

# A Field Assessment of Hardwood Log Bucking Practices in West Virginia

William A. Goff  
Jingxin Wang  
West Virginia University  
Division of Forestry and Natural Resources  
Morgantown, WV 26506

# Introduction

- Log bucking is the second most important factor when discussing value recovery
- Bucking is generally conducted using a sawbuck at the landing site in the Appalachian region
- Bucking decisions are based on numerous variables including: species, diameter, defect, and price

# Objectives

- Assess log bucking practices in the Appalachian region,
- Statistically analyze the differences of log bucking among:
  - Bucker experience,
  - Species,
  - Defects, and
  - Diameter

# Methods

- Six sites were selected in northern West Virginia
- Sites displayed manual and mechanical felling, grapple and cable skidding, and all of them utilized a bucksaw at the landing site for bucking
- Logging companies were representative of the state



# Methods

- A total of 300 trees were sampled
- Red Oak and Yellow-Poplar made up the largest portion of the sample, but mixed oak and Black Cherry were also examined
- Standing tree measurements included:
  - DBH, THT, and Merchantable height

# Methods

- Measurements taken at the landing:
  - Stem diameter at 4-foot increments,
  - Length, width, and location of each defect, and
  - Log length and diameter
- Logs were classified by product



# Methods

## (Analysis)

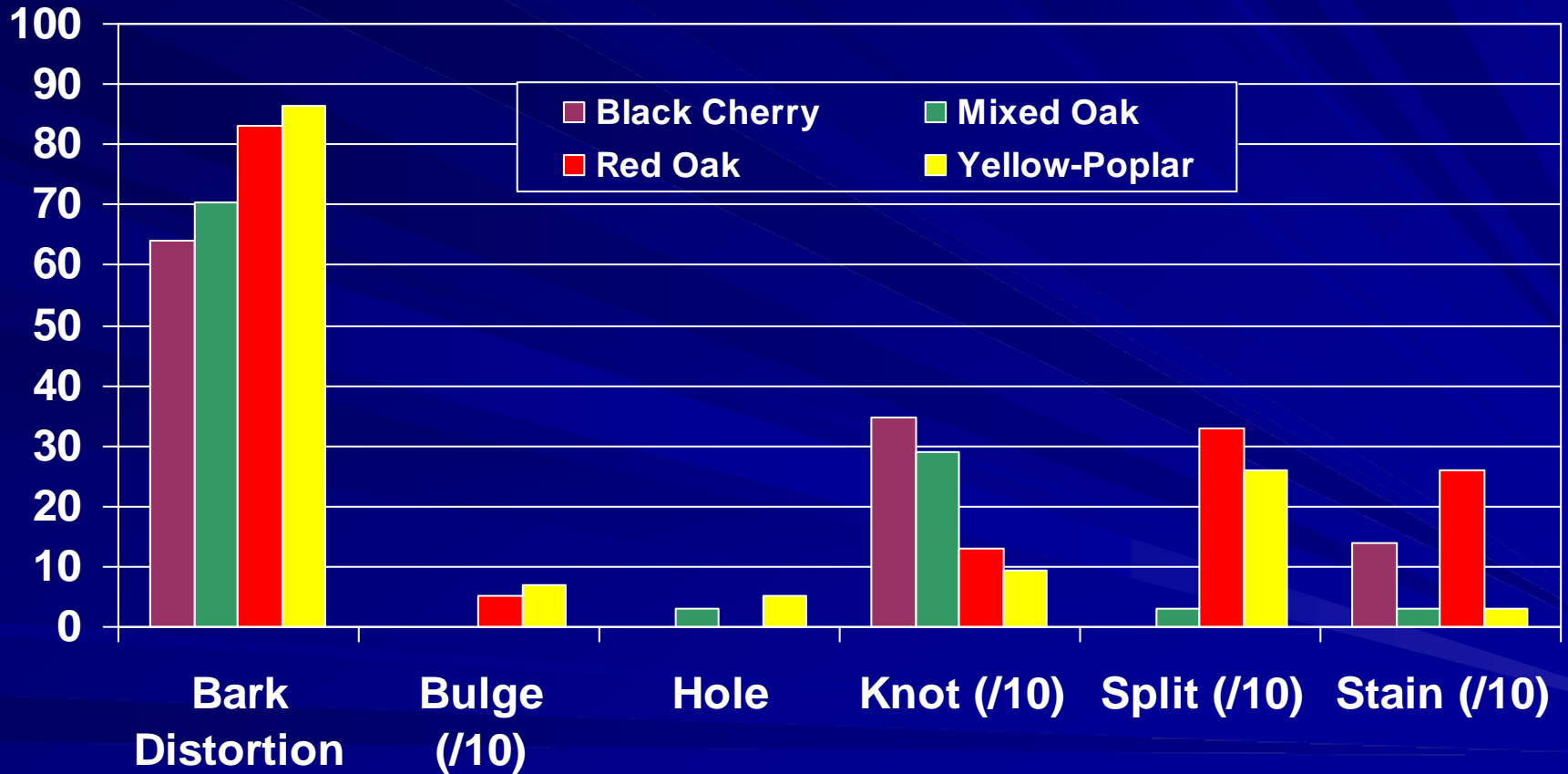
- Examine statistics by species and product
- Assess utilization percentages of total tree height, stem length, and log volume
- Further analyze the effects of bucker experience, defects, species, and diameter

# Results

- Tree data:
  - Averaged 17.9 inches
  - Ranged from 10.5-35.3 inches
  - Average total height was 96 feet
  - Average stem length measured at the landing was 56.4 feet
- Defects:
  - Average of 8 defects per stem
  - Ranged from 0-28

# Results

## (Defect by Species)



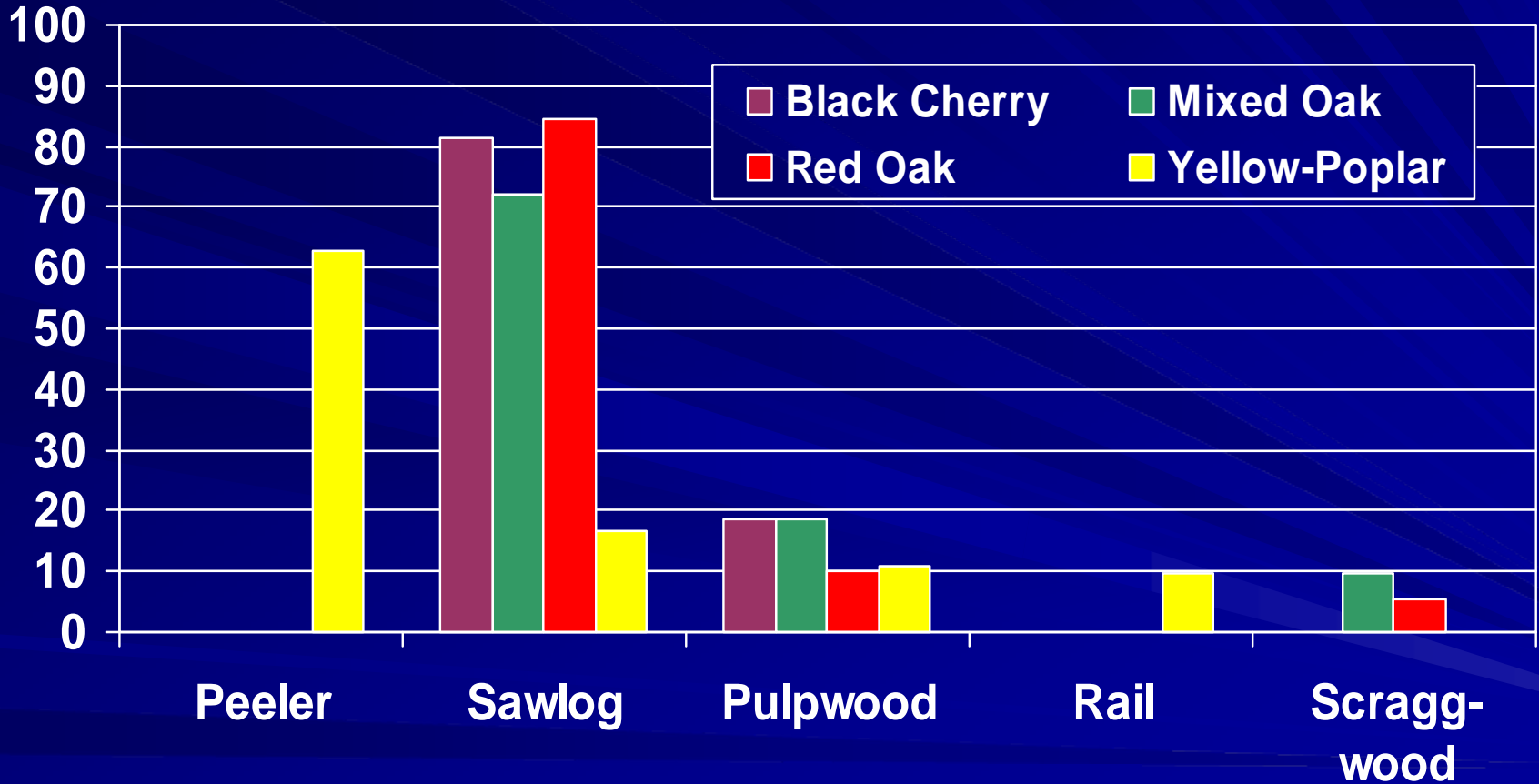
# Results

- Log analysis
  - Total of 1124 logs produced

Log frequency distribution of product class.

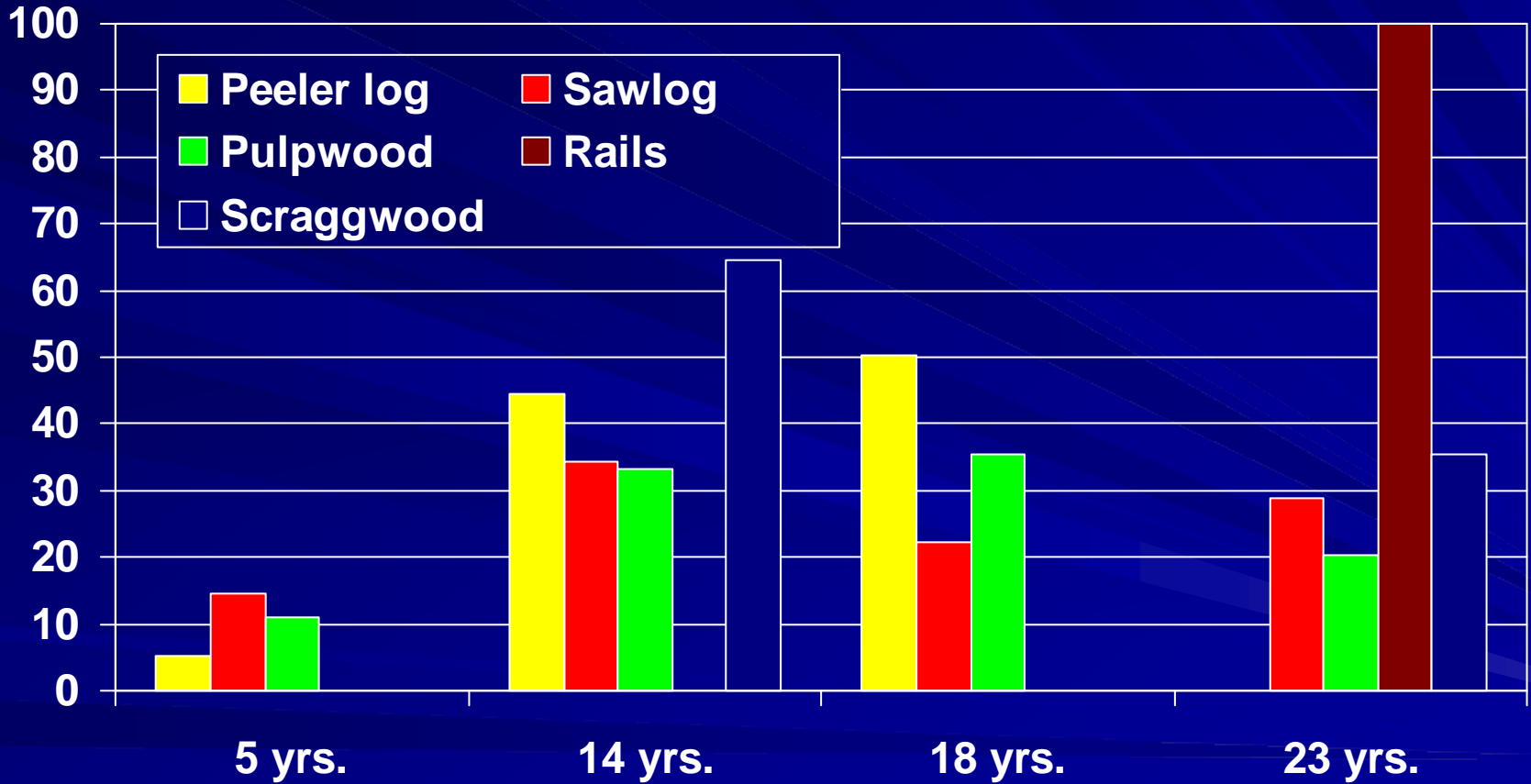
Product	N	Frequency %	Cumulative Frequency %
Sawlog	505	44.5	44.5
Peeler	390	34.1	78.6
Pulpwood	138	12.1	90.7
Rail	60	5.3	96
Scraggwood	31	2.7	98.7
Waste	17	1.3	100

# Results (Product)



# Results

## (Bucker Experience)



# Results

- Percentage of logs bucked by sequence according to product class

Frequency of product type by bucking sequence.

Log Sequence	Peeler	Sawlog	Pulpwood	Rail	Scraggwood
1	31.0	63.3	0.3	4.0	0.3
2	40.9	52.3	0.0	4.4	1.3
3	40.5	40.1	8.4	5.1	4.0
4	30.6	24.0	29.0	7.7	6.6
5	10.5	6.6	71.1	7.9	2.6
6	0.0	0.0	70.0	10.0	10.0

# Results

- One company produced no peeler logs, but produced rails using yellow-poplar
- Log volume was significantly lower for black cherry and red oak compared to the other species
- Stem utilization increased with buckler experience

# Conclusions

- Species, stem dimension, defects, and bucker's experience were found to significantly affect log length
- A higher percentage of 18-foot peeler logs were cut compared to 9-foot logs
- It was observed that several of the peeler logs were bucked improperly with one having a length of 19.2 feet

# Conclusions

- Diameter class had a significant affect on:
  - Total log volume and
  - Price
- Species significantly affected:
  - Total log volume,
  - Total log price, and
  - Log utilization/Total height

# Conclusions

- Sawlogs were bucked at the highest percentage; followed by peeler logs and pulpwood
- Peeler logs were generally bucked as the second or third log from yellow-poplar stems
- Mill specifications generally determine if a sawlog is the first log from a yellow-poplar stem

# Discussion

- Mill requirements and prices change constantly, which ultimately affects bucking
- The log bucker must make quick decisions while incorporating many factors
- Automated programs are available to aid the log bucker or determine cuts based on the stem attributes

# Discussion

- Log bucking assessments are necessary to examine factors affecting bucking decisions
- Data must be collected from waste material to determine the utilization of each stem
- Performing these assessments will better utilize the forest resources for many types of applications

# Future Assessments

- Timber harvesters should be assessed throughout West Virginia
- Assessing the entire state will provide data to examine current market affects on bucking
- Results may help timber harvesters better understand how to merchandize a stem for optimal log production

# The End

