



Program Summary

Forest Inventory and Analysis (FIA) Program National Users Group

Timber Products Output Focus Meeting

February 2 -5, 2021

Virtual Meeting

Credits:

Cindy Sherwood, Delaney Meeting and Event Management, provided outstanding support for the virtual meeting, both by creating and managing the website leading up to the meeting and by providing technical support during the virtual sessions. SAF and NCASI are grateful for the help and support of Ms. Sherwood and her colleagues because they were vital to making the inaugural virtual meeting a success.

Cover Photo: Appalachian Timber Products, Markleysburg, PA. Photo taken on Allegheny SAF Field Trip, February 2019, by Richard Guldin.

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ABBREVIATIONS

AFF	American Forest Foundation	NRCS	Natural Resources Conservation Service, U.S. Department of Agriculture
AWC	American Wood Council		
BBER	Bureau of Business & Economics Research, University of Montana	NRS	Northern Research Station
CAL FIRE	California Department of Forestry and Fire Protection	NTFP	Non-Timber Forest Product
CIO	Chief Information Officer	NWOS	National Woodland Owners Survey (component of the FIA program)
CORRIM	Consortium for Research on Renewable Industrial Materials	OMB-OIRA	Office of Management and Budget, Office of Information and Regulatory Affairs
DCNR	Department of Conservation & Natural Resources	PNW	Pacific Northwest Research Station
DNR	Dept. of Natural Resources	PRA	Paperwork Reduction Act of 1995
EPA	Environmental Protection Agency	PUMA	Public Use Microdata Area
EPD	Environmental Product Declaration	R&D	Research & Development
EMC	Ecosystem Management Coordination Staff, National Forest System, USDA Forest Service	RMRS	Rocky Mountain Research Station
FCWG	Forest Climate Working Group	RPA	Forest and Rangeland Renewable Resources Planning Act of 1974
FIA	Forest Inventory and Analysis	SAF	Society of American Foresters
FIADB	FIA National Data Base	SFI	Sustainable Forestry Initiative
FS	Forest Service	SFRAC	Southern Forest Resource Assessment Consortium
FSC	Forest Stewardship Council	S&PF	State & Private Forestry
GHG	Greenhouse Gas	SRS	Southern Research Station
GIS	Geographic Information System	SUNY CESF	State University of New York, College of Environmental Sciences & Forestry
HWP	Harvested Wood Product	TIMO	Timberland Investment Organization
ISO	International Standards Organization	TPO	Timber Products Output (component of the FIA program)
IMAR	Inventory, Monitoring, and Assessment Research Staff, R&D, FS headquarters	USDA	U.S. Department of Agriculture, Washington Office, USDA FS
LCA	Life Cycle Analysis	WO	
NASF	National Association of State Foresters		
NCASI	National Council for Air and Stream Improvement		
NFS	National Forest System		

PREFACE

For two decades, the Society of American Foresters (SAF) and the National Council for Air and Stream Improvement (NCASI) have jointly organized and convened an annual meeting of users of data generated by the Forest Inventory and Analysis (FIA) program. Past annual meetings have provided many opportunities for users to share with each other how they are using FIA data in their programs and management activities. They have also given FIA national program leaders, station program managers, and researchers opportunities to share their accomplishments and advances from the previous year with the user community and discuss some of their plans for making further program improvements and adjustments in the coming years.

Since 2000, stakeholders in the FIA program's success have also used the FIA program's annual business summaries (<https://www.fia.fs.fed.us/library/bus-org-documents/index.php>) to track program accomplishments and commitments fulfilled. Financial tables--detailed statements of annual income and expenditures—and other tables supporting accomplishments and detailing partner contributions, have made the annual business summaries outstanding models of openness and transparency in the federal government. Consequently, the summaries have been crucial to broadening, deepening, and sustaining outside support, and in turn, advancing the program.

A core component of the FIA program is the Timber Products Output (TPO) survey. The TPO survey tracks how trees harvested are utilized; their conversion into roundwood logs and chips delivered to wood yards of mills that convert them into pulp and paper products, solid wood products, or byproducts. Along with market information, TPO data provide a comprehensive picture of the health and productivity of the forest sector's wood products industries.

This virtual meeting was held in the afternoons of 2-5 February 2020, with 135 attendees. It was the first meeting since April 2017 that focused on the TPO program. During previous TPO meetings from 2012 to 2017, users had outlined major changes needed in the TPO survey to meet their emerging needs. This 2021 meeting reported on the changes that have already been made and others still underway, demonstrating the TPO program's commitments to respond to previous recommendations from users and stakeholders. It also was an opportunity to take stock of recent emerging information needs and issues needing attention in the coming years. This report provides brief descriptions of the oral presentations and links to videos where presentations can be viewed.

SAF and NCASI look forward to continuing their partnership in organizing and convening users group meetings focused on improving the FIA program. All the elements of the FIA program provide vital data for improving the management and monitoring the sustainability of the nation's forests.

Danielle Watson, Director of Policy and Public Affairs, SAF
Stephen Prisley, Principal Research Scientist, NCASI
Richard W. Guldin, Principal, Guldin Forestry LLC

Pre-Session Presentations
Theme: Setting the Stage

Meeting Overview and Goals

Steve Prisley, NCASI

YouTube link: <https://youtu.be/7YzLTRYHTJo> (5:23 long)

Prisley introduced the three objectives of the meeting: inform users of new developments in the TPO program; provide user feedback to TPO staff and FIA program managers about emerging issues, unmet needs, and valued successes; and develop deeper relationships among stakeholders, TPO data users, and TPO staff. He noted that the FIA program is a world leader because it listens to users and stakeholders and uses the feedback to drive continuous improvements to all parts of the program. The program agenda provides many opportunities for attendees to provide feedback through discussion sessions, chat threads, and several polls that will occur throughout the meeting. Prisley then reviewed the five major components of the agenda, briefly describing what will be presented in each one. He concluded by again stressing that the success of the meeting depends on attendees' participation during the meeting, and that additional benefits can be obtained via follow-up emails and dialog after the meeting with presenters and other attendees.

Recap of Past TPO Partners' Meetings & Status of Action Items from Them

John Coulston, SRS

YouTube link: <https://youtu.be/0FeGSGof11E> (13:36 long)

Coulston provided context for this meeting, based on recommendations made at previous FIA National Users Group meetings since 2010. The 2012 meeting stressed the value of TPO data for economic development and forest sector modeling and was the first meeting where shifting the TPO survey to an annual sampling design emerged. In 2013, the recommendations again encouraged FIA to develop a statistically rigorous annualized TPO sampling design and for TPO surveys in the northern and western parts of the U.S. to be as active as in the South. The 2014 meeting further emphasized that TPO sample all types of wood-using facilities and suggested that the annual sample be drawn from a comprehensive list of wood using facilities with probability proportional to the volume of fiber consumed. Many of these recommendations were repeated in the 2014 Farm Bill.

At the 2015 National Users Group meeting, FIA leaders proposed re-designing the TPO program in three steps:

1. Getting a better understanding of users' TPO information needs;
2. Identifying an appropriate sampling design and estimators to meet user needs; and
3. Developing an analytical framework for online delivery of data and analyses.

Step 1 began with a TPO workshop in October 2015 in Raleigh NC attended by a cross-section of TPO users. Five action items emerged: revisit the use of a single federal survey form; develop a national list of mills; develop and test alternative sampling designs for annualized TPO surveys; develop a marketing strategy to bolster support for TPO; and work with other federal agencies and partners to enhance the TPO survey. Most of these action items have been completed, except for a fully developed marketing strategy. Eighteen months later, in April 2018, a second workshop was held. Attendees heard about progress since the Raleigh meeting and planned next steps towards implementing an annualized TPO survey. The following action items emerged:

- Create a reporting line in the FIA annual business summary’s financial statement for TPO and distinguish between federal costs and state costs;
- Separately report the costs of utilization studies—an important basis for making TPO estimates—from the actual implementation of the survey;
- Ensure that mill attributes are consistently defined and that mill capacities are tracked;
- Finish testing an annualized statistical design and get it peer-reviewed and published; and
- Ensure that OMB-OIRA would approve the new annualized sampling design.

All have been completed. The fourth item was accomplished by publishing an article in the October 2018 issue of Forest Science (<https://doi.org/10.1093/forsci/fxy010>) and by including a separate TPO chapter in the ongoing revision of the “Green Book.” The new OMB-OIRA-approved annualized TPO survey began in one region in 2019 and went nationwide in 2020.

Coulston offered a few closing thoughts. Annual TPO surveys are key to understanding actual trends in removals of wood from forests shown in the P2 plot information. We will get past the growing pains in shifting to the annualized TPO sampling design. Wherever possible, nationally standardized approaches should be used to minimize regional differences and reduce confusion. The new TPO design is flexible, so states should use that flexibility to maximize the statistical precision of the estimates they need. Finally, moving TPO forward will require econometric models—developed through partnerships with economics and statistical researchers outside of the FIA program in the Forest Service and at universities.

USDA Forest Service Process for Paperwork Reduction Act Information Collections

Kenli Kim, FS R&D

YouTube link: https://youtu.be/D0D_9rEwUsY (11:42 long)

Kim introduced the key features of the Paperwork Reduction Act of 1995 (Pub. Law 104-12; 44 U.S.C. §3501 et. seq.) (PRA). PRA concerns the collection of information by or for the federal government. PRA seeks to minimize the paperwork burden on members of the public (whether individuals or businesses); ensure the greatest possible public benefit from the information that is collected; and improve the quality and use of federal information to make decisions and policies in open and transparent ways for the benefit society. PRA and its regulations apply broadly. In general, if a federal entity, like the USDA Forest Service, wants to collect information from the public, then the agency must go through the process outlined in PRA and its regulations and ultimately receive approval from the Office of Management and Budget’s Office of Information and Regulatory Affairs (OMB-OIRA) to conduct the survey. Anytime a federal agency wants to send a survey to 10 or more members of the public within a 12-month time frame, it must go through this process. PRA doesn’t distinguish between mandatory responses or voluntary responses to a questionnaire—in both cases, OMB OIRA approval is required.

Kim provided a detailed description of the process to get a questionnaire approved or reapproved, which typically takes 12-18 months. Kim closed by reiterating the importance of all the internal and external reviews required for the survey’s statistical design and methodologies.

Session One – February 2, 2021
Theme: TPO Program Overview

YouTube Link: <https://youtu.be/XbRtSSJe7o4> (2:16:36 long)

Welcome

Danielle Watson, SAF (starts at 0:00:0)

Watson welcomed attendees to the meeting and provided a set of expectations about the meeting and participants' behavior--"best practices" for online meetings.

Forest Service's Work Environment & Performance Emphasis

Linda Heath, FS R&D (starts at 0:08:35)

Heath described ongoing Forest Service emphases on the work environment and working safely. She shared a new brochure that describes the agency's shared values, stances and habits for the everyday work environment and commitments. The mnemonic is: It's SIMPLE and RIMPLE—**R**espect each other, **I**nvest in relationships, **M**odel integrity, **P**rotect one another, **L**earn from experience and **E**mpower each other. I'm going to post it on the WHOVA site. Contact Linda if you have any concerns or kudos about working together with Forest Service employees.

Responses to Questions & Comments from the Pre-Session

Steve Prisley, NCASI - Moderator (starts at 0:12:40)

Q1. Do universities or state partners need OMB-OIRA approval to include their questions with the federal survey when administering the TPO survey. **Ans.** The short answer is Yes. Whenever the federal government contracts with a partner to administer a federal survey, additional questions of interest to the partner also need to be reviewed and approved by OMB-OIRA.

Q2. When a state is administering the TPO survey, do its questions need to be reviewed and approved by OMB? **Ans.** The answer is Yes. The state questions become part of the federal survey when they are both administered together. The state questions are adding to the "burden hours" that the federal survey creates. If the TPO program has a sense of what questions a state wants to ask, then these can be added to the federal survey approval process. The Forest Service does that with other surveys.

Q3. What if the state questions are on a separate form, not a federal form? **Ans.** This is a difficult question to answer in a generalized way. It depends on the specifics of the state questions and how they are presented. If the federal survey is clearly ended, and then the respondent is asked whether they are willing to also respond to some additional questions of interest to the state—and the respondent can decline, if they wish—then this element of separation and opportunity to decline may be permissible. But this intention by the partner should be discussed with the Forest Service and ahead of the partner beginning this additional information collection of interest to the partner.

Q4. Are there differences in the review of a renewal of an existing data collection compared to a new collection? **Ans.** Generally, a renewal is a bit quicker because OMB-OIRA has previously reviewed the details of the collection.

Q5. The limit of using only 9 potential respondents to pre-test a survey is a real constraint. What can be done about that? **Ans.** Generally, pre-tests are limited to 9 or fewer.

Q6. Does the FS envision ever converting the paper and pencil survey form to a fillable PDF form? **Ans.** OMB-OIRA is always interested in ways to reduce the time it takes for a respondent to reply, like using fillable on-line forms. FS responded that they are already creating fillable PDF forms.

TPO Program Overview –Actions During New Annual Cycle & Sample Design Highlights

Consuelo Brandeis, FIA National TPO Lead & Bill Burkman, SRS-FIA (starts at 0:26:00)

Burkman began with a few short remarks. He noted that the TPO survey has been part of the FIA program since the 1940s and that forest industry has changed a great deal since TPO began. Industry changes are one of the reasons that the TPO survey has begun to change, such as adopting an annualized approach to the TPO survey to accelerate data collection and reporting. Burkman ended by referring to the Coulston pre-session presentation that presented many details about what's happened since 2010.

Brandeis then launched her discussion of four points: (1) TPO sample design highlights; (2) benefits of the new annual design; (3) a month-by-month schedule for the new annual TPO survey—both on a calendar year and a fiscal year basis; and (4) challenges faced. The annual, probability-based sample only applies to states with 20 mills or more. The design aims to sample 40 percent of each mill type in a state, using a stratified random sample based on three strata—state, primary product (mill type), and size of mill. The objective is to capture as much data as possible about big wood users. Therefore, mills using over 10 million cubic feet annually always get surveyed each year. All other mills are stratified based on their types and sizes and two mills are randomly selected for each type and size. The new annualized sampling design will better connect roundwood production from timber harvests with local economic activity and social benefits. Brandeis provided a clear graphic showing the month-by-month steps in the annual TPO process during her presentation. All regions should be on this schedule in 2022.

Challenges remain. Updating and keeping current an accurate list of mills and their roundwood consumption and production capacities is a significant challenge because the mill lists are our sample population. Non-response remains a challenge.

Q1. The recent data for South Carolina indicate that sawmill volume is down 8 percent from the prior year. We can't figure out why. Is this a reasonable "error of the estimate?" Can states be given a 30-day review period before the data are released so that we can work with FIA experts to figure out whether any unusual results have emerged? **Ans.** Yes, we can work on developing a 30-day TPO data review period with states, like we do with the plot data.

Q2. Is the timeline presented just for the pulp mill survey or the entire survey of all mills? **Ans.** It's for the entire annual survey of all mills in the sample.

Southern States TPO Update

James Bentley, SRS-FIA (starts at 0:55:50)

Bentley began by promising to implement a 30-day review period of prospective results by state agencies. He then discussed the transition from the biennial census to the annualized approach. The new annual approach was first implemented in the South during 2018. The 2018 data are already available in the TPO database. The 2019 data are processed and awaiting CIO approval of updated software to release it. Details of the 2020 survey sampling frame were discussed.

The southern TPO program encountered the following challenges. The government shut down in 2019 affected processing of the 2018 data. COVID in 2020 affected both the compilation and release of 2019 data, the conduct of the 2020 survey, and planning for the 2021 survey. State partners continue to help with data collection, often using on-site visits to collect data. Visits tend to be more successful in getting good responses.

Q1. To what extent do the responses to specific questions change from year to year? Has anyone looked back over the past years' responses to see what might be changing, such as types of products or amounts and disposal of their residues? **Ans.** No, we haven't had the time or capacity to look at issues like these. But now that a new non-response team has been created, that might free up some time for looking at emerging trends in past data.

Northern States TPO Update

Ron Piva, NRS-FIA (starts at 1:16:10)

Piva said that implementation of the annual design in the NRS territory began in 2019. Prior to that, some states were collecting data only once every three years to once every five years. The irregularity in sampling cycles required difficult computational adjustments to develop regional or national estimates for a given base year. Annual samples are drawn in states with more than 20 mills. Those with fewer mills have a 100 percent sample. In addition, 100 percent of pulp and paper and composite panel mills—the big roundwood consumers—are sampled each year. Three or four states collect the data in mill visits, while NRS employees send mail surveys to sampled mills in the remaining states. Updating old mill lists—some a decade old—was a key first step in going annual. Piva detailed the several letters, cards, and contacts used for the mail survey approach and response rates. In 2019, the unit began analyzing non-response rates for individual questions—“item” non-response. A subsequent presentation by Marla Lindsay discusses those results. Options to improve non-response rates are being studied.

Q1. Is the Northern TPO data posted yet? **Ans.** No. It will be uploaded after the CIO approves the proposed software update.

Western States TPO Update

Glenn Christensen, PNW-FIA (starts at 1:35:50)

Christensen acknowledged that Todd Morgan and Katie Marcille (University of Montana, Bureau of Business and Economic Research), are long-time partners in implementing and analyzing TPO data for western states. The BBER unit has over 40 years of experience tracking the western forest products industry. That unit conducts the TPO surveys in all western states except Washington, who conducts its own survey of mills every two years and shares data with Morgan. Before the annual

approach, TPO data were collected every 4 to 5 years via censuses. Annual sampling started in 2019, but previously scheduled censuses for 2019, 2020, and 2021 also occurred. Christensen described how the lower numbers and smaller sizes of western mills led to a different set of thresholds for determining sampling strata by mill product type to conform to the national approach. He also provided details about sampling intensities for individual states and results from a 2018 pilot study in California. He concluded by outlining challenges, including software programming needs, catching up on COVID-delayed work, loss of capacity through retirements, and non-response issues.

Discussion

Danielle Watson, SAF & Steve Prisley, NCASI (starts at 2:03:00)

Results of a five-question online poll were discussed (see below). Prisley noted that there was good discussion in the chat threads. Non-response was a common topic, along with the impact of the COVID situation on data collection and office work.

Brandeis: Mill and item non-response are high priorities. Rolling data forward was a simple way of imputing data, based on assumptions that technologies and conditions hadn't changed. The annual sampling system will eliminate rolling data forward. But it also means that maintaining accurate mill lists and knowledge of products and technologies will be increasingly important.

Burkman: The Great Recession, and now the COVID era, have illustrated how rapidly situations can change and how changed conditions affect mills—opening/closing, demands for wood products.

Wells: Mill managers are busy people, so it's important to keep TPO questions as simple as possible.

Poll Results: Session 1

	Number of Responses	Percentage
Question 1.1: Geographic extent: Are you primarily interested in TPO statistics occurring in:		
A single state	24	34%
A national forest	0	0%
A region	31	44%
Nationwide	15	21%
No Answer	16	

Question 1.2: On a scale of 1 to 5, how important is tracking TPO statistics for as far back in time as is possible?

1 – Not important	1	1%
2	8	12%
3 – Moderately Important	36	53%
4	14	21%
5 – Crucially important	9	13%
No Answer	18	

Question 1.3: On a scale of 1 to 5, how important is updating TPO statistics annually?

1 – Not important	5	11%
2	3	7%
3 – Moderately important	1	2%
4	20	43%
5 – Crucially important	17	37%
No Answer	22	

Question 1.4: On a scale of 1 to 5, how important is providing TPO estimates over small areas/domains in response to specific events?

1 – Not important	3	5%
2	7	12%
3 – Moderately important	27	46%
4	13	22%
5 – Crucially important	9	15%
No Answer	27	

Question 1.5: What mill type do you think is most often sampled with certainty?

Sawmills	25	43%
Veneer mills	1	2%
Pulp and paper mills	31	53%
Mulch mills	0	0%
Bioenergy/fuelwood mills	1	2%
No Answer	28	

**Session Two – February 2, 2021
Theme: Wood Flows & Sustainability**

YouTube Link: <https://youtu.be/8Xr-l4XlZ> (1:24:47)

Introduction & Overview of Wood Flow Estimates

James Bentley, SRS-FIA (starts at 0:01:15)

Bentley discussed the spatial scale of wood movements: between states, among regions, and exports. To protect confidentiality of individual mills, reporting wood flow depends on having at least three mills in the locale of interest; county being the finest spatial scale. Terminology is important, so listen and review the slide deck carefully. He used Alabama statistics to illustrate the wood flows within the state and to/from surrounding states and overseas. Bentley used an interactive software application pioneered for the Forest Atlas (<https://forest-atlas.fs.fed.us/shapes-forest-harvest.html>) for the north central part of the U.S. to illustrate how flows can be visualized. The application has expanded interest in wood flows from new clients. He closed by soliciting ideas from users and stakeholders for innovative ways to portray wood flows in the South and nationally.

Q1. Is the engagement portfolio of new tools out for review by the public? **Ans.** The application I showed was from the Forest Atlas and it is available to the public.

Q2. Are the flows you showed just roundwood, or does it include pellets? **Ans.** What I showed was just roundwood. Pellets are considered a finished product. TPO isn't tracking finished products. TPO does track chips in addition to roundwood, but it's just chips harvested in the woods, not chips as a residue from other mill processes.

Q3. There used to be several dealers or factors that accumulated logs and shipped them overseas, such as hardwood veneer logs going from New York out the St. Lawrence River. **Ans.** Yes, individuals who are exporting logs, such as in ocean-going containers, are tracked by TPO. We are asking all our mills if they are sorting logs and shipping roundwood overseas. We are not using data from ports, just direct information from the dealers/factors.

Q4. APHIS inspects all the logs in containers going to China and Vietnam. APHIS data might be available. **Ans.** That's good to know.

Leveraging TPO Data to Characterize NFS Timber Flow and Utilization at the Sub-State Level

Chelsea Pennick McIver, Univ. of Montana, Bureau of Business & Economic Research (starts at 0:25:45)

Pennick McIver is working with economists in Forest Service headquarters to study timber flows from national forests. The key questions are, where do federal logs go and how are they utilized? Changes in local employment, labor income, and industry output are important metrics. But data in the agency's "cut and sold" reports aren't very useful to answer the key questions. The objective of the study was to leverage mill-level TPO data to help characterize national forest timber flow and utilization in ways that are useful input for agency impact assessment models used for forest planning. Pennick McIver also showed how spatial information helps provide further detail for individual national forests, creating a unique "signature" for each that can help parse information in the cut and sold reports. The impact model results can help enhance decision report tools, estimate carbon sequestration in harvested wood products, track the pace and scale of restoration and highlight rural community stability.

Q1. Do you have results at the state level that you can share? **Ans.** No. We are focused on building a dataset for the Washington Office. After that's done, Kate Marcille and I can turn our attention to that question.

Q2. How does the mill information from Forest Service data compare to mill information from TPO data? Can individual mills be identified that are receiving federal logs? **Ans.** No, the Forest Service doesn't track that information. They just report the total volume harvested by the purchaser sale by sale and the total volume the mills receive. It's hard to aggregate and compare the different data.

Q3. How difficult would it be to do this work for all national forests? Could the data be standardized in a consistent way? **Ans.** The project is set up to summarize the information for each national forest in the country for experts in agency headquarters.

Accounting for Wood Flows to Mills from Non-Forest Land

Ron Piva, NRS-FIA (starts at 0:45:05)

Piva began by describing harvest utilization studies and the measurements TPO takes on individual trees cut during active logging jobs. Utilization studies are only conducted on forest land. In 2018, the urban FIA program plot work was initiated by NRS. A couple of questions were added to NRS

TPO survey forms in 2018 that asked whether a mill processes logs from cities or towns, and if so, what percentage of total roundwood received at the mill gate came from urban areas. Only 17 of 105 mills across the Mid-Atlantic and Southern New England states reported that they processed roundwood from urban areas. Urban roundwood amounted to 16 percent of the roundwood consumed by the 17 mills, but barely 1 percent of all roundwood in the region. These questions are being proposed on the national form being submitted to OMB this year, and if approved, would be implemented in 2022.

Q1. What types of mills are reporting the larger percentages? **Ans.** The mills reporting larger percentages of their roundwood from urban areas are small independent mills (e.g., using portable sawmill equipment) or mills associated with urban tree service providers.

Q2. Jim Chamberlain has had difficulties in tracking non-wood forest products because of their informal markets. I suspect that similar problems exist here. Some urban roundwood and a lot of tree trimmings are immediately ground up and converted to mulch. **Ans.** Yes, that's true. It adds to the difficulty. TPO is beginning to recognize mulch as a separate type of wood product.

Group Discussion

Steve Prisley, NCASI – Moderator (starts at 1:02:15)

Bradshaw: The information about urban wood is important for Eastern Shore of Maryland counties. It will help educate them about the importance of roundwood from forests going to mills.

Pugh. It's important to know the sources and impacts of log supplies on industry and potential mill expansion planning.

Burkman: If you know the ownership patterns of the county, you can use that information to help make estimates about sources of roundwood supplies for the county.

Prisley: In states with small counties, a mill's woodshed may cover tens of counties.

Neumann: I would distinguish between collecting data by county and reporting information by county. There are differences in types of mills and their sizes among counties. Yet, the aggregate county-level information is very good.

Prisley: Maybe an issue we can consider is, are there other ways to track information? Coulston pointed out that perhaps imagery can help explain the types of lands and ownerships where harvesting is observed. In the East, most harvesting is from private lands, whether larger tracts owned by investors or smaller holdings. In the West, the ownership pattern—federal versus state versus private—is harder to discern.

Rosenberg: There have large swings in logs from federal lands in the west over the past several decades. Policies are more important than markets.

Poll Results: Session 2

Question 2.1: On a scale of 1 to 5, how important to you is reporting at the county level?

	Number of Responses	Percentage
1 - Not Important	8	15%
2	6	11%
3 - Moderately Important	12	22%
4	15	27%
5 - Crucially important	14	25%
No Answer	24	

Question 2.2: On a scale of 1 to 5, how important to you is reporting at the detailed species group level (40 groups) vs softwoods and hardwoods?

1 - Not Important	3	6%
2	5	10%
3 - Moderately Important	17	34%
4	14	28%
5 - Crucially important	11	22%
No Answer	29	

Session Three – February 3, 2021

Theme: Current TPO Program Part 1: Challenges

YouTube Link: <https://www.youtube.com/watch?v=PWf3vpvaUx0> (1:57:00 long)

Welcome and Introduction

Danielle Watson, SAF (starts at 0:00:00)

Watson reviewed the meeting tips and information.

Survey Non-Response: Observed Patterns and Methods to Account for Non-Response

Consuelo Brandeis, TPO National Program Leader (starts at 0:02:00)

Brandeis set the stage by discussing the different patterns of non-response and their effects on statistical bias. Two methods were used to evaluate the non-response patterns: sensitivity analysis using multiple imputation; and comparing timely respondents versus late respondents. The latter assumes that late respondents share similar characteristics with non-respondents. Results of imputation analyses were presented, both nationally and regionally. Response rates varies by region—West being a bit lower—and type of mill—smaller mills producing miscellaneous products or specialty products were somewhat lower in all regions. If non-response rates remain low over several years for certain types of mills, then the number of mills sampled in that stratum may need to be increased.

Q1. What factored into the decision to treat the entire northern region as a one where lack of responses is not random in comparison to the South or West? **Ans.** The imputation model for the North was not a good fit for the data we observed. Thus, we became more conservative in sampling and analyzing data from the North. But this is a preliminary result and study continues.

Q2. Might using different surveys for different types of mills improve non-response? **Ans.** That's a possibility. There is a team working on the survey forms and its content to see if some changes might improve response.

Non-Response to Particular Survey Items or Questions: Northern TPO Experience

Marla Lindsay, University of Massachusetts at Amherst, Family Forest Research Center (starts at 0:24:00)

Lindsay analyzed 2019 TPO responses from the northern states. She briefly described the mail survey form (514 items of data requested) and the survey process used. No survey has a perfect response. Even those who respond often leave some questions unanswered. Missing data can lead to biased estimates. Understanding non-response can help identify patterns of non-response and help focus attention on places where the survey questions could be improved. In the mail survey, the questions most often left unanswered dealt with production amounts and fuelwood consumption. Lindsay provided copious detail on the types of questions not answered and how the response rates differ from mail survey respondents versus telephone survey respondents. It remains unknown whether the answers are absent because the mill doesn't know the answer or because they refuse to share the information. That said, telephone surveys tended to get more and better-quality information than mail surveys.

Q1. A comment. It seems like your data suggest that it's time to revamp the survey into a "smart" survey that considers what is known about the mill from past years or other sources (e.g., photos of equipment). Taking a survey online might lead to better response rates if it's perceived as a time saver.

Could Response Rates be Improved by Rethinking TPO Survey Questions?

Ron Piva, NRS FIA (starts at 0:39:45)

Piva noted that although the current survey form hasn't changed much for 30 years. But in recent years, a few changes have been made, such as asking for residue types by softwoods and hardwoods. It was hoped that this information would help improve the long-used factors that TPO assumed were still valid. There is a critical issue that is hardest for mills to answer, "Where does the roundwood come from, by county?" Most mills reply that they receive roundwood at the mill gate and don't know its origin nor do they have even a rough idea of the average radius of their wood supply region. The team of people looking at the form are proposing new ways to try to get more useful information about roundwood origin. We recognize that as complexity of a survey form increases, response rates decline. The team is exploring what alternative approaches might be useful. TPO leaders worry that a 50% response rate on a 40% sample may not be good enough.

Q1. Is NRS still using conversion factors to estimate residues? **Ans.** Yes. We haven't been able to figure out how to better define terms (e.g., coarse versus fine residues; what constitutes a "truckload"). **Follow up comment.** In Michigan, better detail about mill residues is highly sought by economic development interests.

Data Collection Panel: Opportunities to Partner with Others to Collect Data

Glenn Christensen, Moderator, PNW-FIA (starts at 0:56:00)

Christensen introduced the panelists.

Marla Lindsay, University of Massachusetts at Amherst, Family Forest Research Center (starts at 0:59:30)

Lindsay discussed her experience since 2018 as a data collection partner with NRS TPO. UMass has much experience administering large-scale surveys. They have the background and capacity to streamline the data collection process and upload data to TPO's Oracle database. UMass both administered the telephone survey and integrated data collected by four states (VT, MO, NY, MN) using the standard mail survey form. During the telephone interviews, UMass annotated mill comments on specific questions, which is valuable information for rethinking the questions. Based on their recent experience, developing an electronic fillable PDF form to replace the paper form, and developing a telephone interview form are promising ways forward to streamline both the mail and telephone components of the survey. Her experience with FS TPO data collectors provides important context for rethinking survey form formats for the future. Lindsay also described the three key aspects influencing non-response. Not wanting or not able to provide information was the top one. Not seeing the question on the form—the form is dense—and survey fatigue are the other top aspects.

Dru Preston, Georgia Forestry Commission (starts at 1:09:00)

Preston began by commenting on Lindsay's key aspects, saying that he too has experienced survey fatigue among mill managers. He then turned to the opportunities to partner with NGOs and industry trade organizations to publicize the TPO survey. Two key messages are: the data are handled confidentially; and TPO survey results are important for the industry at large. State forestry associations are also an important partner—through their magazines and at their annual meetings—for highlighting the value of the TPO survey to everyone in the industry. Forestry school deans and faculty also have credibility to share the importance of the TPO data. Having State Foresters send letters to mills about the importance of the survey is another opportunity. Many of these approaches are already being used at various places throughout the South. The same point can be made about Forest Service Station Directors sending letters. Finally, many mills are certified by various organizations. Having the certification systems help stress the importance of participating in the surveys as part of their contribution to research might be a possibility—discussions about this are currently underway. There's no magic silver bullet to improving response. But what's needed is continual use of several of these measures. In closing, Preston commented positively about a chat message suggesting development of electronic "smart" forms.

Kate Marcille, University of Montana, Bureau of Business Economics Research (starts at 1:17:15)

Marcille is the lead data collector and analyst for Alaska and California, coordinates in Washington's own state survey, and helps in Wyoming. BBER wears two hats. First is their 50 years of experience doing regional economic analyses through the Forest Industry Research (FIR) program. FIR helps characterize industry structure, capacity, changes over time, and tracks wood fiber from forest through primary processing. In addition to the FIA program, FIR also has long-term relationships and studies with the FS NFS EMC Staff, Region 1's timber appraisal and cost collection system, Region 2's mill capacity studies, and State management entities, including Oregon Dept. of Forestry and CAL

FIRE. The second hat BBER wears is working with western state partners, including forest industry associations and as other agencies just mentioned. Big contributions of the partners include checking mill lists and contact information and providing “what’s new” updates and valuable local knowledge. The partnerships are more “collaboration” than “delegation” (doing surveys) partnerships. Marcille used growing partnerships with California and Alaska to illustrate multi-faceted contributions. Across all these relationships, cultivating personal relationships among partners and mills is the most valuable attribute for improving data collection and reducing non-response.

Discussion (starts at 1:30:00)

Prisley: I appreciate Preston’s presentation and comment that having FS TPO representatives speaking at industry association meetings is important. SFI is also revising their certification standards. In the current draft, language is included that participating with the FIA program in all three facets—ground plots, NWOS, and TPO—is a way to demonstrate commitment to sustainability. Because of COVID, implementation has been delayed a year until after 2022.

Bergstrand: Is there going to be a national effort to improve communication with partners, such as a brochure, talking points, etc. Should it be national? Or regional? If so, what might that look like?

Prisley: This is what John Coulston’s pre-session highlighted as the need for “marketing.” Burkman responded that SRS-FIA produced a brochure like that several years ago. Based on what we’ve heard here, we need to revise that brochure. While documentation is important, what’s also needed is a “script” that responds to many of the recurring questions. Phase 2 field crews have memorized standard talking points to use when contacting landowners for permission to come on their land and collect data. We need something similar for TPO.

Lindsay: At UMass, our experience has been that students making the telephone calls for surveys need this sort of script too. Already, we’ve collected notes on the questions asked and begun to assemble a set of FAQs. Burkman responded that consistent messages are needed for TPO partners so that the same information is consistently shared with all mills and over the years.

Burns: I’m curious what the acceptable response rate or our goal? Many of the questions are difficult to answer. Is it time to change the questions? What’s the goal for TPO? Is it consumption of fiber? Or something else?

Prisley: You can ask these questions of all the individual components of the survey. What is the goal of each section of the survey?

Burkman: The goals have shifted as TPO has shifted from a periodic 100-percent census to a 40-percent sample. The annual approach is so new that we haven’t set goals, other than, “the best we can get.”

Marcille: In terms of response rate, BBER has been focused on comparing what the TPO’s sample estimate is of total removals, in comparison to removals estimates from other sources that exist in the western U.S. If 7 mills in a state consume 85 percent of the volume used, then if you get responses from those seven, you’ve got good estimates of the state’s removals.

Frederick: I want to comment on the effectiveness of having a small group of people contacting mills. The lumber business is one built on personal relationships. Having many different people contacting mills isn't going to be as successful as having a small group who contact mills repeatedly.

Butler: While the actual response rate is useful information, it's more important to know whether there is bias in the response rate.

Prisley: Will we be able to tease out uncertainty due to sampling error from uncertainty due to non-response? Or do we simply come up with just sampling error? What proportion of uncertainty will be due to sampling error versus non-response? Butler responded: Sampling error just pertains the error due to the sample drawn. There are advanced methods that can decompose error. But those haven't been used yet in TPO.

Morgan: Can we even measure uncertainty with rolling mill data forward or modeling non-responses with missing data? Prisley: That's the point. We've been modeling without having ways to estimate uncertainty. Burkman responded: You're correct. When we had a 100 percent census, we could estimate uncertainty. But with sampling, we are in a new situation and are learning as we go forward. We are going to have to do annual surveys for several years before we can really analyze uncertainty and gaps in knowledge after we have enough annual data. We have incomplete understanding of where we are, and we may remain in this situation for several years.

Poll Results: Session 3

	Number of Responses	Percentage
Question 3.1: At what level would you like to see response/non-response rates reported?		
Overall state level	8	16%
At mill type level, regionally	4	8%
For each type of mill type, by state	13	26%
All the above	25	50%
No need to report response rates	0	0%
No Answer	22	

Session Four – February 3, 2021
Theme: Current TPO Program. Part 2: Advances

YouTube Link: <https://www.youtube.com/watch?v=OkRQFKR0ErM> (1:47:00 long)

Residential Fuelwood Estimates

Marcus Taylor, SRS-FIA (starts at 0:00:30)

Taylor and Coulston have studied residential fuelwood consumption. Over 13.3 million U.S. households (12 percent nationally) use fuelwood either as a primary or secondary heat source, consuming about 25 million cords annually. This is roughly 12-15 percent of total roundwood. In the past, TPO has used U.S. Dept. of Energy—Energy Information Administration figures which is why residential fuelwood estimates can only be produced at the regional level. The Census Bureau also conducts the American Community Survey, which makes some further disaggregation possible,

perhaps to a Public Use Microdata Area (PUMA) or multi-county level. We also used information on heating degree days and non-wood fuel prices (e.g., as propane costs rise, households use more wood). Taylor discussed details of modeling methods used, including classification and regression tree models, random forest, linear mixed-effects models, and multiple imputation models. Results were portrayed in a series of national choropleth maps, followed by a more detailed set of graphics about Oregon. A publication is being drafted.

Unit of Measure Conversion Factors for Roundwood Receiving Facilities

Matt Winn, SRS-FIA (starts at 0:19:25)

Winn began by noting that mills report roundwood arriving at the mill gate in a variety of different measures, including by volume (individual or stacked logs, bark on or peeled), weight (green or dry), or linear (length of log irrespective of diameter). FIA also estimates residues. Although bone dry units of 2,400 pounds is the standard residue measure in the West, but a standard unit is lacking for the North and South. The lack of standard units in mill reports requires conversion factors to common units to summarize information. The TPO data processing system has over 3,400 conversion factors because they vary by region, product type, species, and reporting year. Winn provided details of the many different types of conversion factors. The current project addresses limited documentation on how reported volumes were derived, their consistency and accuracy, differences in conversion factors used with and among regions, and the lack of a comprehensive compilation of conversion factors. One output last year was a new General Technical Report (<https://www.fs.usda.gov/treesearch/pubs/60116>). It contains variability analyses (by region, roundwood type, and conversion type). Examples were discussed. The project also led to suggestions for improvement of conversion factors, which were also discussed.

Enhancing Data Delivery Through New TPO Web Portal

James Bentley, SRS-FIA (starts at 0:41:45)

Bentley introduced attendees to new FIA website pages about the TPO Program. But technological issues led to shifting to Jason Cooper's laptop. Cooper then gave attendees a visual virtual tour of the new pages.

One-Click Factsheets & Tableau Tool Information for Individual States

Jason Cooper, SRS-FIA (starts at 0:43:30)

After Cooper's remarks to cover Bentley's points, he launched into his presentation. It was a real-time demonstration of new options to generate customized reports on the TPO website. Cooper used Georgia for his interactive example. He demonstrated how tables behind the customized factsheets can be downloaded and the available options. With Tableau software, a visual analytics platform (<http://www.tableau.com>), one can download a portion of the TPO database to a user's computer for a deeper dive into the information beyond just summary tables. The new tools are a significant asset for users.

TPO Explorer: Find Spatial and Temporal Patterns in TPO Using Tableau Dashboards

Scott Pugh, NRS-FIA (starts at 0:55:30)

Pugh started by noting that TPO Explorer is a Tableau dashboard workbook. He launched TPO Explorer to illustrate the possibilities. Because 2019 is the latest data in the workbook, the current

version needs to be considered as an “alpha” tool that will move to “beta” when the 2020 data are available. Pugh then launched into a real-time demonstration of TPO Explorer’s capabilities. Some aspects of Tableau work better in one web browser than others, so users might want to shift among available browsers to see which browser gives the user better map displays for their specific needs.

Public TPO Tables Available for TPO Data Downloads

James Gray, SRS-FIA (starts at 1:08:25)

Gray introduced ways to download the most fine-grained spatial data from the TPO website. The information in the workbook is the basis for traditional, in-house TPO reports and to populate new online tools. Currently, 2017 and 2018 data are available for all regions. 2019 data will be available soon, starting with the South. SRS-FIA intends to load earlier years of data as time is available. Gray showed examples that were screenshots of the various tables that can be downloaded.

Discussion (starts at 1:15:45)

Bentley: Although the presenters used southern data to illustrate these tools, the tools will work with data from all regions. Data from other regions will be uploaded after the pending IT approval is obtained. These items are called “toolkits” because we want the tools to continue to grow and develop further. We’d welcome users who want to collaborate with us to improve these tools.

Burkman: When we talk about IT releases, FIA must go through an IT review process by the USDA CIO to make sure that the data and tools pass all security tests. Unfortunately, we cannot make promises or estimates of the actual release date.

Neumann: The tools presented look like they will be quite useful once data for other regions is uploaded.

Bergstrand: Thanks for developing these tools. Regarding the new release mentioned, will that contain national data or just be an update of data for the southern states. **Ans.** The update will let the other regions begin to populate the TPO public database with their data.

Bergstrand: The report that shows species group—hardwood versus softwoods—will be more useful if the data can show species breakdown. **Ans.** Table 4 does disaggregate the hardwood group into individual species groups.

Neumann: My thought about allocation of removals by ownership is that it might have some bias. In Michigan, northern white cedar grows largely from private land. In contrast, the state and federal government own most of the red pine and account for most of its harvest. **Ans.** Piva noted that NRS doesn’t ask about who the landowner was of the roundwood. NRS-FIA allocates removals data, by county, to what is known about the forest cover types. In some northern states, most removals are from public lands, so if there are ownership questions about removals, removal volumes tend to be allocated to public ownerships.

Pugh: There are data from northern TPO surveys that haven’t yet been uploaded. We know our data tend to be old and we are committed to uploading more current data as soon as we can. That may help our response rates, especially from certain classes of mills.

Prisley: Yes, fresh data gets used quickly.

Burkman: Plot data on removals can help allocate removals by ownership type. But removals are a rare occurrence. The Small Area Estimation tools presented at our previous FIA users meeting might help us put some additional certainty around some of the allocations of removals. Remote sensing and other ancillary data may help to improve small area estimates of removals allocations.

Prisley: There have been some comments on chat and from Matt Winn’s presentation. The conversion GTR is a monumental work that greatly enhances transparency. But because some of the factors are so old and of uncertain lineage, I expect there will be some interest in revisiting some of the factors, such as the percent of residues generated from roundwood consumption. If mills haven’t improved their roundwood utilization and reduced the percentage of residue generated over the past 40 years, the industry is in trouble.

Winn: We want mills to look more closely at their residue production. Mill responses about residues generated from their survey forms are coming in higher than the conversion factors being used. It’s unclear why residues are higher than expected and now lower.

Brandeis: It’s amazing that we are still using conversion factors whose origin remain unknown. We have tried to capture some of residue information from mills, but responses weren’t too helpful to us. Perhaps we need to drop or reword the question.

Burkman: One of the things I’ve heard is that as we add more data to the database, we and users are going to uncover issues and questions that deserve more focus and attention. Working together will be essential to address the questions. Some issues might be career-building for some analysts, students, or faculty.

Prisley: I agree. Lots more data will lead to more questions.

Poll Results: Session 4

	Number of Responses	Percentage
Question 4.1: Do you access the TPO information found on the TPO website?		
Yes	24	65%
No	13	35%
No Answer	27	

Question 4.2: On a scale of 1 (not useful) to 5 (very useful), how useful would dashboards with a set of pre-calculated estimates be?		
1	0	0%
2	2	6%
3	14	39%
4	6	17%
5	14	39%
No Answer	28	

Question 4.3: On a scale of 1 (not useful) to 5 (very useful), how useful would a database be with defined queries?

1	1	3%
2	4	11%
3	8	22%
4	10	28%
5	13	36%
No Answer	28	

Question 4.4: On a scale of 1 (not useful) to 5 (very useful), how useful would temporal tools, such as TPO Explorer, be to investigate spatial and temporal patterns?

1	0	0%
2	0	0%
3	9	26%
4	8	23%
5	18	51%
No Answer	29	

Question 4.5: On a scale of 1 (not important) to 4 (critical), how important to you are uncertainty metrics around TPO estimates?

1	2	6%
2	14	40%
3	13	37%
4	6	17%
No Answer	29	

Session Five – February 4, 2021

Theme: Identifying Users’ Emerging Needs

YouTube Link: <https://youtu.be/BZkmh2DbwgA> (3:14:27 long)

Welcome

Danielle Watson, SAF (starts at 0:00:00 in the video)

Watson reviewed the meeting tips and information.

Emerging Needs for TPO Data to Estimate Carbon in Harvested Wood Products

Nadia Tase, CAL Fire (starts at 0:02:00)

Tase said that since 2015, CAL FIRE has issued annual reports highlighting forest carbon. She described the detailed approach being taken for carbon accounting in California and Oregon. In 2018 CAL FIRE hosted special workshop focused on harvested wood products. CAL FIRE is using the IPCC accounting approach with data coming from FIA and other sources. Her slides contain many literature citations for sources of data, conversion ratios and factors, the disposition of carbon by

type and the respective carbon half-lives. Tase then showed some results focused on harvested wood products from 1952 to the present and a 2016 sawmill energy-use study that found wood was the source of 88 percent of mill energy needs. TPO data are also used for an updated logging utilization study, supporting decision-making on the large numbers of recently deceased trees in California. Upcoming is a new report titled, Pacific Coast Temperate Forest Regional Carbon Report, that covers California, Oregon, and Washington and includes timber and finished wood product analyses.

Emerging Needs for TPO Data to Improve Life Cycle Assessments (LCAs)

Michael Goergen, U.S. Endowment for Forestry & Communities (starts at 0:23:30)

Goergen introduced the Endowment's work with LCAs, Environmental Product Declarations (EPDs), and TPO. Major companies all want assurances of sustainability and carbon sequestration for products from the forest sector. Mass timber is an innovative product that is generating billions of dollars of interest from major corporations. LCAs study the environmental aspects and potential impacts throughout a product's cradle-to-grave usage. EPDs allow comparisons within a material category, such as building materials. LCAs and EPDs are developed through mill surveys, suggesting that there are opportunities for collaboration between TPO and others who are marketing and using wood products. Several carbon calculators and tools are available to architects and buildings; LEED being but one example. The American Wood Council is leading an effort to obtain better data from mill managers. They are exploring the minimum number of questions that can generate the information needed for EPDs and LCAs. AWC is trying to develop an on-line, integrated mill survey system. Is there a way for TPO and others to start a dialogue about information needs and possibilities? Goergen's ultimate goal is to have one survey that eases the burden on mill managers and provides all the information needed to meet LCAs, EPD's, and carbon reporting so that forests are better positioned as the premier carbon solution for the future.

Q1. What is the proportion of U.S. sawmills represented by AWC? **Ans.** Between 80-85 percent.

Q2. Would mill managers really know the logging logistics? **Ans.** The basic information is there, such as typical haul radius and fuel usage by harvesting and transportation equipment. But there are other expert sources of data like this. CORRIM is one of those sources. Mill location does make a difference in LCAs; those with larger haul radii create more impact than those with shorter ones.

Emerging Needs for TPO Data: Granularity Requirements for Live Cycle Assessment Allocation

Elaine Oneill, CORRIM (starts at 0:43:40)

Oneill introduced CORRIM as a network of research institutions, started in 1996. CORRIM has produced 27 industry-wide produce LCA reports that conform with ISO standards. Ideally, LCAs for wood products should be at regional or smaller spatial scales. LCAs not only focus on mills, but all aspects of growing and planting seedlings through management activities to harvest and hauling roundwood to the mill. The carbon emissions and sequestration of these "upstream" activities are as important as the "downstream" activities that occur at mills and beyond. The ISO standards (e.g., ISO 14040, 14044, 21930) guide the contents of LCAs and EPDs. Oneill then focused in on silvicultural operations; their inputs (e.g., seedlings grown, fertilizers, mechanical site prep) and their outputs (e.g., logs on trucks, forest residues, and emissions to air, water, and land). Management systems vary, as do rotation ages, yield, and recovery. CORRIM is grappling right now with improved forest management in the southeast (aka high intensity forestry). Silvicultural practices over the

past 80 years have resulted in a 13-fold increase in yield, while cutting rotation age to less than 20 years (for pulpwood). But not all growers are using such intensive management practices. The computations for the “upstream” activities all need to boil down to the carbon footprint per cubic meter of wood grown. The next question is, are current management practices sustainable? That’s the focus of the new ISO 21930. The new standard says that if the acres of timberland in an area are increasing and the growing stock (cubic feet/acre) is increasing over time, then forests and forest management in that region is sustainable. Digging deeper, FIA field data enable allocation of harvests to public, corporate, and private landowners. The challenge is to tie the granularity of silvicultural information back to landownership patterns.

SOFAC – Southern Forest Resource Assessment Consortium: Current and Future Use of TPO Data

Bob Abt, Former Co-Director of SOFAC, Justin Baker, Current Director of SOFAC, both North Carolina State University, and Jesse Henderson, Former Research Associate, NCSU, now SRS (starts at 1:06:00)

SOFAC is a group of 24 southern U.S. forestland owners, managers, organizations, consultants, and wood consumers. SOFAC sits between the SRS FIA program’s results and members who have specific questions for specific counties that can be answered using FIA data. SOFAC brings the latest FIA plot data together in a model to project forest futures at a scale appropriate for strategic planning. SOFAC uses TPO mill consumption data for trends and annual average removals to fixed dates. Abt provided generalized illustrations of the types of questions that SOFAC receives. Emerging issues include carbon estimation; whether there are enough distinct chip-n-saw mills to have their own TPO category (acknowledging that chip-n-saw roundwood diameter preferences fluctuate with prices of larger roundwood for sawmills and/or pulpwood prices are high); compatibility of Texas data with FIA data at the survey unit level; whether TPO data can be publicly available in the following calendar year so analyses are fresher (e.g., related to current markets and prices and disasters like hurricanes); and how to improve dataset compatibility when categories change (e.g., the emergence of a pellets market). SOFAC appreciates the movement to improve small area estimation and how does the new annual TPO sampling strategy affect downscaling to counties (e.g., when a new pellet mill is missed because they are a big player in a small region).

Emerging Needs for TPO Data to Better Serve Commercial Foresters & Landowners

Steve Prisley, NCASI (starts at 1:29:00)

Prisley noted that TPO helps assess the connections between what happens in forests and what happens in wood products markets. As Abt highlighted, TPO information is valuable for strategic planning, including the spatial distribution of wood supplies and consumption, assessing sustainability, and estimating carbon stocks and fluxes. Prisley used a figure from Brandeis and Abt (2019) to illustrate the fact that even if wood pellet sales to Europe double, that would not adversely affect sustainability of current and future southern forests. Improving uncertainty estimates is an emerging need for TPO. Documenting the source of uncertainty in a neutral and objective way can lead to improvements. Prisley showed maps of estimated total non-response volume. Certain areas exceeded 100 million cubic feet of volume attributable to non-response. Maps like these illustrate the FIA survey units where additional emphasis on responses could reduce the uncertainty. He proposed some survey form changes that would simplify and reduce the details that mill managers would need to provide, and perhaps improve response rates. Others have raised similar points. A final point, long-term storage of carbon in products and landfills is crucial for accurate carbon accounting. Utilization of roundwood and residues affect carbon and energy dynamics. Can TPO information tell us when default factors should be changed? Prisley

summarized his remarks in four points. Can we effectively measure and communicate uncertainty? Can we trade details on survey forms for better response rates? When can modeling substitute for detailed survey question responses? Are we confident that decades-old knowledge about conversion factors still apply and are appropriate?

Emerging Needs for TPO Data to Support State Economies & Marketing Councils

Ben Livelsberger, State TPO Lead, & Ellen Schultzabarger, State Forester, Pennsylvania DC&NR (starts at 1:46:30)

Livelsberger coordinates the TPO survey in Pennsylvania. He introduced the wide variety and large number of groups in Pennsylvania who use TPO data. State forestry associations have a large network of landowners, foresters, and industry members. Their conferences are ideal places to share TPO information and discuss its importance. The Pennsylvania Forest Product Assn. is a group of industry primary and secondary manufacturers and equipment supplies. They lobby the state legislature and use TPO data to justify the importance of their businesses in local economies. The PA Sustainable Forestry Initiative Implementation Committee is a subsidiary of PFFPA. The PA Hardwood Development Council (HDC) was created by the State Legislature to promote the development, expansion, and promotion of the hardwoods industry in the state. Its 25 members are drawn from industry, academia, and state and local governments. They promote access to timber resources on private and public lands and the production of value-added products for domestic and international markets. Under the PA HDC, a 30-foot trailer “Woodmobile” tours the state with permanent displays describing the importance of the timber industry. It visits fairs, schools, and community meetings. TPO information is vital to the messaging in the Woodmobile. Underneath the PA HDC, there are Hardwood Utilization Groups (HUGs). The three HUGs were also authorized by the State Legislature as regional groups representing industries and landowners. HUGs use FIA field and TPO data all the time. A strong focus of HUGs is on local governments to maintain and improve local infrastructure essential to a healthy wood products industry, such as roads, bridges, and public utilities. One HUG is on the Allegheny Plateau (the black cherry region), another is in the northern tier of counties that are an outstanding oak resource, and the third is in central Pennsylvania—the sawmill mecca of the state. The Penn-York Lumbermen’s Club was started in 1949 by 4 individuals—two from each state—as a social club to share information on problems and solutions in employment, etc. Today, there are over 150 enthusiastic members, some driving over 150 miles to attend meetings. These folks are primary data sources for TPO data. They share what they like and don’t like about the survey process, which leads to understanding where improvements are needed. All these groups are vital groups and conduits for sharing TPO information, because they are key influencers in so many ways in the state and region. Pennsylvania has 17.3 million acres of forest, less than 20 percent in state forests. The long-term sustainability of Pennsylvania’s forests is dependent on the continuing strength of the forest products industry. Industry and private landowners are dependent on each other, so all need to hear about FIA and TPO data.

Q. Do you ask about ownership source in your survey? **Ans.** No, over 80 percent of our harvest statewide is from private lands.

Q2. Who leads the development of the HUGs? **Ans.** The Hardwood Development Council is responsible for development of the HUGs. I provide the coordination between the HDC and HUGs and the DC&NR Bureau of Forestry.

Just Give Us the Numbers: International and National Level Forest Economics Statistical Reporting and TPO

Guy Robertson & Claire O’Dea, FS R&D (starts at 2:07:40)

Robertson and O’Dea recounted the history for Forest Service national and international reporting on economics and natural resources statistics. The agency has clear responsibilities to provide certain types of statistics yet routine statistical reporting capacity is declining due to retirements. For example, all three scientists in the Forest Products Laboratory responsible for assembling and analyzing these statistics have recently retired—a significant loss of experience and capacity. Robertson detailed six reporting requirements—3 are national and 3 are international. Two critical issues were identified. Credible federal statistics are vital to the Office of the U.S. Trade Representative for international trade negotiations. Second, if the USA can’t consistently report detailed information about its forests and forest industry, then it lacks leverage to insist on better data from other countries where international concerns about deforestation and forest sustainability exist. TPO is an important source of data, but it’s becoming increasingly difficult to capture all its benefits because of erosions in expertise.

O’Dea provided details on RPA Assessment information needs. A recent technical report was issued in January 2021 on the forest products sector status and trends (<https://www.srs.fs.usda.gov/pubs/61862>). A key feature of the RPA Assessment is that it makes projections 50 years into the future under a suite of alternative scenarios (driven by climate, demographic, and economic driving forces developed by other agencies, such as the Dept. of Commerce). TPO data are important for the RPA Assessment’s analyses about how markets have been changing and might change under alternative future scenarios. Good production data are a key dependent variable for projections of production. User questions and comments increasingly focus on “where” in addition to “how much.” The current TPO data are a limiting factor in policy, ecosystem services, and market projections. An ideal future would have precise, complete, detailed estimates of wood products outputs, linked to timber product inputs, linked to timber harvests, at fine spatial and temporal scales. Current data gaps are: (1) harvested wood product carbon pools; (2) how much sawtimber-sized roundwood go to pulping and papermaking or are burned for bioenergy/fuelwood; and (3) how these have changed over time.

Discussion

Richard Guldin, Guldin Forestry LLC, Moderator starts at 2:31:30)

A chat question was, “Do we need different TPO surveys for different types of mills?”

Prisley: To some extent, we already have some differences. The pulp mill survey is handled differently from the others. I can also see some benefits from one survey for smaller mills versus larger mills.

Burkman: I think that makes sense. But some of the questions in the chat this afternoon suggest that we look at the issues/topics where we really need data compared to alternative ways of getting additional information useful for modeling. The challenge is determining the key data needed first, then look at how to structure the questions.

Bergstrand: We have done this on the sawmill survey in the north—differentiate the surveys by size of sawmill and type of product. We didn’t find that it improved responses.

Piva: It gets complicated trying to track the thousand mills sampled each year out of the 3,000 mills on our list in the NRS territory and which is the right form for what mills. The pulp mill survey has a few more questions, focused on incoming residues and incoming chips rather than just roundwood.

Morgan: We also have adjusted some of the questions, depending on the types of products they. It does complicate matters, as Piva indicated. Therefore, we have reduced our survey to only two different forms. We do ask for products manufactured and employment in our surveys.

Prisley: As we begin to summarize what we've heard at this meeting, attendees' participation at tomorrow's meeting will be important. We want to hear regional perspectives and identify places where we need regional flexibility.

Pugh: Do questions that have low response consistently across the entire country suggest where we ought to focus the work of the non-response team. If some mills skip a question because they don't want to reveal the information, don't have the data, or they feel it's too difficult track so they can answer the questions. Some mills have computer tracking, other mills are just happy when wood shows up on their deck.

Guldin: Do other states have similar organizations like Ben Livelsberger reported for Pennsylvania?

Bradshaw: We have several similar groups in Maryland.

Neumann: No, Livelsberger has been extremely successful with his groups. The rest of us don't have that many.

Morgan: We do reach out to state-level groups and share information with them about the confidentiality of the data submitted. In some cases, they endorse the survey.

Unidentified: I want to put a plug in again for the "smart" survey approach that would pre-fill some of the data fields and help people get to the meaty questions of high interest. Equipment can be simplified for some plants, like bioenergy plants, and pre-filled.

Unidentified: Regarding non-response, the mill managers see us survey takers as a problem-maker. They are skeptical of why we are asking for data. Better publicity about the survey is vital to reduce this skepticism.

Livelsberger: When we can show people how we are using their data and how it benefits them, that makes a big difference. TPO data are used by us to help lure economic development into the state.

Bradshaw: The forest products industry in Maryland makes a bigger difference and bigger impact in the state than most people imagine.

Rosenberg: We also encounter skepticism in California about the value of the TPO data. Where we can aim benefit statements at mills, we believe it gets better responses from mills. We also work through the university system to get a different mill survey done. From that, we can help support the TPO folks at PNW Station and in Montana. When we have a person on-the-ground visiting the

mill and having a face-to-face discussion, it improves response. We also check in with mills annually be telephone and that helps.

Butler: I want to put in a quick plug for the Dillman methodology that addresses many of the issues people are bringing up. There is also a social exchange theory that explores how benefits and barriers can be used to understand issues. Cognitive interview methods can also help to test questions.

Oneill: A bit of context. When CORRIM started mill surveys, the personal relationships of individuals with mills were very helpful. Today, industry organizations help sustain the personal relationships that open doors to get better mill survey responses. It's important to build relationships. People won't give you information unless they trust you and can see that the responses they provide won't be used against them.

Daniels: I've been putting a lot of ideas in the chat. The Forest Service internally is a stakeholder group for TPO data. But I think that's an untapped opportunity within the agency. Marketing the value of TPO data inside the agency with timber sales administrators and others could be very helpful. Individual national forests have collaborative groups whom they meet with to share information and discuss issues. The groups include local elected officials and industry people. Talking about TPO to collaborative groups that national forests have set up is a way to broaden knowledge about the FIA and TPO program.

Poll Results: Session 5

	Number of Responses	Percentage
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Question 5.1: Please rank whether accounting for new products or markets is important.

1 - Not important	2	5%
2	4	9%
3 - Moderately important	12	27%
4	15	34%
5 - Very important	11	25%
No Answer	20	

Question 5.2: Please rank whether accounting for harvested wood products from disturbance events is important.

1 - Not important	13	30%
2	10	23%
3 - Moderately important	12	27%
4	7	16%
5 - Very important	2	5%
No Answer	20	

Question 5.3: Please rank whether accounting for harvested wood products supporting climate and carbon goals is important.

1 - Not important	0	0%
2	7	16%
3 - Moderately important	7	16%
4	12	28%
5 - Very important	17	40%
No Answer	21	

Question 5.4: Please rank whether accounting for timber flow -- both domestic and international is important.

1 - Not important	2	5%
2	4	10%
3 - Moderately important	7	17%
4	10	24%
5 - Very important	19	45%
No Answer	22	

Question 5.5: Please rank whether incorporating analyses/projections of harvested wood products is important.

1 - Not important	4	9%
2	4	9%
3 - Moderately important	13	30%
4	11	26%
5 - Very important	11	26%
No Answer	21	

Session Six – February 5, 2021

Theme: Synthesis and Recommendations

YouTube Link: <https://youtu.be/kAxdjOXVIAU> (1:29:57 long)

Welcome

Danielle Watson, SAF, & Steve Prisley, NCASI (starts at 0:00:00)

Watson welcomed participants, reviewed meeting tips and information, and previewed the speakers for the session. Prisley outlined his desires for the session.

What Have We Heard?

Richard Guldin, Guldin Forestry LLC (starts at 0:4:00)

Guldin began by highlighting TPOs proud history and the changes that are happening—moving to an annual sample, responding to 2014 Farm Bill language, and developing new products, technologies, and tools. He identified a dozen emerging needs:

1. TPO data can improve estimates of carbon in harvested wood products. How can TPO partner with developers and users of Life Cycle Analyses (LCAs) and Environmental Product Declarations (EPDs)?
2. Strategically combining TPO and FIA Phase 2 field plot data. The benefits would be better estimates of the carbon footprint of forest management and better allocation of removals to ownership classes and the landscapes they manage.
3. Improve regional forest sector models, including updating biomass estimation equations and product categories when new products or production processes emerge. Accelerate compilation and uploading of fresh annual data; get to, at most, a one-year lag.
4. Include TPO data in small area estimation (SAE research and solutions. Evaluate how the annual sampling design affects down-scaling estimates to counties (as a function of county size) and/or FIA sub-state survey units.
5. Demonstrate opportunities for TPO data to support corporate activities, such as strategic planning, sustainability certification, and marketing opportunities.
6. Radially expand marketing of TPO program and data. Active messages are needed at many more meetings about the importance and value of the TPO program. New/revised written materials are needed. Expand collaboration with partners who have opportunities to describe the program’s benefits.
7. Replace lost capacity for producing national and regional-scale information products.
8. Test modeling as an alternative to obtaining mill or hauler information about roundwood origin. Models using Phase 2 field plot data may help.
9. Non-response rates worry users—both non-response to the entire survey and to specific questions on the form. Attendees feel that it’s time to revisit the design of the survey instrument and questions. The Data Collection Panel and the Non-Response Panel had several interesting suggestions. Follow up on them. Review findings from survey researchers and examine alternatives— “smart forms” --to a paper/online survey.
10. The new GTR on conversion factors adds openness and transparency. But some of the factors may be outdated. Re-look at some factors where mill technology has changed. Focus on residuals.
11. Highlight the value that combining TPO data and Phase 2 field plot data create for assessing/demonstrating sustainability.
12. Frequency of TPO meetings like this one need to be assessed.

There are audiences for recommendations and action items from this meeting both inside the Forest Service and outside the Forest Service. The Deputy Chief, Station Directors, Regional Foresters, and S&PF leaders need to speak more frequently about the value and importance of the TPO program. Looking outside the Forest Service, corporate leaders, key NGOs, university faculty and students, and elected officials—national to local levels—need to know more about the TPO program and what the data mean to them. Constituents who are politically active and have the trust of local elected officials are critical links in the network of influence that need to help raise awareness and interest in the TPO program.

Recommendations & Action Items

Steve Prisley, NCASI, and Danielle Watson, SAF (starts at 0:28:00)

Prisley laid out a broad set of recommendations and action items. Rather than detailed prescriptions, the recommendations and action items point to further work needed by Forest

Service program managers and leaders. He began by acknowledging the significant advances recently made by TPO staff to create a more useful national TPO database, rollout of the annual survey, develop new reporting tools (soon to be released by the USDA CIO), advances in reporting on residential fuelwood estimates, and documenting roundwood conversion factors.

Issues that need further work are;

1. Addressing non-response. Simplifying the form, reducing complexity, collaborating with other interests, messaging about the program to expand awareness of benefits and willingness to fill out the survey, and methods to deliver the survey.
2. Survey design issues. Different forms for different mill types and sizes. Are all questions needed in all regions? How does sampling deal with unsampled new mills. Sampling methods and alternative data sources to deal with persistent non-responders.
3. Expanded analyses and IT efforts. Compiling data, cleaning it up, and uploading it to the national databases need more resources. Reworking past data to develop consistent estimates with contemporary estimates. Combining NWOS ownership data and Phase 2 field plot data—especially using new spatial tools—offers promise. Revisiting roundwood conversion factors will take more effort. More TPO information could be included in state fact sheets and five-year reports. Consider fresh ways to administer the survey on-line. Learn from CIO security reviews to reduce hang-ups with future new releases. Some of the technologies needed, such as Qualtrics and developing online forms and tools development may be beyond the skills of TPO personnel, therefore, additional resources from contractors or partners may be needed.
4. Increasing attention to carbon. This is nationally important and of high interest today. Again, revisiting the proportion of roundwood that goes to long-lived versus short-lived products is important. Retirements have eroded capacity of the FS R&D mission area on carbon-related topics—both outside the TPO program (e.g., at the Forest Products Laboratory), and inside the FIA-TPO program. Utilization studies weren't discussed much at this meeting, perhaps an organizer oversight. But they remain important and need to be revisited to understand harvesting residues and what roundwood goes for what types of products.
5. Expanding partnerships. The user community can be a key asset in explaining the importance of the TPO program, and therefore the importance of filling out the surveys. Partners could be of much help.

Q1. Reviewing mill lists and following up by visiting or calling mills that don't respond is important in Maryland. But our state agency too has lost capacity. The ask for more people to do the TPO work requires more "boots on the ground" by both federal and state agencies. Ans. Key user groups—SAF and others—are participating in the Forest Climate Working Group and through other mechanisms to highlight the importance of the capacity issue.

Q2. Why can't mills get copies of the previous years' survey results along with this year's survey to help emphasize and illustrate the importance of responding to the current survey? Ans. That's a good idea!

Watson then circulated an online poll to attendees so they could rank the recommendations. The poll results indicated that addressing non-response was ranked as most important. Addressing survey design issues and increasing attention to carbon were next highest ranked.

Discussion

Steve Prisley, Moderator (starts at 0:52:00)

Unknown: Why did TPO shift from periodic censuses to annual samples? It seems that periodic censuses ever three or four years had a lower burden on mills. Many mills now are being sampled every year.

Prisley and Burkman: Periodic censuses made it very difficult to deal with roundwood that crossed state lines from harvest location to mill location. Second, quick changes in the forest industry—like happened in 2007-2009—reduced the value of periodic censuses. During that recession, it became evident that hardwood roundwood suffered more than softwoods. Over a thousand mills closed. Periodic censuses do involve tradeoffs. But recent experiences with the recession made lent weight to having annual samples.

Prisley: Should there be other things on the list of recommendations and actions that are missing and should be added?

Burns: The lower tier of mills—the smaller ones—get sampled every year. The burden is lowered on them. But the medium sized mills do seem to be sampled every year or every other year.

Prisley: Larger mills may have more information needs, such as for chain-of-custody related to certification, that require them to keep current information on roundwood coming in and products going out. That may lower the burden of responding on them.

Reactions from TPO Leaders

Consuelo Brandeis, TPO National Program Leader, SRS (starts at 1:00:20)

Thank you to all the presenters and participants in the discussions and polls. We value your contributions.

The TPO program aims to further characterize FIA's harvest removals by species and county-of-origin. We want to understand how much roundwood goes into milled products, what residues are created in milling, how those residues are used in other products, and finally, what fiber is used for energy or wasted. We want to better understand timber flows. We want to explore additional partnerships that add value to our and our partners' programs and can help us improve response rates. We acknowledge that we need to better represent the TPO program to mill managers and owners to spur responses. We need some help from our collaborators and users and communications experts to develop clearer messages and circulate them more broadly. By making our data more easily available through new tools—once approved by the CIO and the database is fully populated—we will be able to better portray the program and users will be able to access the data for their own purposes. Meanwhile, we encourage users to look at the tools and what they can do—even if the data are not for your state or region—and send us comments or questions about how the tools can be improved. All the comments and suggestions we've heard at the meeting need to be evaluated to see what is working and what is not—and most importantly--why. This is work we need to work on right now. Whatever changes we need to make in the future need to be supported or justified by what we and users see in the data. There is a backlog of data to analyze. We need to get moving on it. Progress

has been slower than we desired, but we need more resources. We want to communicate better, more often, and demonstrate how TPO data can help users and stakeholders meet their needs. That includes inside the R&D program and inside the agency.

Glenn Christensen: I want to add a couple of points from a western perspective. We need to get western data into the new database so the cool new tools can be used by western interests. That's my sense of our top priority. We also need some IT support from stations. We also are going to work on response issues—had a discussion already this morning with Todd Morgan and his group who are on the verge of distributing this year's survey. Do we need to change anything in the package of information we will send? Partnerships with NFS are important in the western states. They want to understand what happens to wood harvested from national forests. Currently, those relationships are stronger in the northern parts of the west than the "four corners" area of the interior west. I'd like to thank research leaders in FS R&D for supporting meetings like this, because they are very helpful to us in understanding stakeholders' views and needs.

Closing Remarks

Danielle Watson, SAF & Steve Prisley, NCASI (starts at 1:20:00)

Thank you to everyone who prerecorded and orally presented at this session. Thanks also to all the online attendees. We had rich dialogue and chat threads, which gives us and the TPO leaders much to think about. The videos will be available in the final report as YouTube links. You can use the "start times" listed in the report to get to specific presentations.

The online poll results suggest that attendees would like to see similar TPO meetings biennially. That's good information for the Forest Service, SAF, and NCASI to consider in their future plans. Thanks also to Rich Guldin for helping to organize the meeting and line up interesting speakers.

A final word of thanks for Cindy Sherwood and her colleagues for their technical support at this meeting.

Appendix A – List of Attendees

Bob Abt
North Carolina State University

Mila Alvarez
USDA FS R&D

Stefan Anderes
USDA FS NFS EMC Staff

Alex Anderson
Wisconsin DNR

Brian Anderson
Wisconsin DNR

Terry Baker
SAF

James Bentley
USDA FS Southern Research Station FIA

Helen Beresford
USDA FS Southern Research Station FIA

Erik Berg
University of Montana

Kristen Bergstrand
Minnesota DNR

Peter Beringer
USDA FS S&PF Northeastern Area

Jeff Bradley
American Forest & Paper Association

Tom Bradshaw
Maryland DNR Forest Service

Consuelo Brandeis
USDA FS Southern Research Station FIA

Steven Brink
California Forestry Association

Mindia Brown
Timmons Group

David Bruton
Kansas Forest Service

Collin Buntrock
Wisconsin DNR

Bill Burkman
USDA FS Southern Research Station FIA

Scott Burns
Minnesota DNR

Brett Butler
USDA FS Northern Research Station

Rick Cantrell
Black Briar Environmental LLC

Ausley “Burl” Carraway
Texas A&M Forest Service

Glenn Christensen
USDA FS Pacific Northwest Research Station FIA

Kylie Clay
Forest Carbon & Climate Program, Michigan State Univ.

Jason Cooper
USDA FS Southern Research Station FIA

John Coulston
USDA FS Southern Research Station

Jared Craig
Ohio Division of Forestry

Larry Cyprian
USDA FS Southern Research Station

Jean Daniels
USDA FS Alaska Region

Scott Danskin
South Carolina Forestry Commission

Mike Goldstein
USDA FS Alaska Region

Shawn Derome
Rayonier

Chris Gonso
Indiana Dept. of Agriculture

Henry Eichman
USDA FS NFS EMC Staff

Jim Gray
USDA FS Southern Research Station FIA

Helge Eng
CAL FIRE

Rachel Greene
Tennessee Dept. of Agriculture, Division of Forestry

Sam Evans
University of California-Berkeley

Richard Guldin
Guldin Forestry LLC

Andrew Fast
University of New Hampshire Cooperative Extension

Han-Sup Han
Northern Arizona University

Aron Flickinger
Iowa Department of Natural Resources

Ashton Hargrave
USDA FS Southwestern Region

Tim Foley
Southern Group of State Foresters

Rachel Harris
Virginia Dept. of Forestry

Jereme Frank
Maine Forest Service

Brenda Haskill
Michigan DNR

Paul Frederick
Vermont Dept. of Forests, Parks & Recreation

Dave Haugen
USDA FS Northern Research Station FIA

Kevin Gallagher
Resolute Forest Products

Linda Heath
USDA FS R&D

Daniel "Joey" Gallion
Indiana DNR - Forestry

Rachelle Hedges
Berkeley Forests (UC Berkeley)

Mike Galvin
SavATree Consulting Group

Jesse Henderson
USDA FS Southern Research Station

Brian Garbisch
State of South Dakota

Bill Higgins
Idaho Forest Group, LLC

Sara Goeking
USDA FS Rocky Mountain Research Station FIA

Chris Hinton
Mississippi Forestry Commission

Michael Goergen
U.S. Endowment for Forestry and Communities

Don Hodges
Univ. of Tennessee Dept. of Forestry, Wildlife & Fisheries

Katherine Homra
American Forest & Paper Association

Kenli Kim
USDA FS R&D

Tera King
Idaho Forest Group

Adrian Kiser
USDA FS Pacific Northwest Region

Kristoffer Larson
Washington DNR

Gregory Latta
University of Idaho

Jennifer Leach
Virginia Dept. of Forestry

Daryl Lederle
USDA FS WO Legislative Affairs

Robert Lee
USDA FS Southern Research Station FIA

Joseph Lehnen
Virginia Dept. of Forestry

Marla Lindsay
Univ. of Massachusetts &
USDA FS Family Forest Research Center

Ben Livelsberger
Pennsylvania DCNR Bureau of Forestry

Greg Lord
Maine Forest Service

Taylor Lucey
USDA FS Pacific Northwest Research Station FIA

Scott Lyon
Wisconsin DNR

Donald Mansius
Maine Forest Service

Kate Marcille
University of Montana BBER

Devin Martinez-Orengo
USDA NRCS

James McCarter
Rayonier

Lee McCord
USDA FS Southern Research Station FIA

Chelsea Pennick McIver
University of Montana BBER

Mark Metcalfe
USDA FS Pacific Northwest Region

Melissa Mokry
Wyoming State Forestry Division

Adam Moreno
California Air Resources Board

Todd Morgan
University of Montana BBER

Mike Morris
Missouri Dept, of Conservation

Priscilla Morris
USDA FS State & Private Forestry

Helena Murray
USDA FS California Region S&PF

David Neumann
Michigan DNR Forest Resources Division

Barry New
North Carolina Forest Service

Jarek Nowak
Florida Forest Service

Claire O'Dea
USDA FS R&D

Sara Ohrel
US EPA

Elaine Oneil
CORRIM

Chris Oswalt
USDA FS Southern Research Station FIA

Rajan Paraju
North Carolina State University

Kristen Pelz
USDA FS Rocky Mountain Research Station FIA

Charles Perry
USDA FS Northern Research Station FIA

Matt Peterson
Illinois DNR

Ronald Piva
USDA FS Northern Research Station FIA

Raju Pokharel
Michigan State University

Jagdish Poudel
Michigan DNR

Dru Preston
Georgia Forestry Commission

Steve Prisley
National Council for Air and Stream Improvement

Scott Pugh
USDA FS Northern Research Station FIA

Jim Rakestraw
International Paper Co.

Cotton Randall
Ohio Division of Forestry

Patrick Rappold
USDA FS Northeastern Region

Tim Reader
Colorado State Forest Service/CSU

Matthew Reed
(No affiliation registered)

Guy Robertson
USDA FS R&D

Mark Rosenberg
CAL FIRE

Loren Ross
American Wood Council

Robert Ross
North Carolina Forest Service

R.P. Satomi
Univ. California Cooperative Extension

Cindy Sherwood
Delaney Meeting & Event Management

Ellen Shultzabarger
Pennsylvania DCNR Bureau of Forestry

Eric Simmons
University of Montana BBER

Mitchell Slater
USDA FS Northern Research Station FIA

Mathew Smidt
USDA FS Southern Research Station FIA

Adam Smith
Nebraska Forest Service

William Smith
SUNY CESF

Colin Sorenson
USDA FS Northern Region

Linda Spencer
USDA FS NFS Rangeland Management Staff

Carrie Spradlin
USDA FS Pacific Northwest Region 6

Danielle Watson
SAF

Sharon Stanton
USDA FS Pacific Northwest Research Station FIA

Todd Watson
Enviva

Aaron Stottlemeyer
Texas A&M Forest Service

Logan Wells
Wisconsin DNR

Nadia Tase
CAL FIRE

Stewart West
Kentucky Division of Forestry

Adam Taylor
Univ. of Tennessee Dept. of Forestry, Wildlife &
Fisheries

Jim Westfall
USDA FS Northern Research Station FIA

Marcus Taylor
USDA FS Southern Research Station FIA

Robyn Whitney
National Association of State Foresters

Thomas Treiman
Missouri Dept. of Conservation - Science

Michael Wilson
USDA FS Rocky Mountain Research Station FIA

David Wall
USDA FS Southern Research Station FIA

Matt Winn
USDA FS Southern Research Station FIA

Marcus Warnke
South Dakota Department of Agriculture; Forestry
Division

Andrew Yost
Oregon Dept. of Forestry

Nicholas Zito
Connecticut Dept. Energy & Environmental Protection