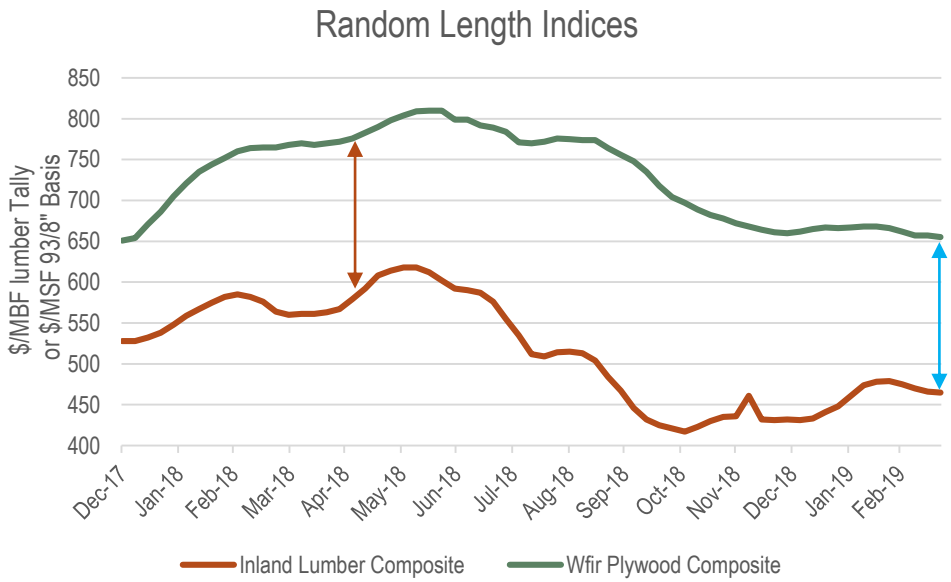
# Scribner to Cubic – Log Sellers delight?

*Timber Measurement Society Central Meeting*
*April, 2019*

# Who am I?

- Log Marketing forester for Hancock Forest Management – even worse I am marketing manager for Hancock's Inland Division – Wild west of log scaling
- I am not a scaler – I know enough about scaling to be dangerous!

Lumber and plywood markets are crazy bad right now!
Westside and eastside




Tariffs on China have killed the export market – especially for the Eastside.
Look for cost saving in domestic markets to improve value for clients

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# As a log Seller, there are some perceived advantages to sell on cubic scale:

- Seller gets value for the full volume of the log.
- Seller no longer needs to "cut for scale" to maximize Scribner volume and value. Better utilization of resource!
- Log lengths no longer an issue – cubic scale is "fair" to both parties for any and all lengths
- Seller's logging contractor can maximize production by extending lengths and concentrate on production and through put. Logging costs stay flat or go down.
- Seller's hauling contractor needs less trucks to haul out sales as log length get longer, need for short logger reduces, and truck shortage is decreased or eliminated. Hauling costs stay flat or go down.
- Buyers (especially random length dimension mills) get the length that give them lengths to meet market quicker.
- We all live happily ever after!

## Because I know enough about Cubic scaling to be dangerous, I have some concerns about cubic scaling. This group could help me deal with these concerns and identify others.

- Butt measurements tend to be inaccurate and/or not precise. I assume the ergonomic of the measurement will tend to lead to an underestimated and present a bias against the seller.

- Average taper used to calculate mid-segment diameters tends to under estimate those mid-segment diameters and present a bias against the seller.

- In an ironic twist of fate or due to the fickle finger of fate, conversion rates will be required to adjust contract payment rates in $/mbf to $/ft3 and/or to convert ft3 back to mbf for reporting purposes. Guess who comes up with those!

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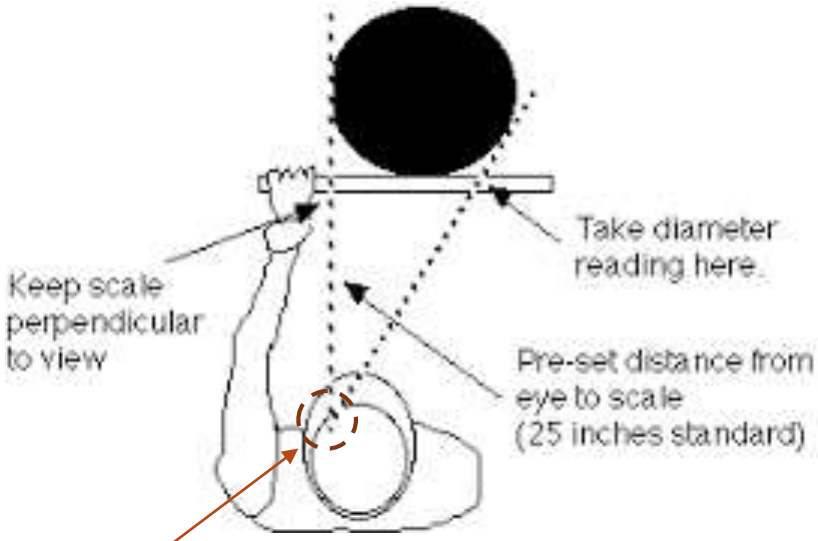
Others time to think about … Please share

# Butt diameter measured at 4’ or any mid segment diameter – Subject to the Biltmore effect?

Cruiser may be familiar with a Biltmore Stick or tree measurement stick that is used to estimate Dbh – diameter breast high




With a Biltmore stick, the cruiser line up the eye with the zero mark and keeps the eye in the same position to read the diameter gradation for the measurement

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# Unlike a scale stick, the diameter gradations on the stick are not full inches.

The formula to calculate the space between the diameter gradations is shown below – this indicates the possible amount of bias that can be generated when a scaler does not fully move to a proper position to read the diameter from a scale stick which has straight inches.

S = d / SQRT(1+d/R)

Where: S = distance from zero mark on Biltmore Stick and line indicating d

Where: d = Estimate diameter OB in inches

and: R = reach or distance between eye usually 25 inches

| d (estimate) | S | Bias | d (estimate) | S | Bias | d (estimate) | S | Bias |
|---|---|---|---|---|---|---|---|---|
| 5 | 4.6 | 9% | 14 | 11.2 | 20% | 23 | 16.6 | 28% |
| 6 | 5.4 | 10% | 15 | 11.9 | 21% | 24 | 17.1 | 29% |
| 7 | 6.2 | 12% | 16 | 12.5 | 22% | 25 | 17.7 | 29% |
| 8 | 7.0 | 13% | 17 | 13.1 | 23% | 26 | 18.2 | 30% |
| 9 | 7.7 | 14% | 18 | 13.7 | 24% | 27 | 18.7 | 31% |
| 10 | 8.5 | 15% | 19 | 14.3 | 25% | 28 | 19.2 | 31% |
| 11 | 9.2 | 17% | 20 | 14.9 | 25% | 29 | 19.7 | 32% |
| 12 | 9.9 | 18% | 21 | 15.5 | 26% | 30 | 20.2 | 33% |
| 13 | 10.5 | 19% | 22 | 16.0 | 27% | 31 | 20.7 | 33% |

This does not account for the conversion from OB to UB – which I have not studied yet!

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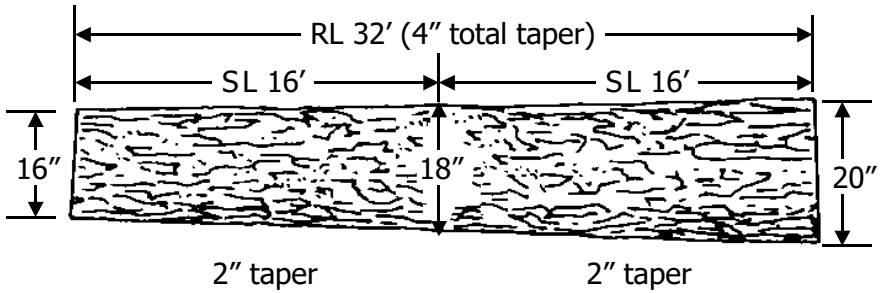
# This does not account for the conversion from OB to UB – which I have not studied yet

- As I think through this, I do not find any situation that would tend to give this measurement a positive bias that would neutralize the negative bias of the Biltmore effect, thus the probability of a negative bias against the seller is likely.

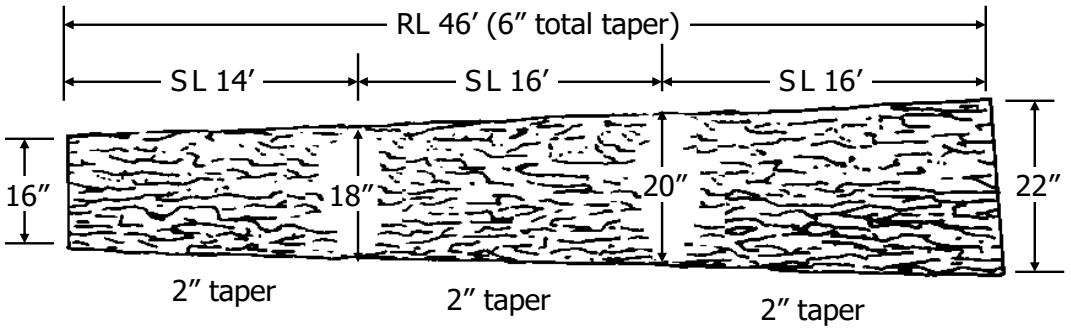
- I would accept that the scalers that participate in Timber Measurement Society events are may not fully fall victim to this bias, but in the world of production scaling, there are physical and time constraints that work against all scalers.

# Average taper tends to underestimate mid-segment diameters

## Distribution of Even Taper in a 32-Foot Log




## Distribution of Even Taper in a 46-Foot Log

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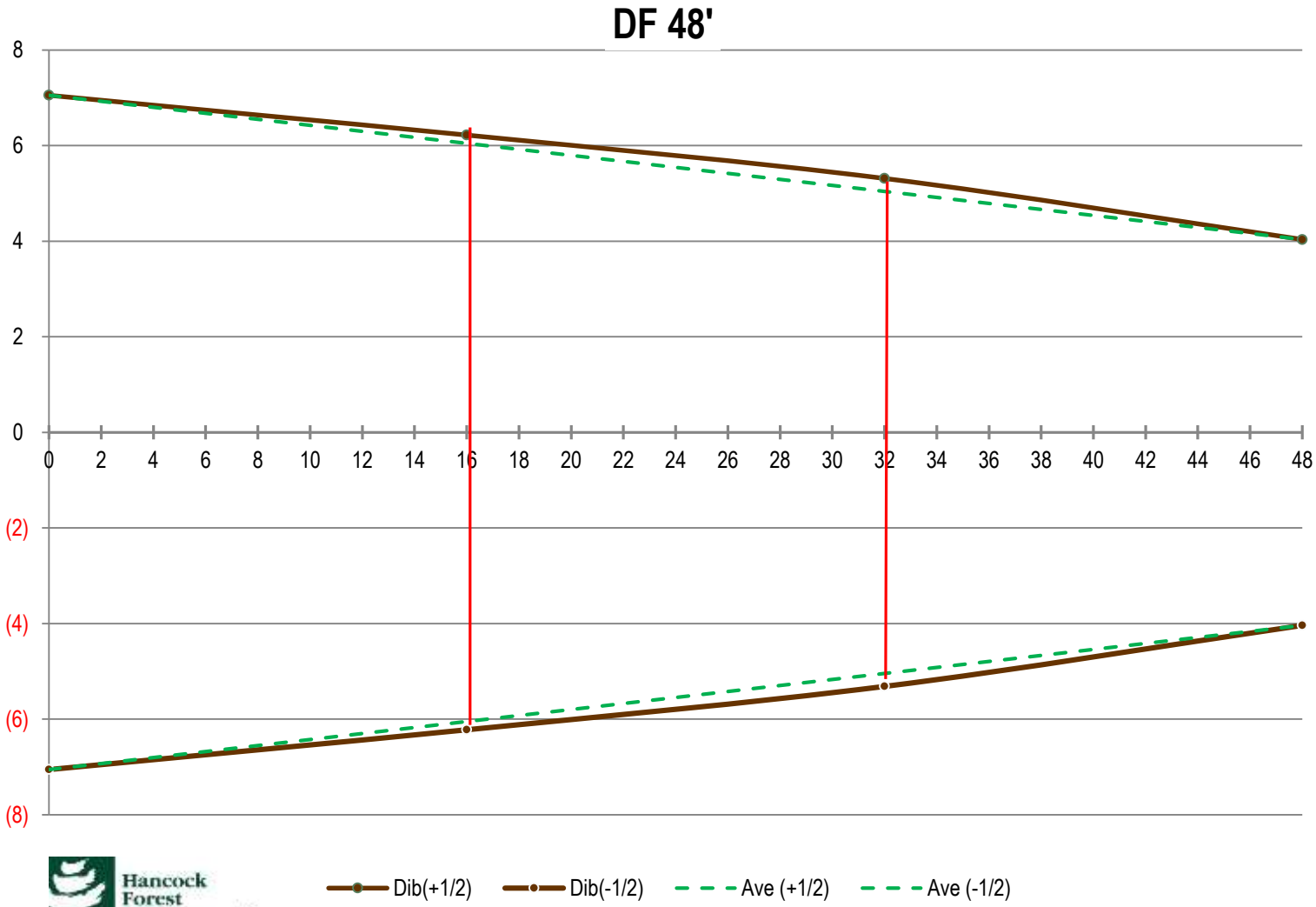
# In a taper study of 39 DF 3 segment logs, on 38 of those logs, the mid-segment diameters were underestimated.

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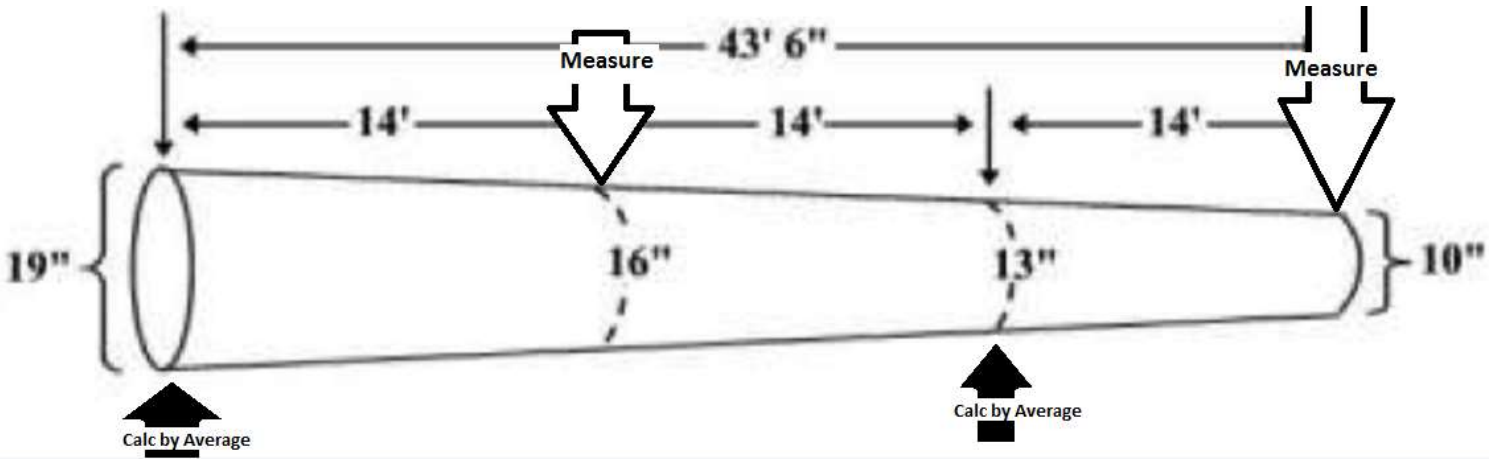
# Those differences in mid-segment diameters led to a 3.6% less gross scale then in the log had been cut as 16'ers.

I have not applied the Smalian formula to this study data, but my hypothesis at this point is there will be a similar loss of cubic volume using the average taper rule.

This may lead back to cutting for scale, which basically gets back to cutting one segment logs to capture true taper.

One of the big incentives to go to cubic was to haul the longest log possible, this says that may work against you.

Even the Idaho scaling manuals solution to this problem would not eliminate it. The study data indicated that this would still have 1.3% less gross scale.




There is also the Biltmore effect as well in this method.

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# Conversion rates will be required to adjust contract payment rates in $/mbf to $/ft3 or to convert ft3 back to mbf for reporting purposes :

After all the gyration to go to cubic, you want to convert it back to mbf? Why?

- Log term log purchase and sale agreement that set a price based on MBF
- Historic reporting is in MBF
  - Do not want to change
  - Needed for comparison to historic

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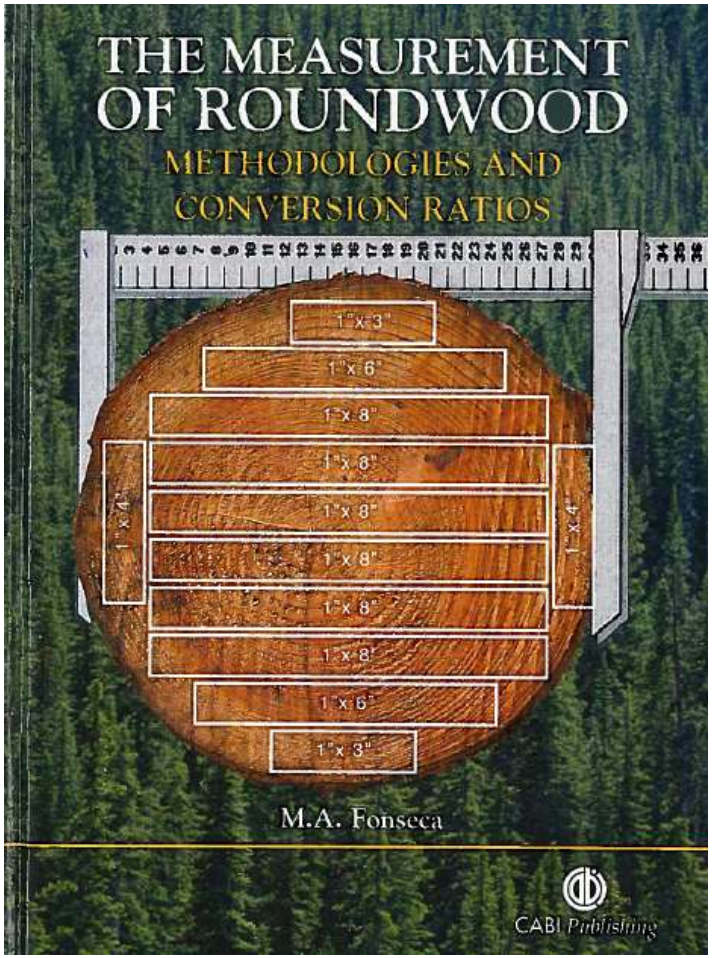
# Want are you goin' do?

## Go to the Conversion Bible!

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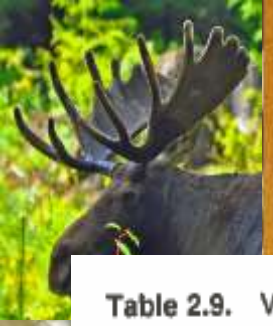

# Section 2.5 and Table 2.9 starts to give you insight as to what you are in for.

**Table 2.9.** Volume index by length and small-end diameter class (1.00 $m^3$ BC Firmwood = 1.000).

| | 2.5–4.6 m 8–15 ft | | 4.7–6.4 m 16–21 ft | | 6.5–9.5 m 22–31 ft | | 9.6–12.5 m 32–41 ft | | Total all lengths | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Gross | Net | Gross | Net | Gross | Net | Gross | Net | Gross | Net |
| | | | | Small-end diameter 11.43–19.05 cm (4.5–7.49") | | | | | | |
| USFS Cubic | 0.941 | 0.901 | 0.925 | 0.871 | 0.966 | 0.904 | 0.920 | 0.897 | 0.930 | 0.897 |
| BC Firmwood | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| Alberta Cubic | 0.979 | 0.929 | 0.962 | 0.912 | 0.980 | 0.928 | 0.979 | 0.956 | 0.978 | 0.946 |
| Ontario Cubic | 0.952 | 0.956 | 0.989 | 0.989 | 0.963 | 0.963 | 0.955 | 0.961 | 0.959 | 0.963 |
| Swedish Cubic* | 0.840 | – | 0.700 | – | 0.817 | – | 0.787 | – | 0.789 | – |
| Russian Standard* | 1.009 | – | 0.979 | – | 0.978 | – | 0.988 | – | 0.987 | – |
| Cubage au Réel* | 0.936 | – | 0.929 | – | 0.943 | – | 0.941 | – | 0.940 | – |
| New Zealand 3-D* | 1.140 | – | 1.040 | – | 1.019 | – | 0.980 | – | 1.000 | – |
| Brereton (PNG) | 0.944 | – | 0.896 | – | 0.902 | – | 0.881 | – | 0.890 | – |
| Hoppus | 0.789 | – | 0.768 | – | 0.766 | – | 0.772 | – | 0.771 | – |
| JAS Scale* | 0.908 | – | 0.723 | – | 0.835 | – | 0.820 | – | 0.821 | – |
| Scribner Short R** | 0.160 | 0.162 | 0.169 | 0.155 | 0.153 | 0.137 | 0.154 | 0.148 | 0.155 | 0.147 |
| Scribner Short NR** | 0.160 | 0.162 | 0.169 | 0.126 | 0.142 | 0.132 | 0.148 | 0.139 | 0.149 | 0.138 |
| Scribner Long Log** | 0.160 | 0.144 | 0.126 | 0.112 | 0.116 | 0.105 | 0.105 | 0.106 | 0.112 | 0.108 |
| Doyle** | 0.038 | 0.035 | 0.023 | 0.022 | 0.080 | 0.075 | 0.061 | 0.059 | 0.060 | 0.058 |
| International ¼"*** | 0.133 | 0.126 | 0.126 | 0.112 | 0.179 | 0.171 | 0.170 | 0.164 | 0.166 | 0.159 |

Continued

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# Basically this section and table shows that the conversion rate changes as a function of log length and diameter. The conversion rate can vary significantly. For instance from Table 29:

Extreme diameter difference

| Gross Scale: 32-41 foot (9.6-12.5 m) log with | Ratio* | | |
|---|---|---|---|
| SED > 15.5 inches (39.36 cm) | 0.247 | | |
| SED 4.5 to 7.49 inches (11.43-19.05 cm) | 0.154 | = | 160% |

Less extreme diameter difference

| Gross Scale: 32-41 foot (9.6-12.5 m) log with | Ratio* | | |
|---|---|---|---|
| SED > 11.5- 15.49 inches (29.2 - 39.35 cm) | 0.195 | | |
| SED 7.5 to 11.49 inches (19.06-29.19 cm) | 0.168 | = | 116% |

Ratio* = 1 mbf compared to 1 m3 BC Firmwood scale

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There are also difference due to taper of the log that may not be captured in the other factors that influence the conversion rate.

# Wait, there is more!

You can also add there are difference due to species – larch in R6 eastside and lodge pole pine in NE Washington.

There would seem to be differences due to taper of the log that may not be captured in the other factors that influence the conversion rate. I wonder if there is a SED/LED ratio study of conversion rate? Anyone

In summary, under current cubic scaling methods, there are some aspects are worth consideration on the part of the log seller. Some of those aspects are brought out here.

There may be others that you have experienced and can share.

Questions or Comments?

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