April 2015

Pennsylvania Timber Product Output Survey

pennsylvania
DEPARTMENT OF CONSERVATION
AND NATURAL RESOURCES

Tom Wolf, Governor

Cindy Adams Dunn, Acting Secretary

Preface

Dear Pennsylvania Forest Stakeholder,

Pennsylvania's forests provide us with many critical values and services including clean water, places for recreation, plant and wildlife habitat, and a beautiful landscape. Additionally, our forests are sources of wood and raw materials used to produce an array of valuable consumer products including hardwood furniture, kitchen cabinets, hardwood flooring, high-quality papers, pallets and packing materials, landscaping mulch, and firewood.

Currently, Pennsylvania is home to more than 2,100 forest product establishments that employ approximately 58,000 Pennsylvanians. The forest product industry has a presence in every county of the Commonwealth. In 2012, the state's wood industry had roughly $11.5 billion in sales and an overall total economic impact estimated at $19 billion contributed to the state's economy.

While economic information is generally available, data on timber harvested and processed by Pennsylvania facilities is lacking. Many states, in cooperation with the US Forest Service, routinely collect information, commonly referred to as a "Timber Product Output" survey. The PA Bureau of Forestry last conducted such a survey in the mid-1990s. In cooperation with our partners, we re-initiated the effort in 2013. Understanding current harvest levels, tree species harvested, and other information on timber market dynamics is important to sustaining both our forests and the forest products industry.

In addition to collecting data and reporting on the timber market, one of our objectives was to strengthen our relationships with our forest industry partners. This effort gave DCNR foresters the opportunity to interact with forest product companies and communicate on common interests.

This report reflects a large investment of time and energy and we are pleased with the results. The response rate was excellent and we thank the businesses for participating. Total volume reported is 185 million cubic feet, equivalent to 1.2 billion board feet of lumber. These numbers are consistent with industry experts' anecdotal estimates. While there are gaps and many lessons learned, this report provides a good snapshot of the industry and gives us a baseline for future work.

This effort would not have been successful without the steadfast work of our foresters and cooperation of the 312 businesses that participated—thank you for your support and assistance!

I hope you find this report useful and informative.

Sincerely,

Daniel A. Devlin
Pennsylvania State Forester

Acknowledgements & Partners

The Bureau of Forestry sincerely thanks all the businesses that shared information for this Timber Product Output Survey.

Additional thanks go to:

- The PA Forest Products Association, PA Hardwoods Development Council, and Penn State University's Department of Ecosystem Science and Management for their contribution and guidance.
- The US Forest Service, Northeast Area State & Private Forestry – Wood Education and Resource Center for their guidance and funding throughout the project.
- The DCNR, Bureau of Forestry foresters who provided advice on the survey process, helped to compile the facility lists, and visited the businesses to gather the data.

Pennsylvania Primary Wood Processors Directory

In addition to this report, we compiled a directory of primary wood processors in Pennsylvania, which can be obtained on the DCNR website or by contacting the Silviculture Section of the Bureau of Forestry (contact information below). Thank you to all the companies that provided information.

Future Participation & Feedback

Other primary wood processing facilities are encouraged to participate in these Timber Product Output Surveys. The Bureau of Forestry plans to conduct TPO surveys every two to three years. If a facility was not contacted in 2013 and would like to participate in the next survey, or if other suggestions can be made to improve information gathering or this report, please send contact information and suggestions to the Bureau's Silviculture Section.

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Table of Contents

Executive Summary

INTRODUCTION

The Pennsylvania Department of Conservation and Natural Resources, Bureau of Forestry (BOF), along with its partners, led an effort to gain information that reflects the current characteristics of the wood products industry in the state. In 2013, the Bureau of Forestry conducted a Timber Product Output (TPO) survey among Pennsylvania's primary wood processing facilities, collecting information from the 2012 production year. The last survey of this type was conducted in the early 1990s and entailed hand-delivered surveys and estimates based on the on-site observations of foresters. The survey was reinstituted in order to gain insight into volumes, species, uses, products and origins of the wood harvested and processed in PA, as well as information about the facilities operating in PA (employment, age, functions, etc.). The survey process also provided an opportunity for BOF foresters to interact directly with the private facilities located in their districts and enhance vital professional relationships. This information can be used by land owners, wood-processing businesses, and other interested parties to plan and adapt to the needs and current condition of the market. In addition, the data collected from such surveys contributes to broader datasets that could be used in long-term trend analysis and assessments of regional dynamics.

Objectives

1. Develop and maintain a directory of mills
2. Collect and report basic timber product information
3. Build a foundation to better understand timber market dynamics
4. Strengthen relationships with the forest products industry

Survey Methods

BOF foresters from across the Commonwealth compiled a list of known primary wood-processing facilities in their district. A primary wood products facility was defined to be one that processes the bole of a tree to produce a product, or exported logs outside of the U.S. (Companies that cut trees and delivered them to another facility for processing were not included in this survey.) After receiving training on the canvass and survey methods, the foresters began to contact facilities, distributing the surveys and gathering information on additional facilities that should be surveyed in the area. Information was provided by the facilities with the understanding that any information provided (besides contact information) would not be associated with the specific facility from which it was collected. The survey approach employed for this process was the Drop-Off/Pick-Up method, in which the forester left the questionnaire with a manager or contact person at each facility. This provided the foresters the opportunity to interact with the mills, but the managers were free to fill out the questionnaire at their convenience, with the forester available as a contact for questions. Although more time is required to hand-deliver the surveys, this method typically leads to a greater response

rate (over mail surveys) because the foresters are able to explain the importance of the survey and address any questions or concerns. The relationship-building aspect is a key advantage over the mail survey method.

Data Analysis

This report represents an initial summary of the information collected in the survey. The reported values were converted to standard units and summarized, as appropriate, across different product types, origins, species, and region of processing. No extrapolations were made to estimate values for non-respondents. Therefore, there is a variable sample size for each summary statistic, since each facility reported different degrees of detail. Many more analyses could be conducted for more in-depth look at the dynamics of the industry in Pennsylvania; however, the purpose of this report is to give a broad overview of survey findings and to determine modifications needed moving forward, as the PA TPO survey becomes a recurrent data collection tool.

RESULTS

Participation & Facility information

Based on the lists of facilities compiled by the Bureau of Forestry, 430 facilities were identified to be surveyed across 62 of the 67 counties in PA. Of those, 312 facilities participated in the survey to some extent. The level of detail was variable: some facilities provided their volumes by species and harvest location for the timber for each section of the survey, while others provided only basic business/contact information and the total annual capacity of their facility. In general, most participants provided information about their functions, number of employees, and number of years in business. Because of the variability in amount of detail provided among surveys, the number of facilities contributing to each summary value is given.

Key points & findings include:

- Statewide participation rate was 73%. Some follow-up contacts were required.
- Most facilities are located in the north-central and south-central regions. County totals ranged from 0 facilities in Allegheny, Beaver, Delaware, Philadelphia, and Washington counties to 30 facilities in Mifflin County.
- Half of the facilities surveyed have been in business between 11 and 40 years. Almost a quarter have been in business less than 10 years. Four facilities have been in business over 100 years.
- Most mills performed lumber/dimension processing (sawmill), international exporting and/or other miscellaneous functions.
- The majority (62%) of the facilities employed between 1 and 10 workers; 9 facilities reported more than 75 employees. A total of 4,394 workers were reported at 211 facilities.

- Annual volume processed per mill ranged from approximately 5,000 board feet to approximately 26 million board feet for sawmills with an average of 3.2 million board feet. The largest pulp mill processed about 29.7 million cubic feet (equivalent to 188 million board feet).

Volumes Processed

The survey was divided into 4 main sections, representing 4 types of volumes: lumber/dimension, pulp/chips, internationally exported logs, and residues. As previously mentioned, response rate and level of detail provided were variable across survey sections. There were 253 mills that provided volume by type for some section (no single section had 253 responses). These data can be used within the state, as well as at a regional level. For example, the U.S. Forest Service conducts a pulpwood survey. The data from the largest pulp processors was compiled and forwarded to the USFS, Northern Research Station, to be included with pulpwood data from other Northern Region states for further analysis and reporting.

Key points & findings:

- Total volume processed at the 253 facilities that reported volumes is 185 million cubic feet (equivalent to 1.2 billion board feet). This total is comprised of lumber/dimension, international exports, and pulp/chips: for lumber/dimension, 637.9 million board feet was reported for 2012; 14.9 million board feet of logs exported out of the U.S.; and 2.5 million green tons of pulp/chips. Based on knowledge of the industry and other published data, we estimate that non-respondents account for about 25% of the statewide volume. Therefore, these totals represent about 75% of the total volumes statewide.

- Volumes were also summarized into additional categories within the three major product types (lumber/dimension, pulp/chips, and exports). This revealed that lumber, cants, and pulp represent almost 90% of all volume processed in 2012

- Approximately 55% of the total volume reported was in lumber/dimension products and 44% processed into pulp/chips. The other 1% was exported logs. Refer to Table 5 on page 22 for a concise overview of total volumes by product type.

- Of the wood processed in Pennsylvania, 63.8% was processed in facilities located in the north-central and south-central regions.

- Pennsylvania has seven large companies that process pulpwood and wood residues in the production of pulp products (e.g., wood pulp and corrugated medium) and composite panel products (e.g., particle board, hardboard, and medium density fiberboard). Five of these companies participated in the 2012 Timber Product Output Survey.

Species & Origins

In many cases, facilities did not keep detailed records on the origin (location where harvested) of logs they were processing, and, in some cases, the species were not recorded (especially for volume used in pulpwood production). Although the numbers of reporting facilities is less for this level of detail in the survey, sufficient numbers of facilities reported these data to provide some insight into the flow of timber from a species and geographical perspective. Although we know what is explicitly reported, we did not extrapolate beyond raw data summaries. For example, red pine volume was only reported in one region; however, we cannot assume other regions had none, since there are species reporting categories for miscellaneous softwoods, as well as mixed pines.

Key points & findings:

- Thirty-three species groups were reported to have been harvested from PA forests based on 224 mills reporting volumes by harvest locations and species (includes some conglomerate groups such as miscellaneous softwood, mixed oak, mixed pine, other). Thirty-seven species groups were reported as processed in PA facilities during 2012, reported by 249 facilities that provided volumes by species. Mixed hardwoods, red oak, miscellaneous softwood, other, red maple, and black cherry are the six top species groups by volume statewide, respectively.
- Approximately 58% of the wood volume that was reported as harvested from PA came from forests in north-central and south-central regions.
- Interestingly, 13.1% of the volume processed was from outside of PA (Unknown origin=8.4%), with volume from Maryland, West Virginia, New York, Virginia, New Jersey, Ohio, Oregon, and international locations (based on 242 reporting facilities).

Residues

Residues are a by-product of the initial or primary processing of roundwood (e.g., sawdust, slabs, bark, log pieces, shavings). They are not the primary target wood product but are volume created as a result of other types of processing (i.e., chips can be the intended product, as well as a by-product; volume processed into chips as the primary product is reported in the pulp/chips section, not in residues). The types and end-uses of these residues are important, as they comprise a large volume of wood in the state and are widely utilized for a variety of products. Residues were reported as one of 5 types [bark, coarse (chips, slabs), sawdust, shavings, and logs/short sections] with 11 options for end-uses (including an open-ended "other" category).

Key points & findings:

- There were 2.0 million green tons (66.3. million cubic feet) of residues reported by 192 mills. Bark, coarse, and sawdust compose most of the residue volume at 41.4%, 31.5% and 23.3%, respectively. Smaller amounts came from shavings (3.1%) and logs/short sections (0.7%).

- Thirty-nine percent of all residues were made into mulch/soil additive, with 81% of that volume came from bark. Approximately 16% of the reported residues were used in the manufacture of fiber/composite products. Most shavings and sawdust were used for animal bedding and represent approximately 17% of the total residue. Residues used for bio-energy pellets comprise coarse, sawdust, and shavings and are approximately 8% of the total residue volume. Less than 1% of the total residues produced was unutilized and were either landfilled or burned.

DISCUSSION & CONCLUSIONS

This endeavor to re-initiate a TPO survey represents a significant improvement in the data available on the wood products industry in Pennsylvania for 2012. This initial survey is a snapshot in time of the Pennsylvania timber product output and repeated surveys are necessary for more precise estimates and tracking changes through time. Moving forward, the Bureau of Forestry plans to conduct TPO surveys on a regular basis, perhaps every two to three years, providing comparisons across surveys for industry trend analyses. Additionally, the networking and professional relationships will continue to strengthen between the Bureau and the private companies, as we are able to provide accurate and informative summaries for the industry while maintaining confidentiality. Many mills were not accustomed to tracking the level of detail requested in the survey. Perhaps with survey regularity mills will become accustomed to providing this information, leading to improved record-keeping and more-detailed documentation.

This report gives some broad summary values to survey data requested. It is possible that the current dataset may be analyzed and extrapolated to statewide values by modeling mill characteristics by size, region, primary function, etc. As well, data could be compared to other states or lumped into larger datasets across the region to assess forest conditions and trends. With subsequent TPO data, it may be possible to conduct more specific regional, temporal, or economic trend analyses that reflect connections to other data or events (e.g. gypsy moth salvage, growth vs. harvest, downturns in the industry following larger global economic trends). Numerous storylines that may emerge from this dataset, and especially as new survey information is added in the subsequent surveys.

Because many years have passed since the last TPO survey in PA, much of the current survey was a learning process. Many details about data collection, communications, and analyses will be adapted and honed based on lessons learned during the 2012 PA TPO survey. Lessons learned range from small things, such as including a "paper milling" option under facility functions, to more overarching alterations, like simplifying the survey form while still ensuring thorough production data is gathered. Results from this initial survey validated some of the anecdotal information about the industry, such as the overall volumes processed, top species processed, general size of individual mills, and impacts of the recent economic downturn. Some interesting trends were also observed, such as the use of processing residues and the volume of wood reported from sources outside of Pennsylvania. With

repeated surveys, further trends will likely emerge, as well as additional validation of the assumed industry conditions.

Some information gaps have been identified and may be addressed in future TPO surveys or supplemental survey projects. For example, since the 2012 TPO survey targeted primary wood processors, the impact of smaller transient and portable mills was not reflected in the data. Additionally, information on the sources and volumes of residential firewood is lacking. Although some facilities indicated they processed firewood, much of the volume used for residential heating may be outside the scope of the TPO survey, so a homeowner survey may be beneficial in constructing the full picture of timber product output in PA. As the process becomes streamlined and the surveys are repeated, the strength of the TPO data will improve. The surveys will provide useful information for land managers and business owners that work within the timber product industry in Pennsylvania and the northeast region.

Report

INTRODUCTION

The Pennsylvania Department of Conservation and Natural Resources, Bureau of Forestry conducted a survey throughout 2013 to provide information on the amount of timber harvested and processed by Pennsylvania's primary wood processing industry during the 2012 production year. The survey also provides general information on employment force, mill size and other general characteristics of the forest products industry. It provides a picture of timber flow from Pennsylvania's forests through the primary forest products industry; it provides insight into timber market dynamics, and information that can be used to help understand the effects of economic growth and decline. This information gives wood-processing companies data on local demand for timber, which they can use in their business and procurement planning. It supplies landowners and other interested parties data about potential market opportunities for their timber. Knowledge of the current production of the industry provides a useful assessment of the health, vigor and direction of Pennsylvania's forest products industry.

BOF foresters started with several listings of primary wood processors and mills. They received training to canvass their assigned counties. Starting early in 2013, they began visiting sawmills and other facilities in the counties where they work to learn more about Pennsylvania's wood products industry. Over 430 facilities were contacted across 62 of Pennsylvania's 67 counties.

Objectives

1. Develop and maintain a directory of mills
2. Collect and report basic timber product information
3. Build a foundation to better understand timber market dynamics
4. Strengthen relationships with the forest products industry

Data Collection

- A primary wood products facility processes the bole of a tree to produce a product, whether that is a board, cant, chip, or sawdust. To be considered for the TPO Survey, the facility had to be located in Pennsylvania and produce a wood product from a log/tree bole or export logs out of the US. If the company cut down trees and simply delivered them to another mill or log broker in PA or another state, they were not part of this TPO Survey; however, facilities that exported logs to another country were included.

- BOF foresters used the Drop-Off/Pick-Up survey method to gather data for Pennsylvania's Timber Product Output Survey 2012. The self-administered questionnaires were hand-delivered and retrieved, which helps to reduce coverage error associated with mail surveys and at lower cost than face-to-face interviews.

- This survey method's strengths are convenience, greater response rate than with mail surveys, and relationship building. Respondents answer the survey at their own convenience. Because the interviewer makes personal contact with respondents, explains the importance of the survey, and answers any questions or concerns the respondent might have, there are higher response rates than with mail surveys. The drop-off survey helps to establish or develop professional relationships with the respondents.

- The sampling frame for the TPO Survey in all Pennsylvania counties was all primary "breakdown" sawmills and wood processors, whole-tree chippers, pulp & paper mills, panelboard mills, and log buyers exporting wood outside the U.S. BOF foresters had local knowledge about facility locations in their respective counties. The intent was to visit each of the known facilities to seek input and to ask each potential respondent to help identify other facilities in a given or adjacent county. Before going to the field to begin the survey, each forester constructed a list of known facilities by utilizing institutional knowledge, timber sale bidder's lists, and other directories and cooperators.

- The foresters called ahead to arrange a facility visit. At the facility, they asked to speak with the owner or manager. They explained the survey was designed to gather data for the PA Timber Product Output Survey for the 2012 production year. They left the survey form with the manager/owner and generally returned a week later to pick-up the completed survey. They completed a survey tracking form to record details of their visits. Foresters could adjust this method to accommodate specific needs, and some found it more effective to assist with the survey completion in-person, so that questions could be addressed if there was confusion with the survey form.

Data Conversions

- All board feet units in this report have been standardized to International ¼-inch rule by applying the conversions in Table 1.

- Pulp/chip totals have been converted from reported units to green tons (Table 1).

- Totals that compare lumber, pulpwood, and residues have been standardized to cubic feet (Table 1), unless industry standard dictated the use of another unit.

Table 1. Conversion factors used in this document. Unless otherwise indicated, all conversions are based on Piva & Treiman 2000*.

Reported Unit	Conversion equivalency
1 Cubic foot	=**6.33** bd ft(1/4-inch international standard)
1 Bd Ft Doyle (Lumber)	=**1.38** bd ft(1/4-inch international standard)
1 Bd Ft Doyle (Veneer)	=**1.14** bd ft(1/4-inch international standard)
1 Bd Ft Scribner (Lumber)	=**1.08** bd ft(1/4-inch international standard)
1 Bd Ft Scribner (Veneer)	=**1.04** bd ft(1/4-inch international standard)
1 Green Ton	=**217.4** bd ft(1/4-inch international standard)
1 Standard cord	=**500** bd ft(1/4-inch international standard)
1 Billet**	=**0.15** bd ft(1/4-inch international standard)
1 Piece	=**7.9** cubic feet
1 Cord	=**79** cubic feet
1 Green ton	=**32.92** cubic feet
1 Linear ft (log siding)***	=**0.1875** cubic feet
1 Cord	=**2.4** green tons

*Piva, R. J., & Treiman, T. B. (2000). Missouri Timber Industry-An Assessment of Timber Product Output and Use. Agriculture, USD o., Ed. North Central Research Station.

**=1 billet=2.5lb=0.00125tons=0.15bd ft

***=assuming log siding is 9 inches wide by 3 inches thick: (0.75ft)*(0.25ft)*(1 linear ft)=0.1875cubic ft

DATA ANALYSIS & RESULTS

For ease of understanding, the results have been divided into four general categories:

1. Participation & Facility information: summarizes the survey participation and level of detail provided by respondents, as well as the general information about the facility (from page 1 of the survey; see Appendix 2).

2. Volumes Processed: provides total volumes of wood processed for various products statewide and by region

3. Species & Origins: characterizes the processed wood by species and where the wood was harvested

4. Residues: summarizes the amount, types and end uses of the residues produced as by-products from primary processing of the timber

Participation & Facility Information

- Figure 1 provides a map of Pennsylvania that gives county information and displays counties grouped into regions used in this analysis. Regions were delineated based on conventions used by the USDA Forest Service during their inventory and analysis of Pennsylvania's forest resources. Counties were grouped into northwest, southwest, north-central, south-central, northeast and southeast regions of the state. Each county is labelled with the county name, the number of mills that returned a completed survey and the total number of known facilities in that county (in 2012).

- Of the 575 facilities originally identified to canvass, 430 facilities were found to be in business during the survey. Of those, 312 facilities provided information for an overall participation rate of 73% statewide. Known facilities per county ranged from 0 in Washington, Allegheny, Beaver, Delaware, and Philadelphia counties to as high as 16, 18, 20, 22, and 30 in Snyder, Clearfield, Bradford, Juniata, and Mifflin counties, respectively (Figure 1). Most counties have 1 to 14 primary wood processors/mills (Figure 1).

- Most data was collected using the Drop-Off/Pick-Up method discussed previously. Some supplemental information was obtained via phone calls to the mills that had not returned a completed survey.

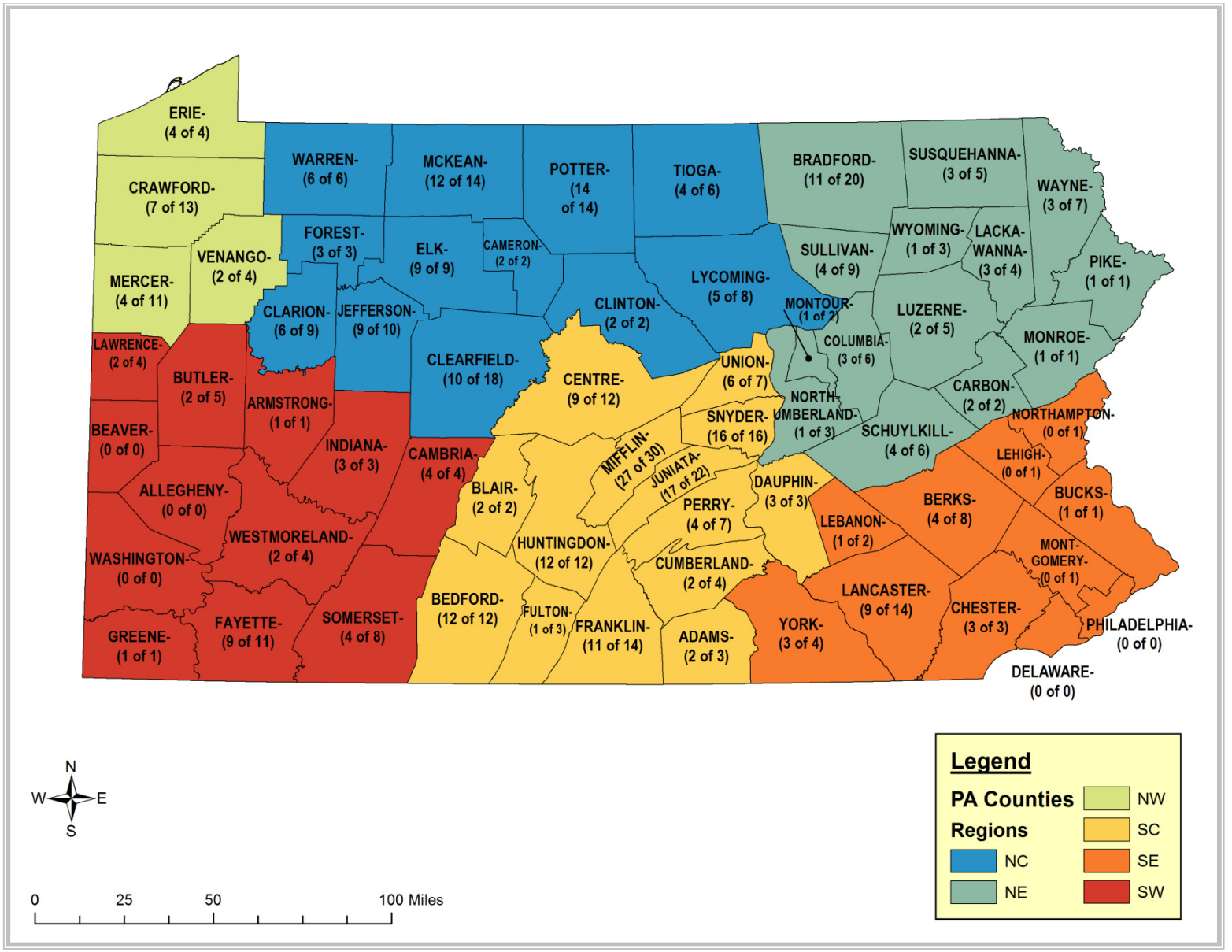


Figure 1 – Map of PA by regions and counties. Each county name followed in parentheses by number of facilities that participated in the survey and number of known facilities in that county during 2012.

- The summaries represent the data provided by survey participants only. No extrapolations have been made to approximate statewide totals or estimate volumes for the non-respondents.
- The level of detail provided by each participant varied considerably. Some participants provided only basic information about their facility, others provided volumes by type of product, and some fully detailed their volumes by species and harvest location of the wood. Table 2 outlines the number of mills reporting for each level of detail within each section of the survey (see Appendix 2 to see the survey form). Because of this variability, captions for each figure provide the number of surveys upon which each summary is based.
- An example of variability of reporting detail: the statewide total volume processed by species is 182.5 million cubic feet (Table A15); however, the statewide total volume processed is 184.7 million cubic feet. The difference occurs because some participants gave a level of detail that included a volume by species breakdown, while others only gave total volume by type of product (which would only be included in the overall total, but not the total for the species breakdown).
- Some mills indicated they did process wood in 2012 but were unable to report volumes. For anecdotal information such as this, no quantification was applied, so they are not included in summary figures.
- For reference, a blank survey can be found in Appendix 2.

Table 2—Number of participants reporting volumes in each of the survey sections (Appendix 2).

Survey Section	Number of mills reporting any volume processed (includes volume unknowns)	Number of mills reporting volumes	Number of mills reporting species/use of material with volume (subsection 2)	Number of mills reporting origin of materials
Section 1: Lumber/Dimension	228	226	223	214
Section 2: Pulp/Chips	55	51	48	45
Section 3: Exports	35	31	30	30
Section 4: Residues	202	192	176	--

- Table 3 lists each Pennsylvania region and the number of counties, survey participants, known facilities/mills, and the percent participation rate for each region. Note that the regions with the highest known number of facilities/mills are the north-central (101 facilities) and south-central (147 facilities) regions.

Table 3 – Regions of Pennsylvania listing the numbers of counties, numbers of survey participants, numbers of known facilities, and percent participation rate to the survey.

Region	Counties	Participants	Known Facilities	Participation Rate (%)
NW	4	17	32	53 %
SW	12	28	41	68 %
NC	12	82	101	81 %
SC	14	124	147	84 %
NE	14	40	74	54 %
SE	11	21	35	60 %
Statewide	67	312	430	73 %

- Of the 238 facilities that provided establishment dates, almost a quarter have been in business less than 10 years; four facilities have been in business over 100 years (Table 4).

Table 4 – Ages of primary wood processing facilities in Pennsylvania, in 10 year increments.

Years in Business	Number of Mills	Percentage of Mills
0-10	**57**	**24%**
11-20	**42**	**18%**
21-30	**45**	**19%**
31-40	**31**	**13%**
41-50	**20**	**8%**
51-60	**16**	**7%**
61-70	**12**	**5%**
71-80	**5**	**2%**
81-90	**4**	**2%**
91-100	**2**	**<1%**
>100	**4**	**2%**
Total	**238**	**100%**

- There were ten main function categories identified by a primary wood-processor (Figure 2). Participants indicated all functions used in their facility. **Some facilities were counted in more than one category, since a mill may have multiple functions.** The percentages in Figure 2 represent the total number of mills of that type relative to the total number of surveyed mills.

- Participants were engaged in various activities and were multifaceted (Figure 2). The number of mills performing each function were:
  - Sawmilling = 244
  - Exporting (out of U.S.) = 70
  - Whole-tree chipping = 13
  - Fuel wood supplying = 8
  - Log brokering = 5
  - Composite/panelboard manufacturing = 4
  - Veneer milling = 4
  - House/cabin log manufacturing = 2
  - Posts-poles-piling manufacturing = 1
  - Other miscellaneous function = 65

- Examples of miscellaneous manufacturers included pulp & paper mills, planing mills, firewood processers, handle blank mills, cooperages, pallet mills, scragg mills, dimension/component mills, mulch manufacturers, and shavings mills.

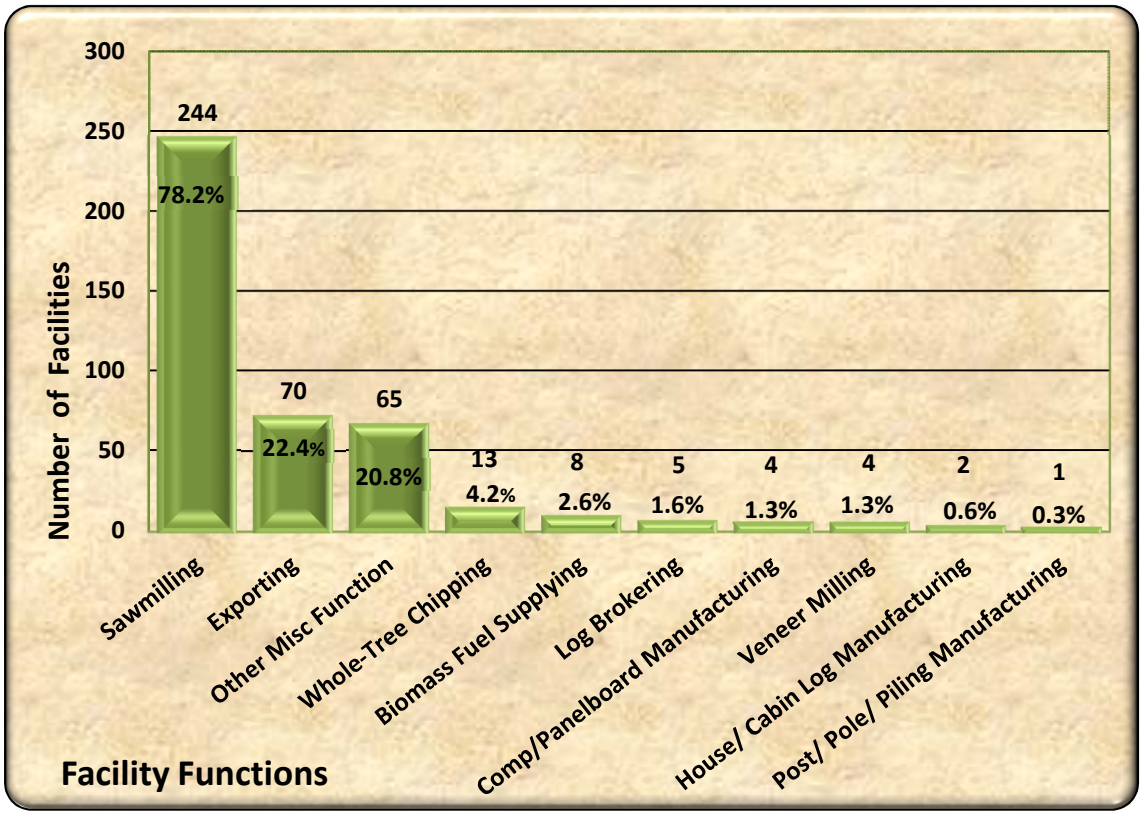


Figure 2– Distribution of facilities/mills by their functions, based on 312 surveys.

- Of the 312 facilities that participated in the TPO survey, 211 facilities reported total number of employees (Figure 3). There were 4,394 employees at those 211 facilities. Eighty-four facilities reported employing between 1 to 5 employees, 46 mills reported employing 6 to 10 employees, 29 reported employing 11 to 15 employees, and 15 reported employing 16 to 20 employees; however, 9 facilities reported employing more than 75 employees.

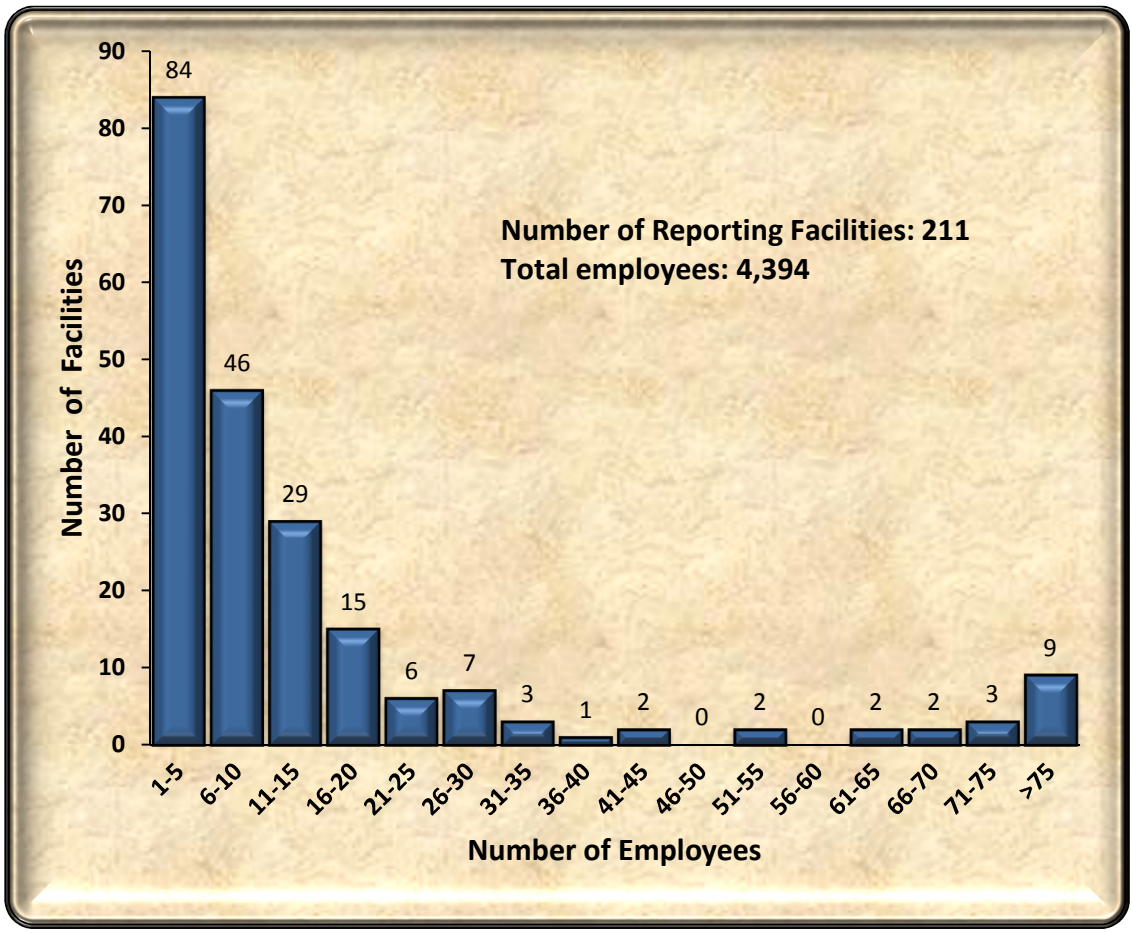


Figure 3 – Total number of employees per facility based on 211 facilities.

- Total volume processed was standardized to board feet, even for pulp/chip volumes, since mill size is typically characterized using board feet. Conversion factors from Table 1 were applied to convert green tons and cubic feet to board feet for this summary.
- Based on 243 mills that provided volumes processed for lumber/dimension and/or pulp/chips (Figure 4):
    - Twenty-five percent of the mills reported annual volumes of less than 0.5 million bd ft (500,000 bd ft) in 2012.
    - Seventy-nine percent of the mills process less than 5 million bd ft of lumber/dimension and pulp/chips each year.
    - The average annual volume processed at these 243 mills was 4.8 million bd ft, with a minimum of 0.005 million bd ft (5,000 bd ft) and a maximum of 188 million bd ft (median=1.6 million bd ft).

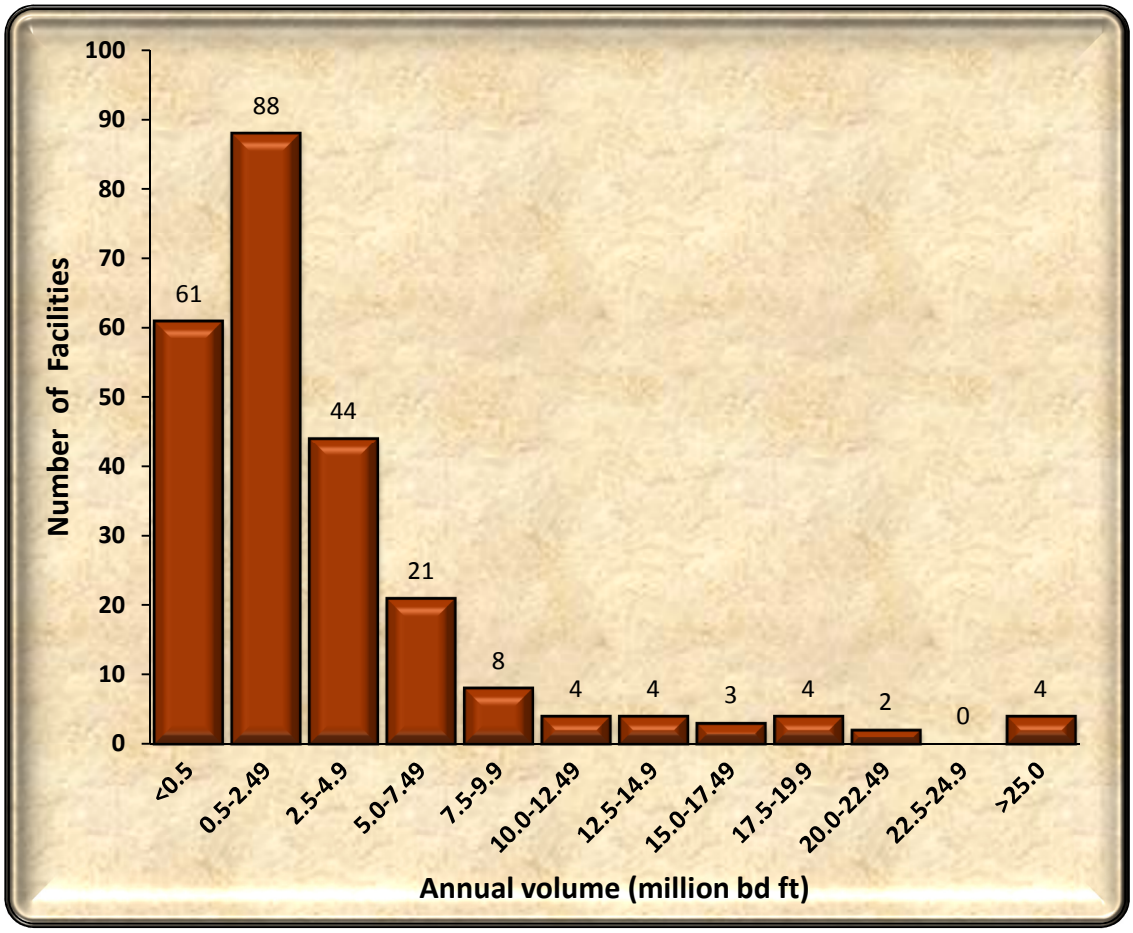


Figure 4 – Distribution of mills by size, based on 2012 wood volumes processed at 243 participating facilities/mills (not including exported material).

Volumes Processed

- The 2012 Timber Product Output Survey addressed **four product types** and gathered the following product volume data from each reporting facility:
    - volume of roundwood/logs processed into lumber/dimension and the percentage of that volume by species and by county, state or country where harvested
    - volume of roundwood/logs processed into pulp/chips and the percentage of that volume by species and by county, state or country where harvested
    - volume of roundwood/logs exported out of the U.S. and the percentage of that volume by species and by county, state or country where harvested
    - volume of residues produced and how it was utilized

- Figure 5 depicts total statewide volumes processed by product type in million cubic feet; volumes reported from 253 mills that reported volume by product type and softwood & hardwood components.

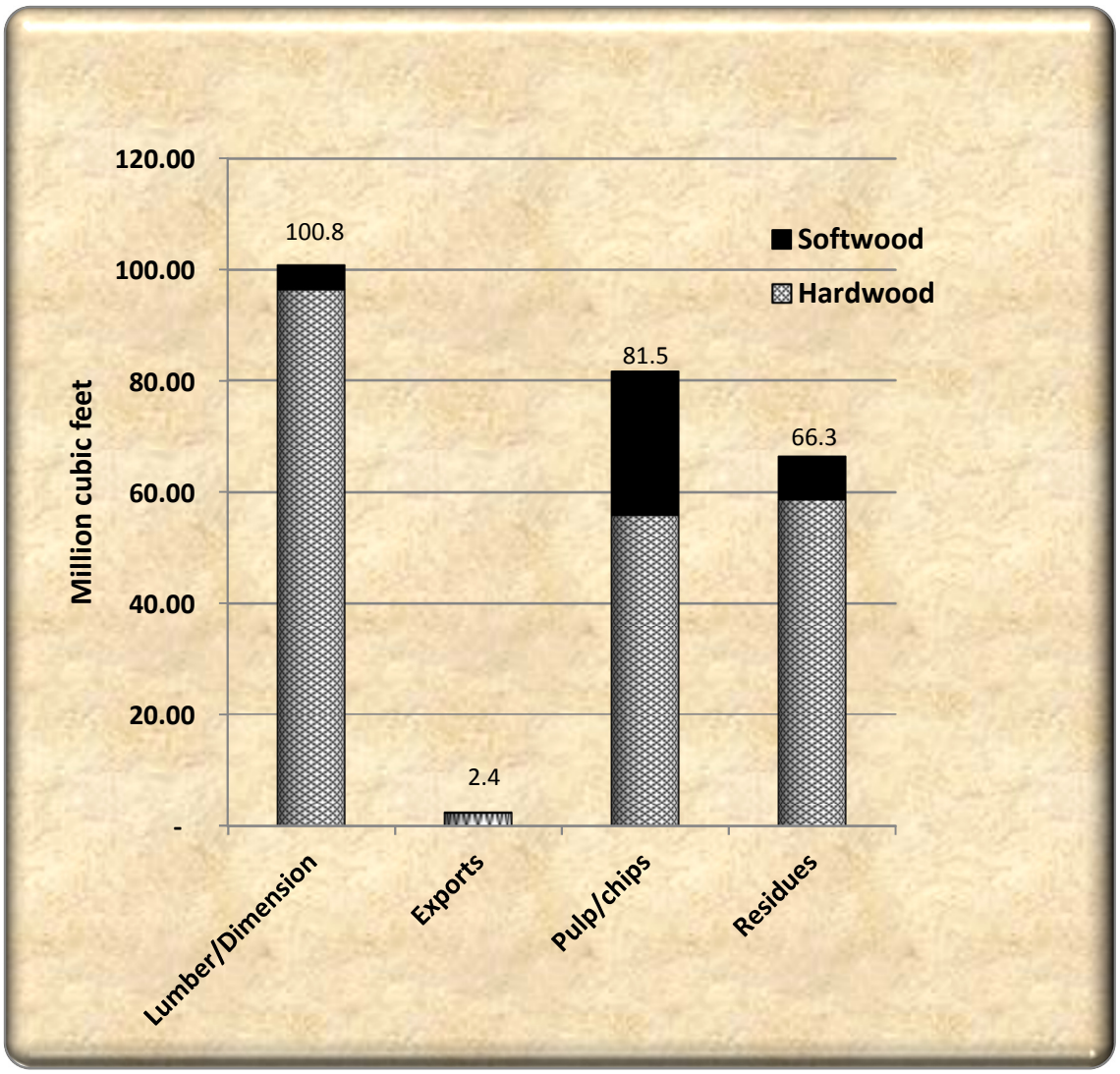


Figure 5 – Total volumes processed by product type in million cubic feet (MM ft^3); based on reported volumes from 253 mills (each category has <253 reporting mills; see Table 2).

- Total reported volume processed equals 184.7 million cubic feet (equivalent to 1.2 billion board feet). Based on knowledge of the industry and other published data, we estimate that non-respondents account for about 25% of the statewide volume. Therefore, these totals represent about 75% of the total volumes statewide.

- The total volume processed into Pulp/Chips does not include any material reported in the Residues Section of the survey. These were defined and reported as different materials. Residues are defined as by-products resulting from the initial processing of roundwood (e.g. slabs, sawdust, bark, log pieces/cut-offs). Residue volume was 66.3 million cubic feet overall (equivalent to 420 million board feet).

- Table 5 presents total volumes processed by species group and product type reported by 253 mills. The last column provides all totals converted to millions of cubic feet. **Table 5 does not include the product "Residues" depicted in Figure 5. Those totals are presented in the Residues section.**

- Total volume processed in 2012 for the Lumber/Dimension, Exported Logs, and Pulp/Chips product types totaled 185 million cubic feet for all species (Table 5).

- Lumber, cants, and pulp represent 89.3% of all volume processed in 2012. The volume of each product reported in Table 5 is represented as a percentage of the total 185 million cubic feet.

- The total processed volume reported for 2012 was 637.9 million board feet for Lumber/Dimension; 14.9 million board feet for Exported Logs; and 2.5 million green tons for Pulp/Chips (Table 5).

Table 5 –Total volume processed by species group and product type reported by 253 mills. See Table 2 for the distribution of mills reporting in each product type.

Total volume processed by species group and product type					
	Species Group			All Species Standardized to million cubic ft	Percentage of Total Volume
Product Type	Hardwood	Softwood	Total		
	-Million bd ft (International 1/4-inch rule)-				
Lumber/Dimension					
Lumber	403.5	21.7	425.2	67.2	36.4%
Veneer	13.0	<0.1	13.1	2.1	1.1%
Cants	145.6	5.8	151.4	23.9	13.0%
Other Lumber	47.7	0.6	48.3	7.6	4.1%
Total	**609.8**	**28.1**	**637.9**	**100.8**	**54.6%**
Exports					
Exported Logs	14.8	0.1	14.9	2.4	1.3%
Total	**14.8**	**0.1**	**14.9**	**2.4**	**1.3%**
	----------Million Green Tons----------				
Pulp/Chips					
Pulp	1.5	0.8	2.2	73.7	39.9%
Composite Chips	0.1	<0.1	0.1	2.5	1.3%
Energy Chips	0.1	<0.1	0.1	1.8	1.0%
Other Pulp/Chip	0.1	<0.1	0.1	3.6	1.9%
Total	**1.7**	**0.8**	**2.5**	**81.5**	**44.1%**
2012 Total Volume processed for Lumber/Dimension, Exported logs, Pulp/Chips= 184.7 million cubic ft					

- The total volumes processed for each of the four product types shown in Figure 5 are presented by region in Figure 6, with the following differences: Lumber/Dimension and Exported Logs are presented in million board feet and Pulp/Chips are presented in million green tons.

- The facilities in the north-central and south-central regions reported larger processed volumes for each product type, reflecting the larger numbers of mills located there (Figure 6). Furthermore, note the relatively large volumes reported in the southeast region for Exported Logs and Pulp/Chips product types. These volumes were 3 million board feet and 0.91 million green tons, respectively.

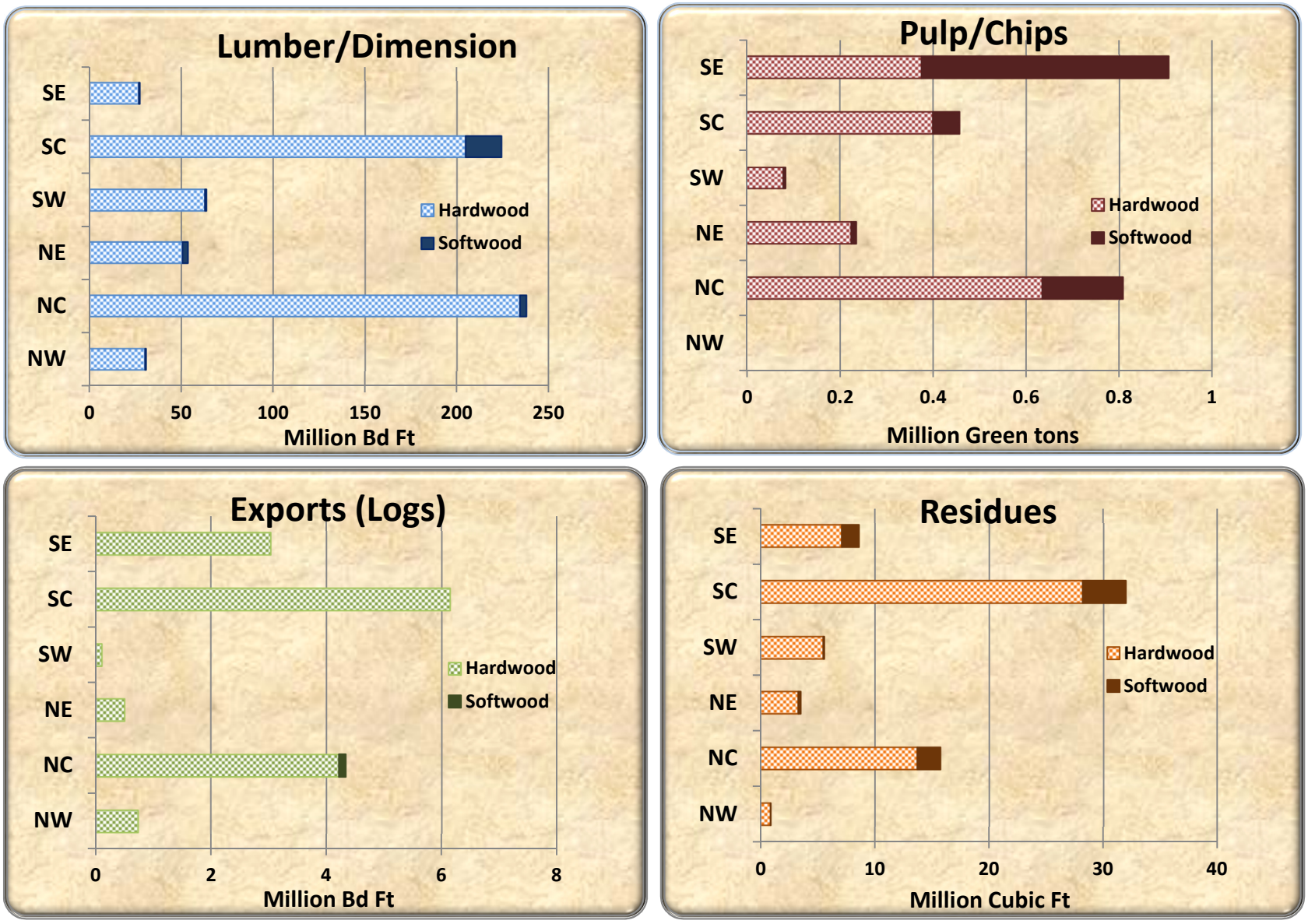


Figure 6 – Reported volumes by product type and region where processed (See Figure 1 for Pennsylvania region map).

Species and Origins

- During 2012, thirty-seven species groups were reported as processed by facilites/mills in Pennsylvania (see Table A15 for the complete list of species and volumes).
- The total volume processed statewide was 184.7 million cubic feet (n=253 mills); species information was reported for 182.5 million cubic feet of that (n=249 mills). These totals include volumes harvested from Pennsylvania's forests, as well as volumes imported from other states and countries.
- The 15 species groups with the highest reported volumes processed during 2012 were as follows (see Table A15 in the appendix for a complete list of species groups and volumes):

mixed hardwoods	20.1%
red oak	13.3%
misc. softwood	12.5%
other	8.7%
red/soft maple	8.2%
black cherry	6.9%
yellow poplar	6.9%
white oak	6.1%
sugar/hard maple	4.9%
ash	3.6%
hemlock	1.3%
chestnut/rock oak	1.0%
hickory	0.9%
black oak	0.9%
mixed maple	0.7%

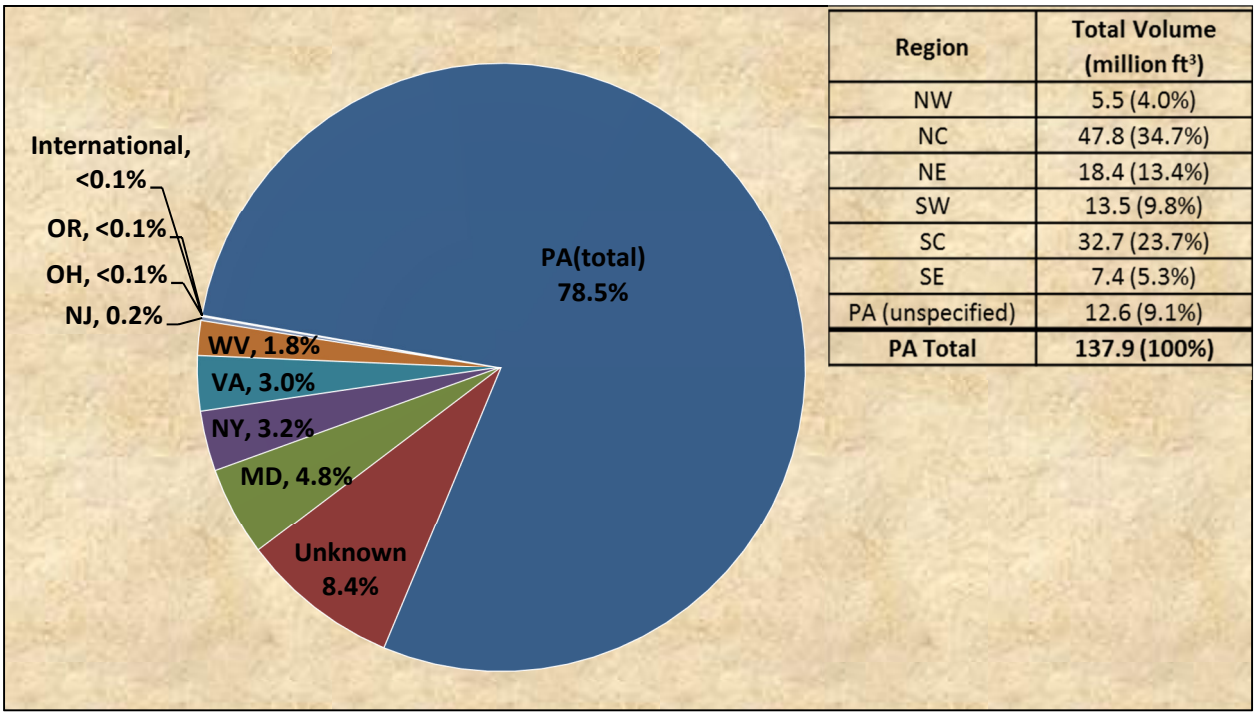
- Figure 7 illustrates the distribution of volume of wood harvested from all major sources as reported by 242 mills providing volumes by origin (where harvested). Approximately 79% of the volume reported by these facilities came from PA forests.

- Unknown sources accounted for 8.4% of total volume, with 4.8% of the volume from Maryland, 3.2% from New York, 3.0% from Virginia, and 1.8% from West Virginia. In addition, minimal volumes came from New Jersey, Ohio, Oregon and international sources.

- The harvested volumes reported for PA are shown by regions in the inset table (Figure 7). Approximately 58% of the volume harvested from PA came from forests in the north-central and south-central regions (see also Figure 8 & Table A14).

- During 2012, 224 mills reported processing 33 species groups that were harvested from Pennsylvania's forests. For these mills, the total volume was 137.9 million cubic feet (Figure 7; see Table A14 for a complete species list and volumes).

- Of the volume from Pennsylvania, 9.1% was harvested from "PA (unspecified)". In other words, this volume was known to be from PA forests, but the specific counties were not reported in the survey.



Region	Total Volume (million ft³)
NW	5.5 (4.0%)
NC	47.8 (34.7%)
NE	18.4 (13.4%)
SW	13.5 (9.8%)
SC	32.7 (23.7%)
SE	7.4 (5.3%)
PA (unspecified)	12.6 (9.1%)
PA Total	**137.9 (100%)**

Figure 7 – Distribution of harvest locations based on reported wood origins from the TPO survey (242 mills provided volumes by harvest location). Of the total volume, 78.5% was harvested from PA forests; the PA volume is shown by region in the inset table.

- The top species harvested from each region of PA (based on 206 mills that provided species volumes and volume by county of origin) are shown in Figure 8. The forests in north-central and south-central regions had the highest reported volumes harvested during 2012 (Figure 8). Refer also to Table A14 for a complete species list and a breakdown of volume by region.

- Note that a considerably larger volume (compared to other regions) of miscellaneous softwoods (7.8 million cubic feet) was harvested from forests in the northeast region (Figure 8). See Table A14 for additional information on the species breakdown for the six Pennsylvania regions.

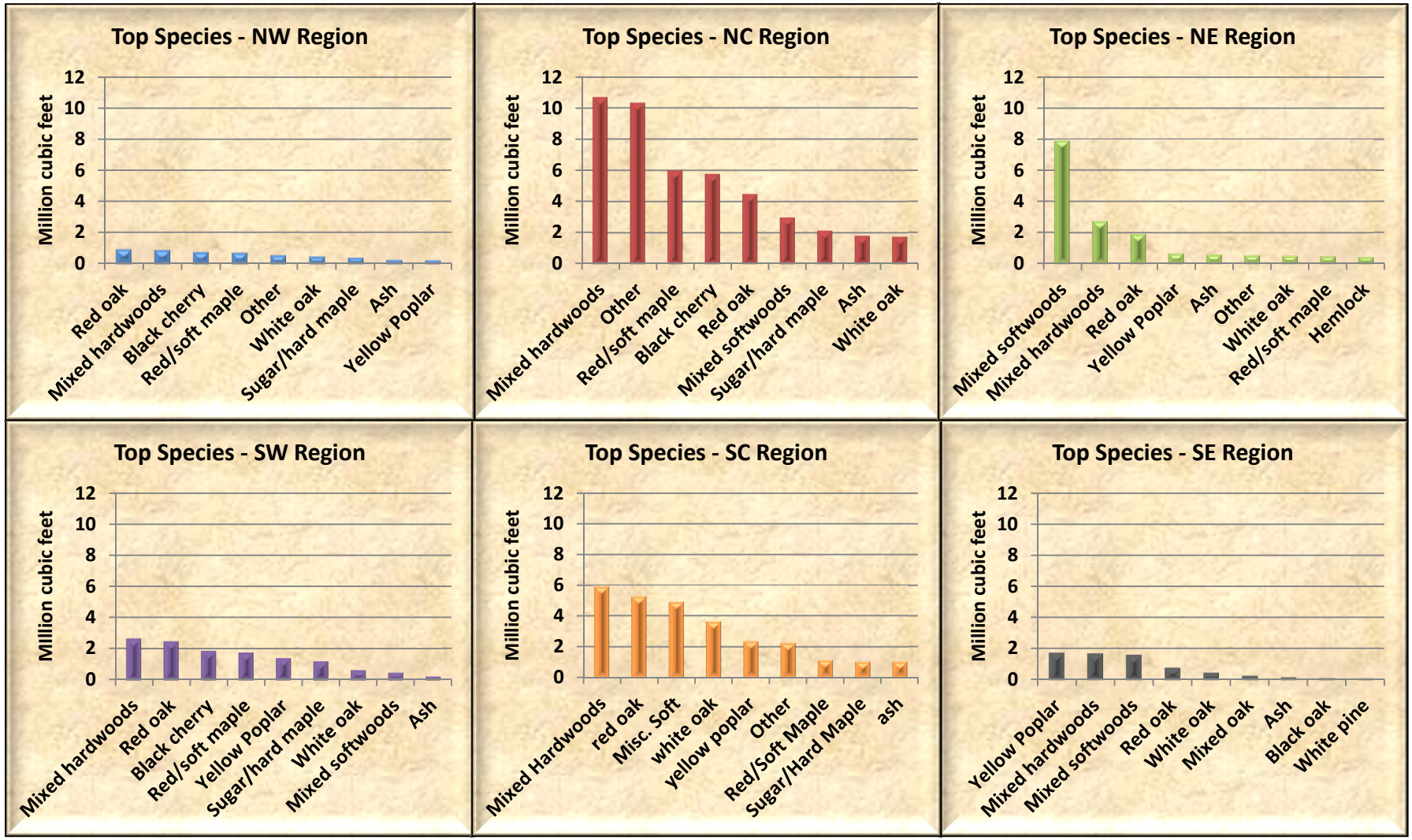


Figure 8 – Top species harvested from forests in each region, based on 206 mills providing species volumes and volume by county where harvested. All axes are scaled to the same maximum to illustrate the differences in total volumes from forests in each region.

Residues

- Residue types generated by 192 facilities/mills are shown in Table 6 as five categories: bark; coarse (chipped slabs, edgings); sawdust; shavings; and logs/short sections (not suitable for lumber).

- There were 2.0 million green tons (66.3 million cubic feet) of residues reported by 192 mills (Table 6).

Table 6 – Residue types generated by 192 reporting wood-processing facilities.

Residue Type	Softwood Volume (million cubic ft)	Hardwood Volume (million cubic ft)	Total Volume (million cubic ft)	Percentage
Bark	3.3	24.2	27.5	41.4
Coarse	1.9	19.0	20.9	31.5
Sawdust	1.3	14.2	15.5	23.3
Shavings	1.1	0.9	2.1	3.1
Logs/Short Sections	<0.1	0.4	0.4	0.7
Total	7.6	58.7	66.3	100

- The largest quantities of residue types (96%) are comprised of Bark, Coarse, and Sawdust (Figure 9).

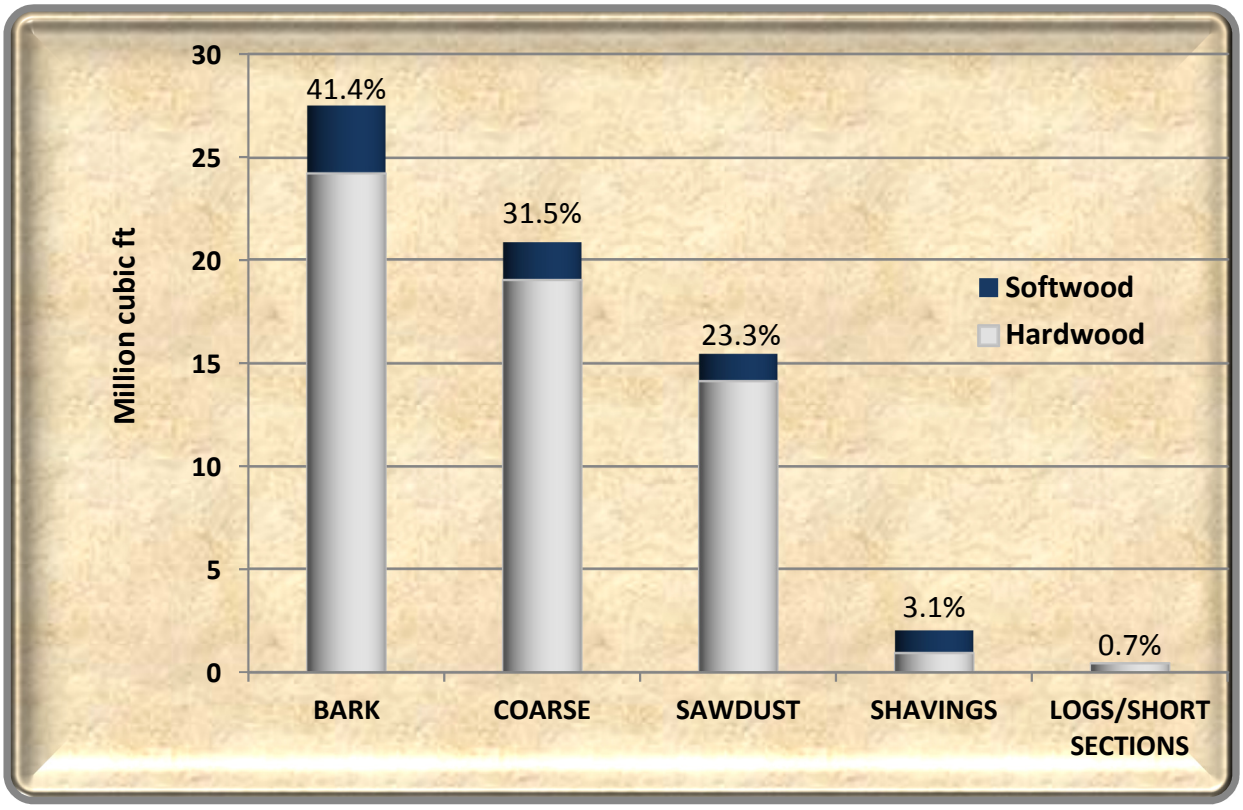


Figure 9 – Distribution of residue types generated by 192 reporting wood-processing facilities.

- Each facility/mill was asked to quantify how each category of residue was utilized. Table 7 lists 11 end-uses plus one non-use category (open-burned, landfill, etc.).
- The totals in Table 7 are different from those reported in Table 6 because fewer facilities (n=176) reported the end-uses of their manufactured residues than the number of facilities (n=192) that reported volumes of residues generated.

Table 7 – End use of manufacturing residues (in million cubic feet) based on 176 facilities/mills reporting residue volumes by use. ("--" designates no data)

	Residue Type						
End Use	**Bark**	**Coarse**	**Sawdust**	**Shavings**	**Log/Short Sections**	**All Types**	**% of Total**
	----------Million Cubic Feet----------						
Manufacture of Fiber/Composite Products	<0.1	7.8	0.4	0.2	--	8.4	16.1%
Small dimension and other sawn products	--	0.7	--	--	--	0.7	1.3%
Charcoal or chemical wood	--	0.5	--	--	--	0.5	1.0%
Industrial fuel at this plant (on-site)	2.7	0.3	0.5	--	--	3.5	6.5%
Industrial fuel at other plants	--	0.5	0.2	--	--	0.7	1.5%
Bio-energy pellets	--	1.9	2.2	<0.1	--	4.1	8.0%
Other Bio-energy products (biodiesel, etc.)	--	--	0.1	--	--	0.1	0.3%
Residential fuelwood	--	1.3	1.3	--	0.1	2.7	5.1%
Mulch/Soil additive (includes biochar)	16.5	3.1	0.6	--	0.2	20.4	39.3%
Animal bedding	<0.1	<0.1	8.1	0.7	--	8.8	17.1%
Other Misc.	0.7	0.7	0.5	--	--	1.9	3.7%
All Uses	19.9	16.9	13.9	0.9	0.2	51.8	>99.9%
Not Utilized (land fill, bark burned, etc.)	<0.1	<0.1	--	--	<0.1	<0.1	<0.1%
Total Produced	19.9	16.9	13.9	0.9	0.2	51.8	100%

- Thirty-nine percent of all residues reported are made into mulch/soil additives. The bulk of that (81%) comes from bark.

- Animal bedding makes up just over 17% of all residues (Table 7). Sawdust and shavings comprise 28.6% (14.8 million cubic feet) of residues reported by end use. Sixty percent of all reported Sawdust and Shavings (combined) was used as animal bedding.

- Eight percent of all residues become feedstocks at pellet mills. Coarse, sawdust and shavings residues are used at pellet mills.

- 6.5% percent of residues are used as industrial fuel at the facility producing it (Table 7). Seventy-nine percent of that industrial fuel is bark. Coarse and sawdust residues are used as industrial fuel at another facility, and this end use compromises 1.5% of all residues reported.

APPENDIX 1: SUPPLEMENTAL TABLES

Index of Tables

Table A1 – Total volume (lumber dimension, pulp/chips, exports) by PA county of origin (i.e. where harvested); 242 mills reported volumes by origin for some or all products.

"--" designates no data

Origin	Volume (million cubic ft)
Clearfield County	13.1
Unspecified PA County	12.6
McKean County	9.0
Schuylkill County	8.7
Huntingdon County	6.4
Centre County	5.7
Potter County	5.0
Warren County	3.6
Perry County	3.3
Somerset County	2.9
Clinton County	2.9
Bedford County	2.8
Venango County	2.8
Cambria County	2.6
Elk County	2.6
Forest County	2.5
Tioga County	2.5
Mifflin County	2.5
Juniata County	2.4
Jefferson County	2.2
Franklin County	2.2
Indiana County	2.0
Luzerne County	1.9
York County	1.9
Lycoming County	1.8
Fulton County	1.8
Clarion County	1.6
Chester County	1.6
Bradford County	1.4
Blair County	1.4
Fayette County	1.3
Snyder County	1.3
Sullivan County	1.3
Berks County	1.3
Westmoreland County	1.2
Lancaster County	1.2

Origin	Volume (million cubic ft)
Crawford County	1.1
Erie County	1.0
Northumberland County	1.0
Armstrong County	0.9
Adams County	0.9
Union County	0.9
Butler County	0.9
Lebanon County	0.8
Cameron County	0.8
Monroe County	0.8
Susquehanna County	0.7
Dauphin County	0.7
Columbia County	0.7
Lawrence County	0.6
Carbon County	0.6
Mercer County	0.6
Wayne County	0.5
Cumberland County	0.4
Lackawanna County	0.4
Greene County	0.4
Allegheny County	0.3
Montour County	0.3
Delaware County	0.2
Bucks County	0.2
Washington County	0.2
Beaver County	0.1
Montgomery County	0.1
Pike County	0.1
Wyoming County	0.1
Northampton County	0.1
Lehigh County	0.1
Philadelphia County	<0.1
Total	137.9

Table A2 – Total volume from other countries/ states of origin (i.e. where harvested); 242 mills reported volumes by origin for some or all products.
"--" designates no data

Origin	Volume (million cubic ft)
Unknown country/state	14.8
Maryland	8.0
Virginia	5.2
New York	3.3
West Virginia	1.8
Preston Co, WV	1.3
Cattaraugus Co, NY	1.2
Allegany Co, NY	0.5
Steuben Co, NY	0.5
New Jersey	0.4
Allegany Co, MD	0.2
Fredrick Co, MD	0.2
Berkley Co, WV	0.1
Canada	0.1
Ohio	<0.1
Europe	<0.1
Garrett Co, MD	<0.1
Oregon	<0.1
Australia	<0.1
South Africa	<0.1
Tioga Co, NY	<0.1
Broome Co, NY	<0.1
Schuyler Co, NY	<0.1
Orange Co, NJ	<0.1
Sussex Co, NJ	<0.1
Total	37.6

Table A3 – Volume of lumber/dimension from PA counties of origin (i.e. where harvested); 223 mills reported volumes by origin.

"--" designates no data

Origins: Lumber/Dimension	Volume (million bd ft)	Volume (million cubic ft)
Unspecified PA County	65.3	10.3
Huntingdon County	18.3	2.9
Potter County	18.0	2.8
Warren County	16.8	2.6
McKean County	15.4	2.4
Venango County	14.0	2.2
Bedford County	13.9	2.2
Juniata County	13.6	2.2
Perry County	13.0	2.1
Clearfield County	12.8	2.0
Indiana County	12.0	1.9
Centre County	11.8	1.9
Elk County	11.3	1.8
Mifflin County	10.8	1.7
Somerset County	10.8	1.7
Cambria County	10.1	1.6
Forest County	9.7	1.5
York County	9.4	1.5
Franklin County	9.2	1.5
Fulton County	9.1	1.4
Tioga County	9.0	1.4
Clinton County	7.8	1.2
Jefferson County	7.7	1.2
Clarion County	7.4	1.2
Fayette County	7.2	1.1
Westmoreland County	6.4	1.0
Lycoming County	6.3	1.0
Snyder County	6.1	1.0
Blair County	6.0	1.0
Lancaster County	5.7	0.9
Berks County	5.5	0.9
Crawford County	5.2	0.8
Armstrong County	5.2	0.8
Bradford County	5.1	0.8
Butler County	4.9	0.8
Northumberland	4.2	0.7

Origins: Lumber/Dimension	Volume (million bd ft)	Volume (million cubic ft)
County		
Sullivan County	3.9	0.6
Union County	3.8	0.6
Lawrence County	3.7	0.6
Adams County	3.7	0.6
Luzerne County	3.6	0.6
Schuylkill County	3.6	0.6
Susquehanna County	3.6	0.6
Dauphin County	3.4	0.5
Chester County	3.2	0.5
Columbia County	3.1	0.5
Erie County	2.7	0.4
Cameron County	2.6	0.4
Mercer County	2.6	0.4
Greene County	2.5	0.4
Allegheny County	2.0	0.3
Montour County	1.9	0.3
Cumberland County	1.3	0.2
Bucks County	1.0	0.2
Lackawanna County	0.9	0.1
Lebanon County	0.6	0.1
Wayne County	0.6	0.1
Monroe County	0.5	0.1
Pike County	0.5	0.1
Wyoming County	0.5	0.1
Montgomery County	0.3	<0.1
Carbon County	0.2	<0.1
Lehigh County	0.1	<0.1
Delaware County	<0.1	<0.1
Philadelphia County	<0.1	<0.1
Beaver County	--	--
Northampton County	--	--
Washington County	--	--
Total	461.5	72.9

Table A4 – Volume of lumber/dimension from other countries/states of origin (i.e. where harvested); 223 mills reported volumes by origin.
"--" designates no data

Origins: Lumber/Dimension	Volume (million bd ft)	Volume (million cubic ft)
Unknown country/ state	56.6	8.9
New York	26.0	4.1
Maryland	19.4	3.1
West Virginia	14.1	2.2
Virginia	5.0	0.8
New Jersey	1.6	0.2
Oregon	<0.1	<0.1
Australia	<0.1	<0.1
South Africa	<0.1	<0.1
Total	122.7	19.4

Table A5 – Volume of pulp/chips from PA counties of origin (i.e. where harvested); 48 mills reported volumes by origin.

"--" designates no data

Origins: Pulp/Chips	Volume (million cubic ft)
Clearfield County	11.1
Schuylkill County	8.1
McKean County	6.5
Centre County	3.9
Huntingdon County	3.5
Potter County	2.0
Unspecified PA County	2.0
Clinton County	1.6
Luzerne County	1.3
Perry County	1.2
Somerset County	1.2
Chester County	1.1
Tioga County	1.1
Cambria County	1.0
Jefferson County	1.0
Forest County	0.9
Warren County	0.9
Lycoming County	0.8
Franklin County	0.8
Mifflin County	0.7
Lebanon County	0.7
Elk County	0.7
Monroe County	0.7
Sullivan County	0.7
Venango County	0.6
Bradford County	0.6
Erie County	0.6
Bedford County	0.5
Carbon County	0.5
Clarion County	0.5
Wayne County	0.4
Berks County	0.4
Cameron County	0.4
Blair County	0.4
York County	0.4
Adams County	0.3
Snyder County	0.3
Fulton County	0.3
Northumberland County	0.3
Lackawanna County	0.3
Union County	0.3
Lancaster County	0.3
Juniata County	0.2
Crawford County	0.2
Cumberland County	0.2
Columbia County	0.2
Delaware County	0.2
Westmoreland County	0.2
Dauphin County	0.2
Fayette County	0.2
Susquehanna County	0.2
Washington County	0.2
Mercer County	0.2
Beaver County	0.1
Armstrong County	0.1
Butler County	0.1
Indiana County	0.1
Montgomery County	0.1
Northampton County	0.1
Lehigh County	<0.1
Lawrence County	<0.1
Greene County	<0.1
Allegheny County	<0.1
Bucks County	<0.1
Montour County	<0.1
Wyoming County	<0.1
Philadelphia County	--
Pike County	--
Total	63.5

Table A6 – Volume of pulp/chips from other countries/ states of origin (i.e. where harvested); 48 mills reported volumes by origin.
"--" designates no data

Origins: Pulp/Chips	Volume (million cubic ft)
Maryland	5.2
Unknown country/ state	5.1
Virginia	4.3
New York	1.4
West Virginia	1.0
New Jersey	0.1
Ohio	<0.1
Total	17.1

Table A7 – Volume of log exports from PA counties of origin (i.e. where harvested); 30 mills reported volumes by origin.

"--" designates no data

Origins: Log Exports	Volume (million bd ft)	Volume (million cubic ft)
Unspecified PA County	1.977	0.312
Potter County	1.226	0.194
McKean County	0.880	0.139
Bedford County	0.662	0.105
Elk County	0.386	0.061
Forest County	0.359	0.057
Huntingdon County	0.328	0.052
Clearfield County	0.304	0.048
Warren County	0.237	0.038
Fulton County	0.200	0.032
Somerset County	0.186	0.029
Blair County	0.160	0.025
Mifflin County	0.158	0.025
Tioga County	0.104	0.016
Venango County	0.101	0.016
Crawford County	0.099	0.016
Centre County	0.072	0.011
Clarion County	0.046	0.007
Bradford County	0.043	0.007
Juniata County	0.041	0.007
Erie County	0.038	0.006
Lycoming County	0.029	0.005
Perry County	0.026	0.004
Cameron County	0.025	0.004
Butler County	0.024	0.004
Jefferson County	0.020	0.003
Clinton County	0.019	0.003
Cumberland County	0.014	0.002
Dauphin County	0.014	0.002
Lancaster County	0.014	0.002
York County	0.014	0.002
Snyder County	0.012	0.002
Cambria County	0.010	0.002
Sullivan County	0.008	0.001
Armstrong County	0.006	0.001
Mercer County	0.006	0.001

Origins: Log Exports	Volume (million bd ft)	Volume (million cubic ft)
Montour County	0.005	0.001
Allegheny County	<0.001	<0.001
Adams County	--	--
Beaver County	--	--
Berks County	--	--
Bucks County	--	--
Carbon County	--	--
Chester County	--	--
Columbia County	--	--
Delaware County	--	--
Fayette County	--	--
Franklin County	--	--
Greene County	--	--
Indiana County	--	--
Lackawanna County	--	--
Lawrence County	--	--
Lebanon County	--	--
Lehigh County	--	--
Luzerne County	--	--
Monroe County	--	--
Montgomery County	--	--
Northampton County	--	--
Northumberland County	--	--
Philadelphia County	--	--
Pike County	--	--
Schuylkill County	--	--
Susquehanna County	--	--
Union County	--	--
Washington County	--	--
Wayne County	--	--
Westmoreland County	--	--
Wyoming County	--	--
Total	7.9	1.2

Table A8 – Volume of log exports from outside PA (i.e. harvested outside of PA but exported by a PA company); 30 mills reported volumes by origin.

"--" designates no data

Origins: Log Exports	Volume (million bd ft)	Volume (million cubic ft)
Unknown country/ state	4.472	0.707
Virginia	0.718	0.113
Maryland	0.646	0.102
Canada	0.324	0.051
West Virginia	0.288	0.046
New York	0.286	0.045
Ohio	0.186	0.029
Europe	0.083	0.013
New Jersey	0.010	0.002
Total	7.0	1.1

Table A9 – Statewide volume by species processed (lumber/dimension, pulp/chips, exports); 249 mills reported by species; descending volume. "--" designates no data

Species	Volume (million cubic ft)	Percentage
Mixed hardwoods	36.7	20.1%
Red oak	24.2	13.3%
Misc. softwoods	22.9	12.5%
Other misc. species	15.8	8.7%
Red/soft maple	15.0	8.2%
Black cherry	12.6	6.9%
Yellow (tulip) poplar	12.5	6.9%
White oak	11.1	6.1%
Sugar/hard maple	9.0	4.9%
Ash	6.6	3.6%
Hemlock	2.4	1.3%
Chestnut/rock oak	1.8	1.0%
Hickory	1.7	0.9%
Black oak	1.7	0.9%
Mixed maple	1.2	0.7%
Mixed oak	1.2	0.7%
White pine	1.1	0.6%
Sweet birch	0.9	0.5%
Beech	0.9	0.5%
Black walnut	0.8	0.5%
Aspen	0.5	0.3%
Yellow birch	0.5	0.3%
Basswood	0.4	0.2%
Other pine	0.4	0.2%
Pallet	0.1	0.1%
Scarlet oak	0.1	<0.1%
Black gum	0.1	<0.1%
Sycamore	0.1	<0.1%
Larch	0.1	<0.1%
Mixed pine	<0.1	<0.1%
Elm	<0.1	<0.1%
Red pine	<0.1	<0.1%
Spruce	<0.1	<0.1%
Jack pine	<0.1	<0.1%
Southern yellow pine	<0.1	<0.1%
Sassafras	<0.1	<0.1%
Other hardwood imports	<0.1	<0.1%
Total	182.5	100.0%

Table A10 – Statewide total volume processed (lumber/dimension, pulp/chips, exports) by species; 249 mills reported volume by species; alphabetical by species. "--" designates no data

Species	Volume (million cubic ft)	Percentage
Ash	6.6	3.6%
Aspen	0.5	0.3%
Basswood	0.4	0.2%
Beech	0.9	0.5%
Black cherry	12.6	6.9%
Black gum	0.1	<0.1%
Black oak	1.7	0.9%
Black walnut	0.8	0.5%
Chestnut/rock oak	1.8	1.0%
Elm	<0.1	<0.1%
Hemlock	2.4	1.3%
Hickory	1.7	0.9%
Jack pine	<0.1	<0.1%
Larch	0.1	<0.1%
Misc. softwoods	22.9	12.5%
Mixed hardwoods	36.7	20.1%
Mixed maple	1.2	0.7%
Mixed oak	1.2	0.7%
Mixed pine	<0.1	<0.1%
Other misc. species	15.8	8.7%
Other hardwood imports	<0.1	<0.1%
Other pine	0.4	0.2%
Pallet	0.1	0.1%
Red oak	24.2	13.3%
Red pine	<0.1	<0.1%
Red/soft maple	15.0	8.2%
Sassafras	<0.1	<0.1%
Scarlet oak	0.1	<0.1%
Southern yellow pine	<0.1	<0.1%
Spruce	<0.1	<0.1%
Sugar/hard maple	9.0	4.9%
Sweet birch	0.9	0.5%
Sycamore	0.1	<0.1%
White oak	11.1	6.1%
White pine	1.1	0.6%
Yellow birch	0.5	0.3%
Yellow (tulip) poplar	12.5	6.9%
Total	182.5	100.0%

Table A11 – Lumber/dimension volume processed by species; 224 mills reported volumes by species.
"--" designates no data

Species	Volume (million bd ft)	Percentage
red oak	138.3	22.1%
red/soft maple	79.9	12.8%
yellow poplar	73.4	11.7%
black cherry	69.9	11.2%
white oak	67.5	10.8%
sugar/hard maple	54.0	8.6%
ash	38.6	6.2%
mixed hardwoods	20.9	3.3%
hemlock	14.1	2.3%
chestnut/rock oak	10.9	1.7%
black oak	10.6	1.7%
hickory	9.9	1.6%
white pine	6.4	1.0%
sweet birch	5.7	0.9%
black walnut	4.4	0.7%
other misc. species	4.1	0.7%
beech	3.2	0.5%
mixed oak	2.7	0.4%
basswood	2.4	0.4%
misc. softwood	1.5	0.2%
aspen	1.3	0.2%
other pine	1.0	0.2%
yellow birch	0.8	0.1%
pallet hardwoods	0.6	0.1%
scarlet oak	0.6	0.1%
black gum	0.5	0.1%
sycamore	0.4	0.1%
larch	0.3	<0.1%
elm	0.3	<0.1%
red pine	0.2	<0.1%
spruce	0.1	<0.1%
mixed pine	0.1	<0.1%
jack pine	0.1	<0.1%
southern yellow pine	0.1	<0.1%
sassafras	<0.1	<0.1%
other hardwood imports	<0.1	<0.1%
Total	624.9	100.0%

Table A12 – Pulp/chip volume processed by species; 48 mills reported volume by species.

"--" designates no data

Species	Volume (million green tons)	Percentage
mixed hardwoods	1.015	41.0%
misc. softwoods	0.688	27.8%
other misc. species	0.461	18.6%
red/soft maple	0.071	2.9%
red oak	0.048	1.9%
mixed maple	0.038	1.5%
black cherry	0.028	1.1%
mixed oak	0.023	0.9%
yellow poplar	0.019	0.8%
ash	0.015	0.6%
sugar/hard maple	0.012	0.5%
beech	0.011	0.4%
yellow birch	0.010	0.4%
aspen	0.010	0.4%
white oak	0.008	0.3%
other pine	0.006	0.2%
hemlock	0.004	0.1%
white pine	0.003	0.1%
hickory	0.002	0.1%
chestnut/rock oak	0.002	<0.1%
mixed pine	0.001	<0.1%
sweet birch	0.001	<0.1%
black oak	0.001	<0.1%
spruce	<0.001	<0.1%
jack pine	<0.001	<0.1%
Total	2.5	100.0%

Table A13 – Log Export volume processed by species; 30 mills reported volume by species.

"--" designates no data

Species	Volume (million bd ft)	Percentage
red oak	5.0	33.3%
black cherry	4.0	26.9%
yellow poplar	1.9	12.6%
white oak	1.4	9.2%
black walnut	0.9	6.4%
sugar/hard maple	0.5	3.5%
hickory	0.3	2.2%
ash	0.2	1.4%
hemlock	0.2	1.1%
mixed hardwoods	0.2	1.0%
yellow birch	0.1	0.7%
red/soft maple	0.1	0.6%
sweet birch	<0.1	0.4%
white pine	<0.1	0.3%
beech	<0.1	0.3%
black oak	<0.1	0.1%
Total	14.9	100.0%

Table A14 –Volume harvested from PA forests by species group and region where harvested; 224 mills reported volumes for both species and PA county of origin.

"--" designates no data

			Regional Volumes (million cubic feet)						
Species Group	**Volume (million cubic ft)**	**Percent -age**	**NW**	**NC**	**NE**	**SW**	**SC**	**SE**	**PA (unspecified region)**
Ash	5.1	3.7%	0.3	1.8	0.6	0.2	1.0	0.2	0.9
Aspen	0.2	0.2%	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1
Basswood	0.3	0.2%	<0.1	0.1	<0.1	<0.1	0.2	<0.1	<0.1
Beech	0.6	0.4%	0.1	0.2	0.1	0.1	0.1	<0.1	<0.1
Black cherry	11.0	8.0%	0.7	5.8	0.4	1.9	0.5	<0.1	1.8
Black gum	0.1	0.1%	--	<0.1	0.1	--	<0.1	--	--
Black oak	1.4	1.0%	0.1	0.2	0.1	0.1	0.7	0.1	<0.1
Black walnut	0.5	0.4%	--	<0.1	<0.1	<0.1	0.4	<0.1	0.1
Chestnut/rock oak	1.5	1.1%	--	<0.1	0.4	<0.1	1.0	0.1	<0.1
Elm	<0.1	<0.1%	<0.1	<0.1	<0.1	--	<0.1	--	<0.1
Hemlock	1.8	1.3%	<0.1	0.1	0.5	0.1	0.9	<0.1	0.3
Hickory	1.3	1.0%	0.1	0.1	0.2	0.2	0.5	0.1	0.1
Jack pine	<0.1	<0.1%	--	<0.1	--	--	<0.1	--	--
Larch	<0.1	<0.1%	--	<0.1	<0.1	--	--	--	--
Misc. softwoods	18.2	13.2%	0.2	3.0	7.9	0.5	4.9	1.6	0.2
Mixed hardwoods	27.3	19.8%	0.8	10.7	2.7	2.6	5.9	1.6	2.9
Mixed oak	0.3	0.2%	--	--	--	--	--	0.3	--
Mixed pine	<0.1	<0.1%	--	--	<0.1	<0.1	--	--	--
Other	13.9	10.1%	0.5	10.3	0.6	0.2	2.3	<0.1	--
Other pine	0.2	0.2%	--	<0.1	0.2	<0.1	<0.1	<0.1	--
Pallet	0.1	0.1%	--	--	--	--	--	0.1	--
Red oak	17.5	12.7%	0.9	4.5	1.9	2.4	5.2	0.8	1.8
Red pine	0.0	0.0%	--	<0.1	<0.1	<0.1	--	--	--
Red/soft maple	12.7	9.2%	0.7	6.0	0.5	1.8	1.2	0.1	2.6
Scarlet oak	0.1	<0.1%	--	<0.1	<0.1	--	<0.1	<0.1	<0.1
Spruce	<0.1	<0.1%	--	<0.1	<0.1	--	--	<0.1	--
Sugar/hard maple	6.1	4.5%	0.4	2.1	0.3	1.2	1.1	<0.1	1.1
Sweet birch	0.8	0.6%	<0.1	0.1	0.2	0.1	0.3	<0.1	0.1
Sycamore	<0.1	<0.1%	--	--	<0.1	--	<0.1	<0.1	--
White oak	7.9	5.7%	0.4	1.8	0.5	0.6	3.6	0.5	0.4
White pine	0.9	0.7%	--	0.1	0.2	<0.1	0.6	0.1	--
Yellow birch	0.4	0.3%	<0.1	0.3	<0.1	<0.1	<0.1	<0.1	<0.1
Yellow Poplar	7.4	5.3%	0.2	0.5	0.7	1.4	2.4	1.7	0.5
Total	137.9	100%	5.5	47.8	18.4	13.5	32.7	7.4	12.6
Percentage of Total	100.0%	100.0%	4.0%	34.7%	13.4%	9.8%	23.7%	5.3%	9.1%

Table A15 – Volume by species group & region of mill location (i.e. where processed); 249 mills that reported volumes for species group; may include volume harvested outside of PA.
"--"designates no data

			Regional Volumes (million cubic feet)					
Species Group	Volume (million cubic ft)	Percentage	NW	NC	NE	SW	SC	SE
Ash	6.6	3.6%	0.3	3.0	1.2	0.3	1.7	0.1
Aspen	0.5	0.3%	0.1	<0.1	0.3	<0.1	0.1	<0.1
Basswood	0.4	0.2%	<0.1	0.1	<0.1	<0.1	0.2	--
Beech	0.9	0.5%	0.1	0.3	0.3	<0.1	0.1	<0.1
Black cherry	12.6	6.9%	1.4	8.2	0.5	1.5	0.9	<0.1
black gum	0.1	<0.1%	--	--	--	--	0.1	--
Black oak	1.7	0.9%	<0.1	0.5	0.1	<0.1	1.0	0.1
Black walnut	0.8	0.5%	<0.1	<0.1	<0.1	<0.1	0.7	0.1
Chestnut/rock oak	1.8	1.0%	--	0.1	0.1	<0.1	1.5	<0.1
Elm	<0.1	<0.1%	<0.1	<0.1	<0.1	<0.1	<0.1	--
Hemlock	2.4	1.3%	<0.1	0.6	0.3	<0.1	1.4	<0.1
Hickory	1.7	0.9%	0.1	0.3	0.1	0.2	0.9	0.1
Jack pine	<0.1	<0.1%	--	--	--	--	<0.1	--
Larch	0.1	<0.1%	--	<0.1	<0.1	<0.1	--	--
Misc. softwoods	22.9	12.5%	--	4.9	--	0.2	0.2	17.6
Mixed hardwoods	36.7	20.1%	0.1	18.0	3.5	1.0	1.7	12.4
Mixed maple	1.2	0.7%	--	--	1.2	--	--	--
Mixed oak	1.2	0.7%	--	--	0.8	--	0.1	0.3
Mixed pine	<0.1	<0.1%	--	--	<0.1	<0.1	<0.1	--
Other	15.8	8.7%	--	0.1	0.4	1.7	13.5	<0.1
Other Import Hdwds	<0.1	<0.1%	--	--	--	--	--	<0.1
Other pine	0.4	0.2%	--	<0.1	0.2	<0.1	0.1	<0.1
Pallet	0.1	0.1%	--	--	--	--	--	0.1
Red oak	24.2	13.3%	0.9	8.6	1.9	2.3	9.4	1.1
Red pine	<0.1	<0.1%	--	<0.1	--	--	--	--
Red/soft maple	15.0	8.2%	0.5	10.7	0.5	1.4	1.8	<0.1
Sassafras	<0.1	<0.1%	--	--	--	<0.1	--	--
Scarlet oak	0.1	<0.1%	--	<0.1	<0.1	--	<0.1	<0.1
Southern yellow pine	<0.1	<0.1%	--	--	--	--	<0.1	--
Spruce	<0.1	<0.1%	<0.1	--	<0.1	<0.1	--	<0.1
Sugar/hard maple	9.0	4.9%	0.7	5.4	0.5	1.0	1.5	--
Sweet birch	0.9	0.5%	<0.1	0.3	<0.1	<0.1	0.6	<0.1
Sycamore	0.1	<0.1%	--	--	<0.1	<0.1	<0.1	<0.1
White oak	11.1	6.1%	0.5	2.4	0.3	1.1	6.3	0.5
White pine	1.1	0.6%	--	0.1	0.3	<0.1	0.8	<0.1
Yellow birch	0.5	0.3%	<0.1	0.4	<0.1	<0.1	<0.1	<0.1
Yellow (tulip) poplar	12.5	6.9%	0.1	1.7	0.7	2.0	6.1	2.0
Total	182.5	100.0%	5.0	65.6	13.5	12.9	50.8	34.6
Percentage of Total	100.0%	100.0%	2.7%	36.0%	7.4%	7.1%	27.8%	19.0%

APPENDIX 2: SURVEY FORM

PA Timber Product Output Survey - 2012

Facility Information Rev. 12/2012 - PA Bureau of Forestry, (570) 326-6020 12000

Facility Name _____

Mailing Address _____

City _____ **State** _____ **Zip** _____

Phone _____ **Fax** _____

e-mail _____ **Web Page** _____

Physical Address _____

(if different from mailing address)

City _____ **State** _____ **Zip** _____

County _____

→→ Check this box to **OMIT** the information above from a "Regional/Statewide/Local" Directory ☐

Company or Headquarters Name _____

(if different from facility name)

Mailing Address _____

City _____ **State** _____ **Zip** _____

Phone _____ **Fax** _____

e-mail _____ **Web Page** _____

Year Established _____ **No. of Employees** All _____ Production _____ Administration _____

Type *(check all that apply)*

- ☐ Sawmill
- ☐ Veneer mill
- ☐ House/cabin log mill
- ☐ Exporter
- ☐ Whole tree chipper
- ☐ Composite panel/Engineered wood product
- ☐ Industrial fuelwood/Biomass energy plant
- ☐ Post, pole, piling mill
- ☐ Broker
- ☐ Miscellaneous/other mill (specify) _____

Maximum Output Capacity Annually (specify units) _____

→→ Check this box if you wish to receive a copy of the report resulting from this study ☐

→→ Check this box if you are willing to accept **urban** shade trees/logs/wood ☐

→→ Check this box if you currently accept **urban** shade trees/logs/wood ☐

Section 1.1- Raw Material (Roundwood/Logs) Processed into Lumber/Dimension at this facility, 2012			Survey # 12000
	Log Volume	**Unit of Measure from list below**	**Percentage Processed for:**
Softwoods			_____% Lumber _____% Cants _____% Veneer _____% Other
Hardwoods			_____% Lumber _____% Cants _____% Veneer _____% Other
Total Log Volume			

Units of Measure

1 - MBF Doyle	6 - BF Scribner	11 - Standard cord	99 - Other (specify):
2 - BF Doyle	7 - MBF International ¼-inch rule	12 - Pieces	
3 - MBF Scribner Decimal C	8 - BF International ¼-inch rule	13 - Thousand Pieces	
4 - BF Scribner Decimal C	9 - MBF Lumber Tally	14 - Green Tons	
5 - MBF Scribner	10 - BF Lumber Tally	15 - Thousand Cubic Feet	

1.2 - Enter the PERCENTAGE of Total Log Volume Processed into Lumber/Dimension at this facility for each Species Group by County, State or Country of origin.

Species Group Code ↓	% of Total Log Volume	← Enter County, State or Country codes →										Total
												100%
												100%
												100%
												100%
												100%
												100%
												100%
												100%
												100%
												100%
												100%
												100%
	100%											

Species Group Codes:

ASH - ash	BO - black oak	JP - jack pine	RP - red pine	SYC - sycamore	Other (specify):
ASP - aspen	BW - black walnut	LAR - larch	SB - sweet birch	WB - white (paper) birch	
BASS - basswood	CO - chestnut/rock oak	OP - other pine	SG - sweet gum	WO - white oak	
BC - black cherry	ELM - elm	PP - pitch pine	SM - sugar/hard maple	WP - white pine	
BCH - beech	HEM - hemlock	RM - red/soft maple	SO - scarlet oak	YB - yellow birch	
BG - black gum	HICK - hickory	RO - red oak	SPR - spruce	YP - yellow poplar	

Section 2.1- Raw Material (Roundwood/Logs) Processed at this facility into Pulp and/or Chips, 2012

	Roundwood Volume	Unit of Measure from list below	Percentage Processed for:
Softwoods			_____% Pulp _____% Composite Chips _____% Energy Chips _____% Other
Hardwoods			_____% Pulp _____% Composite Chips _____% Energy Chips _____% Other
Total Roundwood Volume			

Units of Measure

1 - MBF Doyle	6 - BF Scribner	11 - Standard cord	99 - Other (specify):
2 - BF Doyle	7 - MBF International ¼-inch rule	12 - Pieces	
3 - MBF Scribner Decimal C	8 - BF International ¼-inch rule	13 - Thousand Pieces	
4 - BF Scribner Decimal C	9 - MBF Lumber Tally	14 - Green Tons	
5 - MBF Scribner	10 - BF Lumber Tally	15 - Thousand Cubic Feet	

2.2 - Enter the PERCENTAGE of Raw Material (Roundwood/Logs) Processed at this facility into Pulp and/or Chips for each Species Group by County, State or Country of origin.

Species Group Code ↓	% of Total Roundwood Volume	← Enter County, State or Country codes →										Total
												100%
												100%
												100%
												100%
												100%
												100%
												100%
												100%
												100%
												100%
												100%
												100%
	100%											

Species Group Codes:

ASH - ash	BO - black oak	JP - jack pine	RP - red pine	SYC - sycamore	Other (specify):
ASP - aspen	BW - black walnut	LAR - larch	SB - sweet birch	WB - white (paper) birch	
BASS - basswood	CO - chestnut/rock oak	OP - other pine	SG - sweet gum	WO - white oak	
BC - black cherry	ELM - elm	PP - pitch pine	SM - sugar/hard maple	WP - white pine	
BCH - beech	HEM - hemlock	RM - red/soft maple	SO - scarlet oak	YB - yellow birch	
BG - black gum	HICK - hickory	RO - red oak	SPR - spruce	YP - yellow poplar	

Section 3.1- Raw Material (Roundwood/Logs) Exported by this facility out of the U.S., 2012

	Roundwood/Log Volume	Unit of Measure from list below	Percentage Processed for:
Softwoods			_____% Logs _____%Composite Chips _____% Pulpwood _____%Energy Chips
Hardwoods			_____% Logs _____%Composite Chips _____% Pulpwood _____%Energy Chips
Total Roundwood/Log Volume			

Units of Measure

1 - MBF Doyle	6 - BF Scribner	11 - Standard cord	99 - Other (specify):
2 - BF Doyle	7 - MBF International ¼-inch rule	12 - Pieces	
3 - MBF Scribner Decimal C	8 - BF International ¼-inch rule	13 - Thousand Pieces	
4 - BF Scribner Decimal C	9 - MBF Lumber Tally	14 - Green Tons	
5 - MBF Scribner	10 - BF Lumber Tally	15 - Thousand Cubic Feet	

3.2 - Enter the PERCENTAGE of Raw Material (Roundwood/Logs) Exported by this facility out of the U.S. for each Species Group by County, State or Country of origin.

Species Group Code ↓	% of Total Roundwood /Log Vol.	← Enter County, State or Country codes →										Total
												100%
												100%
												100%
												100%
												100%
												100%
												100%
												100%
												100%
												100%
												100%
												100%
	100%											

Species Group Codes:

ASH - ash	BO - black oak	JP - jack pine	RP - red pine	SYC - sycamore	Other (specify):
ASP - aspen	BW - black walnut	LAR - larch	SB - sweet birch	WB - white (paper) birch	
BASS - basswood	CO - chestnut/rock oak	OP - other pine	SG - sweet gum	WO - white oak	
BC - black cherry	ELM - elm	PP - pitch pine	SM - sugar/hard maple	WP - white pine	
BCH - beech	HEM - hemlock	RM - red/soft maple	SO - scarlet oak	YB - yellow birch	
BG - black gum	HICK - hickory	RO - red oak	SPR - spruce	YP - yellow poplar	

Section 4.1. Residue Produced by this Facility for 2012

Please enter the amount of residue produced by this facility

Type of Residue	Softwood	Hardwood	Unit of Measure (example: green tons, cubic feet, etc.)
Bark			
Coarse (chips, slabs, edgings, trims, cores, etc.)			
Fine - Shavings (Planer or Lathe)			
Fine - Sawdust			
Whole logs or short sections chipped or not processed as the facility's primary product			

4.2. Utilization of Residue Produced by this Facility

Please enter the percentage of softwood and hardwood residue (by Residue Utilization) produced by this facility

		BARK		COARSE (chips, slabs, edgings, etc.)		FINES (Planer or Lathe)				LOGS/ SHORT SECTIONS	
						Shavings		Sawdust			
RESIDUE UTILIZATION	Code	Softwood %	Hardwood %	Softwood	Hardwood	Softwood	Hardwood	Softwood	Hardwood	Softwood	Hardwood
Manufacture of fiber/composite products	1										
Small dimension and other sawn products	2										
Charcoal or chemical wood	3										
Industrial fuel at this plant (on-site)	4										
Industrial fuel at other plants	5										
Bio-energy pellets	6										
Other Bio-energy products(biodiesel,etc)	7										
Residential fuelwood	8										
Mulch/Soil additive (includes biochar)	9										
Animal bedding	10										
Other misc. uses- please specify:	88										
NOT UTILIZED (land fill, bark burned, etc.)	99										
TOTAL		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Please turn in this page with your survey

PA TPO Survey - 2012 - Notes:

Facility Information:
Section 1:
Section 2:
Section 3:
Section 4:
Other:

Please turn in this page with your survey

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Pennsylvania County Codes

Survey # **12000**

1 - Adams
2 - Allegheny
3 - Armstrong
4 - Beaver
5 - Bedford
6 - Berks
7 - Blair
8 - Bradford
9 - Bucks
10 - Butler
11 - Cambria
12 - Cameron
13 - Carbon
14 - Centre
15 - Chester
16 - Clarion
17 - Clearfield
18 - Clinton
19 - Columbia
20 - Crawford
21 - Cumberland
22 - Dauphin
23 - Delaware
24 - Elk
25 - Erie
26 - Fayette
27 - Forest
28 - Franklin
29 - Fulton
30 - Greene
31 - Huntingdon
32 - Indiana
33 - Jefferson
34 - Juniata
35 - Lackawanna
36 - Lancaster
37 - Lawrence
38 - Lebanon
39 - Lehigh
40 - Luzerne
41 - Lycoming
42 - McKean
43 - Mercer
44 - Mifflin
45 - Monroe
46 - Montgomery
47 - Montour
48 - Northampton
49 - Northumberland
50 - Perry
51 - Philadelphia
52 - Pike
53 - Potter
54 - Schuylkill
55 - Snyder
56 - Somerset
57 - Sullivan
58 - Susquehanna
59 - Tioga
60 - Union
61 - Venango
62 - Warren
63 - Washington
64 - Wayne
65 - Westmoreland
66 - Wyoming
67 - York
99 - Unknown

*Use standard state and country abbreviations where necessary.

80 - Canada
90 - Other: _____
91 - Other: _____
92 - Other: _____
93 - Other: _____
94 - Other: _____
95 - Other: _____

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