Using Cubic Log Scale in Idaho: Practical Experience

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Timber Measurement Society Annual Meeting

University Place Hotel

Portland Oregon

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Before we get started!

- No Double Bit Axes Allowed!!!
- Or scaling hatchets…

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The Problem

- The Idaho Department of Lands sells a wide variety of products from Endowment Lands with a Constitutional Mandate to maximize long term financial returns to endowment beneficiaries.
- In order to ensure that we are meeting our fiduciary responsibility we need to be able to accurately measure our output of these products.

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The Problem (Continued)

- We sell Timber Sales (Standing Trees)
- Meaning we don't get to set cutting specifications!
  - We have tried to do so with Pole Sales
- Purchasers may generally choose the products manufactured under our contractual merchantability specifications
- Audits
  - Financial
  - Process

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Endowment Land Products

- Sawlogs
- Poles (Cedar)
- Pulp
- Cedar Products
- Topwood
- Posts and Poles
- Firewood
- Boughs and more

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Current Measurement

- Scribner Decimal C – used for higher value or more variable sawlogs and now poles, unfortunately also used for pulp, firewood, and cedar products much lower value products
- Tons – used to measure low variability or low value sales
- Linear foot (recently ended) – Formerly used for measuring poles
- Lump Sum – used for alternative products usually of low value or very small sales

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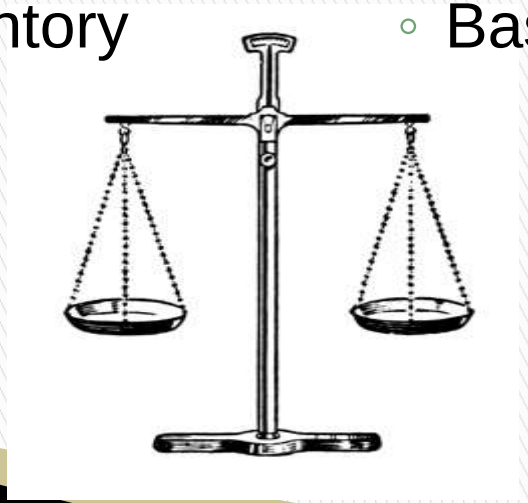
First Question is; "Why do we scale?"

- From the Perspective of both the buyer and seller
  - Establish Log Value
  - Record of species identification
  - Measure of Work Accomplished

- Purchaser
  - Prediction of the quantity of end products
  - Basis for Mill Inventory

- Seller
  - Check the accuracy of Cruise Volumes
  - Basis for Forest Inventory



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Issues IDL needs to address

- Cruise volume ≠ Scaled Volume (Cut-Out)
  - Purchaser Manufactures Forest Products
  - Cedar Pole Sales as example!
  - Holding foresters accountable (18% volume error)
- Multiple Products and Species
  - Poles to Topwood; Products and Pulp
- Accuracy and Precision
- Accountability of value
- High Scaling Frequencies
- High variability in weight factors

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Manipulating Scale

A tree or a log is worth what it is worth and that is it no matter how you measure it!

???

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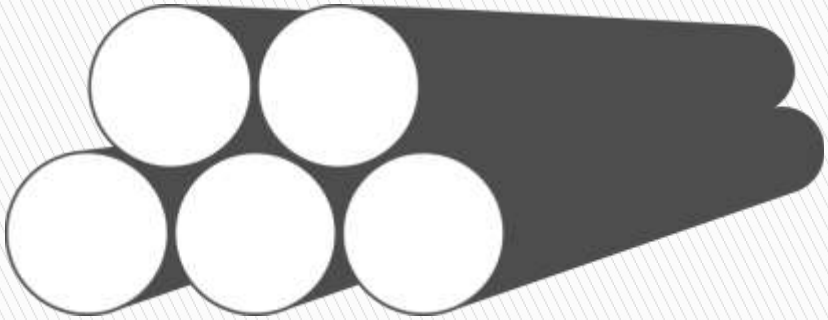
What is a tree worth?



Species	DBH – IB (in)	Merch Ht (ft)	Scribner SL BF Min	Scribner SL BF Max	Scribner LL BF Min	Scribner LL BF Max	International 1/4" BF Min	International 1/4" BF Max	USFS Nat. Cubic CF Min	USFS Nat. Cubic CF Max
Grand Fir	9.3	48	70	100	70	90	90	100	16.6	17.3
Douglas Fir	16.6	78	330	370	230	340	400	425	64.4	67.1
Ponderosa Pine	14.5	64	200	270	180	240	255	300	43.9	45.3
Engelmann Spruce	9.0	48	60	80	50	70	85	85	15.5	15.6
Lodgepole Pine	10.1	40	50	70	40	60	65	70	13.4	13.8
Total volume			710	890	570	800	895.0	980.0	154.2	158.7
% dif. (min to max)				25.4%		40.4%		9.5%		3.4%

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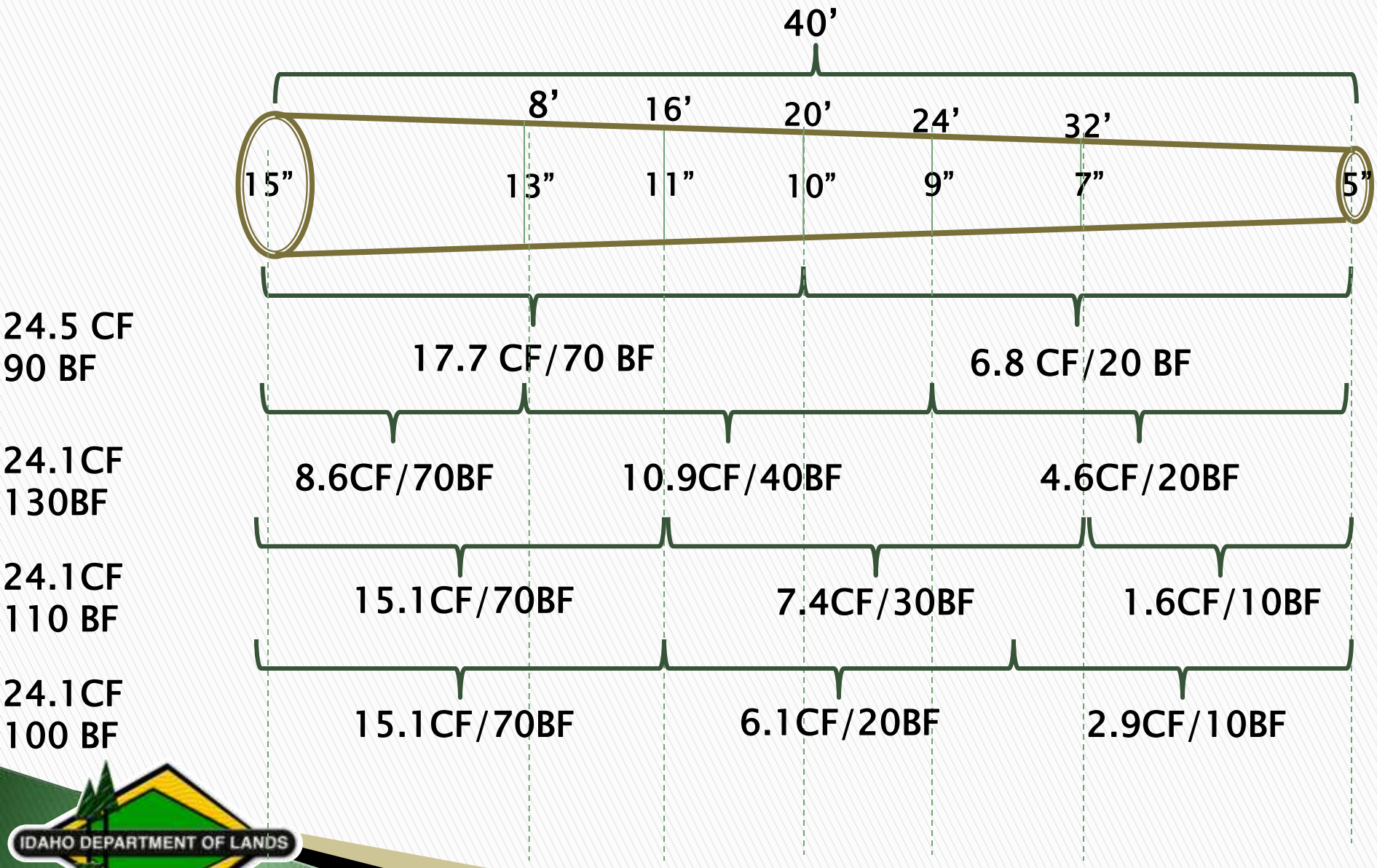
Is any other commodity sold with a unit of measure with this much variability?

Source: The Case for Cubic Log Scale

Differences from bucking a 40’ log into different lengths…



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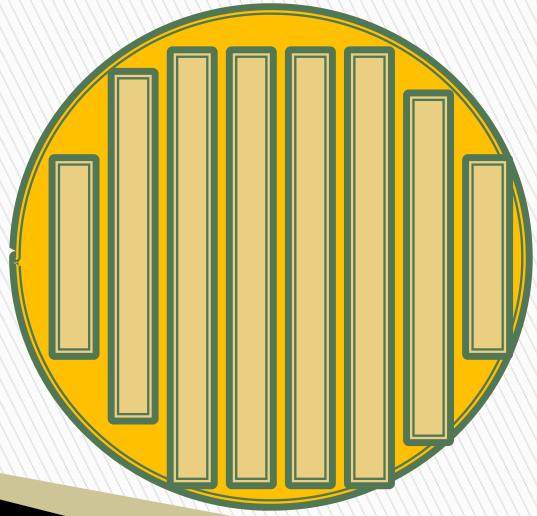
Scribner

- Advantages
  - It's easy
  - It's Fast
  - Mills are comfortable
  - Established (Traditional)
  - Predicts final products



- Disadvantages
  - Consistency and Precision
  - Out of date (1842)
  - BF LS ≠ BF LT
  - Easily Manipulated by Manufacturing
  - BF Cruised ≠ BF Scaled
  - Poor correlation to weight
  - Small logs (5,6, or 7")
  - Focuses only on lumber Limitations for other products
  - Audits

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Other BF Rules

- Advantages
  - Already have established rules in other regions
  - Some are more consistent and accurate than Scribner
  - Some are just as easy to use as Scribner
- Disadvantages
  - Still based on lumber recovery not mathmatical volume
  - No history in Idaho
  - While some are more accurate than Scribner they still have a lot of variability

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Weight

- Advantages
  - Easiest of all
  - Everyone knows what a ton is
  - Accountability
  - Any size logs
  - Any product
  - Paid for Bark!

- Disadvantages
  - Volume = Educated Guess
  - Significanty impacted by many variables especially time
  - Variability among species
  - Combination Logs
  - Wrong Product or species in load
  - No way to calculate net
  - Administration nightmare

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Lump Sum

- Advantages
  - No scaling
  - Utilization
  - Could be easy to administer
  - Works for any products
- Disadvantages
  - Huge risk for both parties
  - Requires very good cruising
  - No way to measure performance
  - Accountability nightmare

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Cubic (Imperial NOT Metric)

- Advantages
  - Most consistent and Precise
  - Measure multiple products
  - Good correlation with weight
  - Correlation with cruise volume
  - Any size tree or log
  - History in other countries
  - Easier conversions
  - Greater accountability
- Disadvantages
  - More complex
  - More measurements
  - More time to scale
  - Very limited history in ID
  - Mills less comfortable

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Issues IDL needs to address (from a previous slide)

- Cruise volume ≠ Scaled Volume (Cut Out)
  - Purchaser Manufactures Forest Products
  - Cedar Pole Sales as example!
  - Holding foresters accountable (18% scaling volume error)
- Multiple Products and Species (247 MMBF)
  - Poles to Topwood; Products and Pulp
- Accuracy and Precision
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- High Scaling Frequencies
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The Chosen Solution

- Obviously Cubic
- Our Goal is improvement not perfection
  - We are not striving for perfect cubic measurement
  - Gross is cubic – Defects are based on Scribner
    - Experience and Industry's Comfort
    - Recognition that one product is still 'King'

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Challenges with Cubic

- Check Scaling – must comply with IBSP
- Techniques (Lengths and Butt Log Dia.)
- Defect (from which end?)
- Rules (overrides)
- Timeline
- Industry et. al. (Politics)
- My own team!
- Productivity
- SAFETY

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Productivity

- Lengths – typically cubic lengths are to the nearest foot can we do two foot multiples to save some time taping logs?
- Diameters
  - Butt Log Diameters are typically taken at 4’ with calipers – this is just plain stupid and unsafe
  - We chose the R6 method over Taper Equations (overrides)
  - Mid Point Diameters on Multi-segment Logs – are they worth the effort?
- Frequencies
- Other Techniques for low value products (3P)

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Safety

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More Problems that Cubic Measurement Helps Resolve

- Slash Disposal
  - We can more easily require removal if we can measure products rather than sell lump sum
- Utilization issues
- Marketing of Delivered Product Sales!
- Realistically Purchasers will eventually better know what they are buying
  - Imagine a world where utilization decisions are made at the mill by merchandizers…why not deliver tree length logs?

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Where are we now?

- Background
  - Handbook
  - Measurements
- Tools
  - Handhelds
  - Navision/Crystal Reports etc. etc.
- Transition period
  - Purchasers and Foresters time to adjust

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History of Cubic in Idaho

- USFS in 80's
- 2006 proposed by IDL
- 2013 initial test studies by IDL and IBSP
- 2015 I come on board
- Here we go…

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Where are we going?

- Plan is to bring in a project manager to assist with IT updates
  - Handhelds
  - Navision
- Handbook/rules are in development
  - Purchaser Input
- Start with former “Pole Sales”
- Report volumes in both rules
- Gradual transition to cubic

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Projects

- Handbook
  - Provide Draft to Industry
  - Second Level Editing
- Techniques
  - Large End Diameter on Butt Logs
  - Midpoints? Lengths? SAFETY!
- Procedures (Frequencies)
- Handheld (Upgrade Planning and Testing)
- Navision (Testing)

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Any questions?

Unit 3- Any more questions?

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