



Forest Service
U.S. DEPARTMENT OF AGRICULTURE

Northern Research Station | General Technical Report NRS-234 | July 2025

Forest Industry in the North, 2018: Results from the USDA Forest Service, Timber Products Output Survey

**Brett J. Butler, Sarah Butler, David E. Haugen,
Marla Markowski-Lindsay, Ronald J. Piva, and Mitchell A. Slater**



Citation

Butler, Brett J.; Butler, Sarah; Haugen, David E.; Markowski-Lindsay, Marla; Piva, Ronald J.; Slater, Mitchell A. 2025. **Forest industry in the North, 2018: results from the USDA Forest Service, Timber Products Output survey**. Gen. Tech. Rep. NRS-234. Madison, WI: U.S. Department of Agriculture, Forest Service, Northern Research Station. 85 p. [plus one online appendix]. <http://doi.org/10.2737/NRS-GTR-234>.

Abstract

The first annual Timber Products Output survey was completed for the northern United States for the 2018 production year. We surveyed a randomly selected sample of 1,546 primary wood-using mills from a total population of 2,941 active mills. We received 927 responses, for a 60 percent cooperation rate. Industrial roundwood production (harvested and utilized) in the region was an estimated 2,421.8 million cubic feet (MMCF). Saw logs accounted for 51 percent of production. Pulpwood accounted for 31 percent of production. Hardwood species accounted for 72 percent of roundwood production. Regionwide in 2018, the production volume occurred over 169.7 million acres of timberland, for an average of 14.3 cubic feet of roundwood production per acre of timberland. County-level production intensity in the region ranged from 0 to 1,196 cubic feet per acre of timberland. The processing of industrial roundwood generated 982.6 MMCF of mill residues, or 23.6 million green tons. Forty-two percent of the mill residues by volume were used for fuel byproducts, 19 percent for fiber by-products, and 37 percent for other various by-products (e.g., charcoal, animal bedding, mulch).

Keywords: annual survey, industrial roundwood, mill residue, nonresponse, production, receipts

Cover photo: Logging in central Maine. USDA Forest Service photo by Preston Keres.

Disclaimer

Reference herein to any specific commercial products, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government, and shall not be used for advertising or product endorsement purposes.

Manuscript received for publication June 2024

Published by:
USDA Forest Service
One Gifford Pinchot Drive
Madison, WI 53726
July 2025

Visit the Northern Research Station website at: <https://research.fs.usda.gov/nrs>

Forest Industry in the North, 2018: Results from the USDA Forest Service, Timber Products Output Survey

Brett J. Butler, Sarah Butler, David E. Haugen, Marla Markowski-Lindsay,
Ronald J. Piva, and Mitchell A. Slater

Contact Author

Brett J. Butler

brett.butler2@usda.gov

(413) 545-1387

About the Authors*

Brett J. Butler is a research forester and co-director of the Family Forest Research Center, USDA Forest Service, Northern Research Station, Forest Inventory and Analysis, Amherst, MA.

Sarah Butler is a research fellow with the Family Forest Research Center, University of Massachusetts, Amherst, MA.

David E. Haugen is a forester, USDA Forest Service, Northern Research Station, Forest Inventory and Analysis, St. Paul, MN.

Marla Markowski-Lindsay is a senior research fellow with the Family Forest Research Center, University of Massachusetts, Amherst, MA.

Ronald J. Piva is a forester (retired), USDA Forest Service, Northern Research Station, Forest Inventory and Analysis, St. Paul, MN.

Mitchell A. Slater is an ecologist, USDA Forest Service, Northern Research Station, Forest Inventory and Analysis, St. Paul, MN.

*Authors listed in alphabetical order.

CONTENTS

INTRODUCTION	1
DATA.....	8
ANALYSIS.....	15
RESULTS.....	18
DATA RESOURCES.....	24
CONCLUSIONS.....	25
GLOSSARY	26
ACKNOWLEDGMENTS.....	31
LITERATURE CITED	31
APPENDIX 1: Forest Service, Timber Products Output Surveys Completed Across the North, 1952 to Present	32
APPENDIX 2: USDA Forest Service, Timber Products Output Survey, North, 2018—Mail Survey Materials	46
APPENDIX 3: USDA Forest Service, Timber Products Output Survey, North, 2018—Nonrespondent Telephone Script	57
APPENDIX 4: USDA Forest Service, Timber Products Output Survey, North, 2019—Nonresponse Summary	71
APPENDIX 5: USDA Forest Service, Timber Products Output Survey, North, 2018—Industrial Roundwood Production and Residues Summary Tables	73

INTRODUCTION

National Resource Use Monitoring (NRUM), which includes Timber Products Output (TPO) and Harvest Utilization (HU) studies, is a key component of the U.S. Department of Agriculture (USDA) Forest Service, Forest Inventory and Analysis (FIA) program.¹ The purpose of the NRUM program is to better understand harvest removals by classifying timber harvests into primary roundwood products and logging residues. The NRUM program accomplishes this task through two data collection efforts: (1) a survey of primary wood-using mills known as Timber Products Output or TPO, and (2) a field data collection at active logging sites to estimate logging residues (i.e., the amount of harvest left on site).

The TPO program aims to improve understanding of industrial roundwood production. This report focuses on the TPO survey, the objective of which is to determine the volume of industrial roundwood production in the United States, such as the sources of timber harvest and removals, the products and residues produced, and the movement of wood materials across the country, at state and county level spatial resolution (Coulston et al. 2018). Industrial roundwood is wood in the rough (i.e., main stem or limbs of a felled tree) such as saw logs, pulpwood, and veneer logs. Industrial roundwood is processed at primary wood-using mills to generate a primary wood product such as lumber, wood pulp, or sheathing. Primary wood-using mills process industrial roundwood in log form, bolt form, or as chipped roundwood.

The NRUM program is nationally coordinated, but the survey of primary wood-processing mills is implemented separately across three regions: North, South, and West (Fig. 1). The focus of this report is the North, which includes the 20 states within the boundaries of the USDA Forest Service, Northern Research Station (NRS), and four Plains states (Kansas, Nebraska, North Dakota, and South Dakota). The state distribution is consistent with the regional boundaries of the northern region of the FIA program (Fig. 1). Legislative authority for the FIA program (including FIA's resource use monitoring component, i.e., TPO and HU) originates from the Forest and Rangeland Renewable Resources Research Act of 1978 (PL 95-307 § 3) and the Agricultural Research, Extension, and Education Reform Act of 1998 (PL 105-185 § 253).

¹ The three core functions of the FIA program are (1) the Nationwide Forest Inventory (NFI), a collection of inventory plots that are field-sampled frequently to monitor and assess the biophysical aspects of the Nation's forests; (2) the National Woodland Owner Survey (NWOS), a survey-based program that examines the Nation's forests from a social context (e.g. forest-owner sentiments and forest-use plans); and (3) the National Resource Use Monitoring (NRUM), which includes TPO and Harvest Utilization (HU) studies. Supplementary and emerging components of the FIA program (e.g. Urban FIA and forest carbon attributes) are described in Westfall et al. 2022.

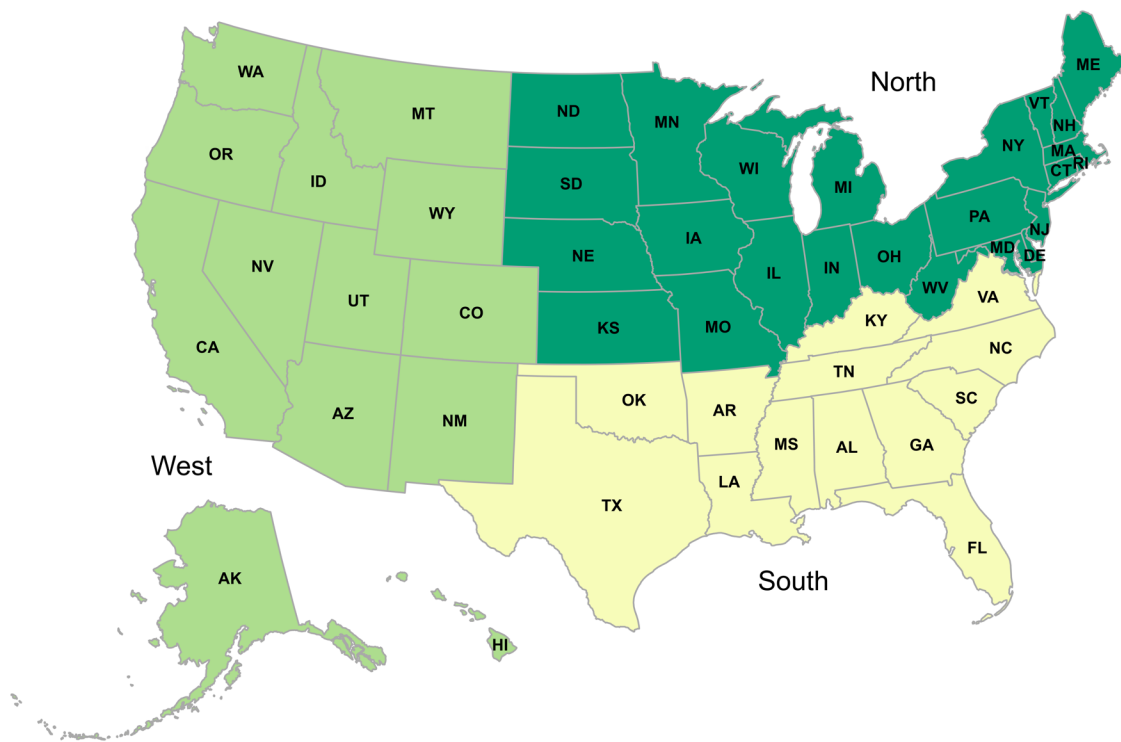


Figure 1.—USDA Forest Service, Timber Product Output survey regions: North, South, and West.

The Forest Service began tracking timber removals in 1948 as a complement to the FIA's national forest inventory program. The TPO program periodically canvassed all known primary wood-using mills within a state, and the time intervals between canvassing mills varied by state. By 2017, some states (e.g., Michigan) had numerous surveys completed for roundwood production (i.e., mill activity), and others (e.g., Maine) had far fewer. Table 1 shows the time intervals between surveys, by state, prior to the implementation of the survey for the 2018 production year (App. 1 gives citations for these surveys).

With the goal of developing consistent and timely estimates across the United States, in 2018 FIA transitioned TPO from a periodic canvass carried out at varying intervals across states to an annualized survey from a population sample. For all states, the annual survey started with production year 2018 (i.e., mill activity occurring in the calendar year 2018); thus, TPO surveys for production year 2018 were conducted in 2019.

Table 1.—USDA Forest Service, Timber Products Output surveys completed across the North, by state and year

State	Year ^a
Connecticut	1971; 1984; 2011; 2016
Delaware	1970; 1985; 2006; 2011; 2016
Illinois	1983; 1996; 2003; 2010
Indiana	1984; 1990; 1995; 2000; 2005; 2008; 2017
Iowa	1972; 1980; 1988; 1994; 2000; 2005; 2017
Kansas	1980; 1993; 1998; 2003; 2009; 2015
Maine	1981; 2014
Maryland	1975; 1985; 2004; 2008; 2015
Massachusetts	1971; 1984; 2010; 2017
Michigan	1969; 1972; 1975; 1977; 1984; 1988; 1990; 1992; 1994; 1996; 1998; 2000; 2004; 2006; 2008; 2010; 2014; 2016
Minnesota	1960; 1973; 1975; 1988; 1990; 1992; 1997; 2004; 2007; 2010; 2014; 2017
Missouri	1969; 1980; 1987; 1991; 1994; 1997; 2000; 2003; 2006; 2009; 2012; 2015
Nebraska	1980; 1993; 2000; 2006; 2009; 2014
New Hampshire	1972; 1982; 2009; 2012
New Jersey	1970; 1986; 2010; 2016
New York	1967; 1979; 1993; 2006; 2009
North Dakota	1993; 1998; 2003; 2009; 2014
Ohio	1952; 1966; 1973; 1978; 1983; 1989; 2006
Pennsylvania	1969; 1976; 1988; 2004; 2012
Rhode Island	1971; 1984; 2010; 2016
South Dakota	1993; 1999; 2004; 2009; 2014
Vermont	1972; 1982; 2009; 2014
West Virginia	1965; 1974; 1979; 1987; 1994; 2000; 2007; 2017
Wisconsin	1973; 1975; 1981; 1986; 1988; 1990; 1992; 1994; 1996; 1999; 2003; 2008; 2013

^a Although tracking of timber removal began in 1948, the earliest found report on the timber product output survey is 1952.

The annual survey protocol established the selection of a random sample of primary wood-processing mills from each state's mill population based on mill size (i.e., estimated receipt or consumption volume) and mill product type. Described in the implementation section of this report, this stratified random sample-based approach is designed to generate a subset of mills, such that approximately 40 percent of a state's mills are selected. The sample design also ensures that a large proportion of total production volume and an adequate representation of mill types are captured during data collection (Coulston 2022, Coulston et al. 2018). When there are 25 or fewer mills (excluding pulp or composite panel mills) in a state, all mills are sampled. If there are five or fewer mills of any given mill type in a state, all of the mills in this stratum are sampled. In addition, all pulp mills and composite panel mills are always sampled because they all exceed the mill size threshold. This process is described further in the implementation section of this report.

The change from a periodic canvass to an annual survey captures roundwood production for the calendar year and is implemented so that mills can report actual activity for all months of that year. This methodology was adopted by all states in the North beginning with 2018 roundwood production (i.e., the 2018 survey) except Maine, which adopted this methodology for the 2019 production year. While data for Maine pulpwood and composite panel mills are provided consistent with other states in the North, summarized data from the annual Maine wood processors report was used in this report for the 2018 production year for all other mill types.

There are a total of 2,941 active mills in the North: 2,568 sawmills (Fig. 2), 135 industrial/residential fuelwood mills, 33 post/pole/piling mills, 28 pulp/paper mills, 27 veneer mills, 19 composite panel/engineering wood product mills, and 131 other/miscellaneous mills (Fig. 3). Sawmills are spread generally throughout the North. Most of the pulp and composite panel mills are in Maine, Michigan, Minnesota, Pennsylvania, and Wisconsin; veneer mills are mainly in the central and mid-Atlantic states (Table 2).

This report describes the TPO survey conducted to collect mill activity data in the North from 2018, and it presents an analysis of that data to better understand whether the roundwood produced in the North satisfies the region's mill demand. Estimates presented describe the region's wood flow, that is, the volume and kind of industrial roundwood harvested in the region and processed within regional facilities (retained) or exported as well as the volume and kind of industrial roundwood harvested outside the region and imported for processing by regional facilities; industrial roundwood product volume; and the volume of mill residues that mills generate and associated mill by-products (i.e., utilized mill residues). All survey responses are considered Controlled Unclassified Information, and only summarized published results where individual responses cannot be revealed are provided. Terms used throughout the report are defined in the key terms box and in the glossary. Appendixes 1 through 5 provide TPO report survey background material and statewide results.

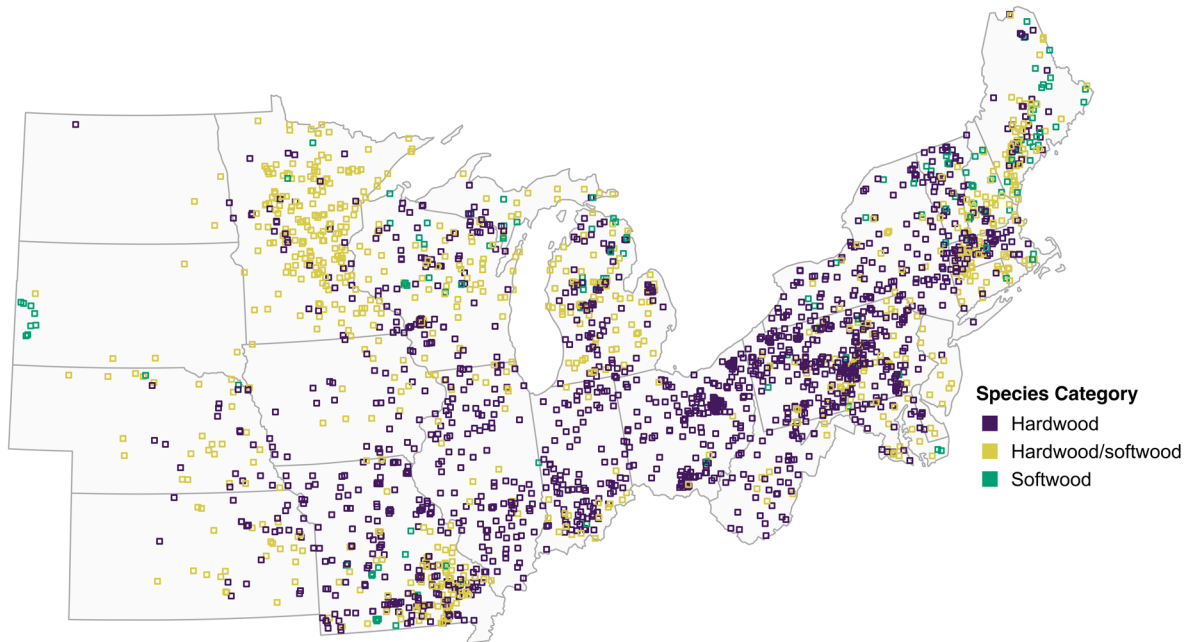


Figure 2.—Location of sawmills and major species categories processed, North, 2018.

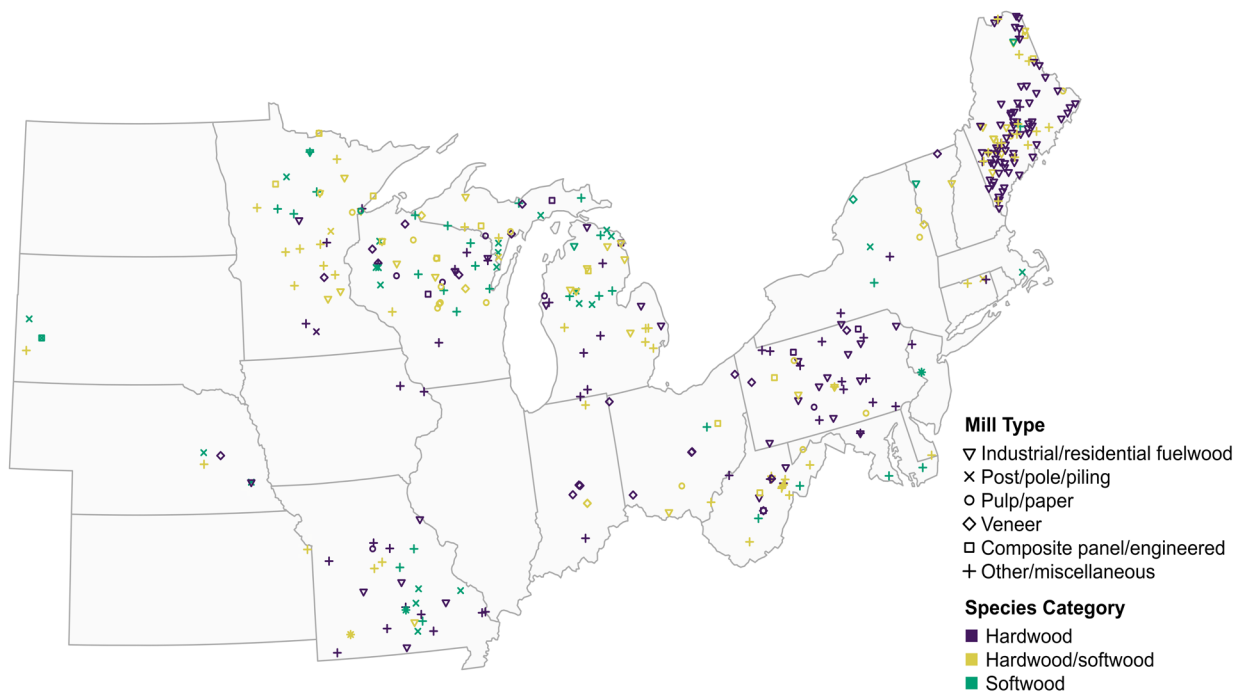


Figure 3.—Location of non-sawmill mill types and major species categories processed, North, 2018.

Table 2.—Number of mills by state and mill type, North, 2018

State	All mill types combined	Sawmills	Composite panel	Industrial/residential fuelwood	Post/pole/piling	Pulp/paper	Veneer	Other/miscellaneous ^a
Connecticut	23	20	0	0	1	0	0	2
Delaware	9	8	0	0	0	0	0	1
Illinois	133	133	0	0	0	0	0	0
Indiana	130	123	0	0	0	0	5	2
Iowa	47	45	0	0	0	0	0	2
Kansas	53	52	0	0	0	0	0	1
Maine	220	110	2	84	0	4	0	20
Maryland	48	43	0	1	0	1	0	3
Massachusetts	86	85	0	0	1	0	0	0
Michigan	320	268	4	13	10	3	3	19
Minnesota	264	231	3	7	3	4	1	15
Missouri	358	327	0	6	7	1	0	17
Nebraska	51	46	0	1	2	0	1	1
New Hampshire	45	45	0	0	0	0	0	0
New Jersey	13	10	0	0	1	0	0	2
New York	147	139	0	0	1	2	2	3
North Dakota	5	5	0	0	0	0	0	0
Ohio	201	192	1	1	0	1	5	1
Pennsylvania	428	395	3	13	0	3	2	12
Rhode Island	4	4	0	0	0	0	0	0
South Dakota	17	13	1	0	2	0	0	1
Vermont	60	57	0	2	0	0	1	0
West Virginia	71	50	2	2	0	0	2	15
Wisconsin	208	167	3	5	5	9	5	14
Total	2,941	2,568	19	135	33	28	27	131

^a Other/miscellaneous mills include cabin/house log mills, excelsior/shavings mills, chemical mills, mulch mills, export/concentration yards, and other mill types not listed.

KEY TERMS

Within the TPO program, the following terms have specialized meanings and describe relationships and aspects of mill activity:

Roundwood refers to logs, bolts, or other round sections cut from trees, including chips from roundwood.

Processed refers to the action of sawing, peeling, or chipping roundwood into a finished or intermediate-state primary product.

Retained amount describes the volume of roundwood harvested from and processed by facilities within a given state or other specified area, such as the North.

Exported amount refers to the volume of roundwood harvested in a given state utilized by primary processing facilities in another state or country (or harvested in a specified geographic area and utilized by primary wood processing facilities outside of that geographic area).

Imported amount refers to the volume of roundwood processed within a given state that was harvested in another state or country (or processed within a specified geographic area but harvested outside that area).

These terms describe the movement of harvested and processed roundwood:

Production reflects the volume of roundwood harvested within a given state (or specified area) and transported to a processing facility; it indicates activity “in the woods” (i.e., conversion of timber stock to roundwood). Production volume consists of the amount of roundwood retained (processed within-state) and exported to other states, countries, or both for processing.

Receipts reflect the volume of roundwood received and processed by facilities within a given state or region. Receipt volume consists of the amount of roundwood retained within a given state plus volume imported from other states, countries, or both for processing. Unprocessed roundwood that is received by the facility and exported out of the country or transferred to another facility is excluded.

DATA

Implementation

Data are collected and organized by calendar year. The TPO annual sampling protocol² consists of five steps that are performed iteratively for each year of the TPO data collection:

1. Sample/survey preparation (i.e., determining which mills will be surveyed and preparing the survey)
2. Data collection (i.e., contacting and surveying mills)
3. Data entry
4. Verification
5. Reporting

The timing of key activities associated with the five steps within a 1-year period is illustrated in Figure 4. Because annual sampling was a change from previous survey protocols, an additional step was implemented before the 2018 survey to alert mills of the upcoming change. All mills in the North were notified of the change via postcard in late January 2019.

Sample and Survey Preparation

Sample selection begins with developing and reviewing the mill population or sample frame (i.e., the list of mills that will be used to draw the sample). For the 2018 survey, the sample frame was derived from all known active and idle mills from the previous periodic survey in each state. State-level mill lists were reviewed by cooperators (e.g., state foresters, forest economists, or state utilization specialists, depending on the state) from each state to update mill status (e.g., identify closed mills) and add new or missing mills. The sample frame for the 2018 survey was also updated with information from returned postcards announcing the annual sampling design.

² As a Federal survey, the TPO survey is subject to the Paperwork Reduction Act (PL 96-511), which mandates that all the TPO survey materials, methods, and respondent burden be approved by the Office of Management and Budget (OMB). Additionally, because TPO for the North is implemented in partnership with the University of Massachusetts Amherst, the survey methods and content are reviewed by the University of Massachusetts Amherst Institutional Review Board (IRB). The OMB approval number is OMB 0596-0010. The University of Massachusetts Amherst IRB approval number is 2016-2908.

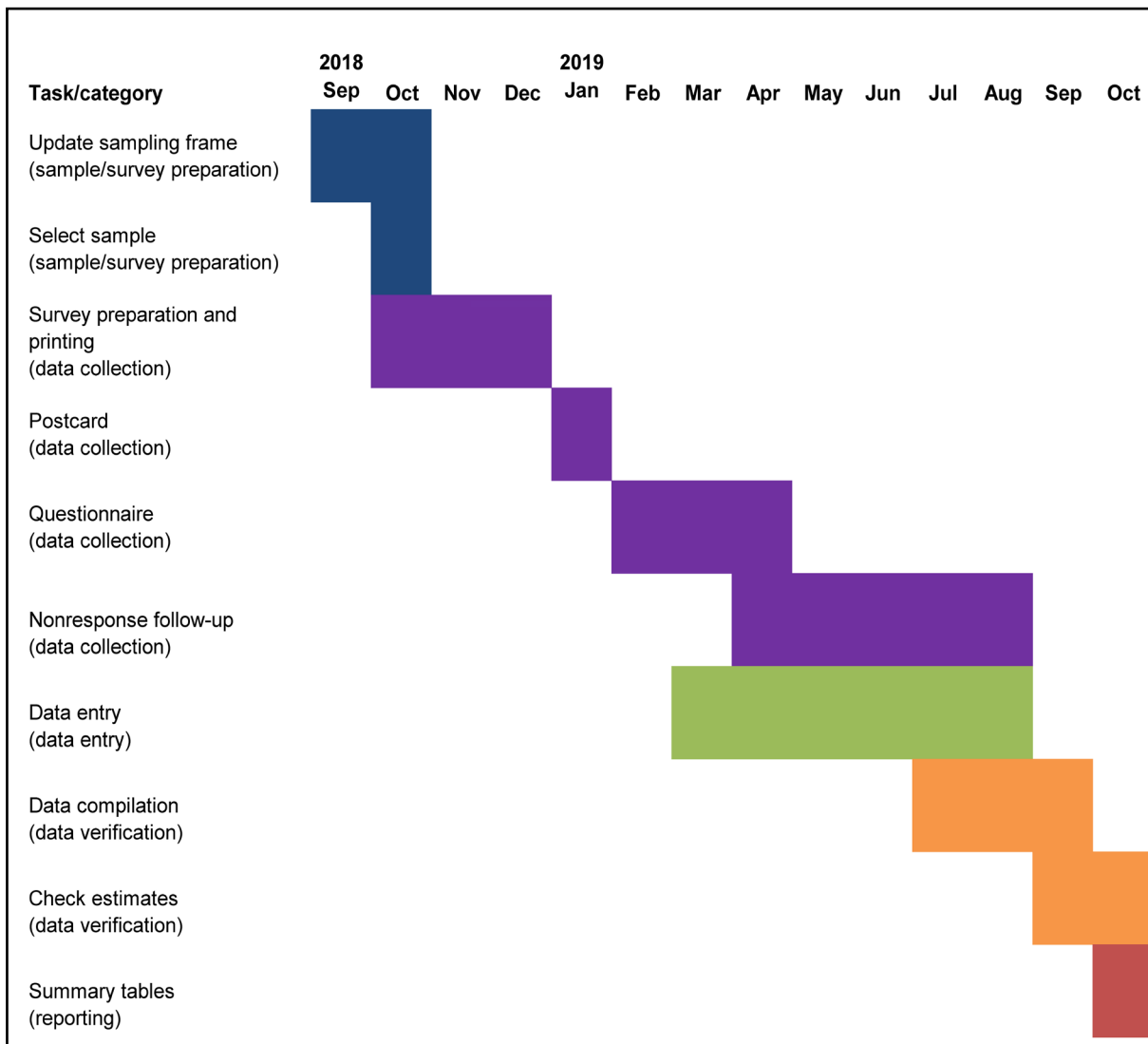


Figure 4.—Desired timing of key activities for deploying the Timber Products Output survey, North, 2018.

The sample of mills was drawn for each state using a stratified random sampling approach as described in Coulston (2022). If a state had 25 mills or fewer, all mills were sampled. If a state had more than 25 mills, for each state the population was stratified first by mill type and then within mill type by mill measure of size (MOS; amount of roundwood received or capacity). The mill type strata included groups for industrial/residential fuelwood, composite panel mills, export logs, cabin/house logs, pilings, poles, posts, pulpwood, saw logs, veneer logs, and other miscellaneous mills.

In cases where sample sizes were too small in a mill type group (i.e., fewer than two mills), all mills of that mill type were sampled. All pulp mills and composite panel mills were always sampled because they all exceeded the 10 MMCF MOS threshold. Mill product groups were combined on a state-by-state basis for sampling. Sawmills were never combined with other mill product groups because their numbers were large enough.

Initial testing suggested that this sampling approach would capture approximately 94 percent of the annual total receipts and provide estimates with precision surpassing estimates of annual timber harvesting based on FIA inventory plots (Coulston et al. 2018). States had the option to intensify sampling of the TPO survey in their state (i.e., sample more mills than the number determined by the sampling protocol), but they were responsible for the data collection from mills that were not selected as part of the sample. Indiana, Michigan, and Wisconsin elected to survey all mills for the 2018 TPO.

Data Collection

Administration of the TPO survey was a collaborative effort, with data collection conducted by the Northern Research Station (NRS), state partners, and partners at the University of Massachusetts. Northern Research Station staff contacted mills in most states, and their efforts were supplemented by state partners in other states (Fig. 5).

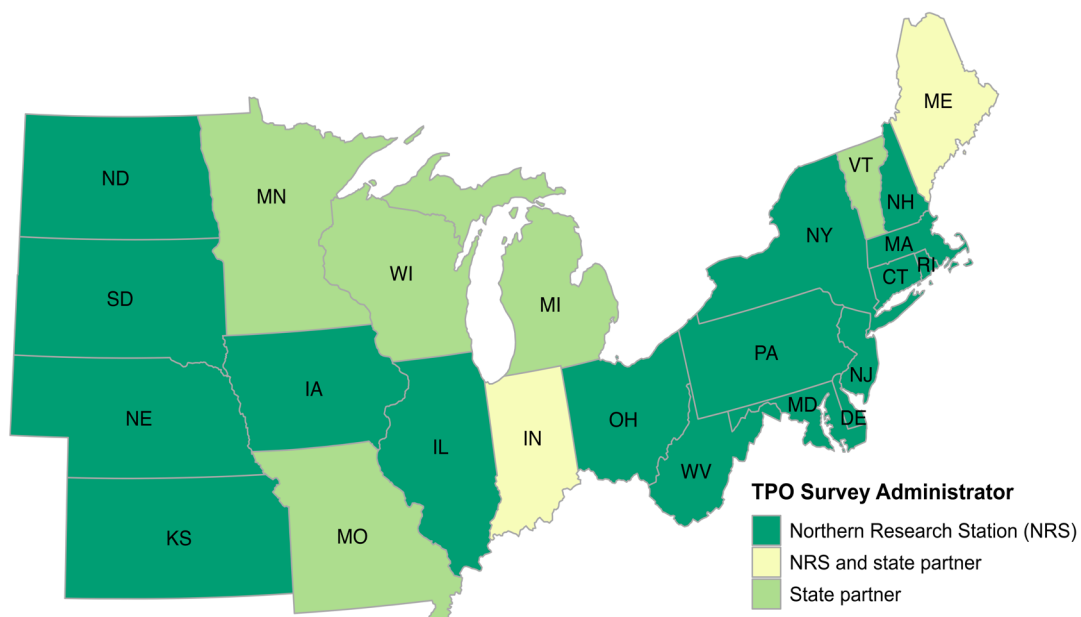


Figure 5.—Survey administrator by state for the USDA Forest Service, Timber Products Output survey, North, 2018.

Survey questionnaires were mailed to the primary wood-processing mills selected for sampling. Questionnaires included instructions for completing the survey and contact information for an assigned NRS staff member in case respondents had questions (see App. 2 for survey implementation materials).

The survey administered by the NRS was conducted using a modified Tailored Design Method (Dillman et al. 2014).

- **Day 1:** A pre-notice postcard was mailed. The postcard let potential respondents know that a survey would be arriving soon and provided basic background information.
- **Day 11:** The survey packet was mailed. The packet contained the survey and a cover letter explaining its purpose and importance, instructions for completing it, and a postage-paid return envelope.
- **Day 32:** A second postcard about the survey, a thank you or reminder to complete the survey, was sent.
- **Day 131:** Northern Research Station staff began calling nonresponding mills in states administered by the NRS to collect data over the phone. If requested, the survey was mailed again or emailed.
- **Day 161:** Partners at the University of Massachusetts began calling nonresponding mills. Nonrespondents reached by telephone were asked an abbreviated version of the survey (see App. 3 for the script). If requested, the survey was mailed again or emailed.

The Northern Research Station used a different protocol to contact pulp and composite panel mills; these mills were contacted via email on February 20, 2019, and sent an electronic version of the form. Nonresponding mills received both a second email and follow-up phone call on October 3, 2019. Maine data collection involved collecting only pulp and paper and composite panel mill activity, not other primary wood-processing mill types.

Data Entry and Verification

Data collected from the surveys are stored in a relational database. Mill responses were verified throughout the data entry process. Prior to loading the data into the relational database, data checks performed during data entry across all fields helped identify illogical or unreasonable responses. For example, a common mistake occurs with roundwood units; “MBF” means “thousand board feet” but is sometimes mistaken for “million board feet.” Data checks were also performed when loading the data into the relational database. Once data were loaded, additional logic checks were run to check again for missing or inconsistent responses.

The mill data were then copied to a set of tables in the relational database, where all industrial roundwood volumes reported on the questionnaires were converted to standard units of measure using regional conversion factors (Table 3). The final mill data were supplemented with the final mill data from other states and regions to determine the total industrial roundwood production for individual states or the region as a whole.

Survey Cooperation

Records indicated a population of 3,198 mills for the 2018 TPO survey of the North. The survey sample comprised a random selection of 1,803 mills from this population; however, 257 mills were considered nonqualified (144 were closed and 113 were idle), for a total of 1,546 qualified mills. Of these, 927 mills responded to the survey, for an overall cooperation rate of 60 percent, defined as $\text{responses} \div (\text{total mills} - \text{nonqualified mills})$ ranging from 0 percent in Rhode Island and 9 percent in Connecticut to 89 percent in Delaware, 92 percent in Michigan, and 93 percent in Minnesota (Table 4). Note that Table 4 excludes comparable data on cooperation rate for Maine; only the six pulp and composite panel mills received surveys in 2018, and their cooperation rate was 50 percent.

Table 3.—Conversion factors from reported unit of measure to standard unit of measure

Product (standard unit of measure)	Mill reported unit of measure							
	International ¼-inch rule MBF ^a	Doyle scale MBF	Scribner Decimal C MBF	Green tons	Standard cord	Lake States cord	Thousand pieces	Thousand cubic feet
Saw logs (MBF International ¼-inch rule)	1	1.38	1.08	0.2174	0.5	0.52085		0.158
Veneer logs (MBF International ¼-inch rule)	1	1.14	1.04		0.5	0.52085		0.158
Pulp and composite products (standard cords)				0.4167	1	1.0417		0.085 ^b 0.079 ^c
Industrial fuelwood (standard cords)				0.4167	1	1.0417		0.079
Poles (pieces)	20		21.6	4.348	10	10.4	1000	0.0079
Posts (thousand pieces)	0.2			0.04167	0.1	0.104	1	0.79
Other products (thousand cubic feet)	0.158	0.21804	0.17064	0.0329193	0.079	0.0822943	7.9	1

^a MBF = thousand board feet

^b Former Northeastern Research Station states

^c Former North Central Research Station states

Table 4.—Cooperation rate percentage by state, North, 2018

State	Cooperation rate (percent)
Connecticut	8.7
Delaware	88.9
Illinois	17.0
Indiana	45.4
Iowa	57.9
Kansas	40.0
Maine ^a	50.0
Maryland	76.9
Massachusetts	55.2
Michigan	92.5
Minnesota	93.1
Missouri	68.6
Nebraska	22.7
New Hampshire	50.0
New Jersey	15.4
New York	30.0
North Dakota	40.0
Ohio	29.9
Pennsylvania	17.2
Rhode Island	0.0
South Dakota	29.4
Vermont	81.8
West Virginia	32.4
Wisconsin	85.6

^a Only pulp and composite data were collected in 2018.

Survey Nonresponse

Almost all surveys have levels of nonresponse, or missingness, associated with either the unit (i.e., respondent or mill) or item (i.e., question). Missingness can be analyzed at the unit level (i.e., mills that fail to respond to the survey at all), the respondent level (i.e., respondents that complete only a subset of the required survey questions), or the question level (i.e., the percentage of valid responses to a specific question) (Butler et al. 2021). Unit-level missingness is described as cooperation rate in the previous section. We refer to respondent-level and question-level missingness together as item nonresponse.

Although we did not analyze factors influencing unit or item nonresponse for the 2018 TPO survey report, we acknowledge the potential for estimation bias associated with that nonresponse. We plan to incorporate nonresponse analysis in reports of future survey results. For illustrative purposes, Appendix 4 of this report discusses the item nonresponse analysis we conducted for the 2019 TPO survey (Markowski-Lindsay et al. 2023), which we believe would be indicative of what would have been expected in the 2018 data because the data collection, coding, and processing were consistent between the 2 years.

ANALYSIS

Several analytical steps were taken with the TPO survey data to produce population-level estimates of the data provided (i.e., mill consumption and in-region processed wood, imports, and exports). The survey data are analyzed for nonresponse and missing data are imputed, and then adjustments are made to account for the stratified sampling design. These steps are described in the following sections.

After population-level estimates are calculated and processed, export and import volume data are used to calculate receipt and production volume. Receipts and production volumes for any given region depend on imports from and exports to other regions. Receipt volume comprises both the retained roundwood (harvested and processed within a given region) and imported roundwood (harvested outside a given region and transported to a processing facility within a given region). Production volume is activity “in the woods” (i.e., conversion of forest timber stock to roundwood) and consists of the amount of roundwood retained (harvested and processed within a given region) and exported to other regions, including other countries, outside of the region analyzed for processing.

Population-Level Estimation

To produce population-level estimates of the 2018 TPO survey responses, the sample design needed to be incorporated into the estimators. To estimate population totals and other population-level parameters associated with the 2018 TPO survey, we first imputed missing items and then accounted for the stratified random sample design using methods outlined by Coulston et al. (2018).

Imputation

For mills that did not reply to the survey at all (i.e., unit nonresponse), information from previous responses for the mill (previous survey information brought forward and not updated), input from state contacts, or web searches were used to enter data for nonresponding mills in the sample (in that order). If none of those options were available, responses from similar type mills located in the state of the nonresponding mill were used to enter data for the nonresponding mill.

For questions that should have been answered but were not (i.e., item nonresponse), previous responses from the mill, input from state contacts, or web searches (in that order) were used to complete the survey. If information was not available from those sources, responses to those questions from similar type mills in the state were used to enter data for the question nonresponse.

Estimation

To generate unbiased, population-level estimates from the sample responses, the features of the stratified random sample design must be incorporated properly. The approach for estimating variables and associated variances is outlined in Coulston et al. (2018) and summarized in Coulston (2022). This method for estimating variable values was applied to the 2018 TPO survey data. Variance estimation has not been implemented as of this writing; variances will be included in future reports.

Following Coulston (2022), the estimated value for a variable was calculated as

$$\hat{Y}_S = \sum_h^H \frac{N_h}{n_h} \sum_{i=1}^{n_h} y_{hi} \quad (1)$$

where

$\hat{Y}_S$ = estimated value of variable Y in sub-population S ;

N_h = the total number of mills in stratum h ;

n_h = the number of sample mills in stratum h ; and

y_{hi} = the observed value for mill i in stratum h .

To generate estimates for a specific domain of interest, Equation 1 is modified as follows:

$$\hat{Y}_{sd} = \sum_h^H \frac{N_h}{n_h} \sum_{i=1}^{n_h} y_{hi} \delta_{hid} \quad (2)$$

where

$\hat{Y}_{sd}$ = estimated value of variable Y in sub-population s in domain d ;

δ_{hid} = a dummy variable indicating that mill i in strata h is in domain d ; and
other variables are defined as above.

RESULTS

This section provides mill information and population-level estimates for key variables across the North: estimates of industrial roundwood movement in the region; production volume for all mills, specific mill types, and hardwoods and softwoods; residue volume by residue type, residue disposal (i.e., management), hardwoods and softwoods; and roundwood production intensity across the region and by county. The population-level estimates are based on the 1,546 mills sampled and supplemented with mills from outside the North that reported using roundwood material sourced from the North. (See the data resources section for where to access these data.)

Appendix 5 presents more detailed mill data for the region and by state, including the following:

- Number of primary wood processing facilities by mill type
- Industrial roundwood volume by wood movement, roundwood type, and hardwoods and softwoods
- Industrial roundwood production volume by product type, species group, and hardwoods and softwoods
- Residue volume by residue type, residue disposal, and hardwoods and softwoods

Roundwood Movement

A total of 2,421.8 million cubic feet (MMCF) of industrial roundwood was produced in the North, comprising 2,323.8 MMCF processed by the primary wood-processing mills in the region and 98.0 MMCF exported to states or countries outside the region (Fig. 6). Two-thirds of the exported industrial roundwood went to other countries (64.7 MMCF), 31 percent was exported to mills in the South (29.9 MMCF), and 3 percent was exported to mills in the West (3.4 MMCF). (See Fig. 1 for South and West regions.)

Industrial roundwood receipts for the North totaled 2,420.8 MMCF, with 2,323.8 MMCF coming from the North and 97.0 MMCF imported from states or countries outside the region. Fifty-four percent of the imported industrial roundwood came from other countries (52.6 MMCF), 41 percent from the South (39.5 MMCF), and 5 percent from the West (4.9 MMCF). (See Fig. 1 for South and West regions.)

Overall, the North was a net exporter of industrial roundwood in 2018. (See App. 5, Tables NORTH-2 and NORTH-3 for wood movement volume [i.e., production, retained, imported, and exported] by roundwood type, and hardwoods and softwoods.)

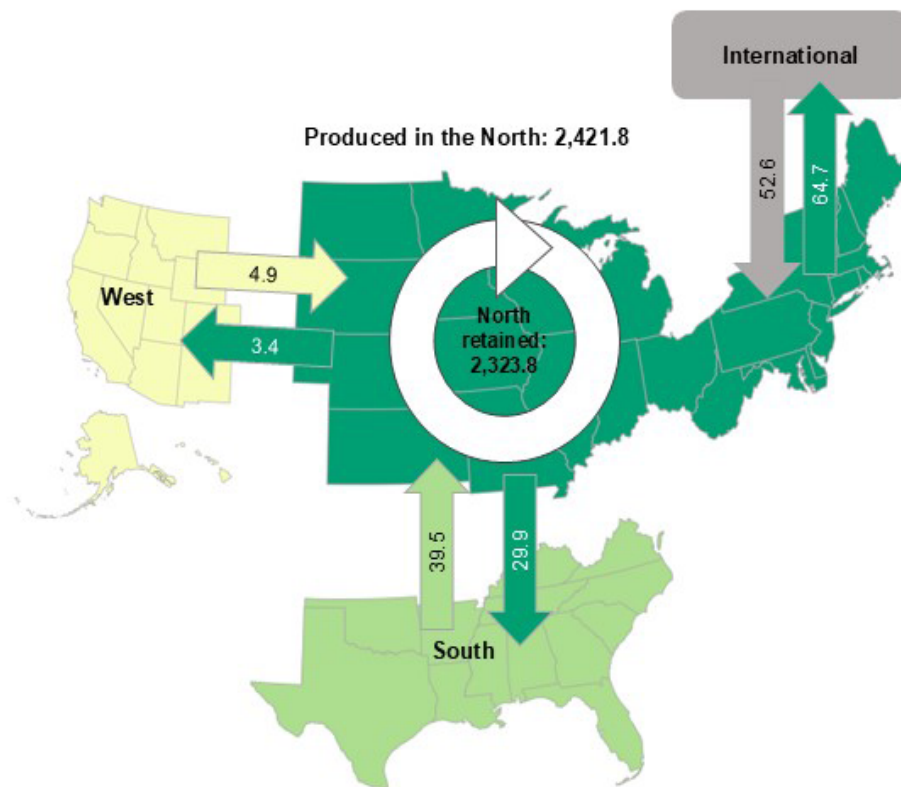


Figure 6.—Industrial roundwood movement in the North, 2018. Values are in million cubic feet (MMCF) produced in the region, retained in the region, exported from the region, and imported to the region.

Production Volume

Industrial roundwood production for the North totaled 2,421.8 MMCF in 2018. Saw logs accounted for most of the production volume (1,240.5 MMCF, roughly 51 percent), followed by pulpwood (751.6 MMCF, roughly 31 percent) and composite panel logs (190.7 MMCF, roughly 8 percent) (Fig. 7). Hardwood species accounted for 1,741.2 MMCF, or 72 percent of the production volume across all product types. Softwood species accounted for 680.6 MMCF, or 28 percent of the production volume across all product types.

Hardwood and softwood production volume by product types are as follows:

- Hardwood saw log production was 856.0 MMCF, or 35 percent of total production volume; softwood saw log production was 384.6 MMCF, or 16 percent of total production volume.

- Hardwood pulpwood production was 565.6 MMCF, or 23 percent of total production volume; softwood pulpwood production was 186.0 MMCF, or 8 percent of total production volume.
- Hardwood composite panel log production was 177.2 MMCF, or 7 percent of total production volume; softwood composite panel log production was 13.5 MMCF, or nearly 1 percent of total production volume.

Tables NORTH-4 and NORTH-5 (App. 5) present industrial roundwood production volume by product type, species group, and hardwoods and softwoods. The region-wide production amounts (App. 5, Table NORTH-4) are distributed differently across the various product types from distributions reported here (Fig. 7); however, overall totals remain consistent. The data in the tables in Appendix 5 derive from state-level volumes, and because state-level data are intended to protect from publicizing proprietary mill data, some state product type volumes were reclassified into the “other roundwood products” (i.e., miscellaneous) category when those product types were associated with fewer than three mills (Fig. 7).

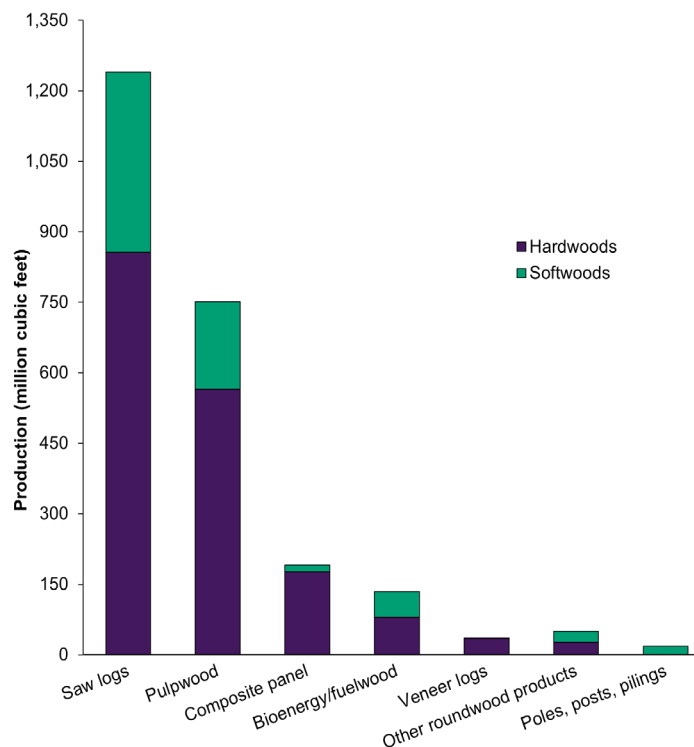


Figure 7.—Production volume by roundwood product and major species categories, North, 2018.

Residue Volume

In converting industrial roundwood into products, primary wood-using industries in the North generated a combined 982.6 MMCF (23.6 million green tons) of bark residue, coarse wood residue (slabs, edgings, and veneer cores), and fine wood residue (sawdust, shavings, fines, and veneer clippings). Bark residue accounted for 42 percent (409.8 MMCF) of the residues generated, coarse residue accounted for 38 percent (370.5 MMCF), and fine wood residue for more than 20 percent (202.3 MMCF). Across the three residue types, hardwoods accounted for between 71 and 75 percent of each residue type total (Fig. 8).

Of the 982.6 MMCF of residues produced, primary mills in the North recovered 99 percent as various byproducts. Industrial fuelwood byproduct accounted for 34 percent (333 MMCF), mulch/soil additives accounted for 20 percent (191.9 MMCF), and the manufacture of fiber/composite products accounted for 19 percent (191.4 MMCF) (Fig. 9).

Hardwood species accounted for 73 percent (719.1 MMCF) of the residue volume, and softwood species accounted for 27 percent (263.5 MMCF). Hardwood species dominated each category, accounting for between 57 and 98 percent of each disposition volume. Tables NORTH-6 and NORTH-7 (App. 5) present mill residue volume by residue type, residue use (i.e., disposition), and hardwoods and softwoods.

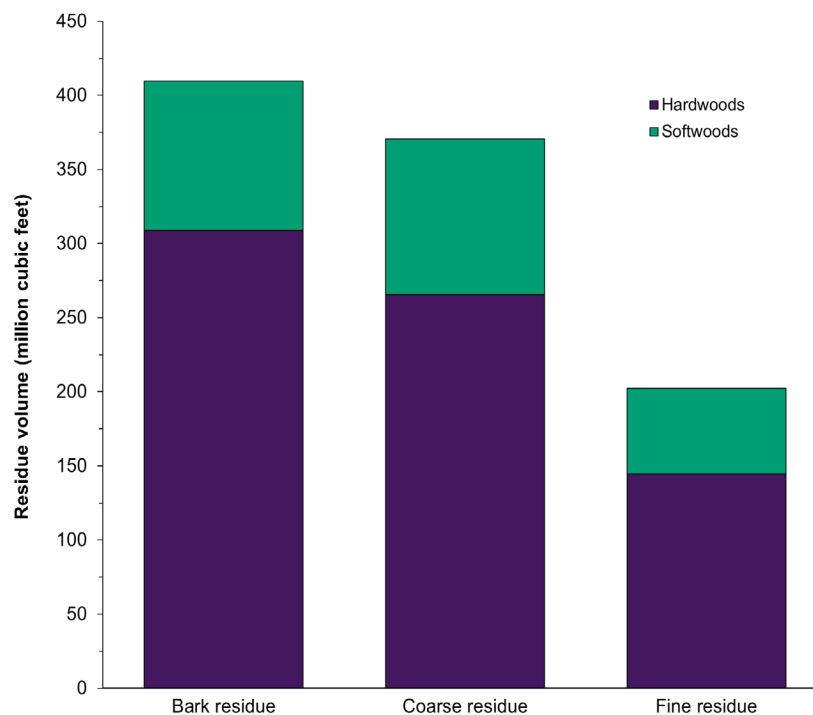


Figure 8.—Mill residue volume, in million cubic feet, by type of residue and major species categories, North, 2018.

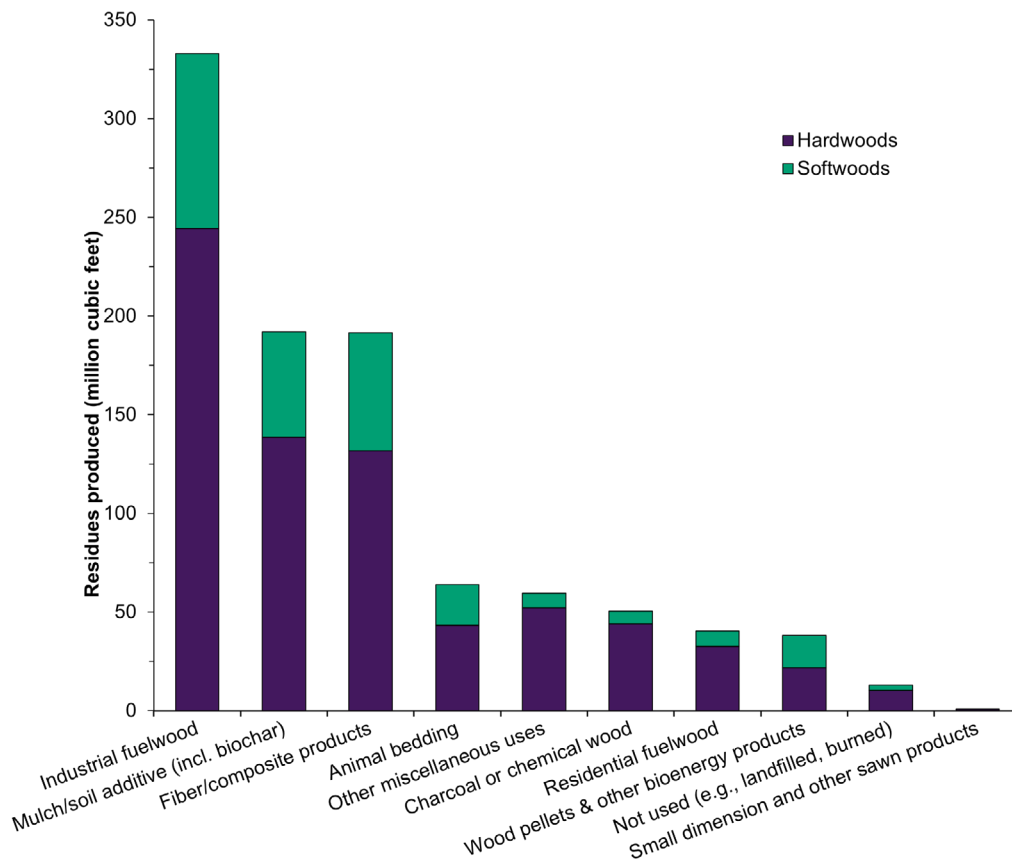


Figure 9.—Mill residue volume, in million cubic feet, by disposition and major species categories, North, 2018.

Residue volume by type and disposal method is shown in Figure 10. Fuel byproducts (i.e., industrial and residential fuelwood, wood pellets, and other bioenergy products) amounted to 411.8 MMCF of mill residues (42 percent). Fuel byproducts comprised bark residue (51 percent), coarse residue (27 percent), and fine residue (22 percent). Fiber byproducts (i.e., mill residues used to produce pulp/paper or composite panel products) totaled 191.4 MMCF of mill residues (19 percent). Mill residue used for fiber products comprised coarse residue (88 percent), fine residue (9 percent), and bark residue (2 percent). All other byproduct types (i.e., small dimension and other sawn, charcoal or chemical wood, mulch/soil additives, animal bedding, and other miscellaneous products) accounted for 366.5 MMCF of total mill residues (37 percent). Charcoal, a wood fuel, is included in the “all other” category (Fig. 10) because its amounts cannot be differentiated from those in chemical wood. Mill residues used for other uses comprised bark residue (52 percent), fine residue (25 percent), and coarse residue (23 percent). About 12.9 MMCF (1 percent) of mill residues generated went unused and comprised bark residue (42 percent), coarse residue (34 percent), and fine residue (23 percent).

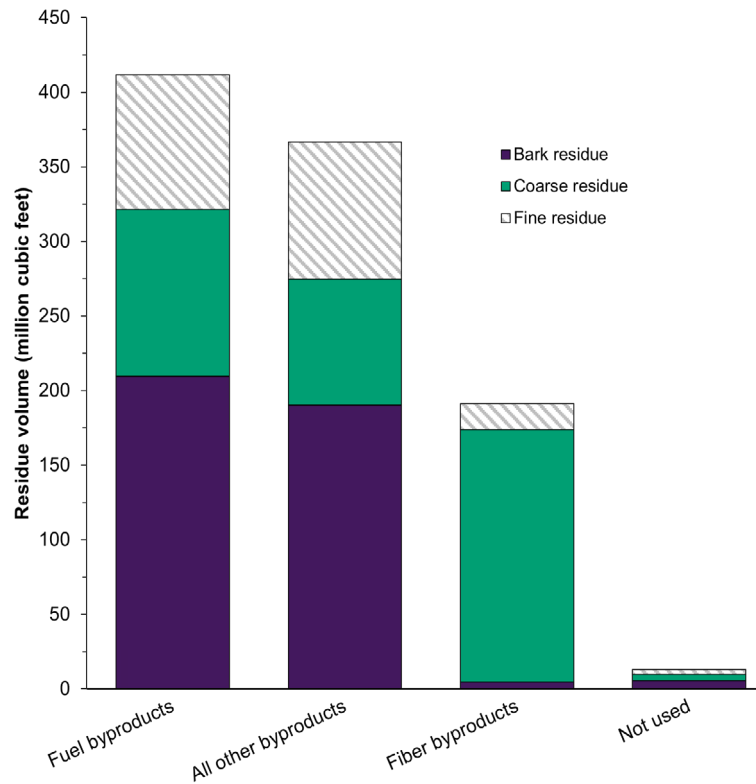


Figure 10.—Mill residue volume by residue type and disposal method, North, 2018.

Roundwood Production Intensity

Regionwide in 2018, the 2,421.8 MMCF of production volume occurred over 169.7 million acres of timberland, for an average of 14.3 cubic feet produced per acre of timberland. County-level roundwood production intensity in the North ranged from 0 to 1,196 cubic feet produced per acre of timberland. The county-level production intensity results depend on the amount of timberland in the county. For example, Clinton, Indiana had the highest intensity at 1,196 cubic feet produced per acre of timberland (producing 131,691 cubic feet over 110 acres of timberland), but the greatest amount of roundwood production occurred in Aroostook, Maine, with a production intensity of 30 cubic feet produced per acre of timberland (producing 111,990,500 cubic feet over 3,752,414 acres of timberland). Figure 11 shows the distribution of county-level intensity of roundwood production for all industrial products across the North. The source of county-level timberland acreage is FIA's Nationwide Forest Inventory for 2018 (USDA Forest Service 2024).

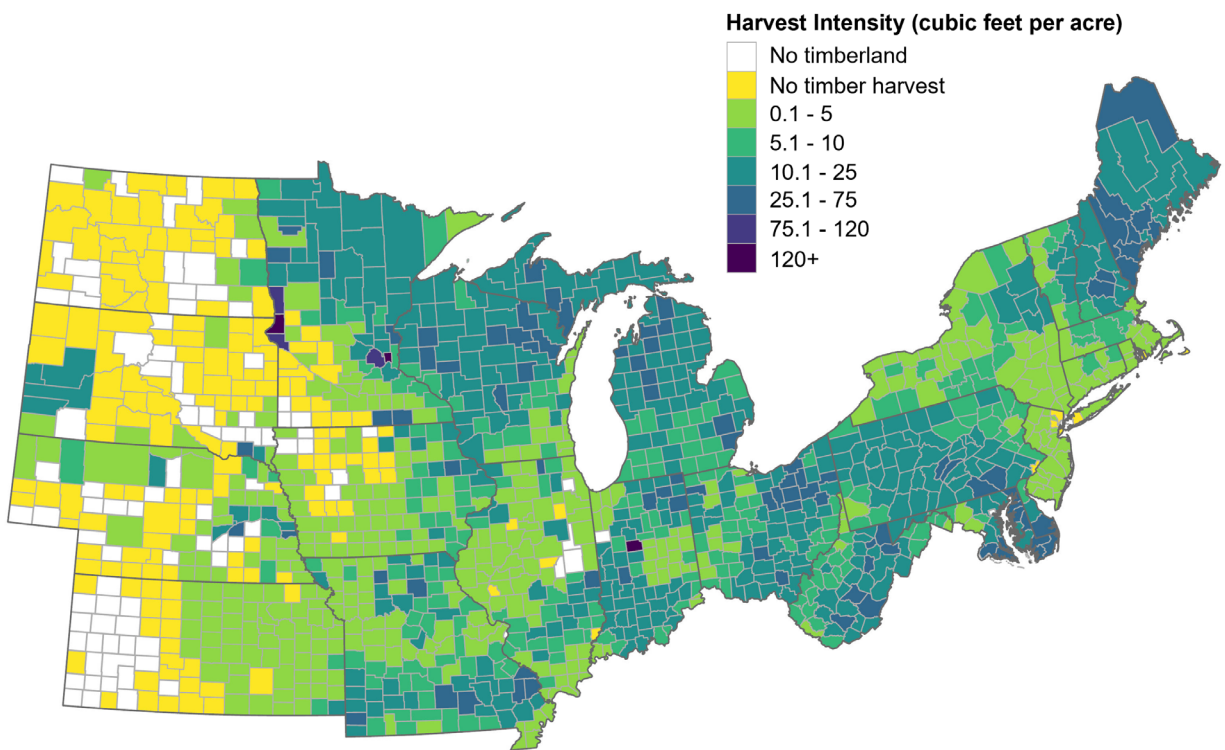


Figure 11.—Intensity of roundwood output (hardwoods and softwoods) for all industrial products for timberland, North, 2018. Source: USDA Forest Service (2023).

DATA RESOURCES

The core products from TPO 2018 include one-click fact sheets for each state summarizing key variables, an interactive reporting tool, and downloadable data at the state and county level. These products can be found at <https://research.fs.usda.gov/programs/nrum#resources>. Core summary tables at the state level and for the region are listed and linked to in Appendix 5 of this report.

CONCLUSIONS

This first annual TPO survey for the northern United States had a cooperation rate of 60 percent (927 mill responses) across 1,546 primary wood-using mills, from the population of 2,941 active mills. The data provided by these mills were used to estimate industrial roundwood production volume, residue volume, and roundwood production intensity.

- Industrial roundwood production volume in the North was an estimated 2,421.8 MMCF (millions of cubic feet). More than half of the production volume was associated with saw logs. More than 30 percent was associated with pulpwood.
- The processing of industrial roundwood in the North generated 982.6 MMCF of mill residues. Forty-two percent of the mill residues by volume were used for fuel byproducts: industrial and residential fuelwood, wood pellets, and other bioenergy products.
- Regionwide in 2018, production volume in the North occurred over 169.7 million acres of timberland, for an average of 14.3 cubic feet produced per acre of timberland. County-level harvest intensity in the region ranged from 0 cubic feet produced per acre of timberland to 1,196 cubic feet produced per acre of timberland.

GLOSSARY

Board foot Unit of measure applied to lumber that is 1.0 foot long, 1.0 foot wide, and 1.0 inch thick (or its equivalent).

Bolt A short log no more than 8.0 feet long, to be sawn for lumber, peeled or sliced for veneer, shaved for excelsior, or converted into shingles, cooperage stock, dimension stock, blocks, blanks, or other products.

Central stem The portion of a tree between a 1-foot stump and the minimum 4-inch top diameter outside bark, or point where the central stem breaks into limbs.

Coarse mill residue Wood residue suitable for chipping such as slabs, edgings, and veneer cores.

Commercial species Tree species presently or prospectively suitable for industrial wood products. (Note: Excludes species of typically small size, poor form, or inferior quality such as hophornbeam, Osage-orange, and redbud.)

Cull removals Net volume of rough and rotten trees plus the net volume in sections of the central stem of growing-stock trees that do not meet regional merchantability standards but are harvested for industrial roundwood products.

d.b.h. See **Diameter at breast height**.

Dead removals Net volume of dead trees harvested for industrial roundwood products.

Diameter at breast height (d.b.h.) The outside bark diameter at 4.5 feet above the forest floor on the uphill side of the tree. For determining breast height, the forest floor includes the duff layer that may be present but does not include unincorporated woody debris that may rise above the ground line.

Doyle rule A simple log rule or formula for estimating the board-foot volume of logs based on a 4-inch slabbing allowance to square the log. This rule is used in the eastern and southern United States.

Exports The volume of roundwood harvested in a given state utilized by primary processing facilities in another state or country (or harvested in a specified geographic area and utilized by primary wood processing facilities outside of that geographic area).

Fine mill residue Wood residue not suitable for chipping, such as sawdust and veneer clippings.

Forest land Forest land has at least 10 percent canopy cover of trees of any size, or has had at least 10-percent canopy cover of trees in the past, based on the presence of stumps, snags, or other evidence, and will be naturally or artificially regenerated. Additionally, the land is not subject to nonforest use(s) that prevent normal tree regeneration and succession, such as regular mowing, intensive grazing, or recreation activities. Forest land includes transition zones, such as areas between heavily forested and nonforested lands that are at least 10-percent canopy cover with trees and forest areas adjacent to urban and built-up lands. Also included are pinyon-juniper and chaparral areas in the West and afforested areas. The minimum area for classification of forest land is 1 acre (0.4 ha) in size and 120 feet (36.6 m) wide measured stem-to-stem from the outer-most edge. Unimproved roads and trails, streams, and clearings in forest areas are classified as forest if less than 120 feet wide. This is the domestic reporting definition which is different from the definition used in international reporting (which includes a minimum tree canopy height criteria).

Growing-stock removals The growing-stock volume removed from timberland by harvesting industrial roundwood products. (Note: Includes sawtimber removals, poletimber removals, and logging residues.)

Growing-stock tree A live timberland tree of commercial species that meets specified standards of size, quality, and merchantability. (Note: Excludes rough, rotten, and dead trees.)

Growing-stock volume Net volume of growing-stock trees 5.0 inches d.b.h. and larger, from 1.0 foot above the ground to a minimum 4.0-inch top diameter outside bark of the central stem or to the point where the central stem breaks into limbs.

Hardwoods Dicotyledonous trees, usually broad-leaved and deciduous.

Harvest residues The total net volume of unused portions of trees cut or killed by logging. (Note: Includes both logging residues and logging slash.)

Industrial fuelwood A roundwood product, with or without bark, used to generate energy or heat at manufacturing facilities and schools, correctional institutions, or electric generating plants.

Imports The volume of roundwood processed within a given state that was harvested in another state or country (or processed within a specified geographic area but harvested outside that area).

Industrial roundwood products Saw logs, pulpwood, veneer logs, poles, posts, pilings, particleboard bolts, shaving bolts, lath bolts, charcoal bolts, and chips from roundwood used for pulp, board products, or other forest products from harvested roundwood material.

International 1/4-inch rule A log rule or formula for estimating the board-foot volume of logs, allowing ½-inch of taper for each 4-foot length, and assuming a 1/4-inch of kerf. This rule is used as the USDA Forest Service standard log rule in the eastern United States.

Limbwood removals Net volume of all portions of a tree other than the central stem (including forks, large limbs, tops, and stumps) harvested for industrial roundwood products.

Logging residue The unused portion of trees cut or destroyed during logging operations.

Merchantable sections Refers to sections of the central stem of growing-stock trees that meet either pulpwood or saw log specifications.

Mill population The list of all known mills thought to be active.

Net volume Gross volume less deductions for rot, sweep, or other defects affecting use for roundwood products.

Noncommercial species Tree species of typically small size, poor form, or inferior quality that normally do not develop into trees suitable for industrial roundwood products. Noncommercial species are listed in the volume tables as rough trees.

Nonforest land Land that has never supported forests, and land formerly forested where use for timber management is precluded by development for other uses. (Note: Includes areas used for crops, active Christmas tree plantations, orchards, nurseries, improved pasture, residential areas, city parks, improved roads of any width and adjoining clearings, powerline clearings of any width, and 1- to 39.9-acre areas of water classified by the Bureau of the Census as land.) If intermingled in forest areas, unimproved roads and nonforest strips must be more than 120 feet wide and more than 1 acre to qualify as nonforest land.

Nonforest land removals Net volume of trees on nonforest lands harvested for industrial roundwood products.

Poletimber A growing-stock tree at least 5.0 inches d.b.h. but smaller than sawtimber size (9.0 inches d.b.h. for softwoods, 11.0 inches d.b.h. for hardwoods).

Poletimber removals Net volume in the merchantable central stem of poletimber trees harvested for industrial roundwood products.

Primary wood-using mills Mills that receive roundwood or chips from roundwood for processing into products such as lumber, veneer, and pulp.

Primary wood-using mill residue Wood materials (coarse and fine) and bark generated at manufacturing plants that process industrial roundwood into principal products. These residues include wood products obtained incidental to production of principal products and wood materials not utilized for some product.

Production The volume of roundwood harvested within a given state (or specified area) and transported to a processing facility; it indicates activity “in the woods” (i.e., conversion of timber stock to roundwood). Production volume consists of the amount of roundwood retained (processed within-state) and exported to other states, countries, or both for processing.

Receipts The volume of roundwood received and processed by facilities within a given state (or region). Receipt volume consists of the amount of roundwood retained within a given state plus volume imported from other states, countries, or both for processing. Unprocessed roundwood that is received by the facility and exported out of the country or transferred to another facility is excluded.

Retained The volume of roundwood harvested from and processed by facilities within a given state (or other specified area).

Rotten tree A tree that does not meet regional merchantability standards because of excessive unsound cull.

Rough tree A tree that does not meet regional merchantability standards because of excessive sound cull, including noncommercial tree species.

Roundwood Logs, bolts, or other round sections cut from trees (including chips from roundwood).

Sample The list of mills drawn from the population of mills, or sample frame, to receive the survey.

Sample frame The list of all known active mills that are used to draw the sample.

Sapling A live tree between 1.0 and 5.0 inches d.b.h.

Sapling removals Net volume in saplings harvested for industrial roundwood products.

Saw log portion That portion of the central stem of sawtimber trees between the stump and the saw log top.

Saw log top The point on the central stem of sawtimber trees above which a saw log cannot be produced. The minimum saw log top is 7.0 inches diameter outside bark for softwoods and 9.0 inches diameter outside bark for hardwoods.

Sawtimber removals Sawtimber removals refer to the net volume in the merchantable central stem of sawtimber-size trees harvested for industrial roundwood products. (Note: Includes the saw log and upper stem portions of sawtimber-size trees.) When referring to the sawtimber volume removed from timberland, sawtimber removals refer to the net volume in the saw log portion of sawtimber-size trees harvested for roundwood products or left on the ground as harvest residue and is usually expressed in thousands of board feet (International 1/4-inch rule).

Sawtimber tree A growing-stock tree containing at least a 12-foot saw log or two noncontiguous saw logs 8 feet or longer and meeting regional specifications for freedom from defect. Softwoods must be at least 9.0 inches d.b.h., and hardwoods must be at least 11.0 inches d.b.h.

Sawtimber volume Net volume in the saw log portion of sawtimber trees.

Softwoods Coniferous trees, usually evergreen, having needles or scale-like leaves.

Timber product output The volume of roundwood products produced from an area's forests.

Timberland Forest land that is producing, or is capable of producing, in excess of 20 cubic feet per acre per year of industrial roundwood products under natural conditions, is not withdrawn from timber utilization by statute or administrative regulation, and is not associated with urban or rural development.

Tree A woody perennial plant, typically large, with a single, well-defined stem carrying a more or less definite crown; sometimes defined as attaining a minimum diameter of 3 inches (7.6 centimeters) and a minimum height of 15 feet (4.6 meters) at maturity. For FIA, any plant on the tree list in the current field manual is measured as a tree.

Upper stem portion That portion of the central stem of sawtimber trees between the saw log top and the minimum top diameter of 4.0 inches outside bark, or to the point where the central stem breaks into limbs.

ACKNOWLEDGMENTS

Special thanks are given to the primary wood-using firms for supplying information for this study and to our northern States for helping us reach out to the respondents. Their cooperation is greatly appreciated.

LITERATURE CITED

- Agricultural Research, Extension, and Education Reform Act of 1998**; PL 105-185 § 253. <https://www.congress.gov/105/plaws/publ185/PLAW-105publ185.pdf> (accessed 20 February 2025).
- Butler, B.J.; Butler, S.M.; Caputo, J.; Dias, J.; Robillard, A.; Sass, E.M. 2021. **Family forest ownerships of the United States, 2018: results from the USDA Forest Service, National Woodland Owner Survey**. Gen. Tech. Rep. NRS-199. Madison, WI: U.S. Department of Agriculture, Forest Service, Northern Research Station. 52 p. <https://doi.org/10.2737/NRS-GTR-199>.
- Coulston, J.W. 2022. **Timber products output**. In: Westfall, J.A.; Coulston, J.W.; Moisen, G.G.; Andersen, H.-E., comps. Sampling and estimation documentation for the enhanced Forest Inventory and Analysis program: 2022. Gen. Tech. Rep. NRS-207. Madison, WI: U.S. Department of Agriculture, Forest Service, Northern Research Station: 50–61. Chapter 5. <https://doi.org/10.2737/NRS-GTR-207>.
- Coulston, J.W.; Westfall, J.A.; Wear, D.N.; Edgar, C.B.; Prisley, S.P.; Treiman, T.B.; Abt, R.C.; Smith, W.B. 2018. **Annual monitoring of US timber production: rationale and design**. Forest Science. 64(5): 533–543. <https://doi.org/10.1093/forsci/fxy010>.
- Dillman, D.A.; Smyth, J.D.; Christian, L.M. 2014. **Internet, phone, mail, and mixed-mode surveys: the tailored design method**. 4th ed. Hoboken, NJ: John Wiley & Sons. 528 p.
- Forest and Rangeland Renewable Resources Research Act of 1978**; PL 95-307 § 3. <https://uscode.house.gov/statutes/pl/95/307.pdf> (accessed 20 February 2025).
- Markowski-Lindsay, M.; Brandeis, C.; Butler, B.J. 2023. **USDA Forest Service Timber Products Output survey item nonresponse analysis**. Forest Science. 69(3): 321–333. <https://doi.org/10.1093/forsci/fxad003>.
- Westfall, J.A.; Coulston, J.W.; Moisen, G.G.; Andersen, H.-E., comps. 2022. **Sampling and estimation documentation for the enhanced Forest Inventory and Analysis program: 2022**. Gen. Tech. Rep. NRS-207. Madison, WI: U.S. Department of Agriculture, Forest Service, Northern Research Station. 129 p. <https://doi.org/10.2737/NRS-GTR-207>.

APPENDIX 1

USDA Forest Service, Timber Products Output Surveys Completed Across the North, 1952 to present

Table 5.—USDA Forest Service Timber Products Output surveys completed across the North, by state, year, and references for published and unpublished results

State	Years (References) ^a
Connecticut	1971 (Bones 1973a); 1984 (Nevel and Wharton 1988); 2011 (unpublished); 2016 (unpublished)
Delaware	1970 (Bones 1973b); 1985 (Nevel and Wharton, 1991; Wharton and Mullarkey 1993); 2006 (unpublished); 2011 (unpublished); 2016 (unpublished)
Illinois	1983 (Blyth, Sester, and Raile 1987); 1996 (Hackett and Sester 1998); 2003 (unpublished); 2010 (unpublished)
Indiana	1984 (Blyth, McGuire, and Smith 1987); 1990 (Hackett and Mayer 1993); 1995 (Hackett and Settle 1998); 2000 (Piva and Gallion 2003); 2005 (Piva and Gallion 2007); 2008 (Walters, Settle, and Piva 2012); 2017 (Walters, Settle, and Piva 2017)
Iowa	1972 (Blyth and Farris 1975); 1980 (Blyth, Tibben, and Smith 1984); 1988 (Smith and Tibben 1990); 1994 (Piva 1996); 2000 (Piva and Michel 2003); 2005 (Haugen and Michel 2010); 2017 (unpublished)
Kansas	1980 (Blyth, Gould, and Smith 1984); 1993 (Hackett and Strickler 1996); 1998 (Reading and Atchison 2001); 2003 (Reading and Bruton 2007); 2009 (Haugen 2013a); 2015 (unpublished)
Maine	1981 (Nevel, Lammert, and Widmann 1985); 2014 (unpublished)
Maryland	1975 (Bones and Brodie 1977); 1985 (Wharton and Mullarkey 1993); 2004 (unpublished); 2008 (Walters, Rider, and Piva 2012); 2015 (unpublished)
Massachusetts	1971 (Bones 1973a); 1984 (Nevel and Wharton 1988); 2010 (unpublished); 2017 (unpublished)

^a Although tracking of timber removal began in 1948, the earliest found report on the timber product output survey is 1952.

continued on next page

Table 5.—(continued)

State	Years (References) ^a
Michigan	1969 (Blyth and Boelter 1971); 1972 (Blyth, Boelter, and Danielson 1975); 1975 (Blyth et al. 1980); 1977 (Blyth, Zollner, and Smith 1981); 1984 (Blyth, Weatherspoon, and Smith 1988); 1988 (Smith, Weatherspoon, and Pilon 1990); 1990 (Hackett and Pilon 1993); 1990 (Hackett and Pilon 1993); 1992 (May and Pilon 1995); 1994 (Hackett and Pilon 1997); 1996 (Haugen and Pilon 2002); 1998 (Haugen and Weatherspoon 2003); 2000 (unpublished); 2004 (Haugen and Weatherspoon 2010); 2006 (Piva and Weatherspoon 2010); 2008 (Haugen et al. 2014); 2010 (Haugen 2016); 2014 (Piva and Neumann 2018); 2016 (unpublished)
Minnesota	1960 (Stone 1966); 1973 (Blyth, Wilhelm, and Hahn 1979); 1975 (Blyth et al. 1980); 1988 (Smith and Dahlman 1991); 1990 (Hackett and Dahlman 1993); 1992 (Hackett and Dahlman 1997); 1997 (Reading and Krantz 2002); 2004 (Reading and Jacobson 2008); 2007 (Haugen and Jacobson 2012); 2010 (Walters, Vongroven, and Piva 2016); 2014 (Walters, Bergstrand, and Piva 2018); 2017 (unpublished)
Missouri	1969 (Blyth and Massengale 1972); 1980 (Blyth, Jones, and Smith 1983); 1987 (Smith and Jones 1990); 1991 (Hackett, Jones, and Piva 1993); 1994 (Piva and Jones 1997); 1997 (Piva et al. 2000); 2000 (Piva and Treiman 2003); 2003 (Treiman and Piva 2005); 2006 (Treiman, Tuttle, and Piva 2008); 2009 (Piva and Treiman 2012); 2012 (unpublished); 2015 (unpublished)
Nebraska	1980 (Blyth, Wardle, and Smith 1984); 1993 (Hackett and Adams 1996); 2000 (Reading and Adams 2002); 2006 (Piva and Adams 2008); 2009 (Walters, Adams, and Piva 2012); 2014 (Haugen, Piva, and Smith 2018)
New Hampshire	1972 (Bones, Engalichev, and Gove 1974); 1982 (Nevel, Engalichev, and Gove 1986); 2009 (unpublished); 2012 (unpublished)
New Jersey	1970 (Bones 1973b); 1986 (Wharton and Mullarkey 1993); 2010 (unpublished); 2016 (unpublished)
New York	1967 (Bones and Mayer 1969); 1979 (Nevel, Sochia, and Wahl 1982); 1993 (Wharton, Martin, and Widmann 1998); 2006 (unpublished); 2009 (unpublished)
North Dakota	1993 (May and Harsel 1995); 1998 (Haugen and Harsel 2001); 2003 (Haugen and Harsel 2005); 2009 (Haugen and Harsel 2013); 2014 (Haugen and Harsel 2017)

continued on next page

Table 5.—(continued)

State	Years (References) ^a
Ohio	1952 (Hutchison and Morgan 1956); 1966 (Bones and Dickson 1969); 1973 (Bones and Redett 1976); 1978 (Nevel and Redett 1980); 1983 (Widmann and Long 1986); 1989 (Widmann and Long 1992); 2006 (Wiedenbeck and Sabula 2008)
Pennsylvania	1969 (Bones and Sherwood 1972); 1976 (Bones and Sherwood 1978); 1988 (Wharton and Bearer 1993); 2004 (Murphy, Smith, and Hansen 2008); 2012 (unpublished)
Rhode Island	1971 (Bones 1973a); 1984 (Nevel and Wharton 1988); 2010 (unpublished); 2016 (unpublished)
South Dakota	1993 (Hackett and Sowers 1996); 1999 (Piva and Josten 2003); 2004 (Piva, Josten, and Mayko 2006); 2009 (Piva and Josten 2013); 2014 (Walters, Garbisch, and Piva 2018)
Vermont	1972 (Bones, Engalichev, and Gove 1974); 1982 (Nevel, Engalichev, and Gove 1986); 2009 (unpublished); 2014 (unpublished)
West Virginia	1965 (Kingsley and Dickson 1968); 1974 (Bones and Glover 1977); 1979 (unpublished); 1987 (Widmann and Murriner 1990); 1994 (Widmann, Wharton, and Murriner 1998); 2000 (Hansen et al. 2006); 2007 (Piva and Cook 2011); 2017 (unpublished)
Wisconsin	1973 (Blyth et al. 1976); 1975 (Blyth et al. 1980); 1981 (Blyth et al. 1985); 1986 (Blyth, Whipple, and Smith 1989); 1988 (Smith and Whipple 1990); 1990 (Hackett and Whipple 1993); 1992 (Hackett and Whipple 1995); 1994 (Hackett and Whipple 1997); 1996 (Hackett, Piva, and Whipple 2002); 1999 (Reading and Whipple 2003); 2003 (Reading and Whipple 2007); 2008 (Haugen 2013b); 2013 (Haugen 2017)

REFERENCES CITED IN TABLE 5

- Blyth, J.E.; Boelter, A.H. 1971. **Primary forest products industry and industrial roundwood production, Michigan, 1969.** Resour. Bull. NC-12. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 12 p.
- Blyth, J.E.; Boelter, A.H.; Danielson, C.W. 1975. **Primary forest products industry and timber use, Michigan, 1972.** Resour. Bull. NC-24. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 45 p.
- Blyth, J.E.; Farris, W.A. 1975. **Primary forest products industry and timber use, Iowa, 1972.** Resour. Bull. NC-28. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 20 p.
- Blyth, J.E.; Gould, L.K.; Smith, W.B. 1984. **Primary forest products industry and timber use, Kansas, 1980.** Resour. Bull. NC-77. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 13 p. <https://doi.org/10.2737/NC-RB-77>.
- Blyth, J.E.; Jones, S.; Smith, W.B. 1983. **Primary forest products industry and timber use, Missouri, 1980.** Resour. Bull. NC-71. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 22 p. <https://doi.org/10.2737/NC-RB-71>.
- Blyth, J.E.; Landt, E.F.; Whipple, J.W.; Hahn, J.T. 1976. **Primary forest products industry and timber use, Wisconsin, 1973.** Resour. Bull. NC-31. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 61 p.
- Blyth, J.E.; Massengale, R. 1972. **Missouri's primary forest products output and industries, 1969.** Resour. Bull. NC-16. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 15 p.
- Blyth, J.E.; McGuire, D.H.; Smith, W.B. 1987. **Indiana timber industry—an assessment of timber product output and use.** Resour. Bull. NC-102. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 34 p. <https://doi.org/10.2737/NC-RB-102>.
- Blyth, J.E.; Sester, J.A.; Raile, G.K. 1987. **Illinois timber industry—an assessment of timber product output and use, 1983.** Resour. Bull. NC-100. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 44 p. <https://doi.org/10.2737/NC-RB-100>.
- Blyth, J.E.; Tibben, J.; Smith, W.B. 1984. **Primary forest products industry and timber use, Iowa, 1980.** Resour. Bull. NC-82. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 21 p. <https://doi.org/10.2737/NC-RB-82>.

- Blyth, J.E.; Wardle, T.D.; Smith, W.B. 1984. **Primary forest products industry and timber use, Nebraska, 1980**. Resour. Bull. NC-80. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 11 p. <https://doi.org/10.2737/NC-RB-80>.
- Blyth, J.E.; Weatherspoon, A.K.; Smith, W.B. 1988. **Michigan timber industry—an assessment of timber product output and use**. Resour. Bull. NC-109. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 55 p. <https://doi.org/10.2737/NC-RB-109>.
- Blyth, J.E.; Whipple, J.W.; Boelter, A.H.; Wilhelm, S. 1980. **Lake states primary forest industry and timber use, 1975**. Resour. Bull. NC-49. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 39 p. <https://doi.org/10.2737/NC-RB-49>.
- Blyth, J.E.; Whipple, J.W.; Mace, T.; Smith, W.B. 1985. **Wisconsin timber industry—an assessment of timber output trends**. Resour. Bull. NC-90. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 61 p. <https://doi.org/10.2737/NC-RB-90>.
- Blyth, J.E.; Whipple, J.W.; Smith, W.B. 1989. **Wisconsin timber industry—an assessment of timber product output and use**. Resour. Bull. NC-112. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 62 p. <https://doi.org/10.2737/NC-RB-112>.
- Blyth, J.E.; Wilhelm, S.; Hahn, J.T. 1979. **Primary forest products industry and timber use, Minnesota, 1973**. Resour. Bull. NC-39. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 34 p.
- Blyth, J.E.; Zollner, J.; Smith, W.B. 1981. **Primary forest products industry and timber use, Michigan, 1977**. Resour. Bull. NC-55. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 54 p. <https://doi.org/10.2737/NC-RB-55>.
- Bones, J.T. 1973a. **Primary wood-product industries of southern New England—1971**. Resour. Bull. NE-30. Upper Darby, PA: U.S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station. 16 p.
- Bones, J.T. 1973b. **The timber industries of New Jersey and Delaware**. Resour. Bull. NE-28. Upper Darby, PA: U.S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station. 17 p.
- Bones, J.T.; Brodie, J.E. 1977. **The timber industries of Maryland**. Resour. Bull. NE-52. Upper Darby, PA: U.S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station. 20 p.
- Bones, J.T.; Dickson, D.R. 1969. **Primary wood products output in Ohio—1966**. Resour. Bull. NE-18. Upper Darby, PA: U.S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station. 18 p.

- Bones, J.T.; Engalichev, N.; Gove, W.C. 1974. **The timber industries of New Hampshire and Vermont.** Resour. Bull. NE-35. Upper Darby, PA: U.S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station. 28 p.
- Bones, J.T.; Glover, R.P., Jr. 1977. **The timber industries of West Virginia.** Resour. Bull. NE-47. Upper Darby, PA: U.S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station. 16 p.
- Bones, J.T.; Mayer, C.E. 1969. **Primary wood products output in New York—1967.** Resour. Bull. NE-17. Upper Darby, PA: U.S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station. 15 p.
- Bones, J.T.; Redett, R.B. 1976. **The timber industries of Ohio.** Resour. Bull. NE-40. Upper Darby, PA: U.S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station. 26 p.
- Bones, J.T.; Sherwood, J.K., Jr. 1972. **Primary wood-product industries of Pennsylvania—1969.** Resour. Bull. NE-27. Upper Darby, PA: U.S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station. 34 p.
- Bones, J.T.; Sherwood, J.K., Jr. 1978. **Pennsylvania timber industries—a periodic assessment of timber output.** Resour. Bull. NE-59. Broomall, PA: U.S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station. 26 p.
- Hackett, R.L.; Adams, D.M. 1996. **Nebraska timber industry—an assessment of timber product output and use, 1993.** Resour. Bull. NC-177. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 35 p. <https://doi.org/10.2737/NC-RB-177>.
- Hackett, R.L.; Dahlman, R.A. 1993. **Minnesota timber industry—an assessment of timber product output and use, 1990.** Resour. Bull. NC-143. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 52 p. <https://doi.org/10.2737/NC-RB-143>.
- Hackett, R.L.; Dahlman, R.A. 1997. **Minnesota timber industry—an assessment of timber product output and use, 1992.** Resour. Bull. NC-186. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 60 p. <https://doi.org/10.2737/NC-RB-186>.
- Hackett, R.L.; Jones, S.; Piva, R.J. 1993. **Missouri timber industry—an assessment of timber product output and use, 1991.** Resour. Bull. NC-151. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 46 p. <https://doi.org/10.2737/NC-RB-151>.
- Hackett, R.L.; Mayer, R.W. 1993. **Indiana timber industry—an assessment of timber product output and use, 1990.** Resour. Bull. NC-146. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 35 p. <https://doi.org/10.2737/NC-RB-146>.

- Hackett, R.L.; Pilon, J. 1993. **Michigan timber industry—an assessment of timber product output and use, 1990**. Resour. Bull. NC-144. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 56 p. <https://doi.org/10.2737/NC-RB-144>.
- Hackett, R.L.; Pilon, J. 1997. **Michigan timber industry—an assessment of timber product output and use, 1994**. Resour. Bull. NC-189. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 66 p. <https://doi.org/10.2737/NC-RB-189>.
- Hackett, R.L.; Piva, R.J.; Whipple, J.W. 2002. **Wisconsin timber industry—an assessment of timber product output and use, 1996**. Resour. Bull. NC-201. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Research Station. 74 p. <https://doi.org/10.2737/NC-RB-201>.
- Hackett, R.L.; Sester, J.A. 1998. **Illinois timber industry—an assessment of timber product output and use, 1996**. Resour. Bull. NC-192. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 67 p. <https://doi.org/10.2737/NC-RB-192>.
- Hackett, R.L.; Settle, J. 1998. **Indiana's timber industry—an assessment of timber product output and use, 1995**. Resour. Bull. NC-193. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 76 p. <https://doi.org/10.2737/NC-RB-193>.
- Hackett, R.L.; Sowers, R.A. 1996. **South Dakota timber industry—an assessment of timber product output and use, 1993**. Resour. Bull. NC-175. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 19 p. <https://doi.org/10.2737/NC-RB-175>.
- Hackett, R.L.; Strickler, J.K. 1996. **Kansas timber industry—an assessment of timber product output and use, 1993**. Resour. Bull. NC-176. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 35 p. <https://doi.org/10.2737/NC-RB-176>.
- Hackett, R.L.; Whipple, J.W. 1993. **Wisconsin timber industry—an assessment of timber product output and use, 1990**. Resour. Bull. NC-147. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 57 p. <https://doi.org/10.2737/NC-RB-147>.
- Hackett, R.L.; Whipple, J.W. 1995. **Wisconsin timber industry—an assessment of timber product output and use**. Resour. Bull. NC-164. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 64 p. <https://doi.org/10.2737/NC-RB-164>.
- Hackett, R.L.; Whipple, J.W. 1997. **Wisconsin timber industry—an assessment of timber product output and use, 1994**. Resour. Bull. NC-187. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 73 p. <https://doi.org/10.2737/NC-RB-187>.
- Hansen, B.; Murriner, E.; Baker, I.; Akers, M. 2006. **West Virginia timber product output, 2000**. Resour. Bull. NE-165. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northeastern Research Station. 18 p. <https://doi.org/10.2737/NE-RB-165>.

- Haugen, D.E. 2013a. **Kansas timber industry: an assessment of timber product output and use, 2009.** Resour. Bull. NRS-88. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. 56 p. <https://doi.org/10.2737/NRS-RB-88>.
- Haugen, D.E. 2013b. **Wisconsin timber industry: an assessment of timber product output and use, 2008.** Resour. Bull. NRS-78. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. 110 p. <https://doi.org/10.2737/NRS-RB-78>.
- Haugen, D.E. 2016. **Michigan timber industry, 2010.** Resource Update FS-78. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. 5 p. <https://doi.org/10.2737/FS-RU-78>.
- Haugen, D.E. 2017. **Wisconsin timber industry, 2013.** Resource Update FS-125. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. 5 p. <https://doi.org/10.2737/FS-RU-125>.
- Haugen, D.E.; Harsel, R.A. 2001. **North Dakota timber industry—an assessment of timber product output and use, 1998.** Resour. Bull. NC-199. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Research Station. 16 p. <https://doi.org/10.2737/NC-RB-199>.
- Haugen, D.E.; Harsel, R.A. 2005. **North Dakota timber industry—an assessment of timber product output and use, 2003.** Resour. Bull. NC-252. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Research Station. 18 p. <https://doi.org/10.2737/NC-RB-252>.
- Haugen, D.E.; Harsel, R.A. 2013. **North Dakota timber industry: an assessment of timber product output and use, 2009.** Resour. Bull. NRS-77. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. 34 p. <https://doi.org/10.2737/NRS-RB-77>.
- Haugen, D.E.; Harsel, R.A. 2017. **North Dakota timber industry, 2014.** Resource Update FS-118. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. 5 p. <https://doi.org/10.2737/FS-RU-118>.
- Haugen, D.E.; Jacobson, K. 2012. **Minnesota timber industry: an assessment of timber product output and use, 2007.** Resour. Bull. NRS-72. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. 110 p. <https://doi.org/10.2737/NRS-RB-72>.
- Haugen, D.E.; Michel, D.D. 2010. **Iowa timber industry—an assessment of timber product output and use, 2005.** Resour. Bull. NRS-38. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. 62 p. <https://doi.org/10.2737/NRS-RB-38>.
- Haugen, D.E.; Pilon, J. 2002. **Michigan timber industry—an assessment of timber product output and use, 1996.** Resour. Bull. NC-203. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 85 p. <https://doi.org/10.2737/NC-RB-203>.

- Haugen, D.E.; Piva, R.J.; Smith, A. 2018. **Nebraska timber industry, 2014**. Resource Update FS-RU-173. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. 6 p. <https://doi.org/10.2737/FS-RU-173>.
- Haugen, D.E.; Walters, B.F.; Piva, R.J.; Neumann, D. 2014. **Michigan timber industry—an assessment of timber product output and use, 2008**. Resour. Bull. NRS-93. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. 67 p. <https://doi.org/10.2737/NRS-RB-93>.
- Haugen, D.E.; Weatherspoon, A. 2003. **Michigan timber industry—an assessment of timber product output and use, 1998**. Resour. Bull. NC-212. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Research Station. 83 p. <https://doi.org/10.2737/NC-RB-212>.
- Haugen, D.E.; Weatherspoon, A.K. 2010. **Michigan timber industry: an assessment of timber product output and use, 2004**. Resour. Bull. NRS-40. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. 91 p. <https://doi.org/10.2737/NRS-RB-40>.
- Hutchison, O.K.; Morgan, J.T. 1956. **Ohio's forests and wood-using industries**. Forest Survey Release no. 19. U.S. Department of Agriculture, Forest Service, Central States Forest Experiment Station. 40 p.
- Kingsley, N.P.; Dickson, D.R. 1968. **Timber products production in West Virginia 1965**. Resour. Bull. NE-10. Upper Darby, PA: U.S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station. 52 p.
- May, D.M.; Harsel, R. 1995. **North Dakota timber industry—an assessment of timber product output and use, 1993**. Resour. Bull. NC-161. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 14 p. <https://doi.org/10.2737/NC-RB-161>.
- May, D.M.; Pilon, J. 1995. **Michigan timber industry—an assessment of timber product output and use, 1992**. Resour. Bull. NC-162. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 64 p. <https://doi.org/10.2737/NC-RB-162>.
- Murphy, J.A.; Smith, P.M.; Hansen, B.G. 2008. **Pennsylvania roundwood purchases and movements by origin and destination**. Forest Products Journal. 58(5): 19–26.
- Nevel, R.L., Jr.; Engalichev, N.; Gove, W.C. 1986. **The timber industries of New Hampshire and Vermont: a periodic assessment of timber output**. Resour. Bull. NE-89. Broomall, PA: U.S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station. 56 p.
- Nevel, R.L., Jr.; Lammert, P.R.; Widmann, R.H. 1985. **Maine timber industries—a periodic assessment of timber output**. Resour. Bull. NE-83. Broomall, PA: U.S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station. 42 p. <https://doi.org/10.2737/NE-RB-83>.

- Nevel, R.L., Jr.; Redett, R.B. 1980. **Ohio timber industries—a periodic assessment of timber output.** Resour. Bull. NE-64. Broomall, PA: U.S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station. 33 p. <https://doi.org/10.2737/NE-RB-64>.
- Nevel, R.L., Jr.; Sochia, E.L.; Wahl, T.H. 1982. **New York Timber industries—a periodic assessment of timber output.** Resour. Bull. NE-73. Broomall, PA: U.S. Department of Agriculture, Forest Service. 30 p. <https://doi.org/10.2737/NE-RB-73>.
- Nevel, R.L., Jr.; Wharton, E.H. 1988. **The timber industries of southern New England—a periodic assessment of timber output.** Resour. Bull. NE-101. Broomall, PA: U.S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station. 28 p. <https://doi.org/10.2737/NE-RB-101>.
- Nevel, R.L., Jr.; Wharton, E.H. 1991. **The timber industries of Delaware, 1985.** Resour. Bull. NE-118. Radnor, PA: U.S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station. 28 p. <https://doi.org/10.2737/NE-RB-118>.
- Piva, R.J. 1996. **Iowa timber industry—an assessment of timber product output and use, 1994.** Resour. Bull. NC-182. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 38 p. <https://doi.org/10.2737/NC-RB-182>.
- Piva, R.J.; Adams, D.M. 2008. **Nebraska timber Industry—an assessment of timber product output and use, 2006.** Resour. Bull. NRS-28. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. 54 p. <https://doi.org/10.2737/NRS-RB-28>.
- Piva, R.J.; Cook, G.W. 2011. **West Virginia timber industry: an assessment of timber product output and use, 2007.** Resour. Bull. NRS-46. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. 58 p. <https://doi.org/10.2737/NRS-RB-46>.
- Piva, R.J.; Gallion, J. 2003. **Indiana timber industry—an assessment of timber product output and use, 2000.** Resour. Bull. NC-216. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Research Station. 109 p. <https://doi.org/10.2737/NC-RB-216>.
- Piva, R.J.; Gallion, J. 2007. **Indiana timber industry—an assessment of timber product output and use, 2005.** Resour. Bull. NRS-22. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. 106 p. <https://doi.org/10.2737/NRS-RB-22>.
- Piva, R.J.; Jones, S.G. 1997. **Missouri timber industry—an assessment of timber product output and use, 1994.** Resour. Bull. NC-184. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 54 p. <https://doi.org/10.2737/NC-RB-184>.

- Piva, R.J.; Jones, S.G.; Barnickol, L.W.; Treiman, T.B. 2000. **Missouri timber industry—an assessment of timber product output and use, 1997**. Resour. Bull. NC-197. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 53 p. <https://doi.org/10.2737/NC-RB-197>.
- Piva, R.J.; Josten, G.J. 2003. **South Dakota timber industry—an assessment of timber product output and use, 1999**. Resour. Bull. NC-213. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Research Station. 31 p. <https://doi.org/10.2737/NC-RB-213>.
- Piva, R.J.; Josten, G.J. 2013. **South Dakota timber industry: an assessment of timber product output and use, 2009**. Resour. Bull. NRS-80. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. 34 p. <https://doi.org/10.2737/NRS-RB-80>.
- Piva, R.J.; Josten, G.J.; Mayko, R.D. 2006. **South Dakota timber industry—an assessment of timber product output and use, 2004**. Resour. Bull. NC-264. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Research Station. 36 p. <https://doi.org/10.2737/NC-RB-264>.
- Piva, R.J.; Michel, D.D. 2003. **Iowa timber industry—an assessment of timber product output and use, 2000**. Resour. Bull. NC-215. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Research Station. 49 p. <https://doi.org/10.2737/NC-RB-215>.
- Piva, R.J.; Neumann, D.D. 2018. **Michigan timber Industry, 2014**. Resource Update FS-RU-169. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. 6 p. <https://doi.org/10.2737/FS-RU-169>.
- Piva, R.J.; Treiman, T.B. 2003. **Missouri timber industry—an assessment of timber product output and use, 2000**. Resour. Bull. NC-223. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Research Station. 75 p. <https://doi.org/10.2737/NC-RB-223>.
- Piva, R.J.; Treiman, T.B. 2012. **Missouri timber industry: an assessment of timber product output and use, 2009**. Resour. Bull. NRS-74. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. 88 p. <https://doi.org/10.2737/NRS-RB-74>.
- Piva, R.J.; Weatherspoon, A.K. 2010. **Michigan timber industry: an assessment of timber product output and use, 2006**. Resour. Bull. NRS-42. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. 66 p. <https://doi.org/10.2737/NRS-RB-42>.
- Reading, W.H., IV; Adams, D.M. 2002. **Nebraska timber industry—an assessment of timber product output and use, 2000**. Resour. Bull. NC-208. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Research Station. 32 p. <https://doi.org/10.2737/NC-RB-208>.

- Reading, W.H., IV; Atchison, R.L. 2001. **Kansas timber industry—an assessment of timber product output and use, 1998**. Resour. Bull. NC-200. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Research Station. 26 p. <https://doi.org/10.2737/NC-RB-200>.
- Reading, W.H., IV; Bruton, D.L. 2007. **Kansas timber industry—an assessment of timber product output and use, 2003**. Resour. Bull. NC-269. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Research Station. 72 p. <https://doi.org/10.2737/NC-RB-269>.
- Reading, W.H., IV; Jacobson, K. 2008. **Minnesota timber industry—an assessment of timber product output and use, 2004**. Resour. Bull. NRS-25. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. 74 p. <https://doi.org/10.2737/NRS-RB-25>.
- Reading, W.H., IV; Krantz, J. 2002. **Minnesota timber industry—an assessment of timber product output and use, 1997**. Resour. Bull. NC-204. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Research Station. 71 p. <https://doi.org/10.2737/NC-RB-204>.
- Reading, W.H., IV; Whipple, J.W. 2003. **Wisconsin timber industry—an assessment of timber product output and use, 1999**. Resour. Bull. NC-218. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Research Station. 91 p. <https://doi.org/10.2737/NC-RB-218>.
- Reading, W.H., IV; Whipple, J.W. 2007. **Wisconsin timber industry: an assessment of timber product output and use in 2003**. Resour. Bull. NRS-19. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. 93 p. <https://doi.org/10.2737/NRS-RB-19>.
- Smith, W.B.; Dahlman, R. 1991. **Minnesota timber industry—an assessment of timber product output and use, 1988**. Resour. Bull. NC-127. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 61 p. <https://doi.org/10.2737/NC-RB-127>.
- Smith, W.B.; Jones, S. 1990. **Missouri timber industry—an assessment of timber product output and use**. Resour. Bull. NC-120. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 51 p. <https://doi.org/10.2737/NC-RB-120>.
- Smith, W.B.; Tibben, J. 1990. **The timber industry of Iowa: an assessment of timber product output and use, 1988**. Resour. Bull. NC-126. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 26 p. <https://doi.org/10.2737/NC-RB-126>.
- Smith, W.B.; Weatherspoon, A.K.; Pilon, J. 1990. **Michigan timber industry—an assessment of timber product output and use, 1988**. Resour. Bull. NC-121. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 67 p. <https://doi.org/10.2737/NC-RB-121>.
- Smith, W.B.; Whipple, J.W. 1990. **Wisconsin timber industry—an assessment of timber product output and use, 1988**. Resour. Bull. NC-124. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 68 p. <https://doi.org/10.2737/NC-RB-124>.

- Stone, R.N. 1966. **A third look at Minnesota's timber**. Resour. Bull. NC-1. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 64 p.
- Treiman, T.B.; Piva, R.J. 2005. **Missouri timber industry—an assessment of timber product output and use, 2003**. Resour. Bull. NC-250. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Research Station. 74 p. <https://doi.org/10.2737/NC-RB-250>.
- Treiman, T.B.; Tuttle, J.G.; Piva, R.J. 2008. **Missouri timber industry—an assessment of timber product output and use, 2006**. Jefferson City, MO: Missouri Department of Conservation. 75 p.
- Walters, B.F.; Adams, D.M.; Piva, R.J. 2012. **Nebraska timber industry: an assessment of timber product output and use, 2009**. Resour. Bull. NRS-69. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. 54 p. <https://doi.org/10.2737/NRS-RB-69>.
- Walters, B.F.; Bergstrand, K.; Piva, R.J. 2018. **Minnesota timber industry, 2014**. Resource Update FS-156. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. 6 p. <https://doi.org/10.2737/FS-RU-156>.
- Walters, B.F.; Garbisch, B.; Piva, R.J. 2018. **South Dakota timber industry, 2014**. Resource Update FS-157. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. 5 p. <https://doi.org/10.2737/FS-RU-157>.
- Walters, B.F.; Rider, D.R.; Piva, R.J. 2012. **Maryland timber industry: an assessment of timber product output and use, 2008**. Resour. Bull. NRS-64. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. 52 p. <https://doi.org/10.2737/NRS-RB-64>.
- Walters, B.F.; Settle, J.; Piva, R.J. 2012. **Indiana timber industry: an assessment of timber product output and use, 2008**. Resour. Bull. NRS-63. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. 72 p. <https://doi.org/10.2737/NRS-RB-63>.
- Walters, B.F.; Settle, J.; Piva, R.J. 2017. **Indiana timber industry, 2013**. Resource Update FS-116. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. 5 p. <https://doi.org/10.2737/FS-RU-116>.
- Walters, B.F.; Vongroven, S.; Piva, R.J. 2016. **Minnesota timber industry: an assessment of timber product output and use, 2010**. Resour. Bull. NRS-101. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. 75 p. <https://doi.org/10.2737/NRS-RB-101>.
- Wharton, E.H.; Bearer, J.L. 1993. **The timber industries of Pennsylvania, 1988**. Resour. Bull. NE-130. Radnor, PA: U.S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station. 40 p. <https://doi.org/10.2737/NE-RB-130>.

- Wharton, E.H.; Martin, T.D.; Widmann, R.H. 1998. **Wood removals and timber use in New York, 1993**. Resour. Bull. NE-141. Radnor, PA: U.S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station. 28 p. <https://doi.org/10.2737/NE-RB-141>.
- Wharton, E.H.; Mullarkey, K. 1993. **Forest products industries of the southern Middle-Atlantic states, 1985–1986**. Resour. Bull. NE-129. Radnor, PA: U.S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station. 40 p. <https://doi.org/10.2737/NE-RB-129>.
- Widmann, R.H.; Long, M. 1986. **Ohio timber products output—1983**. Resour. Bull. NE-95. Broomall, PA: U.S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station. 29 p. <https://doi.org/10.2737/NE-RB-95>.
- Widmann, R.H.; Long, M. 1992. **Ohio timber product output—1989**. Resour. Bull. NE-121. Radnor, PA: U.S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station. 21 p. <https://doi.org/10.2737/NE-RB-121>.
- Widmann, R.H.; Murriner, E.C. 1990. **West Virginia timber products output—1987**. Resour. Bull. NE-115. Radnor, PA: U.S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station. 20 p. <https://doi.org/10.2737/NE-RB-115>.
- Widmann, R.H.; Wharton, E.H.; Murriner, E.C. 1998. **West Virginia timber products output: 1994**. Resour. Bull. NE-143. Radnor, PA: U.S. Department of Agriculture, Forest Service, Northeastern Research Station. 15 p. <https://doi.org/10.2737/NE-RB-143>.
- Wiedenbeck, J.; Sabula, A. 2008. **Ohio roundwood utilization by the timber industry in 2006**. Resour. Bull. NRS-32. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. 18 p. <https://doi.org/10.2737/NRS-RB-32>.

APPENDIX 2

USDA Forest Service, Timber Products Output Survey, North, 2018—Mail Survey Materials

Information Letter



United States
Department of
Agriculture

Forest
Service

Northern
Research Station

1992 Folwell Avenue
Saint Paul, MN 55108-1034
(651) 649-5000

29 January 2018

Mill Address
Mill Address
Mill Address

Dear Mill Owner/Operator,

This letter is to inform you that the Forest Inventory and Analysis (FIA) program within the USDA Forest Service is transitioning from a periodic census of primary wood-using facilities to an annual sample beginning in early in 2019.

In the U.S., Timber Product Output (TPO) monitoring has been an important program within the FIA program since 1948. The goal of this effort is to estimate the amount of roundwood removed (by product) at the county and state-level, along with the cross-regional movement of industrial roundwood. Estimates from the TPO program have provided the essential foundation for U.S. timber market analyses and projections, sustainability analyses, policy analysis, and state availability of wood resources as it pertains to potential market expansion.

Rapid technological changes in the forest product sector, mill closures and start-ups, dynamic housing cycles, and the changing demand for mill residues have increased the need for timelier mill consumption and production data. Over the last few years the FIA program has been working on methodologies to provide annual sample-based estimates of TPO to accompany its annual sample-based forest inventory estimates. The testing is mostly behind us, and over the last several months the Northern Research Station (NRS) TPO staff has been coordinating with State partners to prepare for the 2019 rollout of the enhanced TPO program.

The NRS FIA program will initiate the annual TPO sample for its entire 24-state region starting in early 2019. Your primary wood-using facility may or may not be included in the 2019 sample and/or the annual samples in the years ahead. If your facility is selected for the 2019 sample you will be receiving information from the FIA program or a State partner early in 2019.

Thank you for your cooperation in this important process. If you have any questions or would like more information on the enhanced TPO program, please contact Ron Piva at 651-649-5150 or ron.piva@usda.gov.

Sincerely,

Dennis May
NRS FIA Program Manager



Caring for the Land and Serving People



Information Postcard (front)

NATIONAL TIMBER PRODUCT SURVEY

USDA FOREST SERVICE

1992 Folwell Avenue

ST. PAUL, MN 55108

OFFICIAL BUSINESS

Information Postcard (back)



Dear Mill Operator:

Within the near future you should receive a questionnaire in the mail from the National Timber Product Survey. The survey asks questions about: location, size and type of mill, and the volume of roundwood received by species and geographic origin.

We invite you to participate in the survey by completing the questionnaire when it arrives. All responses will be held in strict confidentiality. With your help, we will be able to get a better picture of timber resources use in your state.

If you have any questions regarding the survey, please call us at 651-649-5150, write us at USDA Forest Service, FIA National Timber Product Survey, 1992 Folwell Avenue, St. Paul, MN 55108, or visit our website at www.nrs.fs.fed.us/fia/topics/tpo/.

Ronald J. Piva

Ronald J. Piva, Forester

Questionnaire Cover Letter

United States
Department of
Agriculture

Forest
Service

Northern Research Station
1992 Folwell Ave.
St. Paul, MN 55108

File Code: 4810
Date: *month day, 2019*

To: *millname*
address
City, ST zip

The US Forest Service is collecting information to create a useful picture of the forests and the forest products of *state*. We encourage you to complete the enclosed form and return it to **Ron Piva** using the enclosed self-addressed, stamped envelope by **March 15, 2019**.

Information from this survey is used to provide information on the products, species, county of harvests, and mill residues. This knowledge aids policymakers, forest managers, forest industry, and others, who evaluate trends in forest product removals, to make informed decisions about available forest resources and/or harvest intensity. States use the information to influence public perceptions and attitudes of and about forest management and timber harvesting. Report numbers detailing the variety of products and volume of products produced positively influence legislation and regulations impacting the forest industry. Those seeking specific products or product information use the report to narrow their search.

Part of the USDA Forest Service, Northern Research Station, Forest Inventory and Analysis' (NRS-FIA) mission is to provide comprehensive assessment of the past trends, current status, and future potential of the region's forest. The Timber Products Output (TPO) group conducts mill canvasses to track timber removals and their consequential impact on the forests and economies of the region. For more information about the TPO group, see: http://nrs.fs.fed.us/inventory_monitoring/inventory/tpo/

This form may be different from those you may have filled out in the past. Please read through the attached instructions and definitions of terms to help complete the form. Please contact me with any questions you may have concerning completion of the form or about the use of the final report.

Your help in making this survey as complete and as accurate as possible is greatly appreciated.

Thank you,

Ronald Piva



Ronald Piva
Forester
Forest Service
Northern Research Station

phone: 651-649-5150
fax: 651-649-5140
ron.piva@usda.gov

1992 Folwell Ave.
St. Paul, MN 55108



Caring for the land and serving people

Enclosures

Questionnaire Instructions (page 1)

Instructions for the "PRIMARY WOOD USING MILL QUESTIONNAIRE"

The following instructions are provided to help you fill out the accompanying survey form. This survey form (Primary Wood Using Mill Questionnaire) has been designed to determine: the location, size, and composition of the primary wood-using mills in your State; the volume of roundwood harvested by product, species, and geographic location; and the volume and disposition of wood residues generated during primary processing, for the calendar year indicated. Your cooperation in completing this form for your mill will make the results of this survey comprehensive, accurate, and timely. All information is held in confidentiality and used only for statistical reports. No individual mill production data will be released. Your cooperation is greatly appreciated.

Please be as accurate and complete as possible when providing information. If complete records are not available, please give your best estimates. If some questions do not apply to your operation, please skip and continue to the next item.

When reporting volume, please do not include logs or bolts sold/transferred to another primary processing plant in the U.S., or to log brokers.

ROUNDWOOD is defined as any log, bolt, or other round section (including chips from roundwood) cut from trees for industrial or consumer use. This includes saw logs, veneer logs, cooperage logs and bolts, pilings, poles, posts, hewn ties, and various other round, split, or hewn products.

Page 1 -- Section 1. Mill Information

- (Section 1.1) Fill in the mill name and parent company name (if applicable) and mailing address.
- (Section 1.2) Record the address of the actual mill location, if different from the mill's mailing address.
 - Record the name of the county in which the mill is located.
- (Section 1.3) Record the name and phone number of the owner, manager, or person that can be contacted if there are any questions concerning the information on the survey form.
- (Section 1.4) Check the box under 'Mill Type' that indicates the type of roundwood received at the mill for processing. If the mill processes more than one type of roundwood, complete a separate page 2 and page 4 for each type.
- (Section 1.5) Check the box indicating the mill status during the survey year. If no raw material was received at this mill location during the survey year, check the box indicated and please return the survey form in the enclosed envelope. No further information is needed.
- (Section 1.6) Indicate if the mill is a portable mill, the number of employees (full-time equivalents), when the mill was established, and the annual capacity and unit of measure (example - thousand board feet for saw logs or thousand pieces for posts) of the mill when operating at full capacity.
- (Section 1.7) Check the appropriate box to indicate if in-wood chips and/or tops and limb wood was received and used for boiler/hog fuel.
 - If you want the mill name and address to be withheld from 'Regional/Statewide Industry' directories please check the appropriate box.
 - Check the 'YES' box to be notified about the report resulting from this study.

Questionnaire Instructions (page 2)

Page 2 -- Section 2. Raw Material (logs/roundwood) Received and Processed at this mill in 2018

**** (This page should be completed for each 'Type of Roundwood Processed' selected in section 2.1.) ****

- (Section 2.1) Check the box under 'Type of Roundwood Processed' that indicates the type of roundwood received at the mill for processing. **If the mill processes more than one type of roundwood, complete a separate page 2 for each.**
- (Section 2.2) Enter the total volume of roundwood received at the mill for the 'Type of Roundwood Processed' checked in Section 2.1, the unit of measure, and the average log length and top diameter of logs processed at the mill. If the Unit of Measure is a weight measurement (example - green tons), please indicate the conversion factor the mill uses for pounds per board foot or pounds per cord.
- (Section 2.3) Indicate if your mill processes logs from cities or towns (urban areas). If so, indicate what percent of the reported volume in Section 2.2 came from urban areas during the survey year.
 - Indicate what percent of the reported volume in Section 2.2 came from salvaged dead trees from forest land during the survey year.
- (Section 2.4) Enter the amount or percent of each species group processed at the mill for the raw material (logs/roundwood) checked in Section 2.2.
 - At the top of the columns across the table, enter the county that the raw material (logs/roundwood) came from. Include the state and/or foreign country if material originated outside of your state.
 - Then, fill in the table by entering the amount (or percent) of each species that came from each county. If the species is not listed, enter it into the last two rows labeled 'Other' from the list of other species at the bottom of the page. The sum of each row should = 100%.
 - If you need more space, please duplicate the page.

Page 3 -- Section 3. Mill Equipment in Use and Products Produced in 2018

- (Section 3.1) Check the mill equipment found at the mill and used in the processing of logs/roundwood.
- (Section 3.2) Enter the percent of each product group for each 'Type of Roundwood Processed' in Section 2.1. Example: 50% rough/grade lumber, 25% pallets/pallet lumber 25% cants, and 100% Posts - fencing. Sums to 100% for the 'Saw logs' group and 100% for the 'Post, poles, and pilings' group.
- (Section 3.3) Enter the total amount produced for each 'Type of Roundwood Processed' in section 2.1, the unit of measure, and the percent dressed for lumber. Enter the percent of finished product exported out of the United States, if any.

Page 4 -- Section 4. Mill Residue and Mill Residue Use in 2018

**** (This page should be completed for each 'Type of Roundwood Processed' selected in section 2.1.) ****

- (Section 4.1) Check the box under 'Type of Roundwood Processed' that indicates the type of roundwood received at the mill for processing. **If the mill processes more than one type of roundwood, complete a separate page 4 for each.**
- (Section 4.2) Enter the percent for each type mill residue, by softwoods and hardwoods, and how it was disposed, whether sold, given away, or paid to dispose of. The columns should sum to 100%.
 - Only record shavings if the mill has a planer.

Questionnaire (page 1)

Forest Service, U.S. Department of Agriculture
Northern Research Station
1992 Folwell Ave.
St. Paul, MN 55108
Phone Number: (651) 649-5150; Fax: (651) 649-5140

Form Approved
OMB 0596-0010
Expires: -- 2/22/22

PRIMARY WOOD USING MILL QUESTIONNAIRE [STATE], 2018

The objective of this survey is to collect and compile quantities and types of logs received by primary wood processing mills, and the disposal of mill residues resulting from the manufacturing or processing of wood products. While you are not required to respond, your cooperation is needed to make the results of the survey comprehensive, accurate, and timely.

Please provide information as complete and accurate as possible. If complete records are not available, please give your best estimates. If some questions do not apply to your operation, please skip and continue to the form's next item.

In the volume reported, please do not include logs or bolts sold or transferred to another primary processing plant.

**INDIVIDUAL MILL INFORMATION WILL BE HELD STRICTLY CONFIDENTIAL WITH ONLY INDUSTRY DATA
SUMMARIZED AT COUNTY AND STATE LEVELS AVAILABLE.**

Public reporting burden for this collection of information is estimated to average 50 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to: Department of Agriculture, Clearance Officer, OIRM, Room 404-W, Washington, DC 20250; and to the Office of Management and Budget, Paperwork Reduction Project (OMB# 0596-0010), Washington, DC 20503.

Questionnaire (page 2)

PRIMARY WOOD USING MILL QUESTIONNAIRE [STATE], 2018

Section 1—Mill Information

1.1 Mill Name

Mailing address

(Street)

(City)

(State and Zip code)

(Phone)

(Fax)

(Company's e-mail)

Mill/Company's Website

Parent Company Name (if different from Mill Name):

Parent Company mailing address (if different from Mill):

(Street)

(City)

(State, Zip code)

1.2 Mill's physical location (if different from mailing address)

Physical address

(Street)

(City)

(State and Zip code)

County of mill

1.3 Contact information

Contact's name and title

(Contact's phone)

(Fax)

(Contact's e-mail)

1.4 Mill Type- check one (If more than one mill type at this site, please complete a separate survey form for each mill type)

☐
☐
☐
☐

Sawmill

Veneer/plywood mill

House/Cabin log mill

Industrial fuelwood/biofuels

☐
☐
☐
☐

Post mill

Pole mill

Piling mill

Miscellaneous/Other (specify) _____

☐

Roundwood/unprocessed logs
Exported out of the Country

1.5 Mill status (check)

New

☐

Active

☐

Idle

☐

Closed/Out of business

☐

Dismantled

☐

☐

Check this box if no raw material (logs/roundwood) was processed at this mill during calendar year 2018 and return the form. No further information is needed.

1.6 Mill info

Is this a portable mill?

☐

YES

☐

NO

Number of employees: _____

Year mill established: _____

Annual mill capacity (volume per year when operating at full capacity): _____

Unit of measure: _____

1.7 During calendar year 2018

Was in-woods chips, whole-tree chips &/or tops and limbwood received and used for boiler/hog fuel?

YES	NO
☐	☐
☐	☐
☐	☐
☐	☐

Would you like to omit the mill information from "Regional/Statewide Industry" Directories

Would you like to receive a copy of the report resulting from this study

Official Use Only:

State of mill (fip): _____ County of mill (fip): _____ Mill Number: _____ Latitude: _____ Longitude: _____

Interviewers Name and Title _____ Phone _____ Date of Interview _____

Interview type: mail _____ phone _____ personal contact _____ e-mail _____

Questionnaire (page 3)

Section 2—ORIGINS AND SPECIES OF ROUNDWOOD PROCESSED

2.1 Type of Roundwood Processed (check one). From Section 1.4. (Please complete a separate form for each TYPE checked.)

☐ Sawmill	☐ Industrial fuelwood/biofuels	☐ Piling mill	☐ Roundwood exported out of the United States
☐ Veneer/plywood mill	☐ Post mill	☐ Pole mill	
☐ House/cabin logs mill	☐ Pole mill	☐ Miscellaneous/other mill (Example - Shavings mill) (specify): _____	

2.2 Amount of Roundwood received and processed at the mill in 2018.

Enter the TOTAL amount of Raw Material (Logs/Roundwood) received and processed at the mill for the 'Type of Roundwood Processed' checked in 2.1 above. Amount: _____	Please Check the Unit of Measure: ☐ MBF Doyle ☐ BF Doyle ☐ MBF Scribner ☐ BF Scribner ☐ MBF International 1/4-inch rule ☐ BF International 1/4-inch rule ☐ MBF Lumber tally ☐ BF Lumber Tally	☐ Standard cord ☐ Lake States cord (100 in.) ☐ Pieces ☐ Thousand pieces ☐ Green tons ☐ Thousand cubic feet ☐ Other : (specify): _____	If Unit of measure is a weight, enter a weight conversion factor	Average Log Length (in feet)	Average Log Top Diameter (in inches)
			Softwoods _____ lbs. per MBF or _____ lbs. per cord Hardwoods _____ lbs. per MBF or _____ lbs. per cord		

2.3 Non-forest and salvage sources in 2018.

Do you process any logs from cities or towns (urban areas) at your mill? ☐ YES ☐ NO If YES, what percent of the total roundwood received was from urban wood? _____ %

What percent of the total roundwood received was from salvaged dead trees from forested areas? _____ %

2.4 Species and Origin of roundwood received at mill in 2018.

Please complete the matrix to the best of your knowledge. If you don't know the exact origin please give approximate values for the top counties within the mill's procurement zone

		Provide county name as headings for column below. If out of state or foreign origin please specify state or Country. Add additional sheets as needed.										Species total All Counties
Species Group Name	Amount or Percentage received by spp											
Cedar/juniper												100%
Loblolly/shortleaf pine												100%
Red pine												100%
White pine												100%
Jack pine												100%
Other pines												100%
Ash												100%
Beech												100%
Black walnut												100%
Black cherry												100%
Cottonwood												100%
Elm												100%
Hickory												100%
Hard maple												100%
Soft maple												100%
Red oak group												100%
White oak group												100%
Sycamore												100%
Yellow-poplar												100%
Other: from list below												100%
Other: from list below												100%

Other species

Cypress	Longleaf/slash pine	Spruce	Tamarack	Aspen/poplar spp.	Yellow birch	Sweetgum	Other softwoods not listed
Balsam fir	Ponderosa/Jeffrey pine	Hemlock	Basswood	White/paper birch	Other birch	Tupelo/blackgum	Other hardwoods not listed

Questionnaire (page 4)

Section 3—Mill equipment, products produced, production amounts, and boiler/hog fuel, amounts.

3.1 Check type of equipment in use.

Headsaw

☐ Band saw
☐ Circular saw
☐ Scragg sawmill
☐ Gang sawmill
☐ Chip-N-Saw

Veneer

☐ Sliced veneer equipment
☐ Peeled veneer equipment
☐ Other - please specify
 Specify: _____

Other

☐ Chipper
☐ Planer
☐ Edger

Other

☐ Debarker
☐ Splitter
☐ Dry kiln
☐ Treating equipment
☐ Chip Canter
☐ Post/Pole Peeler
☐ Shaving machine

Other

☐ Hammer mill
☐ Firewood Processor
☐ Wood-fired boiler
☐ Optimizer equipment
☐ Machine stress-rating
☐ Other - please specify
 Specify: _____

Resaw

☐ Band saw
☐ Circular saw

3.2 Products produced from logs received in 2018.

Enter the percent of the total for each group of products produced from logs, or chipped logs.

Saw logs

☐ % Rough/grade lumber
☐ % Dimension or stud lumber
☐ % Molding or trim
☐ % Siding
☐ % Pallets/pallet lumber
☐ % Timbers/supports
☐ % Ties (railroad ties)
☐ % Landscape timbers
☐ % Furniture stock
☐ % Crane mats
☐ % Lath/stakes
☐ % Cants
☐ % Flooring
☐ % Blocking/dunnage
☐ % Tight stave/cooperage
☐ % Slack stave/cooperage
☐ % Other sawn products -
 Specify: _____

Veneer logs

☐ % Sheathing
☐ % Plywood
☐ % Boxes
☐ % Veneer/Face veneer
☐ % Other veneer -
 Specify: _____

House/cabin logs

☐ % Cabins/house logs
☐ % Sawn house logs
☐ % Turned house logs
☐ % Hand-peeled house logs
☐ % Trusses and other house log products
☐ % Other House/cabin logs-
 Specify: _____

Bioenergy/Fuelwood

☐ % Industrial fuelwood (co-gen, steam, etc)
☐ % Industrial fuelwood - electricity/power
☐ % Industrial fuelwood - heat/steam
☐ % Pellets - Residential grade
☐ % Pellets/briquettes - Industrial grade
☐ % Pellets - Torrefied
☐ % Pellets - other (please specify)
 Specify: _____
☐ % Pressed/reconstituted logs (Presto)
☐ % Liquid fuels - Ethanol
☐ % Liquid fuels - Other (aviation fuel, etc)
☐ % Other energy products -
 Specify: _____

Post, poles, and pilings

☐ % Pilings
☐ % Poles-utility
☐ % Poles-other
☐ % Posts-fencing
☐ % Posts-other
☐ % Round railings
☐ % Grape stakes
☐ % Log furniture
☐ % Other post, pole, piling product
 Specify: _____

Other miscellaneous products

☐ % Mulch, soil additives, compost
☐ % Chemical extractives
☐ % Split rail fencing
☐ % Shingles/shakes
☐ % Shavings/excelsior
☐ % Handles/blanks
☐ % Dowels/blanks
☐ % Novelty
☐ % Foreign Export logs
☐ % Other -
 Specify: _____

3.3 Volume of product produced from Raw Material (Logs/Roundwood) Processed in 2018.

Please enter amount of mill product produced from each type of RAW MATERIAL (Logs/roundwood) by softwoods and hardwoods.

Product Produced	Softwoods			Hardwoods		
	Amount	Unit of Measure (codes below)	Percent Dressed/ Planed (If sawn product)	Amount	Unit of Measure (codes below)	Percent Dressed/ Planed (If sawn product)
Saw log products						
Veneer log products						
House logs						
Industrial fuelwood						
Posts, poles, and pilings						
Other - (Ex. Shavings)						

Units of Measure

16 - Lumber Tally (MBF)

61 - Pieces

71 - Square Feet

99 - Other (specify): _____

Percent of finished product exported out of the United States: _____ %.

Questionnaire (page 5)

Section 4—MILL RESIDUE GENERATED and DISPOSITION

NOTE: Complete a separate Section 4 for each 'Type of Roundwood Processed' checked in Section 1.4, except for logs exported out of the United States. Section 4 does not need to be completed for logs exported out of the United States.

4.1 Type of Roundwood Processed (check one). From Section 1.4.

- | | | |
|--|--|---|
| ☐ Saw logs | ☐ Industrial fuelwood | ☐ Pilings |
| ☐ Veneer/plywood logs | ☐ Poles | ☐ Miscellaneous/other mill (Example - Shavings mill) |
| ☐ House/ cabin logs | ☐ Posts | |

4.2 Disposal of mill residues in 2018

Instructions: For each type of wood residue generated at your mill, enter the percentage that was disposed of by the various means. Each column should sum to 100% for each species group recorded.

Disposal of Mill Residues	BARK		COARSE (chips, slabs, edgings, trims, cores, etc.)		FINE Shavings (Planer or Lathe)				CULL LOGS/SHORT SECTIONS	
	Softwood %	Hardwood %	Softwood %	Hardwood %	Softwood %	Hardwood %	Softwood %	Hardwood %	Softwood %	Hardwood %
Manufacture of fiber/composite products										
Small dimension and other sawn products										
Charcoal or chemical wood										
Industrial fuel at this plant (on-site)										
Industrial fuel at other plants										
Bio-energy pellets										
Other Bio-energy products (biodiesel, etc)										
Residential fuelwood										
Mulch/Soil additive (includes biochar)										
Animal bedding										
Other misc. uses- please specify:										
NOT USED (land fill, burned, etc.)										
TOTAL	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Section 5.1—Volume of hog fuel/industrial fuelwood received in 2018.

If you answered yes to the in-wood chips question (page 1, item 1.6), please provide the volume received in 2018

Origin of byproduct State or foreign country	ST code	Boiler/hog fuel volume	
		Softwood	Hardwood

Check the unit of Measure
(only one)

Dry tons
Green tons
Thousand cu. ft.
Other (specify):

Reminder/Thank You Postcard (front)

NATIONAL TIMBER PRODUCT SURVEY
USDA FOREST SERVICE
1992 Folwell Avenue
ST. PAUL, MN 55108

OFFICIAL BUSINESS

Reminder/Thank You Postcard (back)



Dear Mill owner:

A few weeks ago, a questionnaire regarding your mill operations was mailed to you by the National Timber Product Survey. Your participation in the survey helps us to get a better picture of timber resource use in your state.

If you have already completed and returned the questionnaire, please accept our sincere thanks. If not, we ask that you please do so today.

If you did not receive a questionnaire, or if you need us to send you another copy, please call us at 651-649-5137.

David E. Haugen

David E. Haugen, Forester

APPENDIX 3

USDA Forest Service, Timber Products Output Survey, North, 2018—Nonrespondent Telephone Script

Enter mill name:

Hello, may speak with <Name> or (if no name) the manager of the mill?

If mill manager isn't there: Is there a better time to call back?

Or leave a message and give this number 1-800-233-3372.

If manager doesn't work there anymore: Is there someone I can talk to who is familiar with mill operations?

Hello! My name is <your name> calling on behalf of the USDA Forest Service. I am following up on the Timber Output Products survey we sent to you in the spring of 2019.

Pause

I was wondering if you had 10 minutes to answer a subset of the questions from the Timber Products Output survey.

Pause

Your responses are completely confidential and are extremely important. Your mill is only one of a few selected for this survey. Data will be summarized at county and state levels, such that individual mill responses will be unidentifiable. Your participation is completely voluntary and much appreciated!

Q1: Before we begin with the questions, would you like to omit the mill contact information from regional and statewide industry directories?

Yes

No

Q2: This is the address we have for you (find mill name on spreadsheet). Is this correct?

Yes

No

If Q2=No, Q2A: What is the correct address?

Q3: Is this the actual mill location?

Yes

No

If Q3=No, Q3A: What is the physical address of the mill?

Q4: Did your mill process wood last year?

Yes

No

If Q4=Yes, go to Q5.

If Q4=No, Q4A: What was the last year your mill processed wood?

Q4B: Please choose one of these options to describe the status of your mill. Choose only one:

Mill is idle and you plan to saw again

Mill is closed or out of business, but the mill is still on site and can be restarted

Mill has been dismantled, moved, or is otherwise unoperational

Thank you for your time. Go to Question 30.

Q5: What type of mill is this? Check all that apply.

Sawmill

Veneer/plywood mill

House/cabin mill

Industrial fuelwood/biofuel mill

Post mill

Pole mill

Piling mill

Other:

Q6: Is this a portable mill?

Yes

No

Q7: What was the number of employees at this mill, in full time equivalents during 2018?

Q8: What is the total annual capacity of your mill in running full time in a calendar year? Check all that apply.

If they choose other, write units after (mill type).

Units					
	Thousand board feet	Green tons	Standard cord	Thousand piece	Other
Annual capacity (mill type 1)					
Annual capacity (mill type 2)					
Annual capacity (mill type 3)					
Annual capacity (mill type 4)					

Q9: How much wood was put through the mill in 2018? Please do not include any unprocessed logs that were sent to other mills or exported out of the United States.

Units								
	Thousand board feet	Doyle	Scribner	International quarter inch	Lumber tally	Standard cord	Green tons	Other
Amount of wood processed in 2018 (mill type 1)								
Amount of wood processed in 2018 (mill type 2)								
Amount of wood processed in 2018 (mill type 3)								
Amount of wood processed in 2018 (mill type 4)								

Q10: What is the average log length, in feet, processed at the mill?

Q11: What is the average top diameter of the logs, in inches, processed at the mill?

Q12: What species did you process at the mill in 2018?

Species	Put an X in this column if species processed	What percent would each species account for your production during the year?
Cedar/juniper		
Balsam fir		
Hemlock		
Red pine		
White pine		
Jack pine		
Other pines		
Spruce		
Tamarack		
Ash		
Aspen/balsam poplar		
Basswood		
White/paper birch		
Yellow birch		
Black cherry		
Black walnut		
Cottonwood		
Elm		
Hard maple		
Soft maple		
Hickory		
Red oak group		
White oak group		
Other1		
Other2		
Other3		

Q13: Did all of the wood processed by the mill in 2018 come from (say mill state)

Yes

I don't know

No

Now I would like to ask about what counties wood came from.

Q14: What percentage or amount by county did the processed wood come from in that state?
Please name the county and amount or percentage.

	County name	Amount/%	Units
County 1			
County 2			
County 3			
County 4			
County 5			
County 6			
County 7			
County 8			

Q15: Of the wood that came from your home state, could you please tell me the county name and what amount or percentage by county processed wood came from?

	County name	Amount/%	Units
County 1			
County 2			
County 3			
County 4			
County 5			

Q16: What other states did wood processed in the mill come from? Can you please tell me the percentage or amount by state and the county if you know it? Use if some wood came from home state and some from other states.

	State name	County	Amount/%	Units
State 1				
State 2				
State 3				
State 4				
State 5				
State 6				
State 7				
State 8				

Q17: What is the normal procurement radius?

Q18: Did any of the wood processed came from cities or towns or urban areas?

Yes

I don't know

No

If Q18=No, go to Q19

If Q18=Yes, Q18A: What percentage of the wood processed came from urban areas?

	Amount/%	Units if amount
MillType 1 Amount/%		
MillType 2 Amount/%		
MillType 3 Amount/%		
MillType 4 Amount/%		

Q19: Did any of the wood processed in the mill come from salvaged/dead trees from forest lands?

Yes

I don't know

No

If Q19=No or I don't know, go to Q20

If Q19=Yes, Q19A: What percentage of the wood processed in your mill came from salvaged/dead trees?

	Amount/%	Units if amount
MillType 1 Amount/%		
MillType 2 Amount/%		
MillType 3 Amount/%		
MillType 4 Amount/%		

Q20: Did you export any unprocessed logs out of the United States in 2018?

Yes

I don't know

No

If Q20=No or I don't know, go to Q21

If Q20=Yes, Q20A: What species were exported out of the country in 2018?

Species	Put an X in this column if species processed	What percent would each species account for your production during the year?
Cedar/juniper		
Balsam fir		
Hemlock		
Red pine		
White pine		
Jack pine		
Other pines		
Spruce		
Tamarack		
Ash		
Aspen/balsam poplar		
Basswood		
White/paper birch		
Yellow birch		
Black cherry		
Black walnut		
Cottonwood		
Elm		
Hard maple		
Soft maple		
Hickory		
Red oak group		

Q20: (cont.)

Species	Put an X in this column if species processed	What percent would each species account for your production during the year?
White oak group		
Other1		
Other2		
Other3		

Q21: What type of head rig do you use at your mill?

Circular saw

Band saw

Scragg saw

Other:

Q22: Do you have a resaw?

Yes

I don't know

No

If Q22=No or I don't know, go to Q23

If Q22=Yes, Q22A: What type of resaw is it?

Circular saw

Band saw

Other:

Q23: What other equipment does the mill have? Check all that apply.

Debarker

Edger

Planer

Wood-fired boiler

Dry Kiln

Firewood processor

Other:

Q24: What was produced at the mill during 2018? Check all that apply.

Rough grade lumber

Pallets or pallet lumber

Railroad ties

Other:

Other2:

Other3:

Other4:

Q25: Do you ship any products out of the country?

Yes

I don't know

No

If Q25=No or I don't know, go to Q26

If Q25=Yes, Q25A: What percentage of the total volume of production is shipped out of the country?

Q26: What do you do with your bark residues? Please say a percentage for each category.

Residue use	Percentage
Stays on slabs	
Mulch	
Burned for heat/power at the mill	
Burned for heat/power at another mill	
Animal bedding	
Not used; for example, left on site, land filled, or burned as waste	
Other1	
Other2	

Q27: What do you do with your coarse or slab residues? Please say a percentage for each category.

Residue use	Percentage
Fiber/pulp/ composite products	
Residential fuelwood or firewood	
Heat/power at this mill	
Heat/power at another mill	
Pellets	
Mulch	
Not used; for example, left on site, land filled, or burned as waste	
Other1	
Other2	

Q28: What do you do with your sawdust, shavings, and fine residues? Please say a percentage for each category.

Residue use	Percentage
Fiber/pulp/composite products	
Heat/power at this mill	
Heat/power at another mill	
Pellets	
Animal bedding	
Mulch	
Not used; for example, left on site, land filled, or burned as waste	
Other1	
Other2	

Q29: Did you receive any logging residues or whole tree chips (not mill residues) at the mill that was used for boiler/hog fuel?

Yes

I don't know

No

Q30: Would you like the results of this survey?

Yes

No

If Q30=No. Thank you for your time. End survey.

If Q30=Yes, Q30A: Where should we send the results?

The address we spoke of before

Email

Different address

If Q30A=The address we spoke of before, Thank you for your time. End survey.

If Q30A=Email, Q30B: What is your email address?

Email address:

Thank you for your time. End survey.

If Q30A=Different address, Q30B: What is the address to send the results?

Different address:

Thank you for your time. End survey.

APPENDIX 4

USDA Forest Service, Timber Products Output Survey, North, 2019—Nonresponse Summary

Almost all surveys have levels of nonresponse, or missingness, associated with either the unit (i.e., the respondent or mill) or item (i.e., question). Missingness can be analyzed at the unit level (i.e., mills that fail to respond to the survey at all), the respondent level (i.e., respondents that complete a subset of the questions they were supposed to answer), or at the question level (i.e., the percentage of valid responses to a specific question) (Butler et al. 2021). We refer to unit-level missingness as cooperation rate and respondent-level and question-level missingness together as item nonresponse. Both types of nonresponse occurred with the 2018 TPO survey, with cooperation rate percentage varying by state which ranged from 0 percent in Rhode Island and 9 percent in Connecticut to 89 percent in Delaware and 92 percent in Michigan and 93 percent in Minnesota.

Although we did not analyze factors influencing nonresponse for the 2018 TPO survey report, we acknowledge a potential for estimation bias associated with the nonresponse. We plan to incorporate nonresponse analysis in future iterations of the survey.

For illustrative purposes, in this Appendix we discuss the item nonresponse analysis we conducted for the 2019 TPO survey. The results of that analysis (Markowski-Lindsay et al. 2023) are indicative of what would have been expected in the 2018 data because the data collection, coding, and processing were consistent between the two survey years. The 2019 TPO survey data were evaluated for respondent-level and question-level nonresponse and involved the following steps:

- The 2019 survey question data were re-coded in a new dataframe to track whether each respondent answered the question. First, each question was determined to be either a qualifying or nonqualifying question for a given mill. A qualifying question is one that should have an answer; a nonqualifying question is one that is not required to be answered by the mill because of the survey skip pattern or because the question was never asked.
- The respondent-level nonresponse was calculated for each mill. Respondent-level nonresponse is defined as the ratio of the number of qualifying questions left unanswered by the mill (i.e., nonresponses) by the total number of qualifying questions that should have been answered. The average respondent-level nonresponse is the sum of the individual respondent-level nonresponses divided by the total number of mills.

- The question-level nonresponse was calculated for each question. Question-level nonresponse is defined as the ratio of the number of times that a valid response is not provided for qualifying question by the number of mills for whom that question should have been answered.
- Analysis of the respondent-level nonresponse for the 2019 data indicated that there was greater nonresponse for questions related to mill activity (i.e., product, species, location) compared to questions related to mill profile (i.e., location, size). In addition, survey mode (i.e., mail versus phone) significantly impacted nonresponse; phone surveys had greater response than mail surveys.

APPENDIX 5

USDA Forest Service Timber Products Output Survey, North, 2018—Industrial Roundwood Production and Residues Summary Tables

Appendix 5 consists of folders that provide data tables for the North and by state. All tables are in html format and can be accessed from the link found on the Treearch landing page for this publication: <https://doi.org/10.2737/NRS-GTR-234>.

NORTH

Table NORTH-1.—Number of primary wood processing facilities by mill type, North, 2018

Table NORTH-2.—Volume of industrial roundwood in thousand cubic feet (MCF) by wood movement and roundwood type, North, 2018

Table NORTH-3.—Volume of industrial roundwood in thousand cubic feet (MCF) by wood movement and hardwoods/softwoods, North, 2018

Table NORTH-4.—Volume of industrial roundwood production in thousand cubic feet (MCF) by product type and hardwoods/softwoods, North, 2018

Table NORTH-5.—Volume of industrial roundwood production in thousand cubic feet (MCF) by species group and hardwoods/softwoods, North, 2018

Table NORTH-6.—Volume of mill residues in thousand cubic feet (MCF) by residue type and hardwoods/softwoods, North, 2018

Table NORTH-7.—Volume of mill residues in thousand cubic feet (MCF) by residue disposition and hardwoods/softwoods, North, 2018

CT (Connecticut)

Table CT-1.—Number of primary wood processing facilities by mill type, Connecticut, 2018

Table CT-2.—Volume of industrial roundwood in thousand cubic feet (MCF) by wood movement and roundwood type, Connecticut, 2018

Table CT-3.—Volume of industrial roundwood in thousand cubic feet (MCF) by wood movement and hardwoods/softwoods, Connecticut, 2018

Table CT-4.—Volume of industrial roundwood production in thousand cubic feet (MCF) by product type and hardwoods/softwoods, Connecticut, 2018

Table CT-5.—Volume of industrial roundwood production in thousand cubic feet (MCF) by species group and hardwoods/softwoods, Connecticut, 2018

Table CT-6.—Volume of mill residues in thousand cubic feet (MCF) by residue type and hardwoods/softwoods, Connecticut, 2018

Table CT-7.—Volume of mill residues in thousand cubic feet (MCF) by residue disposition and hardwoods/softwoods, Connecticut, 2018

DE (Delaware)

Table DE-1.—Number of primary wood processing facilities by mill type, Delaware, 2018

Table DE-2.—Volume of industrial roundwood in thousand cubic feet (MCF) by wood movement and roundwood type, Delaware, 2018

Table DE-3.—Volume of industrial roundwood in thousand cubic feet (MCF) by wood movement and hardwoods/softwoods, Delaware, 2018

Table DE-4.—Volume of industrial roundwood production in thousand cubic feet (MCF) by product type and hardwoods/softwoods, Delaware, 2018

Table DE-5.—Volume of industrial roundwood production in thousand cubic feet (MCF) by species group and hardwoods/softwoods, Delaware, 2018

Table DE-6.—Volume of mill residues in thousand cubic feet (MCF) by residue type and hardwoods/softwoods, Delaware, 2018

Table DE-7.—Volume of mill residues in thousand cubic feet (MCF) by residue disposition and hardwoods/softwoods, Delaware, 2018

IA (Iowa)

Table IA-1.—Number of primary wood processing facilities by mill type, Iowa, 2018

Table IA-2.—Volume of industrial roundwood in thousand cubic feet (MCF) by wood movement and roundwood type, Iowa, 2018

Table IA-3.—Volume of industrial roundwood in thousand cubic feet (MCF) by wood movement and hardwoods/softwoods, Iowa, 2018

Table IA-4.—Volume of industrial roundwood production in thousand cubic feet (MCF) by product type and hardwoods/softwoods, Iowa, 2018

Table IA-5.—Volume of industrial roundwood production in thousand cubic feet (MCF) by species group and hardwoods/softwoods, Iowa, 2018

Table IA-6.—Volume of mill residues in thousand cubic feet (MCF) by residue type and hardwoods/softwoods, Iowa, 2018

Table IA-7.—Volume of mill residues in thousand cubic feet (MCF) by residue disposition and hardwoods/softwoods, Iowa, 2018

IL (Illinois)

Table IL-1.—Number of primary wood processing facilities by mill type, Illinois, 2018

Table IL-2.—Volume of industrial roundwood in thousand cubic feet (MCF) by wood movement and roundwood type, Illinois, 2018

Table IL-3.—Volume of industrial roundwood in thousand cubic feet (MCF) by wood movement and hardwoods/softwoods, Illinois, 2018

Table IL-4.—Volume of industrial roundwood production in thousand cubic feet (MCF) by product type and hardwoods/softwoods, Illinois, 2018

Table IL-5.—Volume of industrial roundwood production in thousand cubic feet (MCF) by species group and hardwoods/softwoods, Illinois, 2018

Table IL-6.—Volume of mill residues in thousand cubic feet (MCF) by residue type and hardwoods/softwoods, Illinois, 2018

Table IL-7.—Volume of mill residues in thousand cubic feet (MCF) by residue disposition and hardwoods/softwoods, Illinois, 2018

IN (Indiana)

Table IN-1.—Number of primary wood processing facilities by mill type, Indiana, 2018

Table IN-2.—Volume of industrial roundwood in thousand cubic feet (MCF) by wood movement and roundwood type, Indiana, 2018

Table IN-3.—Volume of industrial roundwood in thousand cubic feet (MCF) by wood movement and hardwoods/softwoods, Indiana, 2018

Table IN-4.—Volume of industrial roundwood production in thousand cubic feet (MCF) by product type and hardwoods/softwoods, Indiana, 2018

Table IN-5.—Volume of industrial roundwood production in thousand cubic feet (MCF) by species group and hardwoods/softwoods, Indiana, 2018

Table IN-6.—Volume of mill residues in thousand cubic feet (MCF) by residue type and hardwoods/softwoods, Indiana, 2018

Table IN-7.—Volume of mill residues in thousand cubic feet (MCF) by residue disposition and hardwoods/softwoods, Indiana, 2018

KS (Kansas)

Table KS-1.—Number of primary wood processing facilities by mill type, Kansas, 2018

Table KS-2.—Volume of industrial roundwood in thousand cubic feet (MCF) by wood movement and roundwood type, Kansas, 2018

Table KS-3.—Volume of industrial roundwood in thousand cubic feet (MCF) by wood movement and hardwoods/softwoods, Kansas, 2018

Table KS-4.—Volume of industrial roundwood production in thousand cubic feet (MCF) by product type and hardwoods/softwoods, Kansas, 2018

Table KS-5.—Volume of industrial roundwood production in thousand cubic feet (MCF) by species group and hardwoods/softwoods, Kansas, 2018

Table KS-6.—Volume of mill residues in thousand cubic feet (MCF) by residue type and hardwoods/softwoods, Kansas, 2018

Table KS-7.—Volume of mill residues in thousand cubic feet (MCF) by residue disposition and hardwoods/softwoods, Kansas, 2018

MA (Massachusetts)

Table MA-1.—Number of primary wood processing facilities by mill type, Massachusetts, 2018

Table MA-2.—Volume of industrial roundwood in thousand cubic feet (MCF) by wood movement and roundwood type, Massachusetts, 2018

Table MA-3.—Volume of industrial roundwood in thousand cubic feet (MCF) by wood movement and hardwoods/softwoods, Massachusetts, 2018

Table MA-4.—Volume of industrial roundwood production in thousand cubic feet (MCF) by product type and hardwoods/softwoods, Massachusetts, 2018

Table MA-5.—Volume of industrial roundwood production in thousand cubic feet (MCF) by species group and hardwoods/softwoods, Massachusetts, 2018

Table MA-6.—Volume of mill residues in thousand cubic feet (MCF) by residue type and hardwoods/softwoods, Massachusetts, 2018

Table MA-7.—Volume of mill residues in thousand cubic feet (MCF) by residue disposition and hardwoods/softwoods, Massachusetts, 2018

MD (Maryland)

Table MD-1.—Number of primary wood processing facilities by mill type, Maryland, 2018

Table MD-2.—Volume of industrial roundwood in thousand cubic feet (MCF) by wood movement and roundwood type, Maryland, 2018

Table MD-3.—Volume of industrial roundwood in thousand cubic feet (MCF) by wood movement and hardwoods/softwoods, Maryland, 2018

Table MD-4.—Volume of industrial roundwood production in thousand cubic feet (MCF) by product type and hardwoods/softwoods, Maryland, 2018

Table MD-5.—Volume of industrial roundwood production in thousand cubic feet (MCF) by species group and hardwoods/softwoods, Maryland, 2018

Table MD-6.—Volume of mill residues in thousand cubic feet (MCF) by residue type and hardwoods/softwoods, Maryland, 2018

Table MD-7.—Volume of mill residues in thousand cubic feet (MCF) by residue disposition and hardwoods/softwoods, Maryland, 2018

ME (Maine)

Table ME-1.—Number of primary wood processing facilities by mill type, Maine, 2018

Table ME-2.—Volume of industrial roundwood in thousand cubic feet (MCF) by wood movement and roundwood type, Maine, 2018

Table ME-3.—Volume of industrial roundwood in thousand cubic feet (MCF) by wood movement and hardwoods/softwoods, Maine, 2018

Table ME-4.—Volume of industrial roundwood production in thousand cubic feet (MCF) by product type and hardwoods/softwoods, Maine, 2018

Table ME-5.—Volume of industrial roundwood production in thousand cubic feet (MCF) by species group and hardwoods/softwoods, Maine, 2018

Table ME-6.—Volume of mill residues in thousand cubic feet (MCF) by residue type and hardwoods/softwoods, Maine, 2018

Table ME-7.—Volume of mill residues in thousand cubic feet (MCF) by residue disposition and hardwoods/softwoods, Maine, 2018

MI (Michigan)

Table MI-1.—Number of primary wood processing facilities by mill type, Michigan, 2018

Table MI-2.—Volume of industrial roundwood in thousand cubic feet (MCF) by wood movement and roundwood type, Michigan, 2018

Table MI-3.—Volume of industrial roundwood in thousand cubic feet (MCF) by wood movement and hardwoods/softwoods, Michigan, 2018

Table MI-4.—Volume of industrial roundwood production in thousand cubic feet (MCF) by product type and hardwoods/softwoods, Michigan, 2018

Table MI-5.—Volume of industrial roundwood production in thousand cubic feet (MCF) by species group and hardwoods/softwoods, Michigan, 2018

Table MI-6.—Volume of mill residues in thousand cubic feet (MCF) by residue type and hardwoods/softwoods, Michigan, 2018

Table MI-7.—Volume of mill residues in thousand cubic feet (MCF) by residue disposition and hardwoods/softwoods, Michigan, 2018

MN (Minnesota)

Table MN-1.—Number of primary wood processing facilities by mill type, Minnesota, 2018

Table MN-2.—Volume of industrial roundwood in thousand cubic feet (MCF) by wood movement and roundwood type, Minnesota, 2018

Table MN-3.—Volume of industrial roundwood in thousand cubic feet (MCF) by wood movement and hardwoods/softwoods, Minnesota, 2018

Table MN-4.—Volume of industrial roundwood production in thousand cubic feet (MCF) by product type and hardwoods/softwoods, Minnesota, 2018

Table MN-5.—Volume of industrial roundwood production in thousand cubic feet (MCF) by species group and hardwoods/softwoods, Minnesota, 2018

Table MN-6.—Volume of mill residues in thousand cubic feet (MCF) by residue type and hardwoods/softwoods, Minnesota, 2018

Table MN-7.—Volume of mill residues in thousand cubic feet (MCF) by residue disposition and hardwoods/softwoods, Minnesota, 2018

MO (Missouri)

Table MO-1.—Number of primary wood processing facilities by mill type, Missouri, 2018

Table MO-2.—Volume of industrial roundwood in thousand cubic feet (MCF) by wood movement and roundwood type, Missouri, 2018

Table MO-3.—Volume of industrial roundwood in thousand cubic feet (MCF) by wood movement and hardwoods/softwoods, Missouri, 2018

Table MO-4.—Volume of industrial roundwood production in thousand cubic feet (MCF) by product type and hardwoods/softwoods, Missouri, 2018

Table MO-5.—Volume of industrial roundwood production in thousand cubic feet (MCF) by species group and hardwoods/softwoods, Missouri, 2018

Table MO-6.—Volume of mill residues in thousand cubic feet (MCF) by residue type and hardwoods/softwoods, Missouri, 2018

Table MO-7.—Volume of mill residues in thousand cubic feet (MCF) by residue disposition and hardwoods/softwoods, Missouri, 2018

ND (North Dakota)

Table ND-1.—Number of primary wood processing facilities by mill type, North Dakota, 2018

Table ND-2.—Volume of industrial roundwood in thousand cubic feet (MCF) by wood movement and roundwood type, North Dakota, 2018

Table ND-3.—Volume of industrial roundwood in thousand cubic feet (MCF) by wood movement and hardwoods/softwoods, North Dakota, 2018

Table ND-4.—Volume of industrial roundwood production in thousand cubic feet (MCF) by product type and hardwoods/softwoods, North Dakota, 2018

Table ND-5.—Volume of industrial roundwood production in thousand cubic feet (MCF) by species group and hardwoods/softwoods, North Dakota, 2018

Table ND-6.—Volume of mill residues in thousand cubic feet (MCF) by residue type and hardwoods/softwoods, North Dakota, 2018

Table ND-7.—Volume of mill residues in thousand cubic feet (MCF) by residue disposition and hardwoods/softwoods, North Dakota, 2018

NE (Nebraska)

Table NE-1.—Number of primary wood processing facilities by mill type, Nebraska, 2018

Table NE-2.—Volume of industrial roundwood in thousand cubic feet (MCF) by wood movement and roundwood type, Nebraska, 2018

Table NE-3.—Volume of industrial roundwood in thousand cubic feet (MCF) by wood movement and hardwoods/softwoods, Nebraska, 2018

Table NE-4.—Volume of industrial roundwood production in thousand cubic feet (MCF) by product type and hardwoods/softwoods, Nebraska, 2018

Table NE-5.—Volume of industrial roundwood production in thousand cubic feet (MCF) by species group and hardwoods/softwoods, Nebraska, 2018

Table NE-6.—Volume of mill residues in thousand cubic feet (MCF) by residue type and hardwoods/softwoods, Nebraska, 2018

Table NE-7.—Volume of mill residues in thousand cubic feet (MCF) by residue disposition and hardwoods/softwoods, Nebraska, 2018

NH (New Hampshire)

Table NH-1.—Number of primary wood processing facilities by mill type, New Hampshire, 2018

Table NH-2.—Volume of industrial roundwood in thousand cubic feet (MCF) by wood movement and roundwood type, New Hampshire, 2018

Table NH-3.—Volume of industrial roundwood in thousand cubic feet (MCF) by wood movement and hardwoods/softwoods, New Hampshire, 2018

Table NH-4.—Volume of industrial roundwood production in thousand cubic feet (MCF) by product type and hardwoods/softwoods, New Hampshire, 2018

Table NH-5.—Volume of industrial roundwood production in thousand cubic feet (MCF) by species group and hardwoods/softwoods, New Hampshire, 2018

Table NH-6.—Volume of mill residues in thousand cubic feet (MCF) by residue type and hardwoods/softwoods, New Hampshire, 2018

Table NH-7.—Volume of mill residues in thousand cubic feet (MCF) by residue disposition and hardwoods/softwoods, New Hampshire, 2018

NJ (New Jersey)

Table NJ-1.—Number of primary wood processing facilities by mill type, New Jersey, 2018

Table NJ-2.—Volume of industrial roundwood in thousand cubic feet (MCF) by wood movement and roundwood type, New Jersey, 2018

Table NJ-3.—Volume of industrial roundwood in thousand cubic feet (MCF) by wood movement and hardwoods/softwoods, New Jersey, 2018

Table NJ-4.—Volume of industrial roundwood production in thousand cubic feet (MCF) by product type and hardwoods/softwoods, New Jersey, 2018

Table NJ-5.—Volume of industrial roundwood production in thousand cubic feet (MCF) by species group and hardwoods/softwoods, New Jersey, 2018

Table NJ-6.—Volume of mill residues in thousand cubic feet (MCF) by residue type and hardwoods/softwoods, New Jersey, 2018

Table NJ-7.—Volume of mill residues in thousand cubic feet (MCF) by residue disposition and hardwoods/softwoods, New Jersey, 2018

NY (New York)

Table NY-1.—Number of primary wood processing facilities by mill type, New York, 2018

Table NY-2.—Volume of industrial roundwood in thousand cubic feet (MCF) by wood movement and roundwood type, New York, 2018

Table NY-3.—Volume of industrial roundwood in thousand cubic feet (MCF) by wood movement and hardwoods/softwoods, New York, 2018

Table NY-4.—Volume of industrial roundwood production in thousand cubic feet (MCF) by product type and hardwoods/softwoods, New York, 2018

Table NY-5.—Volume of industrial roundwood production in thousand cubic feet (MCF) by species group and hardwoods/softwoods, New York, 2018

Table NY-6.—Volume of mill residues in thousand cubic feet (MCF) by residue type and hardwoods/softwoods, New York, 2018

Table NY-7.—Volume of mill residues in thousand cubic feet (MCF) by residue disposition and hardwoods/softwoods, New York, 2018

OH (Ohio)

Table OH-1.—Number of primary wood processing facilities by mill type, Ohio, 2018

Table OH-2.—Volume of industrial roundwood in thousand cubic feet (MCF) by wood movement and roundwood type, Ohio, 2018

Table OH-3.—Volume of industrial roundwood in thousand cubic feet (MCF) by wood movement and hardwoods/softwoods, Ohio, 2018

Table OH-4.—Volume of industrial roundwood production in thousand cubic feet (MCF) by product type and hardwoods/softwoods, Ohio, 2018

Table OH-5.—Volume of industrial roundwood production in thousand cubic feet (MCF) by species group and hardwoods/softwoods, Ohio, 2018

Table OH-6.—Volume of mill residues in thousand cubic feet (MCF) by residue type and hardwoods/softwoods, Ohio, 2018

Table OH-7.—Volume of mill residues in thousand cubic feet (MCF) by residue disposition and hardwoods/softwoods, Ohio, 2018

PA (Pennsylvania)

Table PA-1.—Number of primary wood processing facilities by mill type, Pennsylvania, 2018

Table PA-2.—Volume of industrial roundwood in thousand cubic feet (MCF) by wood movement and roundwood type, Pennsylvania, 2018

Table PA-3.—Volume of industrial roundwood in thousand cubic feet (MCF) by wood movement and hardwoods/softwoods, Pennsylvania, 2018

Table PA-4.—Volume of industrial roundwood production in thousand cubic feet (MCF) by product type and hardwoods/softwoods, Pennsylvania, 2018

Table PA-5.—Volume of industrial roundwood production in thousand cubic feet (MCF) by species group and hardwoods/softwoods, Pennsylvania, 2018

Table PA-6.—Volume of mill residues in thousand cubic feet (MCF) by residue type and hardwoods/softwoods, Pennsylvania, 2018

Table PA-7.—Volume of mill residues in thousand cubic feet (MCF) by residue disposition and hardwoods/softwoods, Pennsylvania, 2018

RI (Rhode Island)

Table RI-1.—Number of primary wood processing facilities by mill type, Rhode Island, 2018

Table RI-2.—Volume of industrial roundwood in thousand cubic feet (MCF) by wood movement and roundwood type, Rhode Island, 2018

Table RI-3.—Volume of industrial roundwood in thousand cubic feet (MCF) by wood movement and hardwoods/softwoods, Rhode Island, 2018

Table RI-4.—Volume of industrial roundwood production in thousand cubic feet (MCF) by product type and hardwoods/softwoods, Rhode Island, 2018

Table RI-5.—Volume of industrial roundwood production in thousand cubic feet (MCF) by species group and hardwoods/softwoods, Rhode Island, 2018

Table RI-6.—Volume of mill residues in thousand cubic feet (MCF) by residue type and hardwoods/softwoods, Rhode Island, 2018

Table RI-7.—Volume of mill residues in thousand cubic feet (MCF) by residue disposition and hardwoods/softwoods, Rhode Island, 2018

SD (South Dakota)

Table SD-1.—Number of primary wood processing facilities by mill type, South Dakota, 2018

Table SD-2.—Volume of industrial roundwood in thousand cubic feet (MCF) by wood movement and roundwood type, South Dakota, 2018

Table SD-3.—Volume of industrial roundwood in thousand cubic feet (MCF) by wood movement and hardwoods/softwoods, South Dakota, 2018

Table SD-4.—Volume of industrial roundwood production in thousand cubic feet (MCF) by product type and hardwoods/softwoods, South Dakota, 2018

Table SD-5.—Volume of industrial roundwood production in thousand cubic feet (MCF) by species group and hardwoods/softwoods, South Dakota, 2018

Table SD-6.—Volume of mill residues in thousand cubic feet (MCF) by residue type and hardwoods/softwoods, South Dakota, 2018

Table SD-7.—Volume of mill residues in thousand cubic feet (MCF) by residue disposition and hardwoods/softwoods, South Dakota, 2018

VT (Vermont)

Table VT-1.—Number of primary wood processing facilities by mill type, Vermont, 2018

Table VT-2.—Volume of industrial roundwood in thousand cubic feet (MCF) by wood movement and roundwood type, Vermont, 2018

Table VT-3.—Volume of industrial roundwood in thousand cubic feet (MCF) by wood movement and hardwoods/softwoods, Vermont, 2018

Table VT-4.—Volume of industrial roundwood production in thousand cubic feet (MCF) by product type and hardwoods/softwoods, Vermont, 2018

Table VT-5.—Volume of industrial roundwood production in thousand cubic feet (MCF) by species group and hardwoods/softwoods, Vermont, 2018

Table VT-6.—Volume of mill residues in thousand cubic feet (MCF) by residue type and hardwoods/softwoods, Vermont, 2018

Table VT-7.—Volume of mill residues in thousand cubic feet (MCF) by residue disposition and hardwoods/softwoods, Vermont, 2018

WI (Wisconsin)

Table WI-1.—Number of primary wood processing facilities by mill type, Wisconsin, 2018

Table WI-2.—Volume of industrial roundwood in thousand cubic feet (MCF) by wood movement and roundwood type, Wisconsin, 2018

Table WI-3.—Volume of industrial roundwood in thousand cubic feet (MCF) by wood movement and hardwoods/softwoods, Wisconsin, 2018

Table WI-4.—Volume of industrial roundwood production in thousand cubic feet (MCF) by product type and hardwoods/softwoods, Wisconsin, 2018

Table WI-5.—Volume of industrial roundwood production in thousand cubic feet (MCF) by species group and hardwoods/softwoods, Wisconsin, 2018

Table WI-6.—Volume of mill residues in thousand cubic feet (MCF) by residue type and hardwoods/softwoods, Wisconsin, 2018

Table WI-7.—Volume of mill residues in thousand cubic feet (MCF) by residue disposition and hardwoods/softwoods, Wisconsin, 2018

WV (West Virginia)

Table WV-1.—Number of primary wood processing facilities by mill type, West Virginia, 2018

Table WV-2.—Volume of industrial roundwood in thousand cubic feet (MCF) by wood movement and roundwood type, West Virginia, 2018

Table WV-3.—Volume of industrial roundwood in thousand cubic feet (MCF) by wood movement and hardwoods/softwoods, West Virginia, 2018

Table WV-4.—Volume of industrial roundwood production in thousand cubic feet (MCF) by product type and hardwoods/softwoods, West Virginia, 2018

Table WV-5.—Volume of industrial roundwood production in thousand cubic feet (MCF) by species group and hardwoods/softwoods, West Virginia, 2018

Table WV-6.—Volume of mill residues in thousand cubic feet (MCF) by residue type and hardwoods/softwoods, West Virginia, 2018

Table WV-7.—Volume of mill residues in thousand cubic feet (MCF) by residue disposition and hardwoods/softwoods, West Virginia, 2018

In accordance with Federal civil rights law and U.S. Department of Agriculture (USDA) civil rights regulations and policies, the USDA, its Agencies, offices, and employees, and institutions participating in or administering USDA programs are prohibited from discriminating based on race, color, national origin, religion, sex, disability, age, marital status, family/parental status, income derived from a public assistance program, political beliefs, or reprisal or retaliation for prior civil rights activity, in any program or activity conducted or funded by USDA (not all bases apply to all programs). Remedies and complaint filing deadlines vary by program or incident.

Persons with disabilities who require alternative means of communication for program information (e.g., Braille, large print, audiotope, American Sign Language, etc.) should contact the State or local Agency that administers the program or contact USDA through the Telecommunications Relay Service at 711 (voice and TTY). Additionally, program information may be made available in languages other than English.

To file a program discrimination complaint, complete the USDA Program Discrimination Complaint Form, AD-3027, found online at [How to File a Program Discrimination Complaint](#) and at any USDA office or write a letter addressed to USDA and provide in the letter all of the information requested in the form. To request a copy of the complaint form, call (866) 632-9992. Submit your completed form or letter to USDA by: (1) mail: U.S. Department of Agriculture, Office of the Assistant Secretary for Civil Rights, 1400 Independence Avenue, SW, Mail Stop 9410, Washington, D.C. 20250-9410; (2) fax: (202) 690-7442; or (3) email: program.intake@usda.gov.

USDA is an equal opportunity provider, employer, and lender.



Northern Research Station

<https://research.fs.usda.gov/nrs>