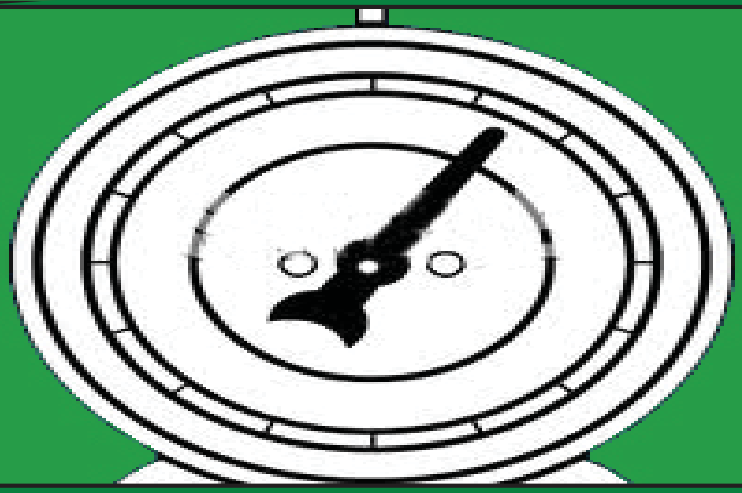
# Transacting Logs by Weight
# A Western US Overview



**Neal T. Hart, Jendro & Hart, LLC**

**Timber Measurement Society, Central Meeting, April 6-8 2011, Tacoma Washington**

**Western US log scaling practices are changing**

**cubic and weight scaling is replacing board foot measure**

# Weyerhaeuser Company, 2008 Annual Report

## HOW WE MEASURE OUR PRODUCT

Beginning this year, we have started to report Timberlands data in cubic meters. Cubic meters is a measure of the total volume of wood fiber in a tree or log that can be sold. Cubic meter volume is determined from the large- and small-end diameters and length and provides a more consistent and comparative measure of timber and log volume among operating regions, species, size and seasons of the year than other units of measure.

CALIFORNIA DIVISION OF FORESTRY

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF CONSERVATION

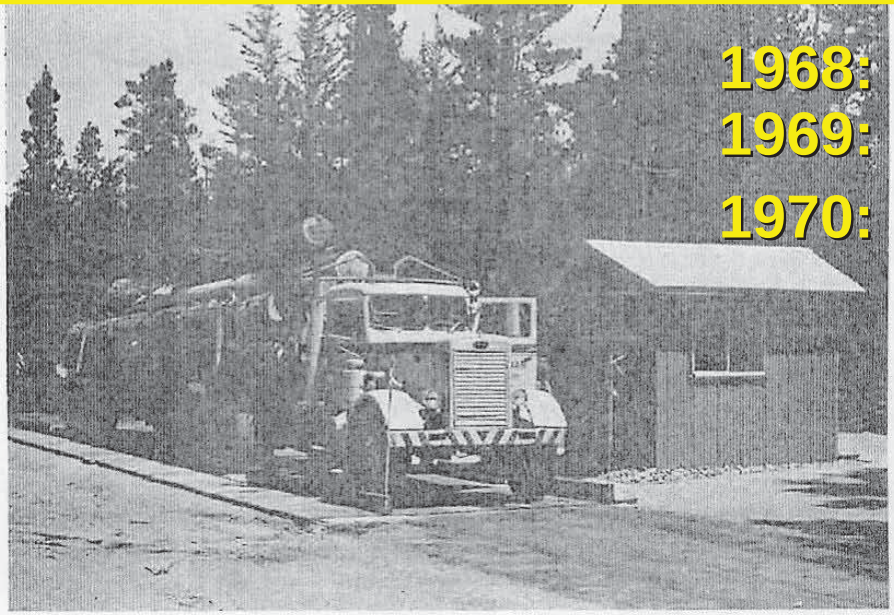
# STATE FOREST NOTES

Office of the State Forester
Sacramento

No. 42 August, 1970

## BOARD FOOT BY THE POUND

David M. Burns[1/]



1968:
1969:
1970:

[1/] Staff forester for State Forests, Sacramento, formerly Assistant Forest Manager, Jackson State Forest.

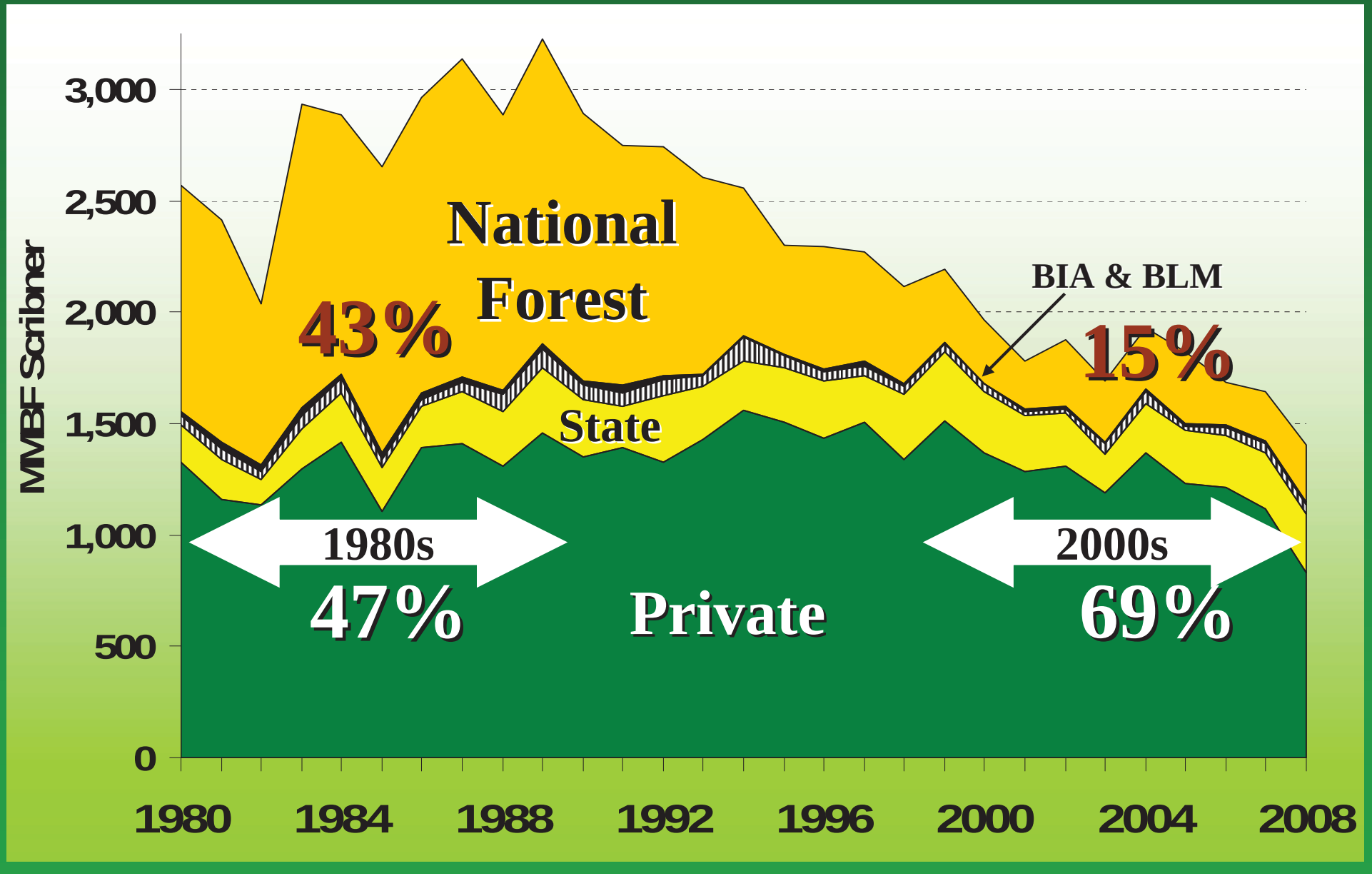
# Weight Scaling in California's Jackson State Forest

"It is operational and it works."

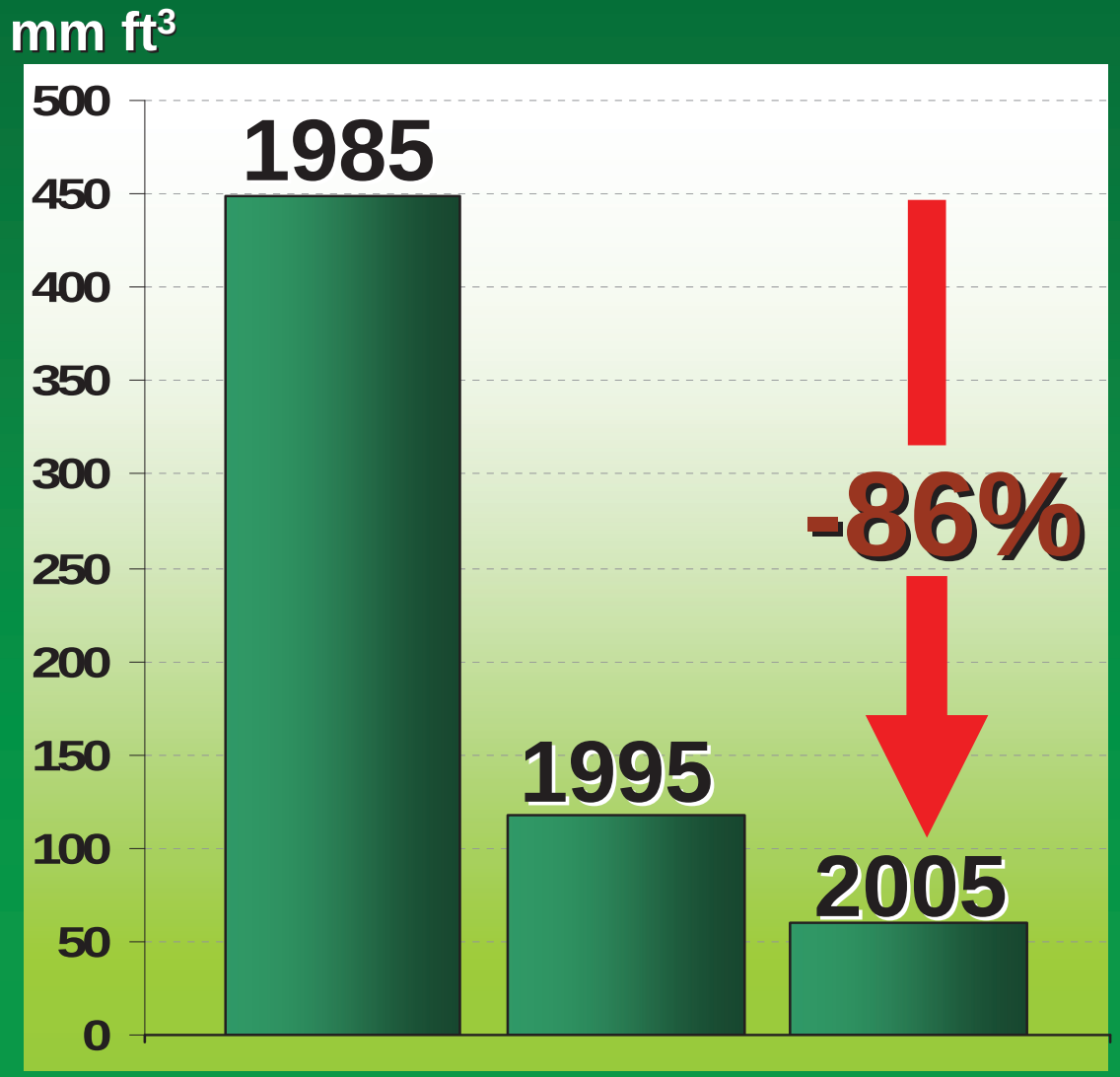
**Two Young Growth Sales**
**21 mmbf of SG**

**Entire JSF Sale Program**
**including 19 mmbf SG &**
**15 mmbf of OG**

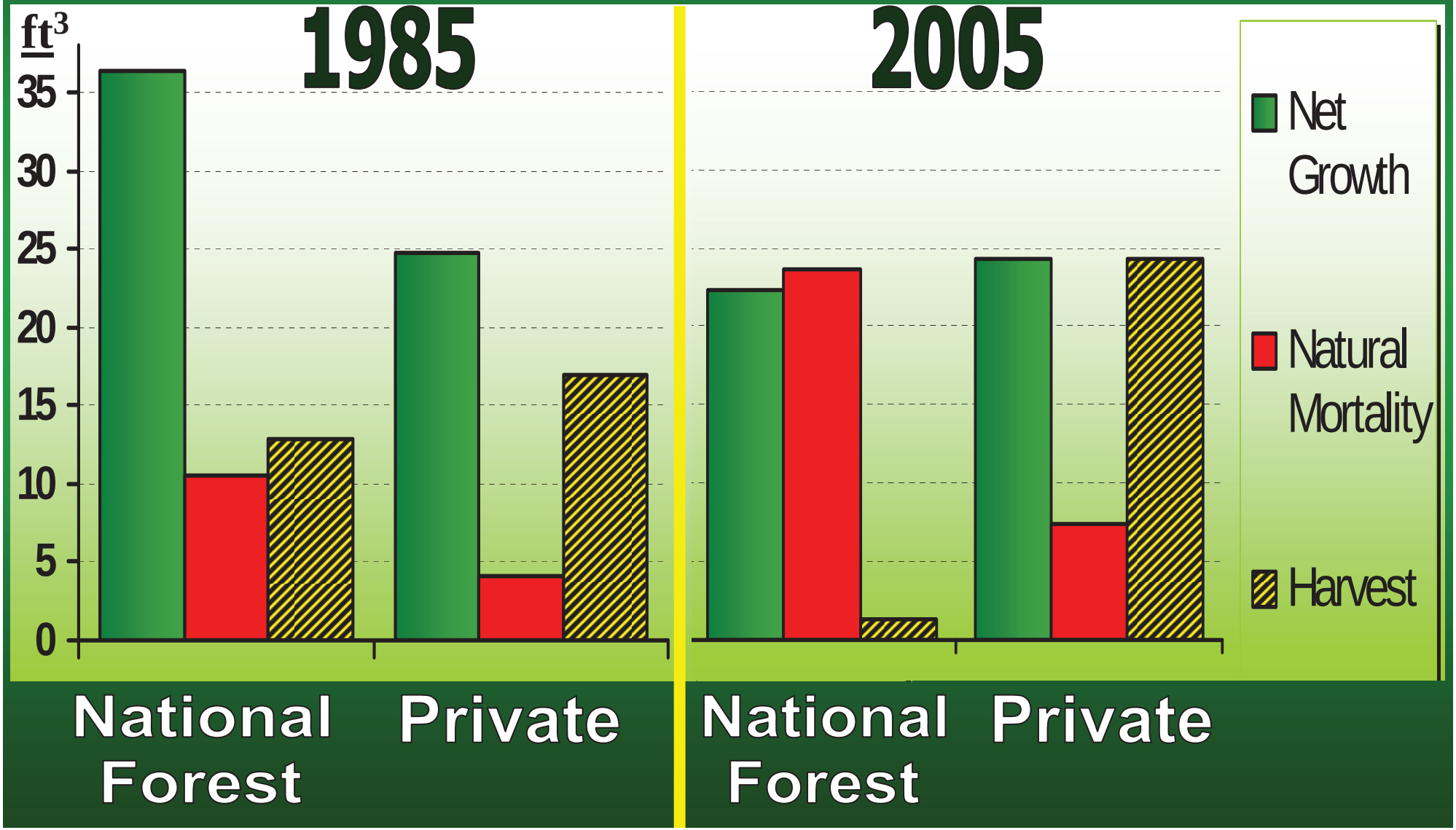
# Idaho & Montana Timber Harvest by Ownership, 1980 - 2008



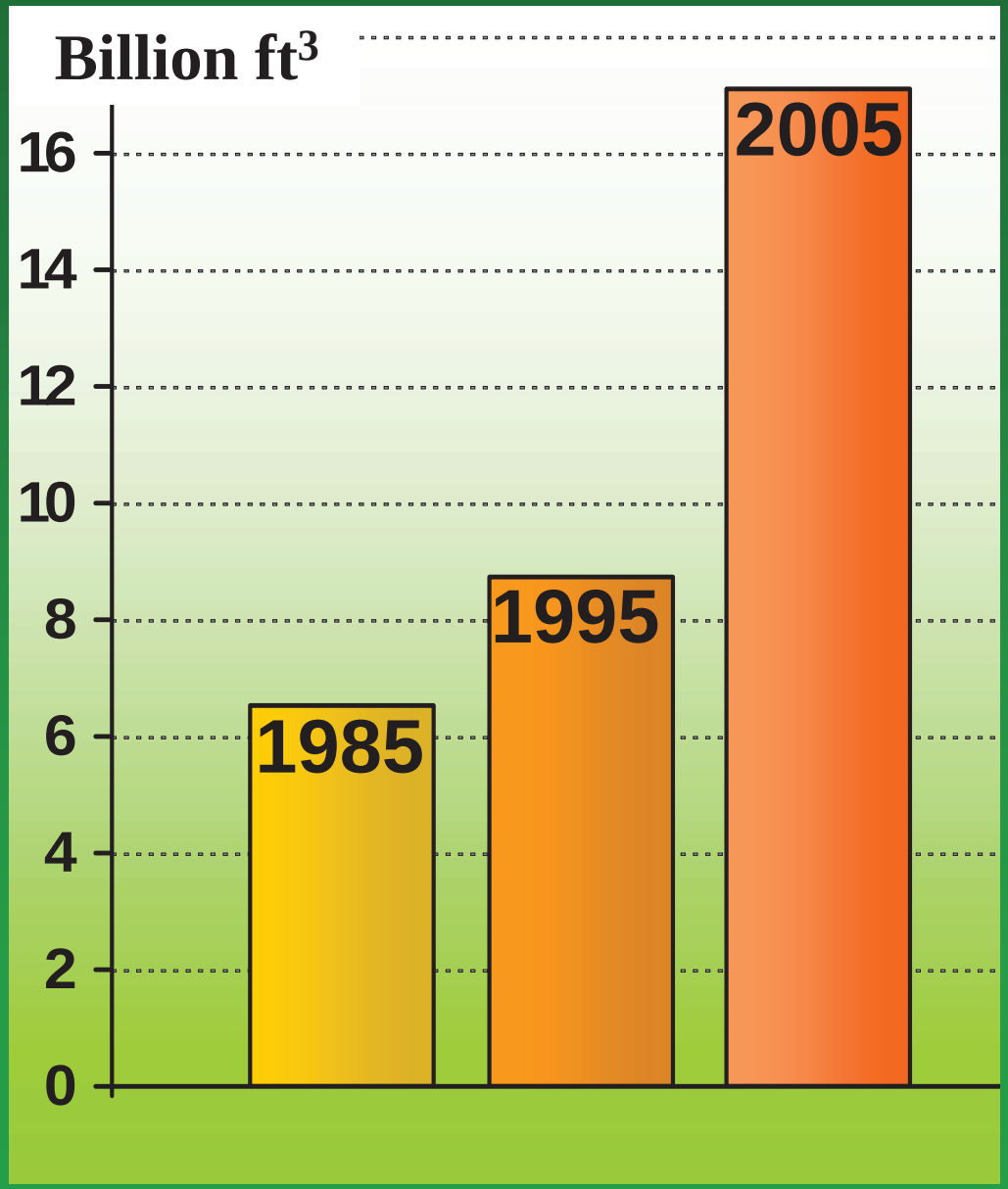
# Harvest from National Forests in the Intermountain West



# Intermountain Region
# Net Growth, Mortality & Harvest
## per acre of Timber Land



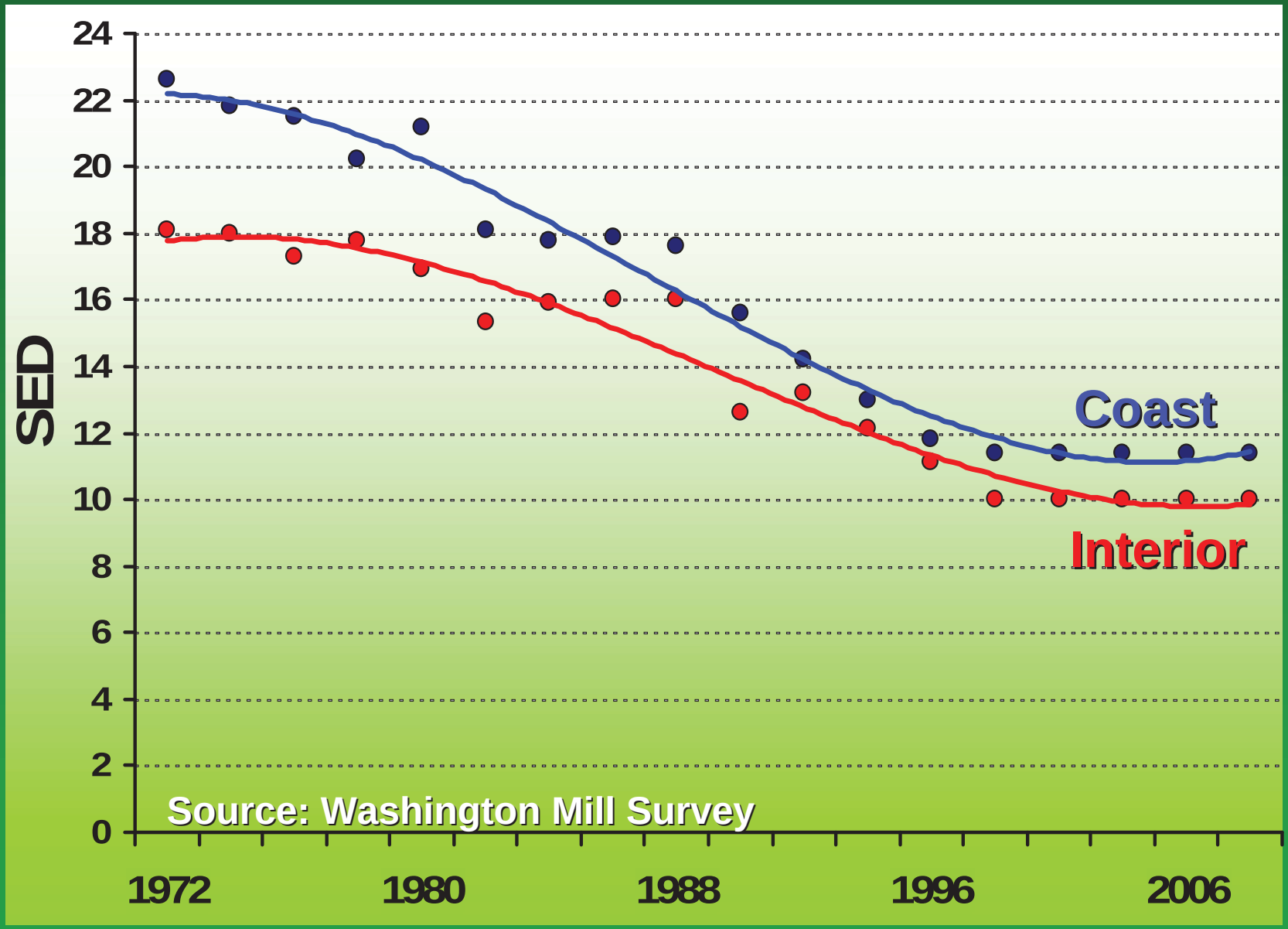
# Inventory of Sound Dead Volume Intermountain Region



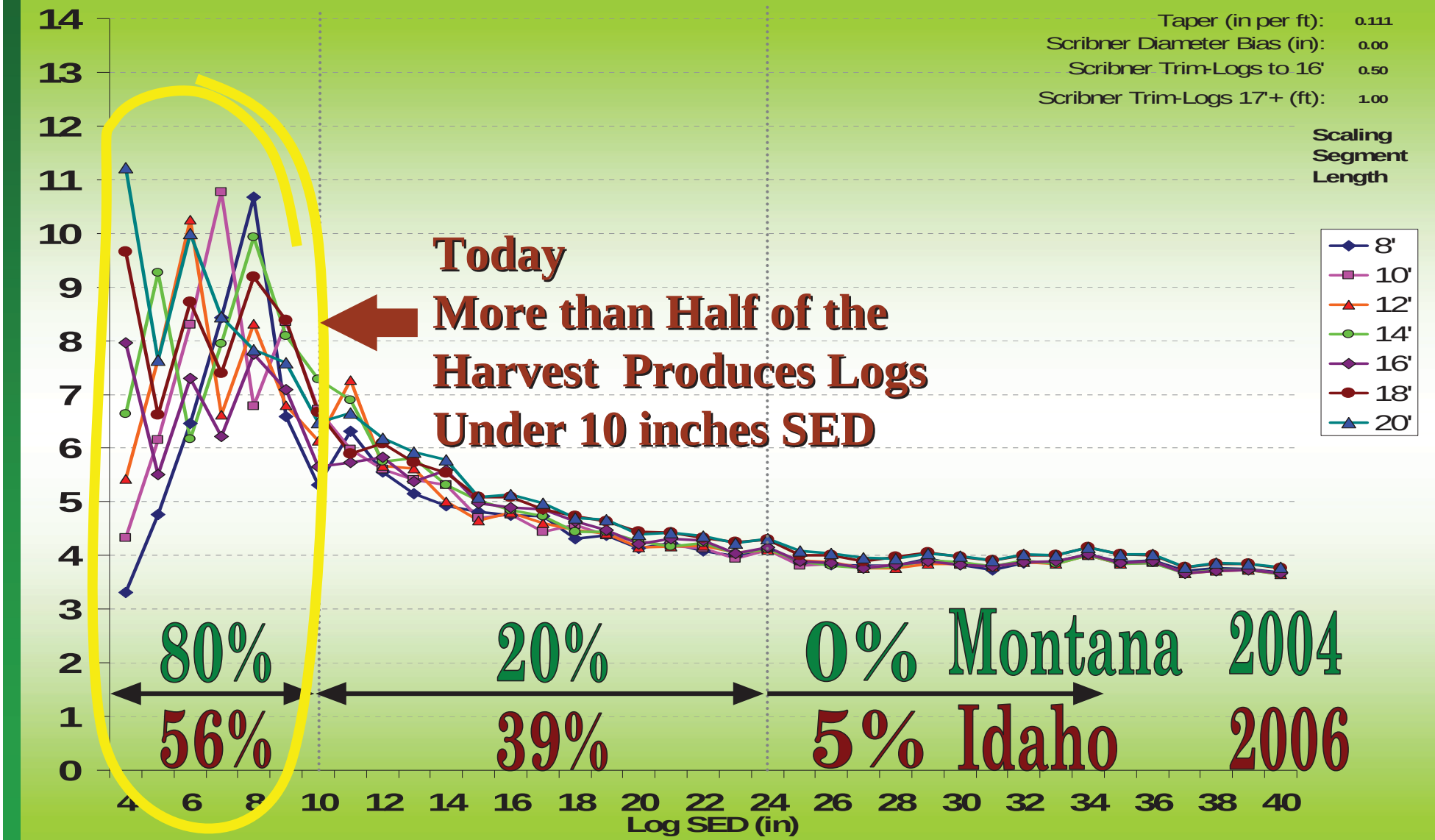

**17.1 Billion Cubic Feet**

**35 times annual harvest from all ownerships**

# Average Sawlog Diameter
# Washington Sawmills 1972 - 2008

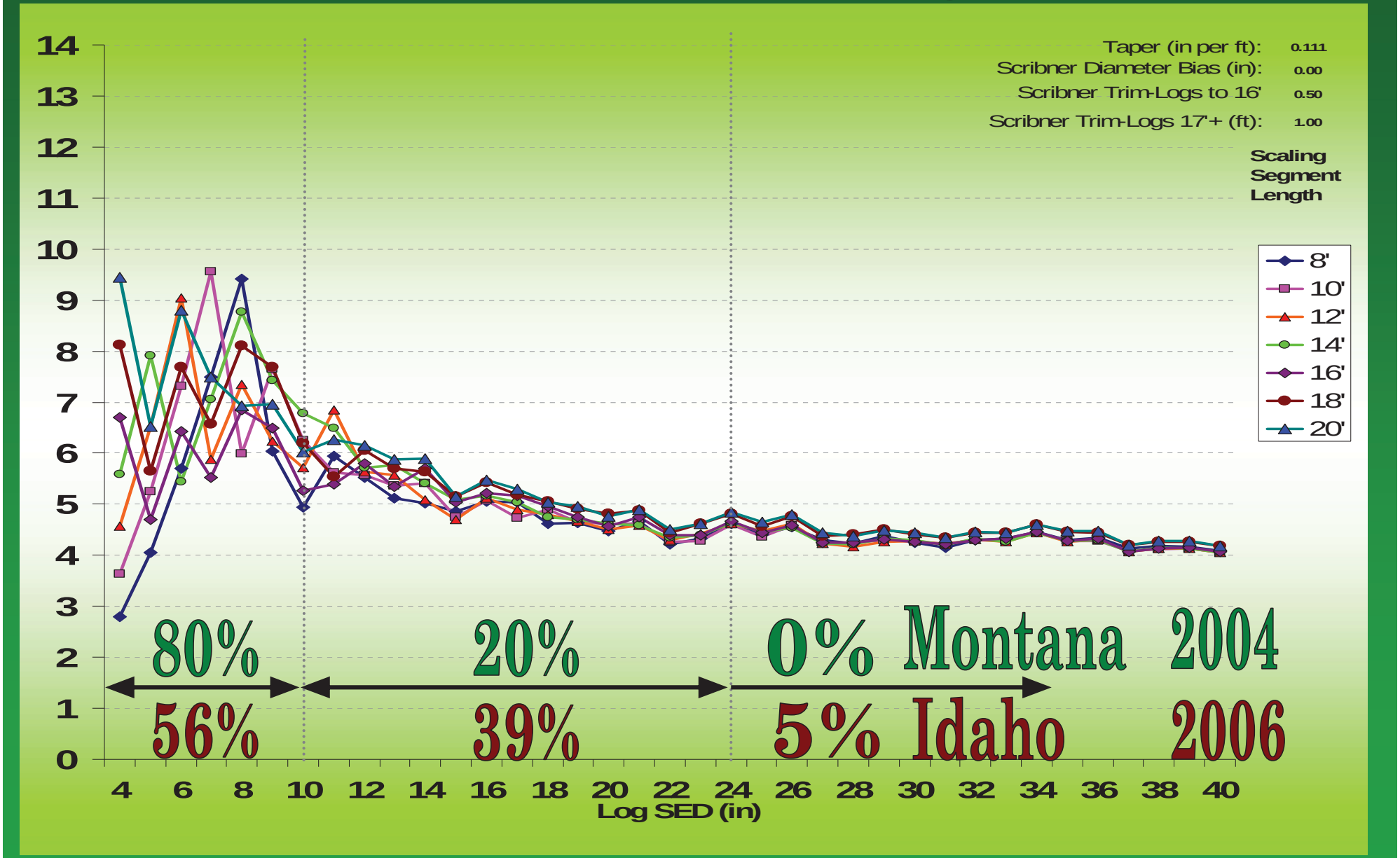


# Cubic Meters per MBF Scribner Decimal C,
## Gross Short Log Scale



# Tons per MBF Scribner

## Decimal C, Gross Short Log Scale



# Weight Is Blind

**On the Plus Side Weight Can't:**

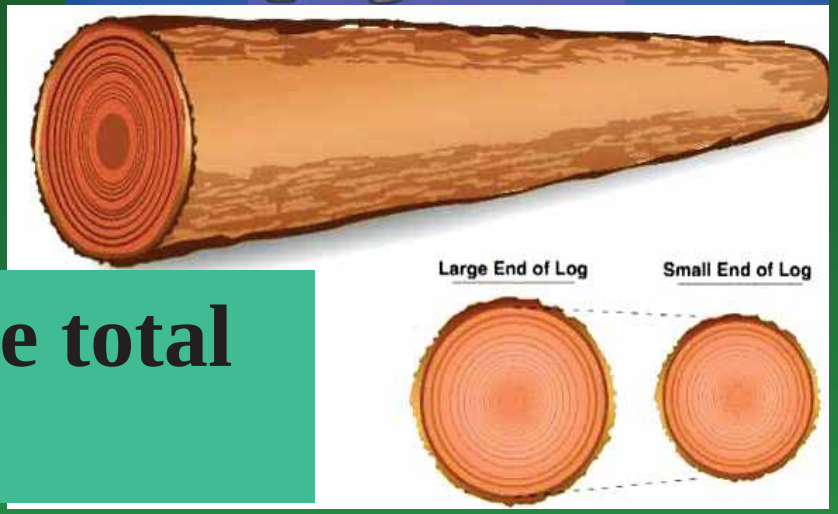
- Ignore Trim
- Ignore Taper
- Truncate Diameter
- Round to X #lbs

**It Can't "See" Cracks, or Any Other Defects**

# The Alternatives:

-0.003

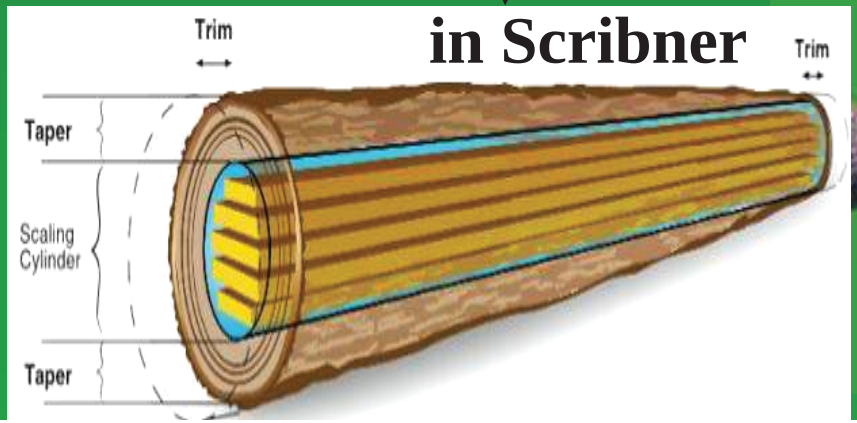
- Weight *is* Weight
- Cubic ~ Cubic




**Where its goal is to measure total solid-wood fiber**

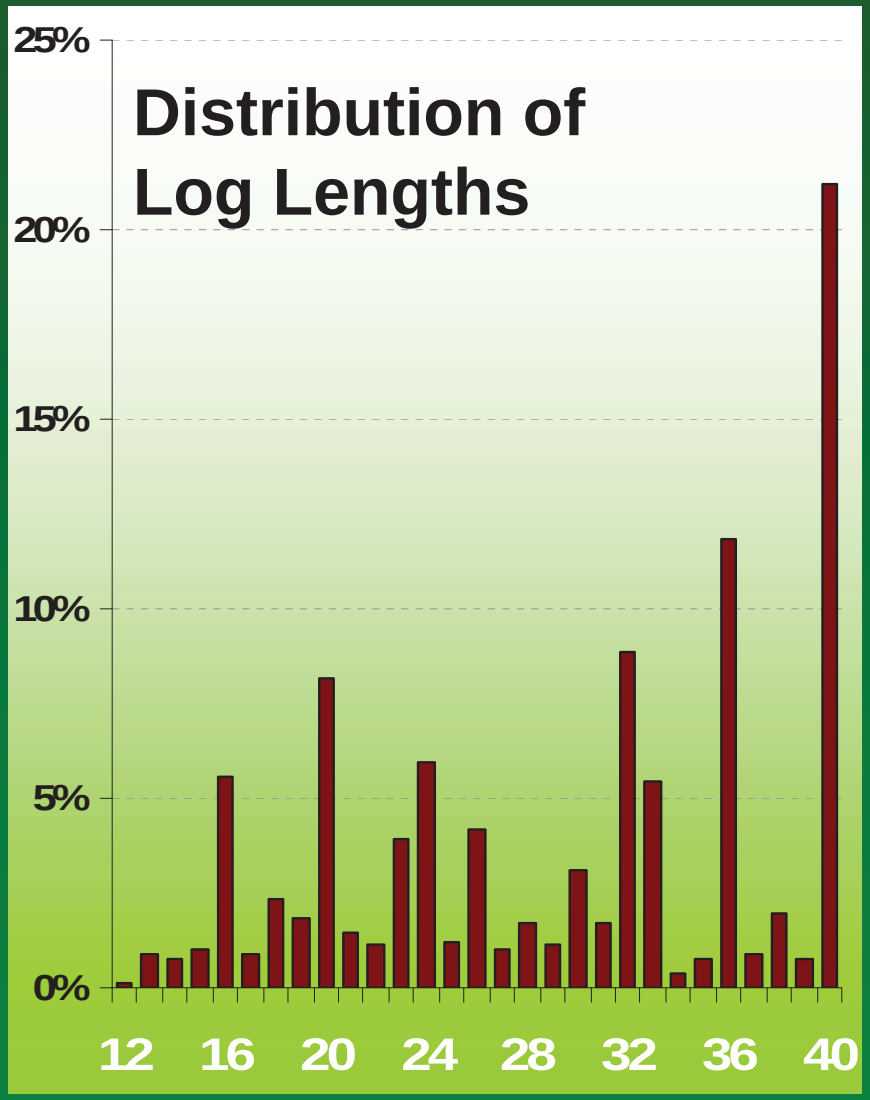
- Board Foot *is <u>not</u>* a Board Foot

in Scribner




of Lumber

# Hypothetical Mill Test for 100 $m^3$ of Logs in Each Diameter Class from 6” to 11”




## Assumptions

- Same Distribution of Lengths in Each Diameter Class
- Constant Taper of 1 inch in 9 feet
- Defect-Free DF Logs

# Hypothetical Mill Test for 100 $m^3$ of Logs in Each Diameter Class from 6” to 11”

| Logs In | 6” | 7” | 8” | 9” | 10” | 11” |
|---|---|---|---|---|---|---|
| # of Logs | 338 | 267 | 217 | 179 | 150 | 128 |
| Cubic Meters | 100 | 100 | 100 | 100 | 100 | 100 |
| Tons | 113 | 111 | 110 | 108 | 104 | 103 |
| Scribner MBF: | | | | | | |
| LLS | 12.5 | 12.5 | 12.2 | 12.8 | 14.4 | 15.3 |
| SLS | 14.1 | 15.1 | 15.9 | 16.6 | 17.9 | 18.5 |
| **Lumber & Chips Out** | | | | | | |
| MBF LT | 25.5 | 27.4 | 29.0 | 30.3 | 31.4 | 32.4 |
| BDU | 19 | 18 | 16 | 15 | 14 | 13 |

# Hypothetical Mill Test for 100 $m^3$ of Logs in Each Diameter Class from 6” to 11”

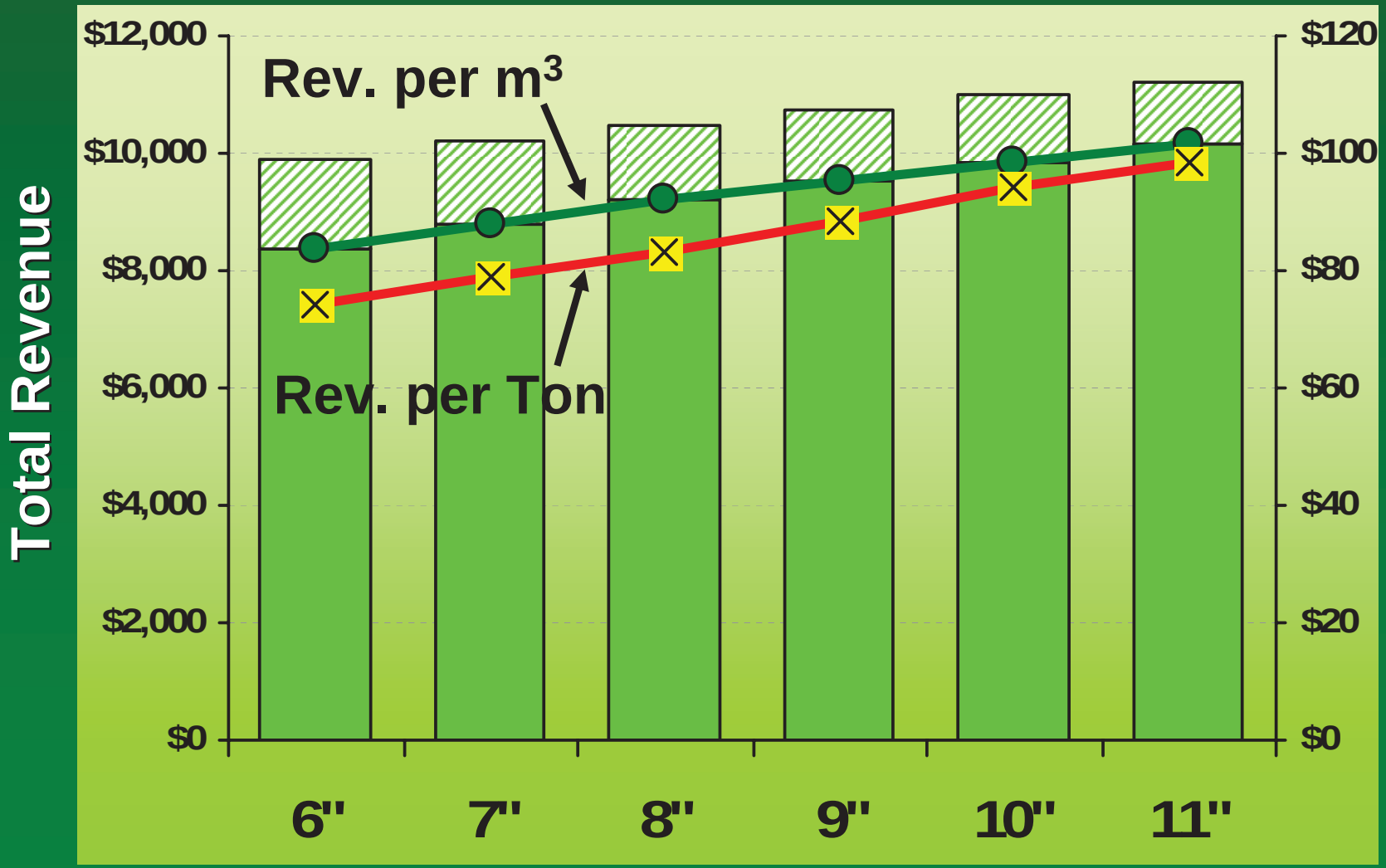
## Lumber Recovery Factors

| SED: | 6” | 7” | 8” | 9” | 10” | 11” |
|---|---|---|---|---|---|---|
| BF / $m^3$ | 260 | 278 | 297 | 313 | 326 | 335 |
| BF / Ton | 232 | 249 | 269 | 290 | 312 | 325 |

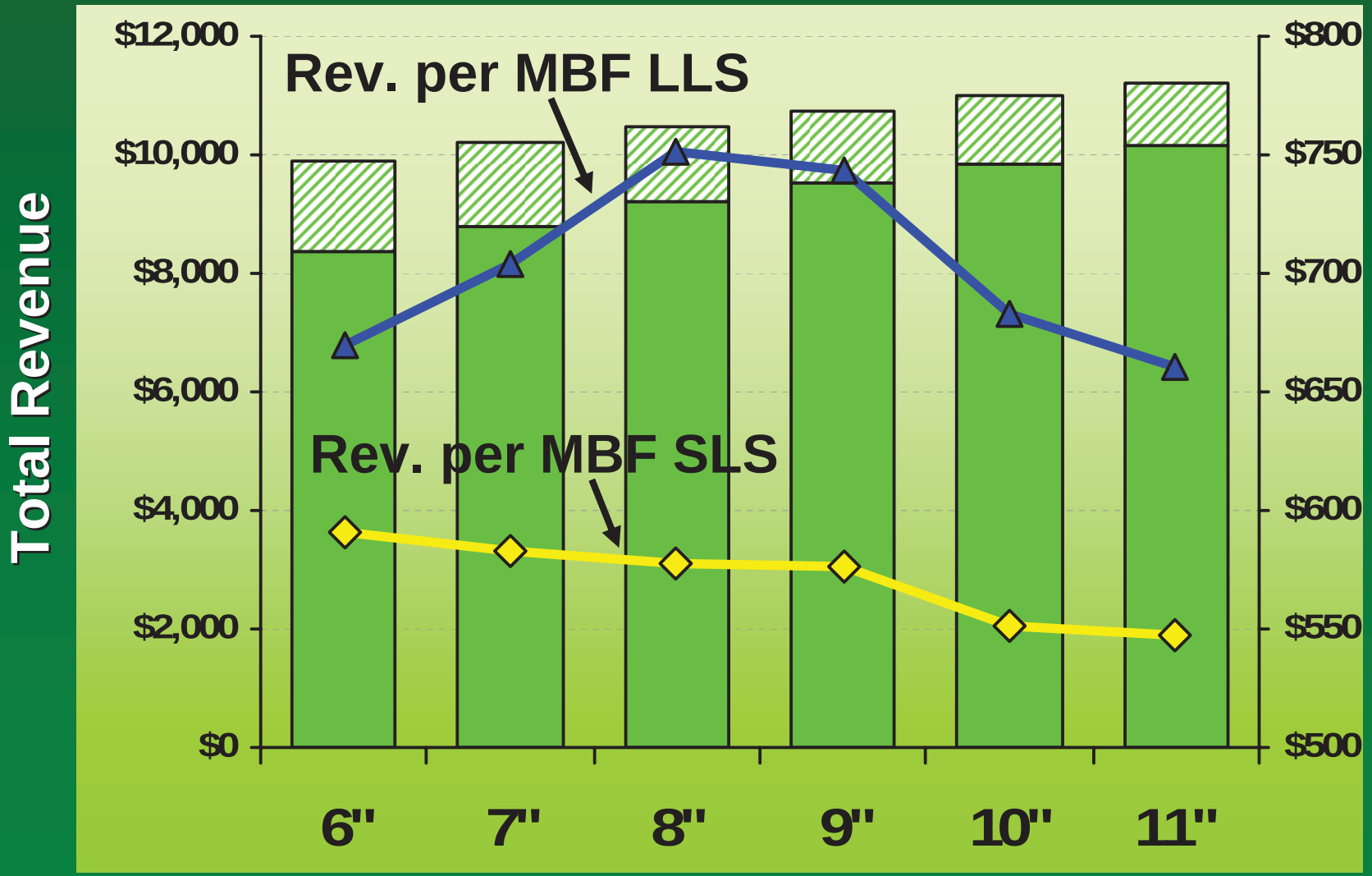
## Scribner Overrun:

| | | | | | | |
|---|---|---|---|---|---|---|
| Long Log | 1.98 | 2.07 | 2.21 | 2.10 | 1.92 | 1.97 |
| Short Log | 1.92 | 1.87 | 1.87 | 1.87 | 1.79 | 1.78 |

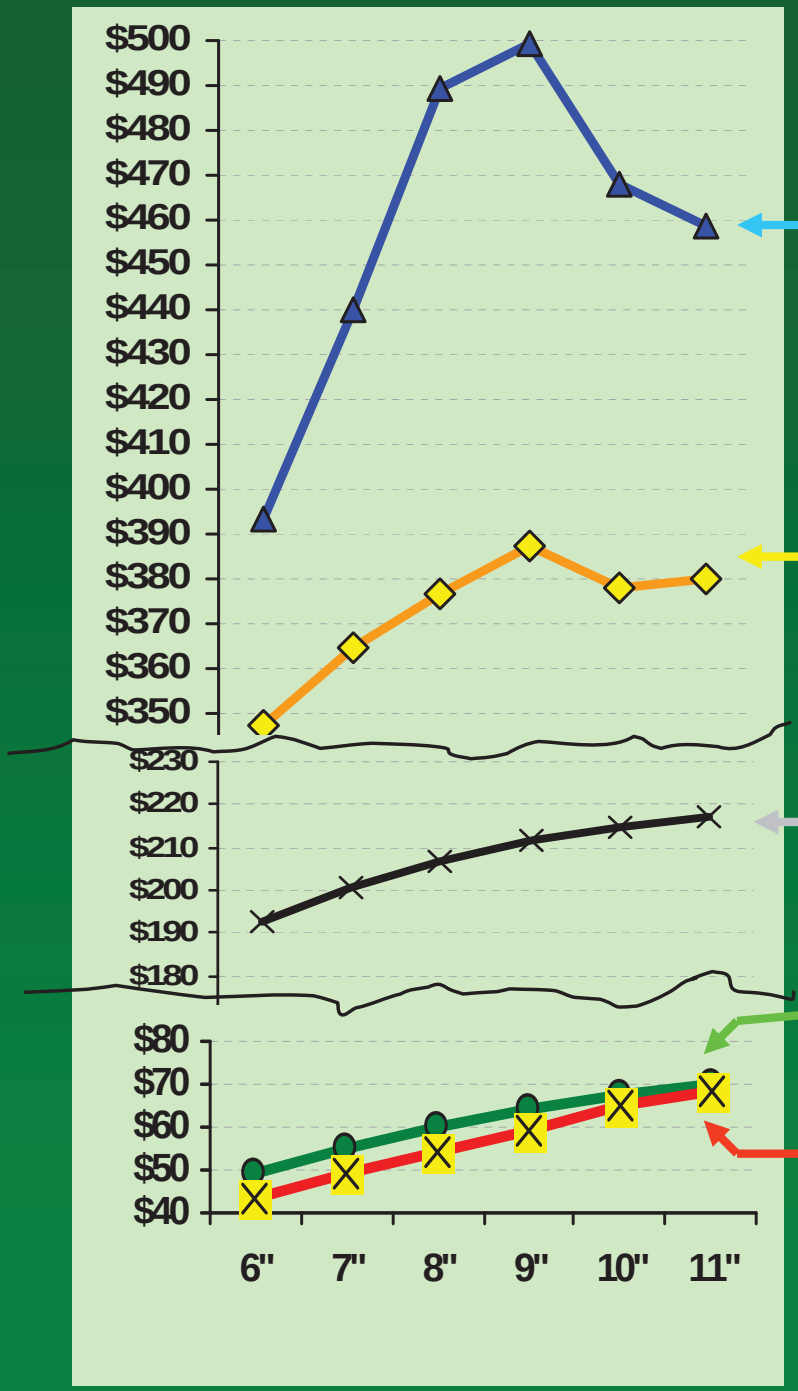
# Total Sales Revenue, Revenue per $m^3$ and Revenue per Ton



# Total Sales Revenue, Revenue per MBF Scribner, LLS & SLS



# Return To Log Value




$/MBF LL Scribner

$/MBF SL Scribner

$/MBF Lumber Tally

$/Cubic Meter

$/Ton

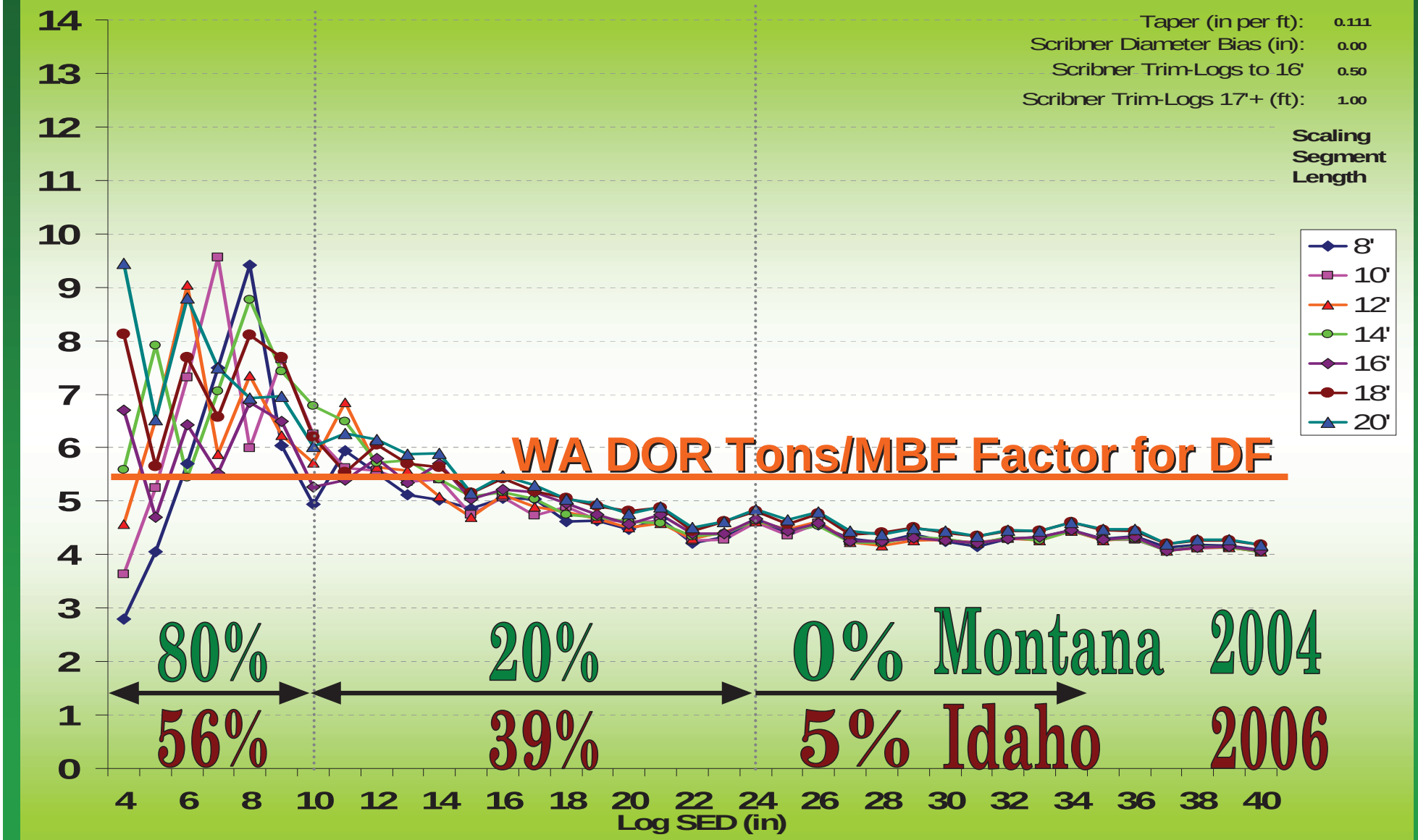
# Tons per MBF Scribner Conversion Factors
# Washington Department of Revenue (DOR)

| | WA DOR Tons/MBF Factor | | | | Implied SL / LL Factor |
|---|---|---|---|---|---|
| | Eastside SL Scribner | | Westside LL Scribner | | |
| Douglas-fir | 5.50 | ÷ | 7.50 | = | 0.73 |
| Western Hemlock | 5.50 | ÷ | 8.25 | = | 0.67 |
| Western Red Cedar | 4.50 | ÷ | 7.00 | = | 0.64 |

**WA DOR Conversion Factor to translate from SL to LL Scribner is: 0.82**

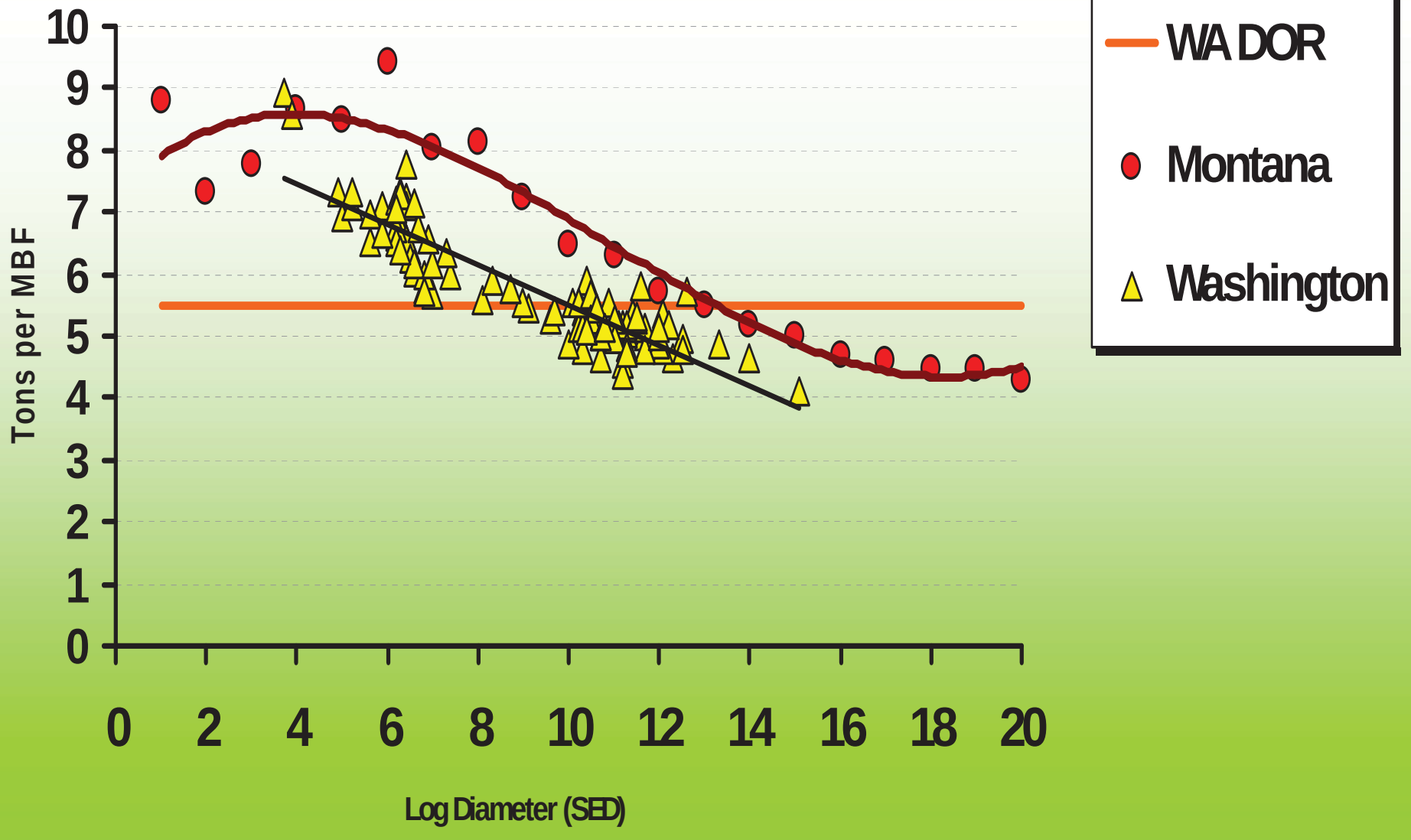
# Tons per MBF Scribner

## Decimal C, Gross Short Log Scale



# Douglas-fir: Tons/MBF Net Scribner SLS

## Montana & Washington Scale Data Compared With WA DOR Statutory Conversion @ 5.5 Tons/MBF



# Using A Tons/MBF Factor That Is Too Low Results in Overpayment of Taxes

| If Correct Tons/MBF Factor is: | Using 5.50 Tons/MBF Will Cause Excise Tax Overpayment of: |
|---|---|
| 6.50 | 18% |
| 7.50 | 36% |
| 8.50 | 55% |

# Published Conversion Factors

Forest Products Utilization
Handbook
2010 EDITION

| | |
|---|---|
| 4.53 cubic meters sawlogs | = 1,000 board ft |
| 1 cubic foot sawlogs | = 6.25 board ft |
| 1 cubic meter roundwood | = 0.6 metric ton (air dry) wood volume w/o bark |

Colorado Wood Utilization & Marketing Program

Colorado State University Extension