<b>Direct</b>	<b>Indirect</b>	<b>Induced</b>	<b>Total</b>
Evergreen	48.0	22.4	38.7	109.1
Interfor	125.0	98.1	69.0	292.1
Port Angeles Hardwood	83.0	65.1	45.8	193.9
<b>Grand Total Employment</b>	<b>256.0</b>	<b>185.6</b>	<b>153.5</b>	<b>595.1</b>

Table 5: The 2016 employment impacts of businesses directly dependent on the Port Log Yard.<sup>22</sup>

The flow of wood fiber moving through the Port Log Yard helps support 48 Jobs directly associated with Evergreen, 125 Jobs at Interfor, and 83 Jobs at Port Angeles Hardwoods. The indirect employment impact in the supply chain is 22.4, 98.1, and 65.1 respectively. The induced Job impacts from those directly and indirectly employed are 38.7, 69.0, and 45.8 respectively. The total employment impact for each business – sum of direct, indirect and induced employment – upon the economy of Clallam County is 109.1, 292.1, and 193.9 respectively. The grand total employment impacts are 256 direct Jobs, 185.6 indirect Jobs and 153.5 induced Jobs. Thus, the total directly dependent employment effect of the Port Log Yard is 595.1 Jobs as accounted for by the operations of Evergreen, Interfor, and Port Angeles Hardwoods, the primary local wood product manufacturers in Clallam County.

<sup>21</sup> While the reports economic impact analysis focused on Clallam County, it is critical to note that energy and material resources moving through the Port Log Yard are a critical source of inputs to Port Townsend Paper Company in adjacent Jefferson County that employs 300 people at an average monthly wage of \$6,300 with a LWP of \$2,013.

<sup>22</sup> Daniel Underwood, *The Port of Port Angeles Log Yard: A Nexus in the Forest Products Industry*, August 2018, p. 5.

## Concluding Observations

This brief executive summary report has highlighted the economic impacts of the Forest Products Industry in Clallam County.

Every direct Job in that sector – Forestry, Logging, Milling, Port Log Yard – provides, on average, a Wage of \$5,259 with LWP = \$972 which increases the average standard of living in Clallam County.

At the same time, each Job in the Forest Products Industry supports an additional 0.45 Jobs in the supply chain (Indirect Impact) at a Wage of \$2,982 which also increases the average standard of living. Lastly supported are 0.83 Induced Jobs at a Wage of \$1,886.

These economic impacts reveal only part of the significance of the Forest Products Industry in Clallam County. The forests of the North Olympic Peninsula provide a vast array of services, including aesthetics, wildlife habitat, watershed to protect fresh water, and lands for recreation; at the same time, they provide a continuous flow of renewable energy and material resources that reduce carbon dioxide emissions by producing substitute energy and materials products for carbon intensive fossil fuel based electricity, and concrete and steel in construction, while providing living wage employment to local families in an economically distressed County. Thought of holistically and strategically, the industry is central to any policies that have sustainability and mitigation of climate change as an objective.

Consider the following as examples of the synergies associated with the Industry in general, and Port Log Yard in particular. First, with the acquisition Nippon Paper by McKinley Paper, operations have resumed, producing cardboard using recycled materials. The bio-generator is capable of producing 12 megawatts of electricity utilizing materials that are a by-product of wood harvesting and processing, which can support additional economic activities. Second, companies have begun experimenting with the development of international markets for hog fuel as an energy source to produce electricity to reduce carbon emissions and meet commitments to the Paris Climate Accords. Third, barge operations at the Port Log Yard have increased as Interfor has developed markets in Vancouver for wood chips, increasing its margins and sustaining local employment.

The Forest Products Industry uses sustainably grown and harvested energy and material from local forests to directly support 665 living wage Jobs that raise the average wage in Clallam County and thus increases the standard of living.

The Forest Product Industry has one of the highest job multipliers of any sector in Clallam County. This sector supports an additional 856 Jobs, for a total of 1,521 Jobs.

Several of these businesses are directly dependent on the Port's Log Yard.

The Forest Product Industry consists of diverse businesses that are highly integrated in terms of supply chains and access to final markets.

The Forest Products Industry is the largest source of external revenues to the County, \$144 million in 2017 (2020\$), which supports and sustains the 665 living wage Jobs that raise the average wage in Clallam County.

With its location amidst the productive forests of the North Olympic Peninsula and deep-water port, the Forest Product Industry and the Port Log Yard are uniquely situated to advance and implement new technologies to access domestic and global markets for green energy and building materials, from bio-electricity to mass timber products as substitutes for carbon intensive concrete and steel in construction.