Measuring Biomass and other Low Value Forest Products

Sale & Measurement Methods

- **Low Value Policy, June 2009**
- **3P Photo**
- **Slash Piles**
- **Load Count & Weight**
- **Sample Error Policy**
- **Random Branch Sampling**

Low Value Policy

- **Implemented June 2009**
- **Gross Scale and Cruise only**
- **Biomass & non saw timber prices:**

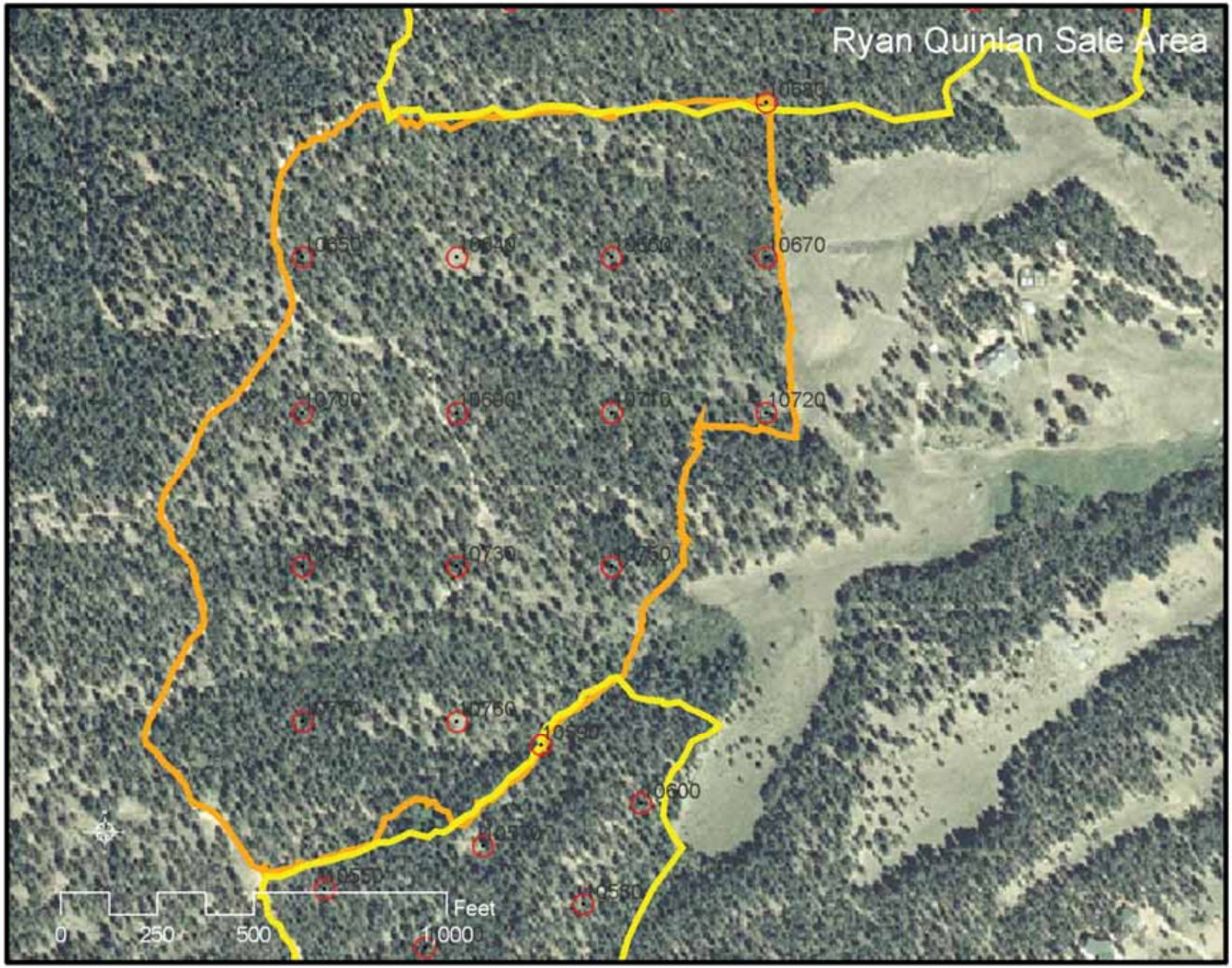
  25 cents/ CCF

  50 cents/MBF

  01 cents/Ton
- **30% sample error for biomass sales as a whole. (not per strata)**
- **Timber contracts include "*Timber Subject to Removal*" provision**
- **Minimum size piece in timber contracts increased**
- **Efficiency in all aspects**

3P Photo

- **Cover thousands of acres per day**
- **Requirements: Ortho photo, GIS, GPS equipment**
- **Relative Value Index, use percent or volume**
- **Two stage sampling**
    1. **RVI estimate from photo**
    2. **Field plot measurement**
- **Fixed plots**


Ryan Quinlan Sale Area
0680
0650
0670
0700
0720
0730
0750
0760
0600
0550
0580
Feet
0
250
500
1,000

Field Data

First Stage

Second Stage

Plot	Estimate (KPI)	Running Tally		Sample Plot	Gross Vol/Acre	MP Ratio
1	15	15				
2	85	100				
3	75	175		1	900	12.0
4	90	265				

Statistics

2 stage Stats:

Sum of RVI (%) & Sum of Sample Plots

Standard Deviation, CV, Standard Error and Combined Error

Volume = Volume x acres

3P photo has been used in Oregon, California and Jordan

Piles

United States
Department of
Agriculture

Forest Service

Pacific Northwest
Forest and Range
Experiment Station

Administrative
Report PNW-1
February 1982

Estimating the Volume of Wood in Large Piles of Logging Residue

Susan N. Little

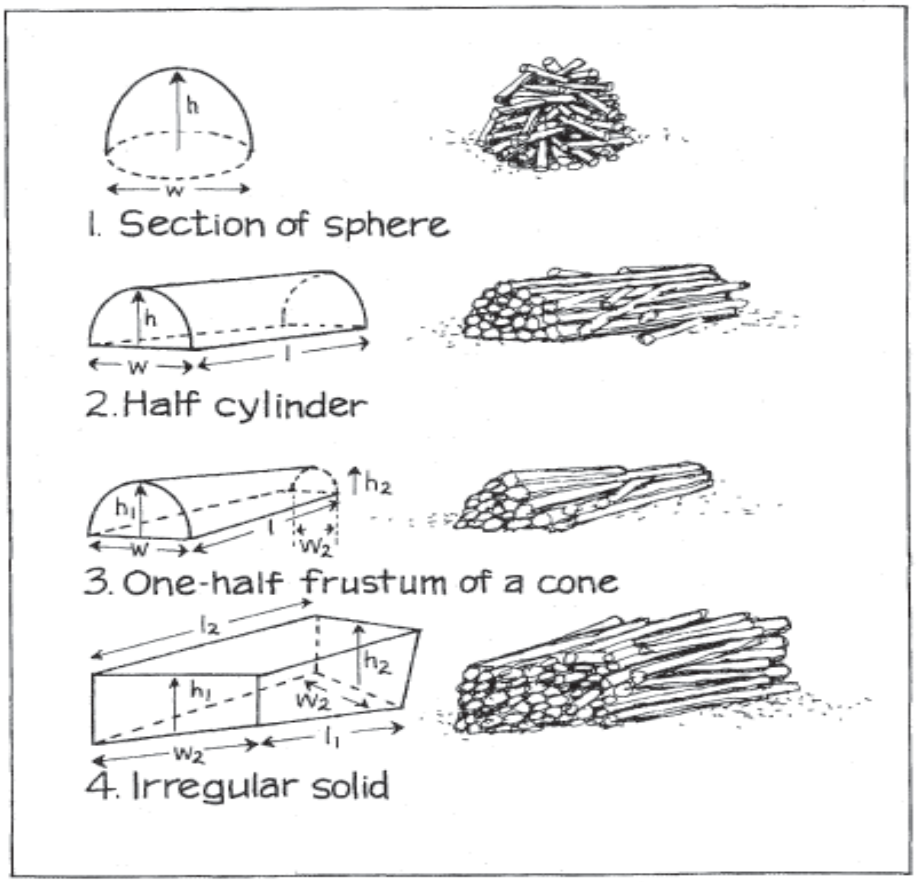


Figure 1.—Shapes and related dimensions of piles.

The procedure was to locate a pile, measure the dimensions, weigh material removed from the pile during salvage, and measure the pile remaining after salvage. Pile volumes and wood volumes were calculated and a ratio of wood volume to pile volume was developed.

Piles

Colville National Forest example:

W x H x L, apply 80% fudge factor

Sale Methods:

- **Load Count; CCF or Ton**
- **Weight; guts feathers & all**
- **Tree Measurement**

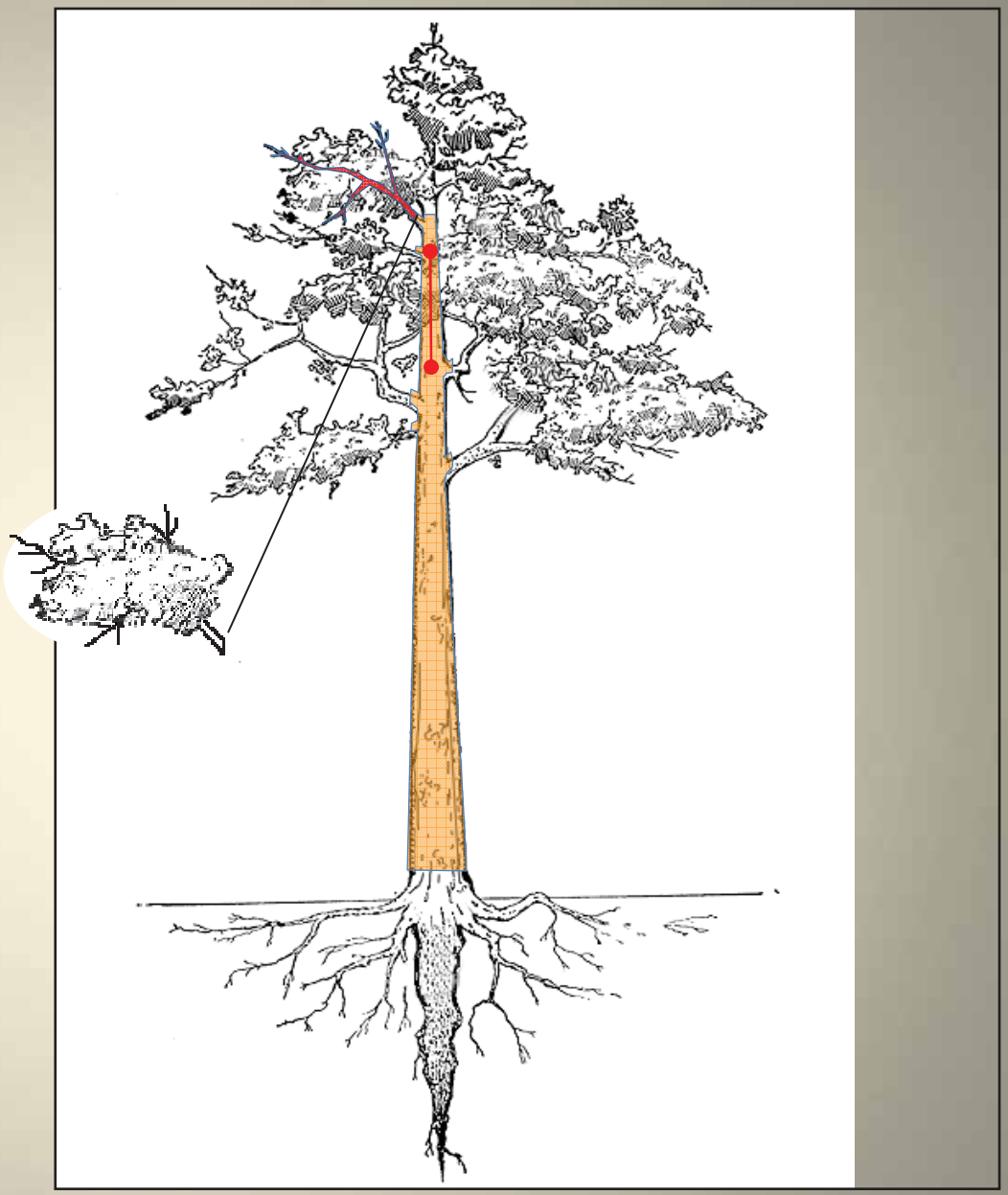
Randomized Branch Sampling

- Develop by Jessen (1955) for estimating fruit counts on trees
- Similar to point sampling in that it uses variable probabilities
- Probability of selecting a j^{th} branch from the k^{th} node where j = 1, …, N

$$q_{kj} = \frac{dia_{kj}^{2}}{\sum_{i=1}^{N} dia_{ki}^{2}}$$

RBS Methods

1. Select multiple paths by
2. Progressing up thee tree measuring branch diameteFell the tree
3. rs at each node
4. Select path segments proportional to branch diameter
5. Once minimum diameter is reach, collect unbiased sample
6. Parse components, weight them, and expand by $1/q_{kj}$



QUESTIONS