

---

# **Virginia Harvesting Overview and Update on VT Forest Operations Projects**

---

**Scott Barrett**

**Extension Specialist - Forest Operations**

**Virginia Tech**

**Department of Forest Resources and Environmental Conservation**

**College of Natural Resources and Environment**

---

# Update on the SHARP Logger Program

- **Andrew Vinson working as an Extension Associate**
- **With 1/1/18 SHARP Logger renewals we will now be enforcing the SHARP Logger Update Requirement**
- **Enacted in early 2015, with the primary goal of ensuring that everyone had a BMP update at least once every 3 years**



# SHARP Logger Required Update

## Three hour (3 CE credit) class

- **BMP Refresher**
- **Logging Safety Refresher**
- **Other relevant topics (sometimes issues that are regionally relevant)**
  - **291 still need required class**
  - **Offered this afternoon**
  - **11 other update classes planned this year**
    - Buena Vista, Buckingham, Caroline, Halifax, Galax, Martinsville, Clifton Forge, Alberta, Pattonville, Franklin, New Kent



# Regional Harvest Characteristics

- Student class project
- Worked in cooperation with the VDOF to analyze harvest notification data across VA
- We all know harvests vary across Virginia, but there is not a lot of data available
- VDOF harvest notification data is one of the best sources



## Regional Forest Harvest Characteristics across Virginia

*Chandler Dangle, Graduate Research Assistant, Forest Resources and Environmental Conservation, Virginia Tech*

*Andrew Vinson, Forestry Extension Associate, Forest Resources and Environmental Conservation, Virginia Tech*

*Scott M. Barrett, Extension Specialist, Forest Operations and Biomass Utilization, Forest Resources and Environmental Conservation, Virginia Tech*

### Introduction

Sustainable forestry is practiced across the Commonwealth of Virginia. Recent data indicates that in Virginia the volume of wood harvested is less than half of the total annual growth (VDOF 2016). While some of the general public may view forest harvesting as a negative environmental impact, forestry is one of the most sustainable and beneficial industries in the country. Forest management, including timber harvesting operations, provide benefits to our communities, including jobs, wood products, recreational value and water quality protection. Active management of the forest also benefits wildlife, improves forest health and provides protection to the waters of the U.S.



Skidding operation in the Virginia mountain region.

from sedimentation when compared to other industries and land uses (Aust and Blinn, 2004). The forest industry in Virginia contributes more than \$17 billion to the state's economy each year and provides more than 103,000 jobs for Virginia's citizens (VDOF 2016).

The Virginia Department of Forestry (VDOF) is responsible for the protection of water quality during harvesting operations. This is done through an active inspection program to ensure compliance with the Virginia Silvicultural Water Quality Law. Loggers are required to notify the VDOF when harvesting timber so the site can be inspected to ensure protection of water quality. The Virginia Tech Department of Forest Resources and Conservation (FREC) partnered with VDOF to analyze the information in the harvest notifications / inspections and characterize timber harvests in Virginia. The harvests were divided into three physiographic regions of the state for comparison: Mountains (including Alleghany Plateau, Blue Ridge and Ridge and Valley), Piedmont and Coastal Plain.

### Methods

The Virginia Tech team acquired a list of 5,169 individual harvests completed between

# Regional Harvest Characteristics

- Looked at harvests over a 1 year period (July 2015-July 2016)
- Total of 5,169 harvests
  - 4,539 > 5 acres
  - 230,775 acres
- Analyzed harvests by region using the data available with the notifications



## Regional Forest Harvest Characteristics across Virginia

*Chandler Dangle, Graduate Research Assistant, Forest Resources and Environmental Conservation, Virginia Tech*

*Andrew Vinson, Forestry Extension Associate, Forest Resources and Environmental Conservation, Virginia Tech*

*Scott M. Barrett, Extension Specialist, Forest Operations and Biomass Utilization, Forest Resources and Environmental Conservation, Virginia Tech*

### Introduction

Sustainable forestry is practiced across the Commonwealth of Virginia. Recent data indicates that in Virginia the volume of wood harvested is less than half of the total annual growth (VDOP 2016). While some of the general public may view forest harvesting as a negative environmental impact, forestry is one of the most sustainable and beneficial industries in the country. Forest management, including timber harvesting operations, provide benefits to our communities, including jobs, wood products, recreational value and water quality protection. Active management of the forest also benefits wildlife, improves forest health and provides protection to the waters of the U.S.



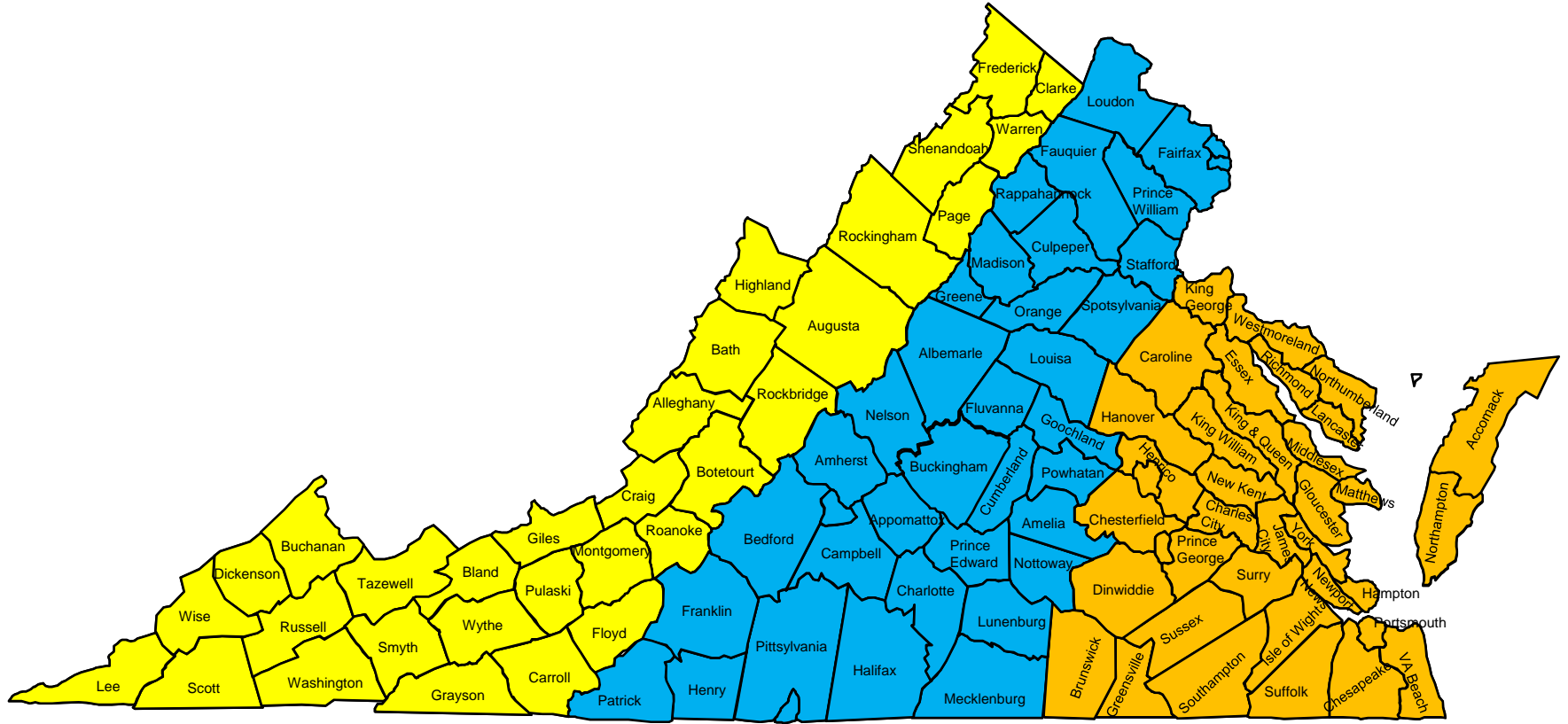
Skidding operation in the Virginia mountain region.

from sedimentation when compared to other industries and land uses (Aust and Blinn, 2004). The forest industry in Virginia contributes more than \$17 billion to the state's economy each year and provides more than 103,000 jobs for Virginia's citizens (VDOP 2016).

The Virginia Department of Forestry (VDOP) is responsible for the protection of water quality during harvesting operations. This is done through an active inspection program to ensure compliance with the Virginia Silvicultural Water Quality Law. Loggers are required to notify the VDOP when harvesting timber so the site can be inspected to ensure protection of water quality. The Virginia Tech Department of Forest Resources and Conservation (FREC) partnered with VDOP to analyze the information in the harvest notifications / inspections and characterize timber harvests in Virginia. The harvests were divided into three physiographic regions of the state for comparison: Mountains (including Alleghany Plateau, Blue Ridge and Ridge and Valley), Piedmont and Coastal Plain.

### Methods

The Virginia Tech team acquired a list of 5,169 individual harvests completed between



# Regional Harvest Characteristics

## Area (acres) harvested by region

Harvest Type	Mountains	Piedmont	Coastal Plain	Total
Commercial Selection	7986	9065	1572	18623
Complete Harvest	9496	79014	57306	145815
Other Silvicultural Systems	409	1733	257	2399
Thinning	7840	29947	26151	63938
<b>Grand Total</b>	<b>25730</b>	<b>119759</b>	<b>85286</b>	<b>230775</b>

## Average tract size (acres)

Harvest Type	Mountains	Piedmont	Coastal Plain	Statewide
Commercial Selection	34.13	31.70	41.37	33.37
Complete Harvest	35.70	50.75	51.72	49.75
Other Silvicultural Systems	31.46	69.34	36.69	53.32
Thinning	34.84	61.37	89.56	63.62
<b>Overall Average</b>	<b>34.86</b>	<b>50.83</b>	<b>59.02</b>	<b>50.84</b>

# Area (acres) harvested per logging business by region

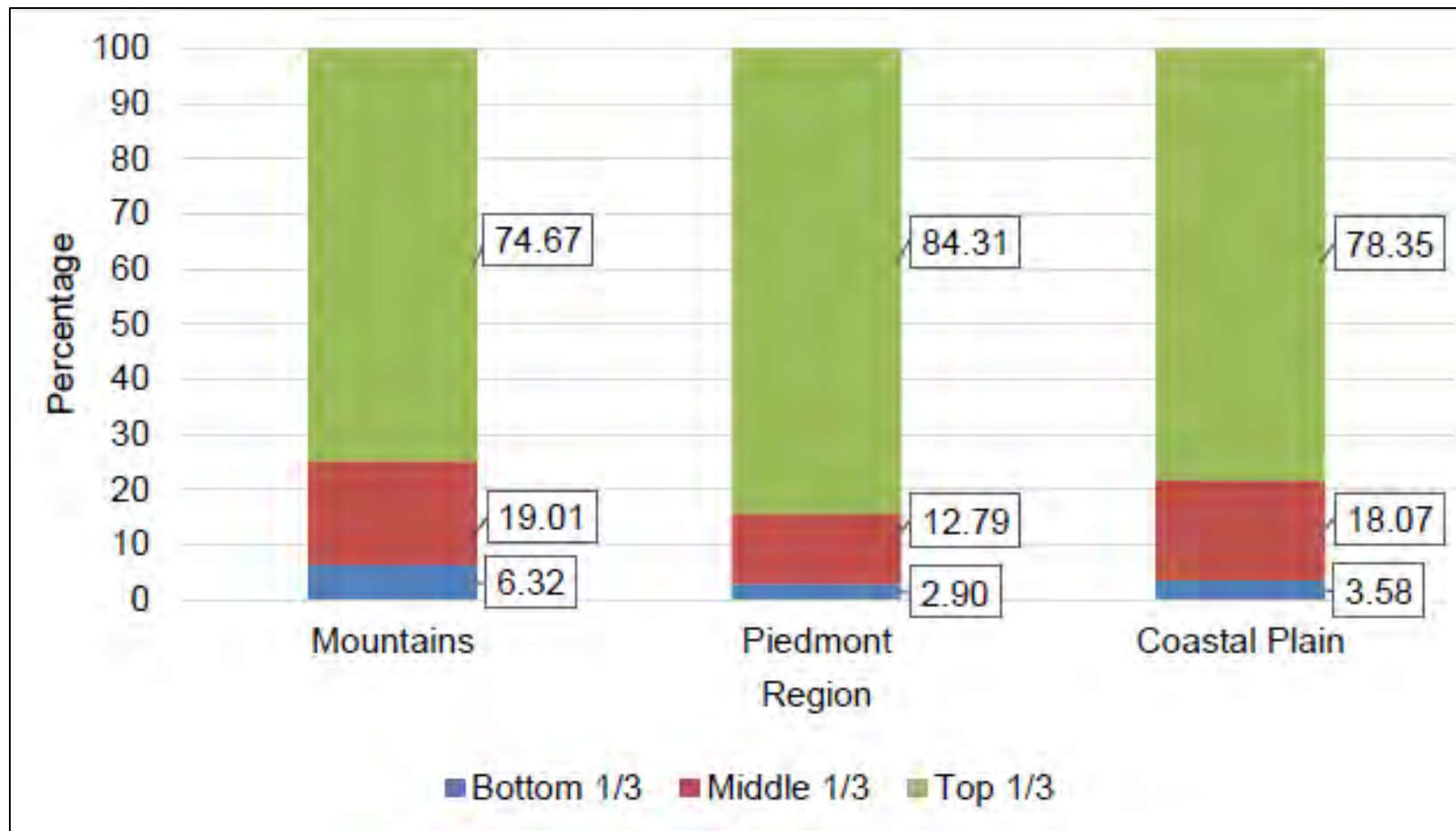
	Mountains	Piedmont	Coastal Plain
<b>Average Acres per Business</b>	83.32	265.97	488.50
<b>Maximum Acres per Business</b>	660	5949	4298

## Area harvested by top 10 logging businesses in each region

	Mountains	Piedmont	Coastal Plain
<b>Acres Harvested</b>	4492	32557	23862
<b>Percent of total acres harvested in Region</b>	17.5	27.2	27.9
<b>Percent of total Logging businesses in region</b>	3.1	1.9	4.5



**Total acres harvested by region for the top, middle, and lower 1/3 of logging businesses when grouped by acres harvested per business.**

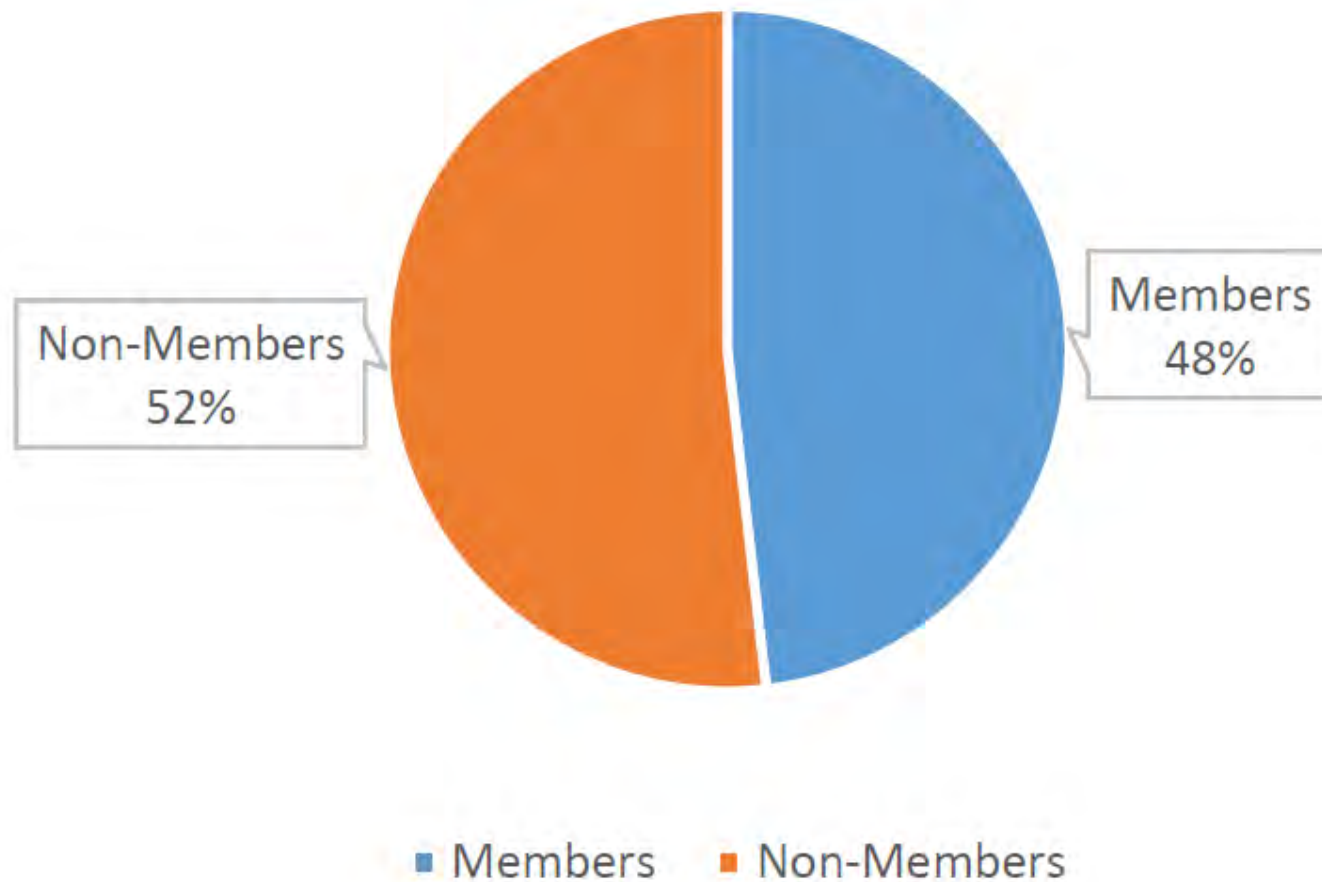


# How do VLA Members Compare to Others?

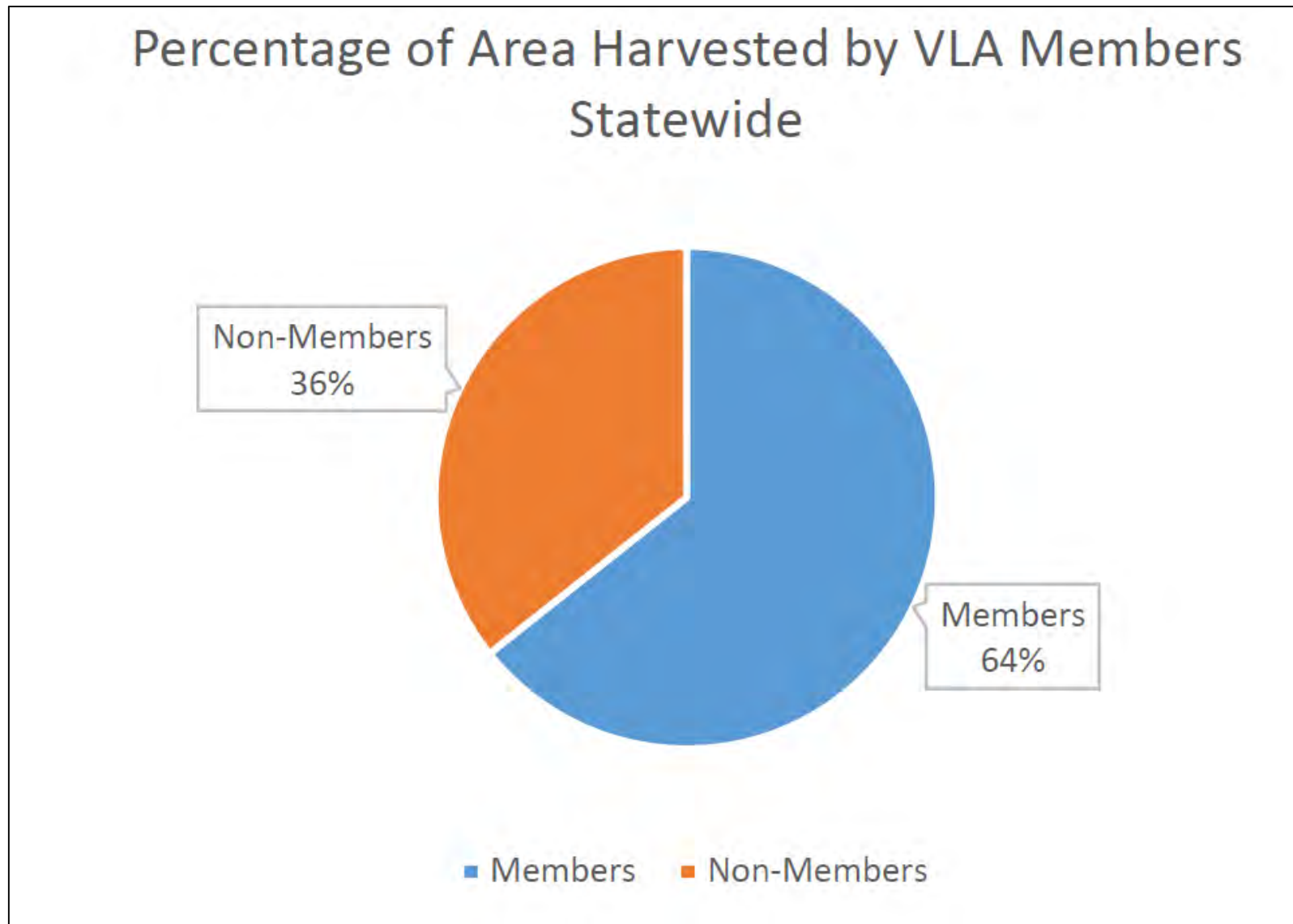
- Used the same data set as the other harvest data
- Logger information based on VDOF NAID
- List of all loggers from harvest notification was compared to list of VLA members
- 22% of loggers that had notified VDOF of a harvest during the 1 year period were VLA members



## Percentage of Harvests Conducted by VLA Members Statewide



# Area Harvested by VLA Members




**VLA member businesses on average are larger and more productive (acres harvested) and accounted for almost 2/3 of all acres harvested in Virginia.**

**But what about BMP implementation scores?**

# BMP Implementation and VLA Members

- The harvest notification data doesn't have a BMP score
- We had to go to a different data set to answer that question
- VDOF BMP audits are a sample of BMP implementation (240 tracts/year) and they provide a score



**Silvicultural Best Management Practices Implementation Monitoring for Virginia**  
2016

**Introduction**

The Virginia Department of Forestry Best Management Practices Implementation Audit Program is based primarily on the Southern Group of State Foresters published framework for state forestry agencies ([http://www.southernforests.org/publications/SGSF%20Regional%20BMP%20Framework%20Protocol%20publication\\_2007.pdf/view](http://www.southernforests.org/publications/SGSF%20Regional%20BMP%20Framework%20Protocol%20publication_2007.pdf/view)). This standardized protocol was intended to ensure that data collected by southern states could be combined into one report. That report is periodically compiled, prepared and submitted to the USDA Forest Service Region 8, as well as USEPA in Atlanta by the Southern Group of State Foresters. However, this protocol is sufficiently flexible to be applied to each state's individual BMP guidelines. At the direction of the State Forester, Virginia is monitoring 240 harvested tracts each year and compiling an independent annual report based on this protocol. These data are submitted periodically for the Southern Group five-year report (<http://www.southernforests.org/publications>).

**Methods**

Every quarter of every year, 60 tracts are selected randomly from harvests that received a VDOF final inspection two quarters previous to the audit quarter. This allows approximately six months between BMP implementation and the audit field visit. This timing allows for an assessment of how BMP integrity changes over time and provides for a modest sampling of silvicultural practices, such as site preparation, tree planting and weed control. VDOF is randomizing within each of the three administrative regions (Eastern, Central and Western) with the number of selected tracts proportional to the number of harvests for each sample quarter. This concentrates BMP audits in areas where most harvesting is occurring. In this, the ninth audit cycle (1st - 4th quarter, 2016), there are 240 total audits completed and the regional breakdown is displayed in Table 1.

**Table 1. Number of BMP audits completed by VDOF administrative region during the audit cycle for the 2016 calendar year.**

Region	Number of Audits
Central	107
Eastern	82
Western	51


Each audit tract will result in a "% Yes" score for each BMP category. That percentage describes what proportion of audit questions in that category that were applicable to that tract were positively fulfilled by the operator in the field. The audit questions are evaluated and answered during a field visit by one of four water quality engineers and/or nine water quality specialists who are full-time VDOF personnel. Every auditor is regularly trained in a group setting to maintain accuracy and consistency across the state. This enables VDOF to evaluate audit results generally by BMP category or type.

Each of the 240 tracts audited is treated as a discreet unit, and the average and median tract scores are reported as the "harvest average or median score." Each audit is comprised of 117 questions in 10 categories (Appendix A). These data are also combined across all tracts, and all question responses are averaged together as a single data set by audit category and reported as the "BMP average." This is the average percentage of "Yes" responses when all audit questions are considered together without regard for the individual tract audits. This approach attempts to more accurately describe the overall BMP condition as a whole in Virginia. This BMP average also assigns greater importance to audits that have more applicable questions. These data consist of 28,080 total questions of which 19,886 were deemed not applicable, 728 were answered "No" and 7,466 were answered "Yes." These categories and questions relate directly to the major recommendations outlined in the BMP manual entitled *Virginia's Forestry Best Management Practices for Water Quality, 5th Edition*. This technical manual is available online

Page 1

# BMP Implementation and VLA Members

- VDOF agreed to provide the audit data for two years (480 tracts) for comparison to VLA Member list , Andrew Vinson analyzed the data
- 243/480 Tracts harvested by VLA Members (50.6%)
- Good sample - (48% of all notifications from VLA members)



## Silvicultural Best Management Practices Implementation Monitoring for Virginia

2016

### Introduction

The Virginia Department of Forestry Best Management Practices Implementation Audit Program is based primarily on the Southern Group of State Foresters published framework for state forestry agencies ([http://www.southernforests.org/publications/SGSF%20Regional%20BMP%20Framework%20Protocol%20publication\\_2007.pdf/view](http://www.southernforests.org/publications/SGSF%20Regional%20BMP%20Framework%20Protocol%20publication_2007.pdf/view)). This standardized protocol was intended to ensure that data collected by southern states could be combined into one report. That report is periodically compiled, prepared and submitted to the USDA Forest Service Region 8, as well as USEPA in Atlanta by the Southern Group of State Foresters. However, this protocol is sufficiently flexible to be applied to each state's individual BMP guidelines. At the direction of the State Forester, Virginia is monitoring 240 harvested tracts each year and compiling an independent annual report based on this protocol. These data are submitted periodically for the Southern Group five-year report (<http://www.southernforests.org/publications>).

### Methods

Every quarter of every year, 60 tracts are selected randomly from harvests that received a VDOF final inspection two quarters previous to the audit quarter. This allows approximately six months between BMP implementation and the audit field visit. This timing allows for an assessment of how BMP integrity changes over time and provides for a modest sampling of silvicultural practices, such as site preparation, tree planting and weed control. VDOF is randomizing within each of the three administrative regions (Eastern, Central and Western) with the number of selected tracts proportional to the number of harvests for each sample quarter. This concentrates BMP audits in areas where most harvesting is occurring. In this, the ninth audit cycle (1st - 4th quarter, 2016), there are 240 total audits completed and the regional breakdown is displayed in Table 1.

Region	Number of Audits
Central	107
Eastern	82
Western	51

Each audit tract will result in a "% Yes" score for each BMP category. That percentage describes what proportion of audit questions in that category that were applicable to that tract were positively fulfilled by the operator in the field. The audit questions are evaluated and answered during a field visit by one of four water quality engineers and/or nine water quality specialists who are full-time VDOF personnel. Every auditor is regularly trained in a group setting to maintain accuracy and consistency across the state. This enables VDOF to evaluate audit results generally by BMP category or type.

Each of the 240 tracts audited is treated as a discreet unit, and the average and median tract scores are reported as the "harvest average or median score." Each audit is comprised of 117 questions in 10 categories (Appendix A). These data are also combined across all tracts, and all question responses are averaged together as a single data set by audit category and reported as the "BMP average." This is the average percentage of "Yes" responses when all audit questions are considered together without regard for the individual tract audits. This approach attempts to more accurately describe the overall BMP condition as a whole in Virginia. This BMP average also assigns greater importance to audits that have more applicable questions. These data consist of 28,080 total questions of which 19,886 were deemed not applicable, 728 were answered "No" and 7,466 were answered "Yes." These categories and questions relate directly to the major recommendations outlined in the BMP manual entitled *Virginia's Forestry Best Management Practices for Water Quality, 5th Edition*. This technical manual is available online

Page 1

# So How Does BMP Implementation of VLA Members Compare to Non-Members?

- Well...
- There's good news!
- There's maybe bad news...
- But the bad news is actually pretty good news



**Silvicultural Best Management Practices Implementation Monitoring for Virginia**  
2016

**Introduction**

The Virginia Department of Forestry Best Management Practices Implementation Audit Program is based primarily on the Southern Group of State Foresters published framework for state forestry agencies (<http://www.southernforesters.org/publications/2007%20Regional%20BMP%20Framework%20Final%20Publication%2007.pdf>). This standardized protocol was intended to ensure that data collected by southern states could be combined into one report. That report is periodically compiled, prepared and submitted to the USDA Forest Service Region 8, as well as USEPA in Atlanta by the Southern Group of State Foresters. However, this protocol is sufficiently flexible to be applied to each state's individual BMP guidelines. At the direction of the State Forester, Virginia is monitoring 240 harvested tracts each year and compiling an independent annual report based on this protocol. These data are submitted periodically for the Southern Group five-year report (<http://www.southernforesters.org/publications>).

**Methods**

Every quarter of every year, 60 tracts are selected randomly from harvests that received a VDOF final inspection two quarters previous to the audit quarter. This allows approximately six months between BMP implementation and the audit field visit. This timing allows for an assessment of how BMP integrity changes over time and provides for a modest sampling of silvicultural practices, such as site preparation, tree planting and weed control. VDOF is randomizing within each of the three administrative regions (Eastern, Central and Western) with the number of selected tracts proportional to the number of harvests for each sample quarter. This concentrates BMP audits in areas where most harvesting is occurring, so that the sixth audit cycle (1st - 6th quarter, 2016), there are 240 total audits completed and the regional breakdown is displayed in Table 1.

**Table 1. Number of BMP audits completed by VDOF administrative region during the audit cycle for the 2016 calendar year.**

Region	Number of Audits
Central	107
Eastern	82
Western	51

Each audit tract will result in a "% Yes" score for each BMP category. That percentage describes what proportion of audit questions in that category that were applicable to that tract were positively fulfilled by the operator in the field. The audit questions are evaluated and answered during a field visit by one of four water quality engineers and/or nine water quality specialists who are full-time VDOF personnel. Every auditor is regularly trained in a group setting to maintain accuracy and consistency across the state. This enables VDOF to evaluate audit results generally by BMP category or type.

Each of the 240 tracts audited is treated as a discrete unit, and the average and median tract scores are reported as the "harvest average or median score." Each audit is comprised of 137 questions in 10 categories (Appendix A). These data are also combined across all tracts, and all question responses are averaged together as a single data set by audit category and reported as the "BMP average." This is the average percentage of "Yes" responses when all audit questions are considered together without regard for the individual tract audits. This approach attempts to more accurately describe the overall BMP condition as a whole in Virginia. This BMP average also assigns greater importance to audits that have more applicable questions. These data consist of 28,080 total questions of which 19,886 were deemed not applicable, 728 were answered "No" and 7,466 were answered "Yes." These categories and questions relate directly to the major recommendations outlined in the BMP manual entitled Virginia's Forestry Best Management Practices for Water Quality, 3th Edition. That technical manual is available online.

Page 1



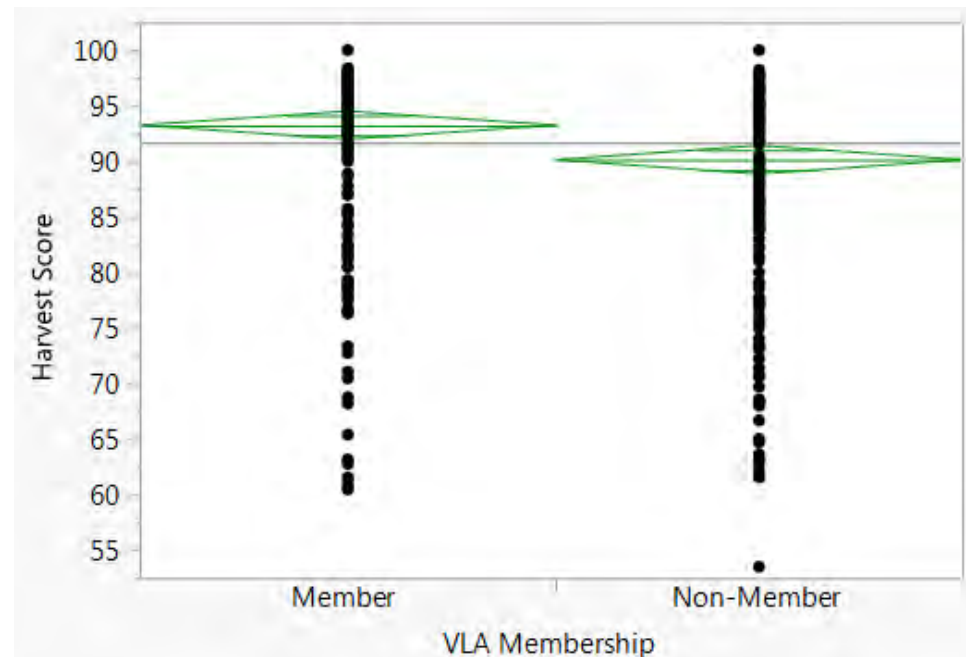
## **The Good News**

**BMP implementation scores are significantly higher for VLA members than non-members**

## The Bad News

**They are not a whole lot higher....**

- **Non-members average was 90.13%**
- **VLA Members average was 93.24%**



## **The Bad News is Actually Pretty Good News...**


- **BMP Implementation by both groups is good!**
- **There's not a whole lot of room to be a whole lot better than average**
- **A testament to the hard work, planning and financial commitment that loggers make to protect water quality in the Commonwealth**
- **On average, over 90% of all applicable BMPs were installed appropriately**

## **Update on Other VA Tech Forest Operations Projects**

- **TEAM SAFE Trucking research project**
  - **Neila Cole – will be graduating in May**
- **BMP upgrades at stream crossings**
  - **Chandler Dangle – will be graduating in May**
- **We will be hosting the COFE Meeting in Williamsburg in 2018**

# Council on Forest Engineering 2018

Williamsburg, VA

 **VirginiaTech**  
Invent the Future®

July 15-18, 2018



*Revolutionary Traditions, Innovative Industries*

**41<sup>st</sup> Annual Meeting**

**July 15-18, 2018**

**Williamsburg, Virginia**

---

**Williamsburg Lodge**

# Hosts and Sponsors

## ➤ Virginia Tech

- Department of Forest Resources & Environmental Conservation
- Forest Operations and Business Research Cooperative

## ➤ Enviva Biomass

- Signature Sponsor
  - Host of field trip
  - Sponsor of themed tavern dinner



**Thanks!**

**Publications can be found at  
<http://pubs.ext.vt.edu/>**

---

**Scott Barrett**

**Extension Specialist - Forest Operations**

**Virginia Tech**

**[sbarrett@vt.edu](mailto:sbarrett@vt.edu) 540-231-6702**

**Department of Forest Resources and Environmental Conservation**

**College of Natural Resources and Environment**