

Western U.S. Roundwood Industry

**Results from Surveys of:
Western U.S. Roundwood
Manufacturers &
Western U.S. Loggers**



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CHAPTER 1 – EXECUTIVE SUMMARY

1.1 BACKGROUND

The Western Wood Preserver's Institute (WWPI) is a non-profit trade association that works on issues impacting the use of preserved wood in North America. The Intermountain Roundwood Association (IRA) is a trade association focused on production, education, and marketing of quality roundwood products in the Western U.S. Roundwood (post and pole) manufacturers are a key market for small diameter materials harvested from private and public lands in the Western U.S. Additionally, roundwood products are frequently treated with chemical preservatives to enhance their utility when placed into service. The roundwood manufacturing industry was last formally surveyed in 2002. Therefore, the two organizations jointly agreed to conduct a survey of roundwood manufacturers. Additionally, to better understand raw material supply for roundwood manufacturers a survey of logging contractors in the Western U.S. was also conducted. And finally, post imports were also analyzed. The survey was funded, in part, by a grant from the U.S. Forest Service. The Beck Group, a Portland, Oregon, forest products planning and consulting firm, was retained to carry out the survey and summarize the results.

1.2 ROUNDWOOD MANUFACTURING SURVEY RESULTS

1.2.1 Key Results

An online survey instrument was developed to gather information about roundwood raw materials, staffing, production, treating, product mix, etc. An invitation to complete the survey was sent to 84 companies in the roundwood manufacturing and treating industry in the Western U.S. Eighteen useable surveys were received including 7 from companies that manufacture and sell untreated roundwood; 7 from companies that manufacture, treat, and sell roundwood, and 4 companies that purchase untreated roundwood, treat, and sell roundwood. Completed surveys were provided by companies in eight states including Arizona, Montana, Idaho, South Dakota, Colorado, Wyoming, Oregon, and California. The responding companies had been in business an average of 40 years.

The following bullet points are highlights of the survey results. See Chapter 3 for additional details:

- The respondents reported purchasing a combined total of over 293,000 green tons of raw material in the year, which equals an average of about 18,300 green tons purchased per facility.
- 65% of the raw material consumed was supplied from Federally owned lands followed by 20% from State owned lands. Thus, raw material supply for the roundwood industry is overwhelmingly dependent on publicly owned timber.
- Just over 50% of the raw material consumed by the plants comes from ongoing supply contracts with logging contractors. This suggests that few roundwood manufacturers have forestry staff or purchase standing timber. Instead the manufacturers rely on logging contractors to purchase and harvest timber and sort the pieces suitable for roundwood manufacturing.
- Roundwood manufacturers reported that nearly 90% of their raw material arrives at the manufacturing facility in the form of random length stems.
- The volume weighted average haul distance for raw material was 68 miles.
- Raw material supply was rated the most influential factor constraining the ability of roundwood manufacturers to operate at full capacity. Market and labor related issues were rated second and third respectively.
- Respondents reported selling 377,000 green tons (an estimated 33.7 million linear feet) of finished product. Note the finished product volume is higher than the raw material volume because untreated posts and poles purchased by treaters were not considered raw material.
- Lodgepole pine accounted for nearly 90% of the species produced and sold among respondents.

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- Product size mix was relatively evenly distributed as shown **Table 1.1** below.

Table 1.1 – Post and Pole Diameter Size Mix

Diameter Range (Inches)	Percentage of Production
2.0 to 2.9	29
3.0 to 4.9	22
5.0 to 6.9	29
7.0 plus	20
Total	100

- Nearly three-quarters of the production is produced as a dowelled post/pole.
- Post and pole manufacturing operations reported an average of 9 hourly employees and 2 salaried employees per operation. Treating operations reported an average of 2 hourly employees and less than 1 salaried employee per operation.
- Nearly 90 percent of the treated volume was treated with Arsenical chemicals and about two-thirds of the volume was treated to a customer specified treating standard.
- The total sales value of the production among respondents was just over \$34 million, which equates to an overall average of about \$1.00 per linear foot, \$102 per green ton, or \$2.50 per cubic foot.
- 50% of all product is taken to market directly via a retailer, followed by 19% via wholesalers, and 18% direct to end-use customers.
- 60% of the volume was sold in the Midwestern U.S. and 34% in the Western U.S.

1.2.2 2019 Industry-Wide Estimates

The project team extrapolated the preceding results into estimates that apply to the entire Western U.S. roundwood industry. The industry-wide estimates are summarized in **Table 1.2**.

Table 1.2 – Estimates of Total Western U.S. Roundwood Industry Metrics/Impact

Metric	Value	Units
Raw Material Consumption	1,391,750	Green tons
Federal Acres Treated Annually	18,093	Acres
State Acres Treated Annually	5,567	Acres
Private/other Acres Treated Annually	4,175	Acres
Total Acres Treated Annually	27,835	Acres
Finished Product Production	1,756,820	Green tons
Finished Product Production (linear footage estimate)	140,000,000	Linear Feet
Imports of blunt end treated and untreated posts	3,500,000	Linear Feet
Salaried Jobs	168	jobs
Hourly Jobs	756	jobs
Total Jobs	924	jobs
Total Annual Revenue	160	Revenue (\$ in millions)

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As the data in the preceding table shows, in aggregate the industry has a significant impact on the number of acres treated annually across the Western U.S.; totaling nearly 28,000 acres and consuming nearly 1.4 million tons of raw material annually. Note that acres treated estimates assume that 50 green tons of biomass are harvested from each acre. Forest Inventory and Analysis data indicates that as a rule of thumb, Inland West forests contain about 100 green tons of standing timber per acre. Thus, the assumption is that harvest treatments are thinnings and fuel reduction treatments that remove half of the standing volume.

The products produced by the industry generate an estimated \$160 million in annual revenue. Imports of blunt end treated and untreated posts and poles appear to have significantly declined relative to the peak that occurred from the mid-1990's to mid-2000's. And Finally, the industry supports nearly 1,000 jobs in rural economies. Please note these data are estimates extrapolated from a small sample, thus caution is recommended about assuming these estimates truly represent the industry. Additional research is recommended to validate these industry-wide estimates.

1.2.3 Comparison between 2019 and 2002 Surveys

Table 1.3 compares key results from the 2002 roundwood industry survey to the 2019 survey. As the results indicate, in virtually all categories, the industry appeared more vital in 2002. Note, however, that conclusion may be a function of lower response rate due to the survey methodology used in the 2019 survey versus the 2002 telephone interview methodology. Also note the data shown in the table is specific to the respondents of each survey. It is not data that was extrapolated to represent industry-wide statistics.

Table 1.3 – Roundwood Industry Survey Comparison 2002 vs. 2019

Metric	2002	2019
Respondents	35	18
States represented	12	8
Production (linear feet)	125,000,000	35,000,000
Raw Material from Federal (% of Total)	27%	65%
Raw Material from State (% of Total)	2%	20%
Raw Material from Private/Other	71%	15%
Product Value (\$ in millions)	83	34
Total jobs	1014	924

1.3 LOGGING SURVEY RESULTS

An online survey of logging contractors was developed. Notice of the survey was sent to 7 state logging associations in Oregon, Washington, California, Montana, Idaho, Arizona, and North Dakota/South Dakota. The associations notified their members via email and other organizational communication (e.g., monthly newsletter) about the opportunity to complete the survey. A total of 16 useable surveys were received.

The following bullet points are highlights of the survey results. See Chapter 4 for additional details:

- The respondents reported producing a total of 274,000 green tons of product of which 70% was veneer and sawlogs and 16% was post and pole raw material.
- 52% of the material produced by the respondents was sourced from publicly owned lands.

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- 7 of the 16 respondents reported using ground based logging equipment and whole tree yarding, the most frequent equipment configuration among respondents.
- Of the post and pole volume sold by respondents was 90% lodgepole pine.
- The most problematic factor cited by logger's in accessing post and pole markets was not having enough material to harvest that is appropriate size and species for roundwood manufacturing.
- 2/3's of the respondents reported selling material to post and pole markets with no length or diameter specifications (i.e., random length stems). The remaining 1/3 of the respondents reported selling cut-to-length logs with specific diameter requirements.
- The average haul distance to a post and pole market among respondents was 65 miles. The average delivered price to post and pole markets was \$61 per green ton and ranging between a low of \$50/green ton and a high of \$72/green ton.

1.4 POST IMPORTS

Several key points about roundwood imports include:

- Imports spiked dramatically in the mid 1990's to well over 20 million linear feet and then remained at elevated levels for about 10 years before an extended decline leading into the Great Recession. Since the Great Recession, imports have been flat to declining. During the big spike in imports, the majority was for material imported through the Seattle and Great Falls customs districts while imports through all other districts was essentially flat.
- The data shows that imports into Seattle and Great Falls averaged \$3.839 million per year from 1990 to 2018. Also, the value of all imports, on average, totaled \$5.471 million per year over the entire time period.
- Over the entire time period, on average, nearly 80 percent of the value of the imports are treated and about 20 percent of the value is for untreated. There is typically a \$0.40 to \$0.50 per linear foot premium for posts that have been treated.

1.5 CONCLUSIONS AND RECOMMENDATIONS

Several conclusions and recommendations can be drawn from the preceding information.

- The roundwood industry is highly dependent on supply from publicly owned and managed lands. The industry should continue to work with land managers to assure continued programs for supply adequate volumes of raw material.
- Related to the previous point, it appears that focus on precommercial thinning or fire mitigation of public lands is not resulting in volumes or sizes sufficient for roundwood post and pole even though the demand for the material exists at prices considerably higher than allowed by most other small-diameter utilization technologies.
- Logging contractors are willing and able to supply roundwood manufacturers with raw material, but they are constrained by limited volumes of appropriate material from the bids they win.
- As the relatively even product size mix demonstrates, 20-30%, roundwood manufacturers can consume any sizes between 2 to 7+ inches in diameter.
- With raw material shortages being the biggest constraint to roundwood manufactures and loggers, The US Forest Service, States and private land owners need to consider further means to help loggers bid underutilized small diameter roundwood or precommercial thinning for post and pole markets.

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- The 20% yield loss when converting raw roundwood logs into posts and poles also provides an opportunity for chips, firewood, mulch and other by-products sales to be generated.
- Less than 50% of logging firms reported that they had sold material to post and pole manufacturers within the last year. Clearly more education needs to be done with loggers about the post and pole market.
- Loggers reported sizes consistent with the roundwood manufacturers with 3” to 8” sizes. Anything larger than 8” is considered a saw log and has a higher value. However, these sizes are also desirable for pulpwood, biomass and other devalued products.
- Loggers and roundwood manufactures both stated the average haul distance was around 65 miles. Distance thus plays a small role in determining if post and pole is going to be part of a bid for a stand and shows the significance of relationships between roundwood manufacturers and nearby loggers.
- The average delivered price to post and pole markets was \$61 per green ton and ranging between a low of \$50/green ton and a high of \$72/green ton. These values are significantly higher than published pulpwood prices, which typically range between the low \$30’s and low \$40’s per green ton per RISI Log Lines and industry log price reporting service for the Western US.
- The volume and value of treated and untreated blunt end posts have declined significantly from the high-water marks of the mid 2000’s.
- For both surveys, the response rates were low. Thus, the results may not be representative of the industry and a degree of caution should be used in applying the results to the industry as a whole.
- A web-based survey was used because it was judged to be more cost effective to administer and because it minimizes the number of questions for respondents. For example, the online methodology allows for the different kinds of respondents (manufacture only, manufacture/treat, treat, etc.) to be routed to questions specific to their type of operation. Despite this strategy, respondents indicated the survey was too detailed and required too much effort to complete. Strategies for addressing this problem include greatly simplifying the survey or reverting to the more time intensive (and costly) methodology of collecting the information via mail or telephone survey.

CHAPTER 2 – STUDY BACKGROUND & PURPOSE

The Western Wood Preservers Institute (WWPI) is a nonprofit trade association that works on issues impacting the use of preserved wood in western North America. The Intermountain Roundwood Association (IRA) is focused on production, education, and marketing of quality roundwood products. Together the two organizations represent most of the treated wood roundwood manufacturers west of the Mississippi. Roundwood manufacturing is a key and high value market for small diameter logs harvested from commercial thinning and other practices on public and privately held lands.

In 2002 the IRA, WWPI and the University of Montana engaged with the U.S. Forest Service and other organizations to produce two reports on small roundwood including the “Treated Wood Post Awareness Campaign Characterization of the Small Roundwood Industry” and “Western United States Imports of Roundwood Posts from Canada 1991-2001”. In 2004, an additional report was commissioned on “Treated Wood Post and Pole Government Buyers Survey Report”. To date there has been no follow-up to these reports. As a result, relatively little information is known about changes and trends in the industry that have occurred over the last two decades.

Given these circumstances, WWPI, supported by funding from the U.S. Forest Service, engaged The Beck Group to conduct a survey of Western U.S. roundwood manufacturers and Western U.S. logging contractors. The results of those studies are contained in this report.

CHAPTER 3 – WESTERN U.S. ROUNDWOOD MANUFACTURING SURVEY

This report chapter describes the results and methodology of a survey of Western U.S. roundwood manufacturers.

3.1 SURVEY METHODOLOGY

It is known that the Western U.S. roundwood manufacturing industry is largely comprised of small, independently operated, family-owned businesses. It is also known that a significant portion of the products produced by those businesses are treated with chemical preservatives to inhibit rot and decay while in use and thereby increasing the useful service life of roundwood products. Those businesses can be categorized into four types including:

1. *Manufacture and sell untreated roundwood* – businesses that purchase raw material (logs) and convert them into roundwood products that are sold in untreated form
2. *Manufacture, treat, and sell treated roundwood* – businesses that purchase raw material (logs) and convert them into roundwood products, treat them with chemicals, and sell the treated products.
3. *Purchase untreated roundwood, treat, and resell treated roundwood* – businesses that purchase untreated roundwood products, treat them with chemicals, and sell the treated products.
4. *Service treat only* – businesses that provide the service of chemically treating roundwood products, but do not take ownership of the materials.

Given these different roundwood manufacturing business types, a questionnaire was developed to collect information about the operation of each of these business types. There was also a questionnaire developed for the 2002 roundwood industry survey. In the 2002 survey, the questionnaire was administered via mail and telephone. In the current study, the questionnaire was administered via survey monkey, an online survey service. Importantly, the online survey allowed for the questionnaire to be designed so that each respondent only answered questions specific to their business type (e.g., companies that do not treat roundwood were not asked questions about treating).

3.1.1 Respondent List

WWPI staff provided BECK with a list of roundwood industry members. The list included company name, business type, location, contact person, phone, and email address. A total of 84 contacts were in the original list. In the summer of 2018, emails were sent to the 84 contacts, which resulted in 6 of the contacts being eliminated from the list because the email addresses were no longer active. The initial response was 13 fully completed surveys; 7 partially completed surveys; 56 no responses; and 2 companies that opted-out of further communications. In an effort to increase the response rate, in the fall of 2018, WWPI and BECK identified companies in the contact list judged to be high priority for collecting responses. Those companies were sent a paper copy of the survey by mail, called by phone to remind them to complete the survey, and sent a follow-up post card reminder. The follow-up effort resulted in a total of 18 useable surveys. Getting roundwood industry members to complete the survey was a major obstacle in doing the work. The problems encountered and lessons learned are described more fully in Chapter 5.

3.1.2 Respondent List Characteristics

The initial respondent list of 84 companies included firms in 16 Western U.S. states as shown in **Table 3.1**, which also shows the number of companies in each state.

Table 3.1 – Number and Location of Companies in Initial Respondent List

State	Count of Companies	State	Count of Companies
Montana	14	South Dakota	4
Oregon	11	Wyoming	4
Idaho	10	Arizona	3
California	9	Hawaii	2
Colorado	9	North Dakota	1
Washington	6	New Mexico	1
Nebraska	4	Nevada	1
Oklahoma	4	Utah	1

Additionally, the respondent list contained an indication what type of business each company was operating. That information is shown in **Table 3.2**.

Table 3.2 – Business Type Among Companies in Initial Respondent List

Business Type	Count
Treater	46
Manufacturer/Treater	8
Manufacturer	5
Unspecified	25
Total	84

3.1.3 Completed Survey Characteristics

The 18 completed surveys included 7 companies that manufacture and sell untreated roundwood, 7 companies that manufacture, treat, and sell treated roundwood, and 4 companies that purchase untreated roundwood, treat, and resell treated roundwood. None of the completed surveys were from companies that service treat only. Completed surveys were received from companies in eight states including Arizona, Montana, Idaho, South Dakota, Colorado, Wyoming, Oregon, and California. Among the responding companies, companies reported having been in business for as little as 1 year to well over 100 years. The average number of years in business among respondents was 40 years. The surveys were overwhelmingly completed by senior staff including titles such as owner, president, general manager, sales manager, plant manager, etc.

3.2 SURVEY RESULTS

Survey questions were broadly organized into four categories including Raw Material, Production and Labor, Revenue, and Market Trends. Accordingly, the remainder of this report is organized into those four categories. Additionally, there is a final section with various demographic type information about the respondents.

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3.2.1 Raw Material

The responding companies (excluding service-treat-only operations) reported using a total of 293,400 green tons of raw material annually. Note that one responding company accounted for nearly 50 percent of that total. The balance were all smaller operations with average annual raw material consumption typically ranging between 10,000 and 15,000 green tons. **Table 3.3** shows the source of the raw material by landowner type. As the results, indicated nearly two-thirds of all raw material consumed at the responding companies was source from federally owned land. An additional 20 percent of the consumed volume was from state owned land. Thus, a significant majority (84%) of the raw material supply among the reporting plants came from publicly owned lands. Privately owned lands accounted for less than 10 percent of the raw material consumed.

Table 3.3 – Source of Raw Material by Landowner Type

Landowner Type	Green Tons	% of Raw Material Volume
Federal	190,530	65%
State	58,008	20%
Tribal	1,498	1%
Industrial Private	8,901	3%
Non-Industrial Private	24,390	8%
Canada	10,050	3%
Total	293,376	100%

Similarly, **Table 4.4** shows the raw material supply by source. In other words, how roundwood manufacturers procure raw material (e.g., buying standing timber, buying material delivered to their gate, contracts with loggers, etc.). As the results indicate over half of the supply among respondents came from ongoing contracts with loggers while only about 18 percent is purchased as standing timber. This suggests that few post and pole manufacturers maintain forestry staff whose responsibility is bidding on stands to purchase raw material. Rather it seems most post and pole manufacturers rely on relationships with logging contractors, landowners, and others to provide raw material to their operations.

Table 3.4 – Raw Material Consumption by Source Type

Landowner Type	Green Tons	% of Raw Material Volume
Standing Timber Owned by Others	51,139	17%
Company Owned Timberland	0	0%
Gatewood	21,240	7%
Ongoing Contracts with Loggers	156,148	53%
Ongoing Contracts with Landowners	19,849	7%
Other Brokers/Suppliers	45,000	15%
Total	293,376	100%

Another raw material consideration is the form in which roundwood is delivered to the manufacturing facilities. Among the responding companies the overwhelming majority of the raw material is delivered as random length stems. A relatively small amount is delivered as cut-to-length stems. **Table 3.5** displays the results.

Table 3.5 – Raw Material Delivered Form

Landowner Type	Green Tons	% of Raw Material Volume
Random Length Stems	258,314	88%
Cut-To-Length Logs	35,062	12%
Total	293,376	100%

The volume weighted average haul distance for raw material delivered to the responding companies was 68 miles. However, there was a considerable range in average haul distances among respondents. **Table 3.6** shows the average haul distances organized into four categories, the green tons in each category, and the percentage of the total consumed volume in each haul distance category.

Table 3.6 – Raw Material Haul Distance, Volume by Distance Category

Haul Distance Category	Green Tons	% of Raw Material Volume
0 - 30 miles	46,207	16%
31 - 60 miles	27,055	9%
61 - 90 miles	153,390	52%
91 - 120 miles	66,725	23%
	293,376	100%

3.2.2 Production

The following report section describes a variety of production related statistics from survey respondents. Two-thirds of the respondents reported that their business operated at full capacity in the year prior to the survey.

The respondents who did not operate at full capacity were asked about the leading contributing factors in their limited operating schedule. Specifically, the respondents were asked to rank raw material supply, labor, market, and other on a scale of least to most influential with 1 being most influential. The results are shown in **Table 3.7**. As the results indicate, “raw material” had the lowest average score, which indicates that respondents ranked raw material, on average, as the most influential factor constraining the productive capacity of their operations. This result is consistent with anecdotal information provided by industry members.

Additionally, the survey respondents who indicated raw material supply was an operational constraint were asked about the extent of the constraint. Those respondents reported, that on average, they were only able to obtain 65% of the raw material needed to operate their manufacturing facility at full capacity. Specific to the post and pole manufacturing part of operations, respondents reported that their plants ran an average of 35 hours per week. Specific to treating operations, respondents reported that their plants ran an average of 82 hours per week.

Table 3.7 – Ranking of Factors Related to Production Constraints

Factor	Average Ranking Score
Raw Material	2.19
Market	2.38
Labor	2.44
Other	2.56

Table 3.8 illustrates the volume of finished product sold by the responding firms organized by manufacturer type. As the results indicate a total of 377,000 green tons were sold, which translates into an estimated 24.5 million linear feet.

Table 3.8 – Finished Product Sold Volume Among Respondents

Manufacturer Type	Green Tons	Cubic Feet	Linear Feet
Manufacture, Sell Untreated	30,801	1,234,007	1,590,286
Manufacture, Treat, Sell Untreated & Treated	206,385	8,268,618	29,839,801
Buy Untreated, Treat, Sell Treated	139,985	5,506,369	4,344,716
Service Treat Only	197	7,894	6,983
Total	377,367	15,016,888	35,781,786

Several things to note about the information in the preceding table include:

- The sold volume is reported on three different measurement bases since respondents reported sold volumes as measured at their individual operations. Tons were converted to cubic feet using a factor 50 green pounds per cubic foot. Cubic feet were converted to linear feet based on the average estimated diameter of the products produced at each individual operation.
- The sold volume is grouped by manufacturer type. The total sold volume is greater than the raw material volume reported in Table 3.4. This is because only logs were considered raw material. Untreated posts and poles purchased by treaters were not considered raw material.
- Among the Manufacture, Sell Untreated group 100% of products were sold untreated. Among the Manufacture, Treat, Sell Untreated and Treated group 24% (volume weighted average) of the products were sold untreated and the balance was sold treated. Among the Buy Untreated, Treat, Sell Treated Group 95% (volume weighted average) of the products were sold treated.
- A comparison of raw material volume to sold volume among only the companies that manufacture, suggests that about 80 percent of the incoming raw material is sold. In other words, there is a 20 percent yield loss when converting raw roundwood logs into posts and poles.
- The 2002 study found that respondents produced 125 million linear feet. Thus, this survey represents a considerably small portion of the industry.

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Regarding the species mix of the products sold among respondents, **Table 3.9** shows that 89% of the volume was lodgepole pine followed by 9% ponderosa pine.

Table 3.9 – Percentage of Production by Species

Species	Green Tons	Cubic Feet	Linear Feet	% of Total
Lodgepole	273,501	10,881,091	31,752,042	89%
Ponderosa	86,602	3,444,133	3,049,778	9%
Western Larch	1,500	60,096	102,393	0%
Douglas fir	8,114	325,078	267,521	1%
Other	7,650	306,490	610,053	2%
Total	377,367	15,016,888	35,781,786	100%

Regarding the size mix of the roundwood products sold by respondents, **Table 3.10** shows the volume produced in each size class among each type of manufacturer. The bottom part of the table shows the percentage in each size class within each manufacturer type.

Table 3.10 – Product Size Mix Among Responding Companies

Diameter Class	Manufacture, Sell Untreated (green tons)	Manufacture, Treat, Sell (green tons)	Buy Untreated, Treat, Sell Treated (green tons)	Service Treat Only (green tons)
2.0 to 2.9	3,440	98,390	7,775	65
3.0 to 4.9	9,567	56,820	15,669	77
5.0 to 6.9	14,739	26,634	68,801	35
7.0 and larger	3,055	24,541	47,740	20
Total	30,801	206,385	139,985	197
Diameter Class	Manufacture, Sell Untreated (green tons)	Manufacture, Treat, Sell (green tons)	Buy Untreated, Treat, Sell Treated (green tons)	Service Treat Only (green tons)
2.0 to 2.9	11%	48%	6%	33%
3.0 to 4.9	31%	28%	11%	39%
5.0 to 6.9	48%	13%	49%	18%
7.0 and larger	10%	12%	34%	10%
Total	100%	100%	100%	100%

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Regarding product type of the untreated post and poles, **Table 3.11** shows the volume produced in each product finishing type among each type of manufacturer. The bottom part of the table shows the percentage in each product finishing type within each manufacturer type.

Table 3.11 – Product Finishing Among Responding Companies

Product Finishing	Manufacture, Sell Untreated (green tons)	Manufacture, Treat, Sell (green tons)	Buy Untreated, Treat, Sell Treated (green tons)	Service Treat Only (green tons)
Peeled	9,696	59,325	15,459	0
Dowelled	20,157	137,248	110,516	197
Barky	948	9,410	13,754	0
Other	0	402	255	0
Total	30,801	206,385	139,985	197
Product Finishing	Manufacture, Sell Untreated (green tons)	Manufacture, Treat, Sell (green tons)	Buy Untreated, Treat, Sell Treated (green tons)	Service Treat Only (green tons)
Peeled	31%	29%	11%	0%
Dowelled	65%	67%	79%	100%
Barky	3%	5%	10%	0%
Other	0%	0%	0%	0%
Total	100%	100%	100%	100%

Regarding value-added processing to untreated products sold by the respondents, **Table 3.12** shows the volume produced in each product finishing type among each type of manufacturer.

Table 3.12 – Product Value Added Among Responding Companies

Product Finishing	Manufacture, Sell Untreated (green tons)	Manufacture, Treat, Sell (green tons)	Buy Untreated, Treat, Sell Treated (green tons)	Service Treat Only (green tons)
Pointed Ends	4,230	58,622	4,230	67
Chamfer Top	1,734	41,201	1,734	65
Drilling	1,783	42,981	1,783	65
Split	490	2,623	490	0
Other	22,564	60,957	22,564	0
Total	30,801	206,385	30,801	197
Product Finishing	Manufacture, Sell Untreated (green tons)	Manufacture, Treat, Sell (green tons)	Buy Untreated, Treat, Sell Treated (green tons)	Service Treat Only (green tons)
Pointed Ends	14%	28%	1%	34%
Chamfer Top	6%	20%	29%	33%
Drilling	6%	21%	39%	33%
Split	2%	1%	28%	0%
Other	73%	30%	2%	0%
Total	100%	100%	100%	100%

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Regarding labor among the responding companies, **Table 3.13** displays results indicating that on average of 9 hourly staff and nearly 2 salaried staff operate the post and pole manufacturing part of the operations. There was, however, a wide range given the size of the company as indicated by the maximum and minimum number of hourly and salaried staff among respondents. Regarding the treating portion of operations, there was less variability with an average of 2.1 hourly positions and 0.3 salaried positions at each company.

Table 3.13 – Salaried and Hourly Staffing Levels Among Respondents

Statistic	Hourly (# of employees)	Salaried (# of employees)
Post & Pole Manufacturing Operations: Average	9.2	1.8
Post & Pole Manufacturing Operations: Maximum	35.0	4.0
Post & Pole Manufacturing Operations: Minimum	2.0	1.0
Treating Operations: Average	2.1	0.3
Treating Operations: Maximum	5.0	1.0
Treating Operations: Minimum	1.0	0.0

Given the wide range in staffing levels, the productivity per employee was also calculated from the data to provide an indication of plant out per unit of staffing. As show in Table 3.14

Table 3.14 – Production Rate per Hourly Employee

Manufacturing Type/Stage	Annual Green Tons per Hourly Employee	Annual Cubic Feet per Hourly Employee	Annual Linear Feet per Hourly Employee
Manufacture, Sell Untreated	811	32,507	33,481
Manufacture, Treat, Sell	2,869	114,951	643,015
Treating	29,693	1,198,064	495,525

CHAPTER 3 – WESTERN U.S. ROUNDWOOD MANUFACTURING SURVEY

3.2.4 Chemical Treatment

Regarding chemical treatment, **Table 3.15** shows that the most commonly used chemical type is arsenicals (volume weighted).

Table 3.15 – Preservative Chemical Usage by Type (Volume Weighted %)

Chemical Type	Percent of Usage
Oil Borne (Creosote, Penta, Cu Nap)	2%
Arsenicals (CCA, ACZA)	88%
Other Copper Based (ACQ, CA, MCA)	8%
Other	2%
Total	100%

Additionally, **Table 3.16** shows the volume weight percentage treatment to a given standard. As the results indicate, it is most common that treatment is to customer specification rather than AWPA standard or to refusal.

Table 3.16 – Chemical Treatment Standard (Volume Weight %)

Chemical Type	Percent of Usage
AWPA	25%
Refusal	9%
Customer Specification	66%
Total	100%

3.2.5 Revenue & Distribution

Survey respondents reported combined annual revenue totaling nearly \$34.3 million dollars. Table 3.16 shows how that revenue was distributed among manufacturer types and the sales value on various \$/unit reporting bases. Also note that 10 respondents reported an additional \$631,000 of revenue from by-products sales.

Table 3.16 – Revenue Summary

Manufacturer Type	Total \$	Linear Feet (LF)	\$/LF	Green Tons (GT)	\$/GT	Cubic Feet (CF)	\$/CF
Manufacture, Sell Untreated	\$6,129,250	960,829	\$0.16	14,801	\$414.12	592,982	\$10.34
Manufacture, Treat, Sell Untreated & Treated	\$16,672,000	26,748,913	\$1.60	165,420	\$100.79	6,627,404	\$2.52
Buy Untreated, Treat, Sell Treated	\$4,356,157	784,746	\$0.18	12,455	\$349.76	498,981	\$8.73
Service Treat Only	\$6,891,000	4,320,218	\$0.63	139,505	\$49.40	5,589,138	\$1.23
Total	\$34,048,407	32,814,706	\$0.96	332,180	\$102.50	13,308,504	\$2.56

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Regarding how and where respondents take their product to market. **Table 3.17** shows that fifty percent of the product goes to market directly via a retailer.

Table 3.17 – Distribution Channel

Distribution Channel	Green Tons	Percent of Total
Broker	12,614	5%
Other Treaters	18,254	7%
Wholesaler	45,812	19%
Retailer	123,031	50%
End User	44,219	18%
Other	0	0%
Total	243,930	100%

Similarly, **Table 3.18** shows that well over 90 percent of all production is sold in either the U.S. Midwest or Western U.S.

Table 3.18 – Geographic Market Area

Geographic Market Area	Green Tons	Percent of Total
Western U.S.	83,070	34%
Midwestern U.S.	146,774	60%
Southern U.S.	5,105	2%
Eastern U.S.	756	0%
Other	0	0%
Total	235,705	100%

Finally, **Table 3.19** shows the amount of product sold into various end-use applications for both treated and untreated materials.

Table 3.19 – End Use Application

End Use Application	Untreated	% of Untreated Total	Treated	% of Untreated Total
Agriculture	40,802	59%	64,952	30%
Fencing	17,923	26%	122,624	57%
Highway	0	0%	26,618	12%
Other	10,486	15%	1,245	1%
Total	69,211	100%	215,439	100%

CHAPTER 3 – WESTERN U.S. ROUNDWOOD MANUFACTURING SURVEY

Respondents were also asked a series of open-ended questions about market trends. The responses are shown in **Table 3.20**. Note that some minor edits were made for grammar and clarity. Generally, the edits are contained in parentheses.

Table 3.20 – Respondent Opinions about Post and Pole Markets and End Uses

- More and more (industry focus) is how inexpensive can it be done (post/pole manufacturing). Durability is low on scale (of importance among product attributes)
- Markets are growing (because) the popularity of high density orchard plantings has been a boost to our industry
- Solid (markets) for the serious players!
- Demand seems to be stable. Raw material supply is always the major issue.
- Canadian unfair competition (is affecting markets)
- Our industry is relatively stable. The last few years there have been some new entrants in the manufacturing of post and poles (that are affecting markets).
- With wood being harder and harder to find you might see companies diversifying by buying new species. Steel prices are also very high right now so you might see wood posts become more viable because they will be cheaper.
- There has been a dramatic increase in pointed posts compared to blunt post. I see this continuing.
- There has been a slow down on post and poles for ag use fencing due to the downturn in the energy and farming businesses.
- More value added trends and more doweled material.
- Continued difficulty of obtaining wood resources from publicly managed lands in the Western US (Forest Service, BLM). Environmental lawsuits are a significant and consistent ongoing factor affecting resources coming from public lands. There have been occasions where even salvage timber harvesting has not been allowed after a forest fire, therefore valuable and salvageable timber goes unused.
- More items are fabricated than just a peeled product.

Respondents were also asked a yes/no question about whether they plan to change their business in the future. Fifty-five percent of the respondents indicated they did plan to change their business. **Table 3.21** lists the types of changes respondents plan on making.

Table 3.21 – Planned Business Changes Among Respondents

- Up grading some processing machinery to streamline our production.
- Efficiency, production, value added.
- Opened a second peeling facility in late 2018 and will continue to work and modernize that new plant.
- Develop more supply resources from private landowners for dead standing Lodgepole
- Dowell line
- We typically reinvest an average of \$40K to \$50K/year into the business's infrastructure to improve efficiency.
- We are constantly trying to come up with new ways to market waste product or come up with new products in general.
- More Covered Storage
- change suppliers of posts & rails
- Buy more untreated post already pointed

CHAPTER 3 – WESTERN U.S. ROUNDWOOD MANUFACTURING SURVEY

Finally, respondents were also asked a variety of open ended questions about the influence of factors including producers in other regions, raw materials, technology, etc. Table 3.22 summarizes the responses.

Table 3.22 – Responses to Open Ended Questions

Labor Related Comments

- Quality laborers for these operations are hard to find.
- Wages will continue to go up. Those companies unwilling to pay better wages will fade away and those paying better and offer benefits will grow.
- In any physical trade it is increasingly difficult to find willing laborers, emphasis placed on easing the burden through automation helps attract employees.
- No young people in the industry. Same people at meetings as 20 years ago.
- Automation in the industry has made the intense physical handling of posts decrease significantly - at our plant each post is only lifted by hand once in the entire process.
- Less availability to find people willing to work in production and manufacturing
- It's hard to find good people and we are very lucky that we have good employee retention. If we had high turn over it would hurt our business and the hiring pool is very limited at the moment.
- Continued shortage of available manufacturing labor.
- The hand cutter unfortunately is a thing of the past, more and more mechanization at higher and higher cost are squeezing loggers.
- Labor costs are just going to continue to increase.

Raw Material Related Comments

- I am optimistic in US. DNRC and Private are good sources. The USFS is slowly turning the corner. National Fire Plan, Stewardship sales, and Good Neighbor sales area gaining momentum.
- It looks positive with new emphasis on forest health and stewardship.
- Our supply chain seems to be pretty steady right now.
- The multi-product sales that are offered near us (mix of saw and post and pole timber) has increased the availability of raw material for our company. While the saw mills are bothered by the high percentage of post and pole timber in these sales (typical nature of lodgepole pine stands) these sales best utilize the stands and achieve the desired outcome for the entity managing the timber program.
- Extended break-up or mid-season puts these logger in a lot of financial jeopardy.
- It is all based on finding raw material and this year seems like it might be a good year.
- The raw materials are getting harder to find. It's hard to get good quality green logs
- Less material available even after large fires. Mainly due to legal challenges and slow approval of sales.
- Hopefully the Forest Service will begin to thin the forests on a much larger scale to reduce the fire hazards

Comments about the Influence of Other Regions

- We are always competing against the SYP creosote market
- Our location is close to the Canadian Border so we see and hear of the effect of this every day in the sales that the brokers we work with miss out on because of the proximity. Also, because our location sits right on Hwy 95 in Idaho, which is the 2nd busiest route for goods coming out of Canada, we see several truckloads of treated post/pole products traveling to market. Also, with the exchange rate of the Canadian dollar -vs- American dollar being so offset it gives the Canadian producers a HUGE advantage. 30-35%
- People know that we make a quality product so many Canadian post buyers have switched to our product because they can stand behind it.
- The entire central Washington fruit market is affected by unfair Canadian priced post and poles
- New Mexico product coming to Montana and other western states
- Current price is influenced by Canadian Supply.
- Not sure why the roundwood coming out of Canada has always been exempt from the tariffs applied to lumber and other wood products. These are finished products coming out of Canada not raw material
- Lots of the big buyers still source Canadian wood because of cost. We are not on an even playing field.

Technology & Market Related Comments

- Processing methods keep getting better and better so we should be able to have higher production totals.
- The only trend is that more companies invest in this equipment as they become more established and can afford to add them to their process. No change in Morbark peelers in 40 years. However, we are using scanning and sorting technology.
- Production capacity shrunk during recession. It is now growing again.
- Moving more toward dowels because of peeling speed and quality.
- Scary getting replaced by steel for organic farms
- We believe that more capacity will be needed.
- Available capacity appears to be declining overall. Cost of labor and benefits continue to increase.
- Appears to be less small round wood production as alternatives come into the market and Organic certification becomes bigger precluding the use of preserved wood.
- Larger diameters being lathe turned to uniform diameter and more fabrication prior to treatment.

CHAPTER 4 – WESTERN U.S. LOGGER SURVEY

This report chapter describes the results and methodology of a survey of Western U.S. logging contractors, a group representing an important link in the roundwood industry's supply chain.

4.1 SURVEY METHODOLOGY

Similar to the survey of roundwood manufacturers, the logging industry is largely comprised of small, independently operated family-owned businesses. To reach this group, Beck identified professional logging associations (e.g., Montana Logging Association, Associated California Loggers, etc.) and asked each group to forward a link to an online survey (survey monkey) to their memberships. A total of 7 state logging associations were identified in Oregon, Washington, California, Montana, Idaho, Arizona, and North Dakota/South Dakota. Beck emailed each association about the survey and then followed up with phone calls to ask for their assistance. Despite repeated efforts not every association participated.

4.1.1 Respondent Characteristics

A total of 16 useable responses were received. Despite the limited response from state logging associations, completed survey responses were received from logging contractors in 6 different states including Arizona, Oregon, Montana, Minnesota, Idaho, and South Dakota. Ten companies were from Montana, two from Oregon, two from Idaho, and one each from Arizona and Minnesota. Responding firms reported an average of 5 full time employees. The average number of years in business among responding firms was 21.5.

4.2 SURVEY RESULTS

Survey respondents were asked about their annual production of material and what types of material they produce. **Table 4.1** illustrates the results. As shown in the table post and pole production was a distant second to veneer and sawlog production. Note it is possible that loggers focused on post and pole markets self-selected participation in the survey and thus the results may over state production of post and pole material. It's likely that a more general representation of the industry would show a higher proportion of pulpwood production.

Table 4.1 – Amount and Type of Primary Forest Products Produced

Product Type	Veneer/Sawlogs	Pulpwood	Post & Poles	Firewood	Other	Total
Green Tons	191,716	19,227	44,238	15,468	3,843	274,492
% of Total	70%	7%	16%	6%	1%	100%

Respondents were asked about the proportion of their production that was sourced from various landowner types. **Table 4.2** shows that about 52 percent is from publicly held timber (e.g. USFS, BLM State, County, etc.) while 48 percent is from privately held timber. The U.S. Forest Service is the largest single supplier (46%) followed by non-industrial private at 36%. Respondents also reported that they utilized nearly 90 percent of their production capacity. Note that the results were calculated on a volume weighted basis.

CHAPTER 4 – WESTERN U.S. LOGGER SURVEY

Table 4.2 – Proportion of Production by Landowner Type

Landowner Type	U.S. Forest Service	Bureau of Land Mgmt.	State	County	Non-Industrial Private	Industrial Private	Tribal	Other
Green Tons	126,023	8	16,000	204	94,939	34,023	0	3,295
% of Total	46%	0%	6%	0%	35%	12%	0%	1%

Respondents were also asked about the type of equipment configuration used in their operation. **Table 4.3** shows the results.

Table 4.3 – Logging Equipment Configurations

Equipment Configuration	Count (# of respondents)
Ground-based: cut-to-length forwarding	4
Ground-based: whole tree yarding	7
Ground-based: shovel logging	2
Cable yarding	3
Helicopter	0
Other (hand falling)	1
Total	16

The results also indicated that 14 of the 16 responding firms were responsible for marketing the timber products they produced. In other words, they likely purchase all of their timber while it is standing and then merchandise and market it to the best available markets. In contrast, two respondents indicated their firm did not market the timber products produced, which suggests they only contracted the service of cutting, yarding (and possibly trucking) timber products.

7 of the 16 responding firms reported that they had sold material to post and pole manufacturers within the last year. Of the firms that had sold material to post and pole manufacturers, they reported selling the volume weighted species mix shown in **Table 4.4**.

Table 4.4 – Post and Pole Sold Volume Species Mix (Volume Weighted %)

Species	% of Volume Sold
Lodgepole Pine	90%
Ponderosa Pine	0%
Western Larch	<1%
Douglas fir	0
Other	9%
Total	100%

CHAPTER 4 – WESTERN U.S. LOGGER SURVEY

Regarding the specifications for post and pole material, 2/3's of the respondents reported selling logs with no length or diameter specifications. The remaining 1/3 of the respondents reported selling cut-to-length logs with specific diameter requirements. The average reported minimum small end diameter for those respondents was 3". Those respondents also reported the maximum allowable diameter for material sold to post and pole manufacturers. It averaged 8". Regarding the minimum allowable log length, only two respondents reported with one specifying 16' and the other 12.5'. The average haul distance to a post and pole market among respondents was 65 miles. The average delivered price to post and pole markets was \$61 per green ton and ranging between a low of \$50/green ton and a high of \$72/green ton.

Respondents were also asked to rank a series of statements about post and pole markets on a scale of 1 being most problematic to 6 being least problematic. The results are shown in Table 4.5.

**Table 4.5 – Ranking of Factors Related to Ease of Accessing Post and Pole Markets
(1= most problematic; 5 = least problematic)**

Factor	Average Ranking
Not enough P&P material to harvest	2.0
Limited Trucking	3.3
Species not suitable for P&P	3.6
Market is too distant	3.7
Too costly to sort P&P	3.7

CHAPTER 5 – POST IMPORTS

This chapter provides an analysis of roundwood imports between 1991 and 2018.

5.1 HISTORICAL PERSPECTIVE

In 2002 the Montana Community Development Corporation and the Oregon Economic and Community Development Department sponsored a study of Western United States Imports of Roundwood Posts from Canada between 1991 and 2001.¹ The purpose of that study was to gather data from the U.S. International Trade Commission about imports of Canadian roundwood posts to develop a better understanding of the nature, extent, and trends of Western U.S. imports of Canadian roundwood posts.

Key findings from that study included:

Growth Trends—post and pole industry interviews indicated that Canadian imports of roundwood posts were affecting the Western U.S. marketplace by the early 1990s. This was confirmed by import data which showed that imports peaked at 12.1 million linear feet in 1997 and the value of imports peaked at \$15.6 million in 2002.

Treated vs. Untreated—the vast majority of imported fenceposts were treated.

Mature Markets—the data collected showed that between 1997 and 2001 imports of blunt end fenceposts were essentially flat. The authors concluded this finding may be a signal that the market for blunt end fenceposts was mature and represented little opportunity for further growth.

Little Increase in Product Value—over the whole time frame of the study, there was almost no change in the declared value of the imported material (i.e., \$0.47 per linear foot (LF) in 1991 and \$0.45/LF in 2001).

Value Added for Treating—the import data indicated that treated posts had a declared value that was, on average, \$0.13 per linear foot higher than untreated.

Significant Potential for Error—study authors concluded there was significant potential for underestimating the volume and value of roundwood posts imported from Canada because customs brokers consulted at the time of the study judged that a significant portion of posts and poles imported into the U.S. were assigned to a “catch all” tracking category rather than being more accurately categorized as a treated or untreated blunt end fence post.

5.2 CURRENT ANALYSIS

The objective of the current analysis was gathering additional import data about post import trends into the Western United States over the years 1990 to 2018. Accordingly, the United States International Trade Commission dataweb information portal was used to collect fence post imports into the Western U.S. Data was collected for Harmonized Tariff Schedule (HTS) number 4403.10.0040 described as treated blunt end roundwood posts described as wood in the rough, whether or not stripped of bark or sapwood, or roughly squared; treated with paint, stain, creosote, or other preservatives. Also, data was gathered for HTS number 4403.20.0015 described as untreated blunt end roundwood posts described as wood in the rough, whether or not stripped of bark or sapwood, or roughly squared; other coniferous; fence posts. The data was segregated by import district with special focus given to imports passing through the Seattle and Great Falls customs districts since those districts are judged to be the entry point for posts destined for markets in western states.

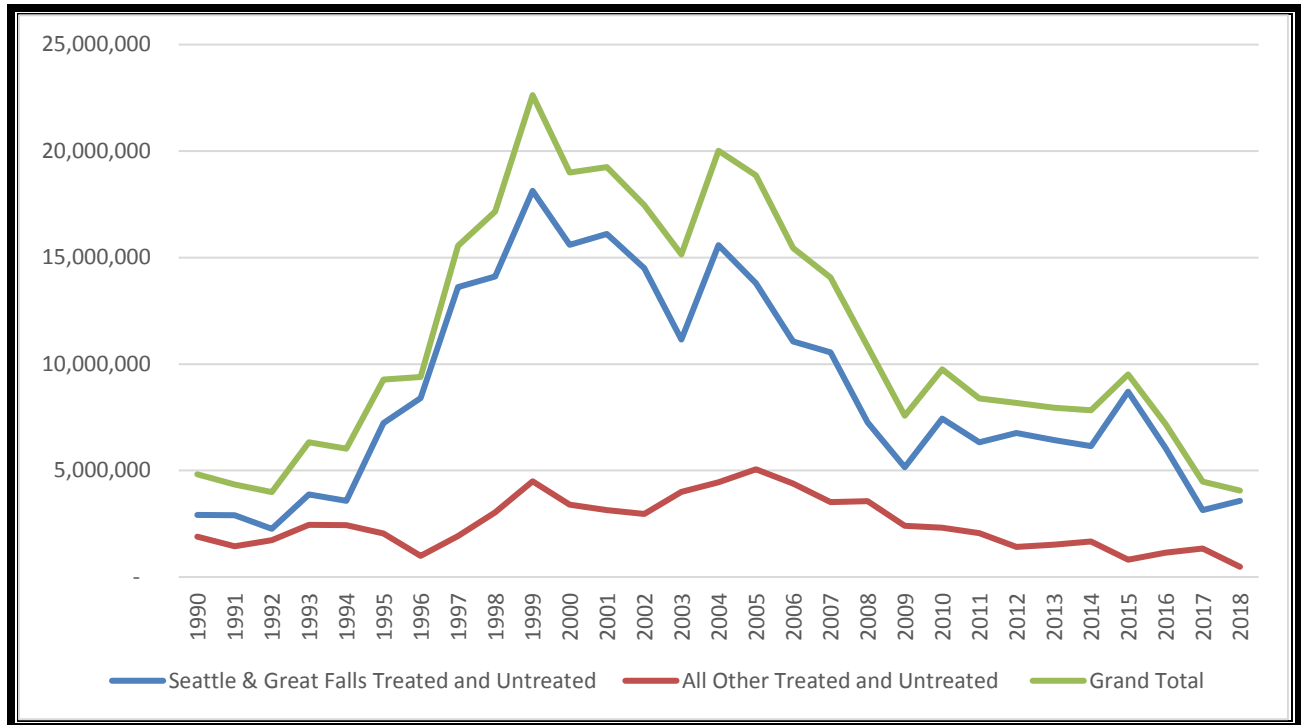
¹ Western United States Imports of Roundwood Posts from Canada: 1991 to 2001. Seattle and Great Falls Customs Districts. Accessed at: <http://intermountainroundwood.org/wp-content/uploads/2013/10/march2002.pdf>

CHAPTER 5 – POST IMPORTS

5.2.1 Import Volumes

Figure 5.1 below illustrates a nearly 30 year history of treated and untreated blunt end posts combined. Note the blue line represents imports through Seattle and Great Falls. The red line represents imports through all other customs districts. The green line is all imports combined. A few things to note: Imports spiked dramatically in the mid 1990's to well over 20 million linear feet and then remained at elevated levels for about 10 years before an extended decline leading into the Great Recession. Since the Great Recession, imports have been flat to declining. During the big spike in imports, the majority was for material imported through the Seattle and Great Falls customs districts while imports through all other districts was essentially flat.

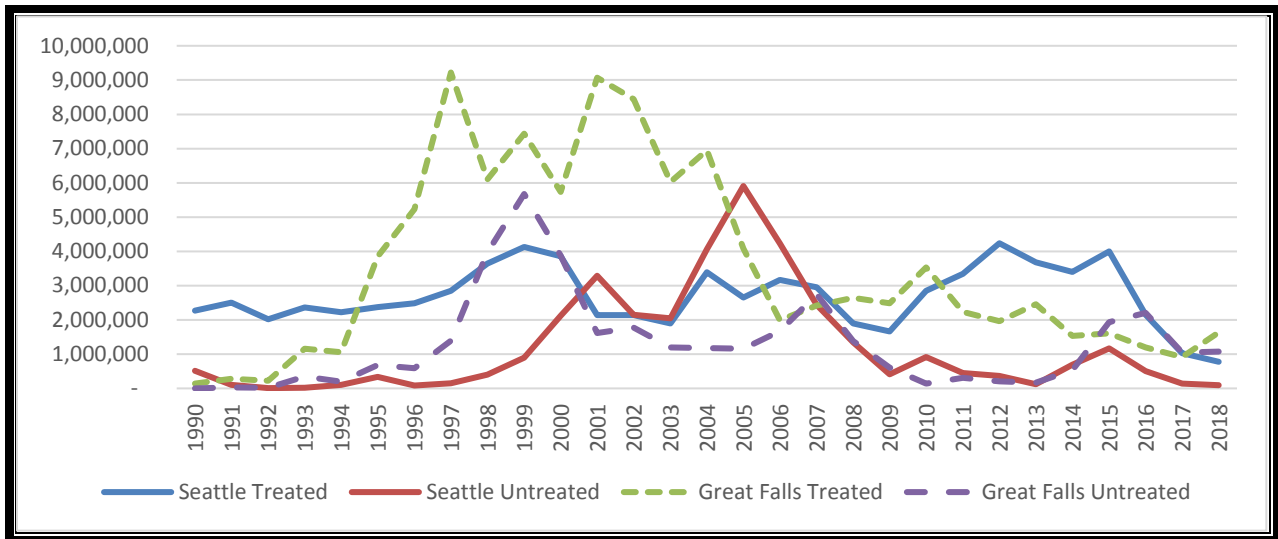
Figure 5.1 – Imports of Treated and Untreated Blunt End Posts 1990 to 2018 (LF)



For only the imports through the Seattle and Great Falls customs districts, **Figure 5.2** provides a break out of the amount of treated versus untreated material. Over the entire time period, on average, about 70 percent of the imports are treated and about 30 percent are untreated. This is true for both the Seattle and Great Falls customs districts. On average about 4.8 million linear feet of posts are imported through Great Falls annually versus about 3.9 million linear feet annually through Seattle. Thus, the majority of the imports enter the United States through the Great Falls customs district apparently driven by proximity of that entry point to the region where most post and poles are manufactured in Canada.

Also of note is that imports of treated posts into Seattle were fairly stable of most of the period. However, there was about a six year period in the early-to-mid 2000's when untreated posts imports into Seattle were greater than treated.

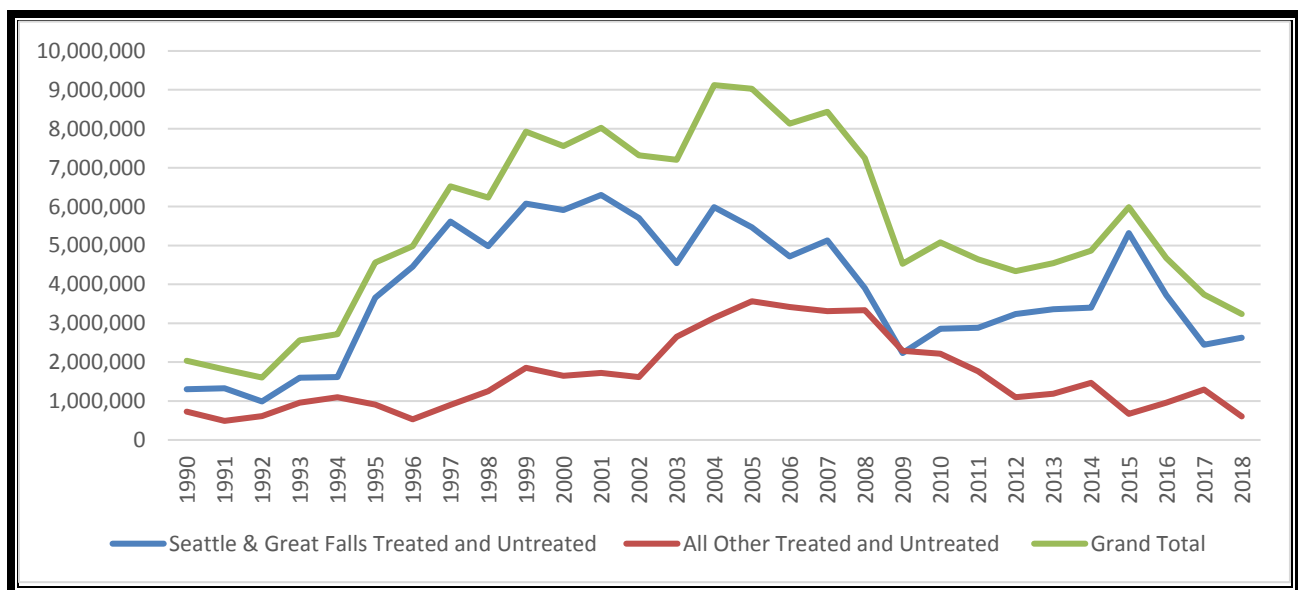
Figure 5.2 – Seattle and Great Falls Imports of Treated and Untreated Blunt End Posts 1990 to 2018 (LF)



5.2.2 Import Values

The US ITC import data also provides information about the value of imports. **Figure 5.3** is analogous to Figure 5.2 in that post imports are grouped in the same way (i.e., Seattle and Great Falls Treated and Untreated, All Other Treated and Untreated, and Grand Total). However, in Figure 5.3 the data illustrates the declared value of the imported material in dollars. The shape of the graph lines in the two analogous figures is generally the same. The exception to this statement is that in the late 1990’s as import volumes spiked, the associated value was not as high as the second spike in in the mid 2000’s. Additionally, the data shows that, on average, imports into Seattle and Great Falls averaged \$3.839 million per year over the entire time period. Also, the value of all imports, on average, totaled \$5.471 million per year over the entire time period. The grand total of all imports peaked in value in 2004 and 2005 when over \$9.0 million of posts were imported into the United States. Of that amount, about \$5.0 million in value (or about 55 percent of the total) was imported via Seattle and Great Falls.

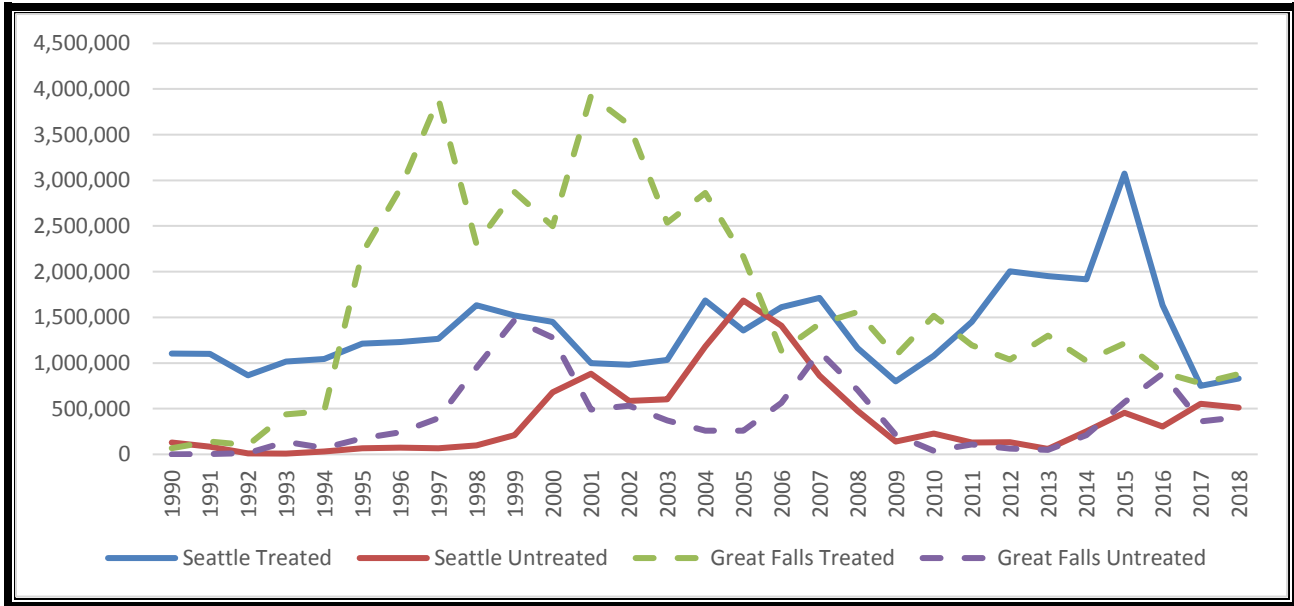
Figure 5.3 – Declared Value of Imported Treated and Untreated Blunt End Posts (\$)



CHAPTER 5 – POST IMPORTS

Figure 5.4 provides a break out of the value of treated versus untreated material. Over the entire time period, on average, nearly 80 percent of the value of the imports are treated and about 20 percent of the value is for untreated. This is true for both the Seattle and Great Falls customs districts. On average, the value of imports arriving via Great Falls was just over \$2.0 million and about \$1.8 million, on average, via Seattle.

Figure 5.4 – Seattle and Great Falls Imports of Treated and Untreated Blunt End Posts 1990 to 2018 (\$)



Finally **Table 5.1** shows the average, maximum, and minimum value of imports arriving into the United States via Seattle and Great Falls on a \$/Linear Foot basis between 1990 and 2018. As the data shows, treated posts imported via Great Falls had the highest value on a \$/LF basis. Additionally there is typically a \$0.40 to \$0.50 per linear foot premium for posts that have been treated.

Table 5.1 – Declared Value of Treated and Untreated Blunt End Posts 1990 to 2018 (\$/LF)

Region/Product Type	Average	Maximum	Minimum
Seattle Treated	0.60	1.36	0.33
Seattle Untreated	0.18	0.74	0.00
Great Falls Treated	0.73	1.73	0.03
Great Falls Untreated	0.18	0.65	0.00

In summary, the imports of treated and untreated blunt end posts peaked during roughly a 10 year period beginning in the mid 1990’s and ending in the mid 2000’s. The major trends in data gathered in the more recent analysis is consistent with the prior analysis, but there are some discrepancies. For example, the total volume imported in each year is slightly higher than what was reported in the prior study. Similarly, the more recent analysis indicates a significantly higher premium for treating that what was reported in the earlier study. The reasons for these differences are unclear.

CHAPTER 6 – CONCLUSIONS AND RECOMMENDATIONS

Several conclusions and recommendations can be drawn from the preceding information.

- The roundwood industry is highly dependent on supply from publicly owned and managed lands. The industry should continue to work with land managers to assure continued programs for supply adequate volumes of raw material.
- Related to the previous point, it appears that focus on precommercial thinning or fire mitigation of public lands is not resulting in volumes or sizes sufficient for roundwood post and pole even though the demand for the material exists at prices considerably higher than allowed by most other small-diameter utilization technologies.
- Logging contractors are willing and able to supply roundwood manufacturers with raw material, but they are constrained by limited volumes of appropriate material from the bids they win.
- As the relatively even product size mix demonstrates, 20-30%, roundwood manufacturers can consume any sizes between 2 to 7+ inches in diameter.
- With raw material shortages being the biggest constraint to roundwood manufactures and loggers, The US Forest Service, States and private land owners need to consider further means to help loggers bid underutilized small diameter roundwood or precommercial thinning for post and pole markets.
- The 20% yield loss when converting raw roundwood logs into posts and poles also provides an opportunity for chips, firewood, mulch and other by-products sales to be generated.
- Less than 50% of logging firms reported that they had sold material to post and pole manufacturers within the last year. Clearly more education needs to be done with loggers about the post and pole market.
- Loggers reported sizes consistent with the roundwood manufacturers with 3” to 8” sizes. Anything larger than 8” is considered a saw log and has a higher value. However, these sizes are also desirable for pulpwood, biomass and other devalued products.
- Loggers and roundwood manufactures both stated the average haul distance was around 65 miles. Distance thus plays a small role in determining if post and pole is going to be part of a bid for a stand and shows the significance of relationships between roundwood manufacturers and nearby loggers.
- The average delivered price to post and pole markets was \$61 per green ton and ranging between a low of \$50/green ton and a high of \$72/green ton. These values are significantly higher than published pulpwood prices, which typically range between the low \$30’s and low \$40’s per green ton per RISI Log Lines and industry log price reporting service for the Western US.
- The volume and value of treated and untreated blunt end posts have declined significantly from the high-water marks of the mid 2000’s.
- For both surveys, the response rates were low. Thus, the results may not be representative of the industry and a degree of caution should be used in applying the results to the industry as a whole.

A web-based survey was used because it was judged to be more cost effective to administer and because it minimizes the number of questions for respondents. For example, the online methodology allows for the different kinds of respondents (manufacture only, manufacture/treat, treat, etc.) to be routed to questions specific to their type of operation. Despite this strategy, respondents indicated the survey was too detailed and required too much effort to complete. Strategies for addressing this problem include greatly simplifying the survey or reverting to the more time intensive (and costly) methodology of collecting the information via mail or telephone survey.