WASHINGTON STATE UNIVERSITY
EXTENSION

Forest Inventory "Cheat Sheet"

Important Online Resources

Download this Extension publication for more information:

PNW630 – Basic Forest Inventory Techniques for Family Forest Owners
https://pubs.extension.wsu.edu/basic-forest-inventory-techniques-for-family-forest-owners

NOAA online declination calculator:

https://www.ngdc.noaa.gov/geomag/declination.shtml

Fixed plot radius table

Plot Size (acres)	Radius (feet)
1/5	52.7
1/10	37.2
1/20	26.3
1/30	21.5
1/40	18.6
1/50	16.7

Quick steps – Measuring DBH with a woodland stick

1. Hold the stick against the tree at breast height, 25 inches from your eye.
2. Visually line up the left edge of the stick with the left edge of the tree.
3. Moving your eyes (not your head!) read where the right edge of the tree falls on the stick.
4. Repeat the measurement for a different side of the tree and take the average.

Quick steps – Measuring tree height with a clinometer

1. Move back a measured distance from the tree, preferably 100 feet.
2. Looking at the top of the tree with one eye and through the clinometer with the other, line up the horizontal marker in the clinometer with the top of the tree and read the value on the percent scale.
3. Repeat this for the bottom of the tree. If the percentage to the bottom is on the negative part of the scale, add it to the percentage from Step 2; if it is positive, subtract it.
4. Multiply the combined percentage by the distance back from the tree to determine total tree height.

Clinometer example:

- Distance from tree = 100 feet
- Tree top reading = +90%
- Tree bottom reading = -5%
- Combined reading = 90% + 5% = 95%
- Tree height = 95% x 100’ = 95 feet

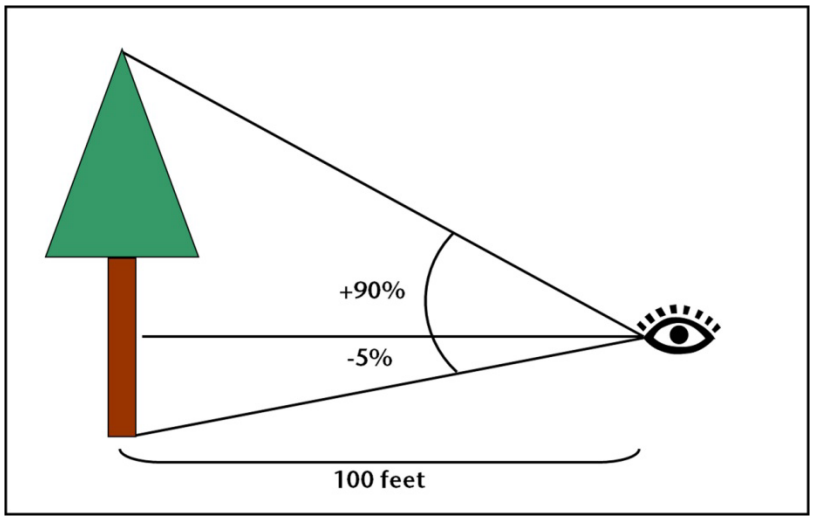

Figure 1: A clinometer measures the percent slope between your eye and both the top and bottom of the tree. In this case the clinometer reads 90% up and 5% down, for a total of 95%. Since the tree is 100 feet away, the height of the tree is 0.95 x 100 = 95 feet.

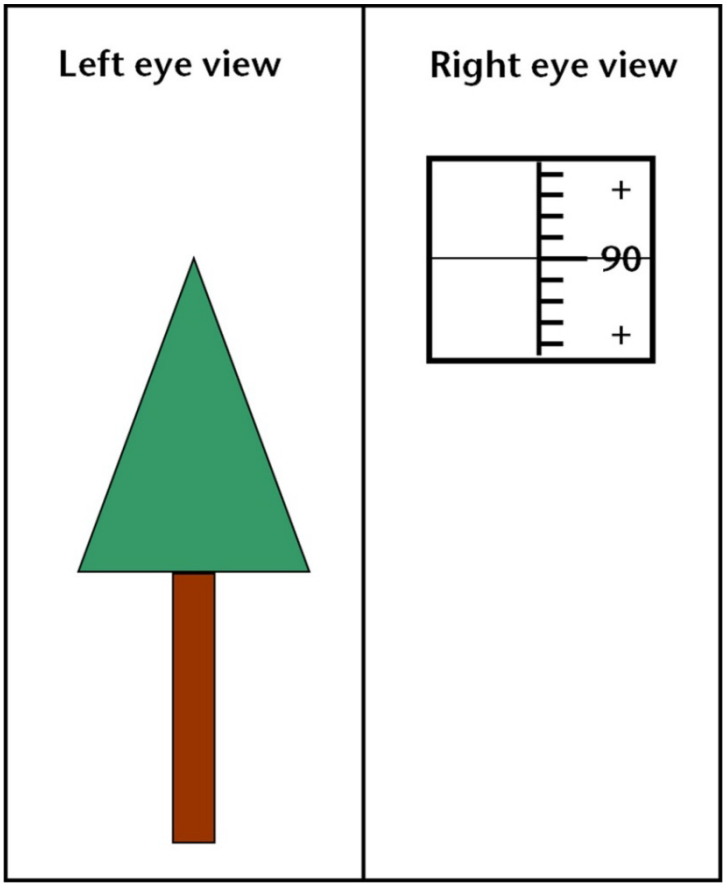

Figure 2: When using a clinometer, look into the clinometer with one eye and look at the top of the tree with the other. Line up the horizontal marker in the clinometer with the top of the tree and read the value (in this case 90%).

Quick steps – Measuring tree height with a woodland stick

1. Stand the prescribed distance away from the tree (usually 66’ or 100’ depending on the woodland stick).
2. Hold the stick vertically, 25 inches from your eye.
3. Visually line up the bottom edge of the stick with the bottom of the tree.
4. Moving your eyes (not your head!) read where the top of the tree falls on the stick.

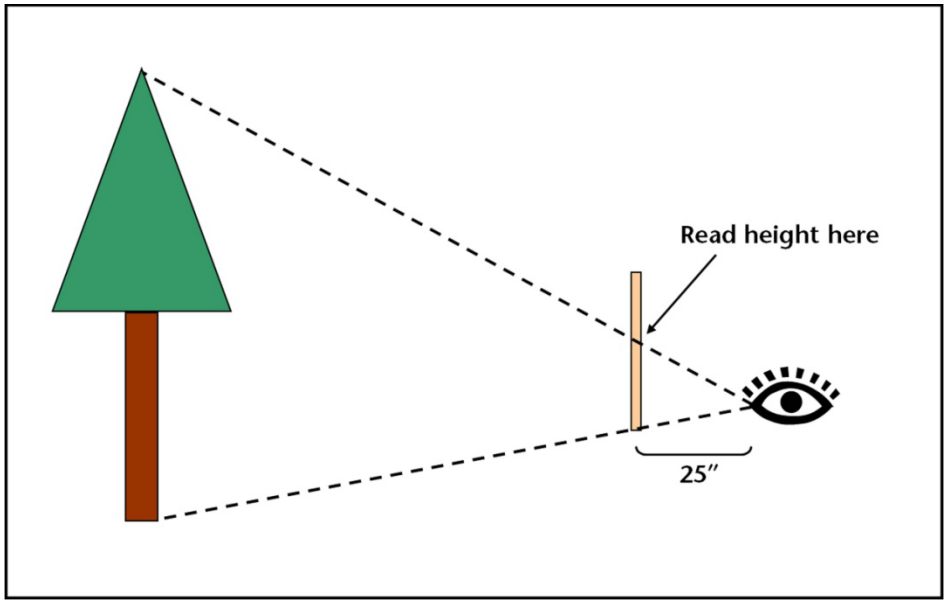

Figure 3: Visually line up the stick with the bottom of the tree and read where the top of the tree falls the stick.

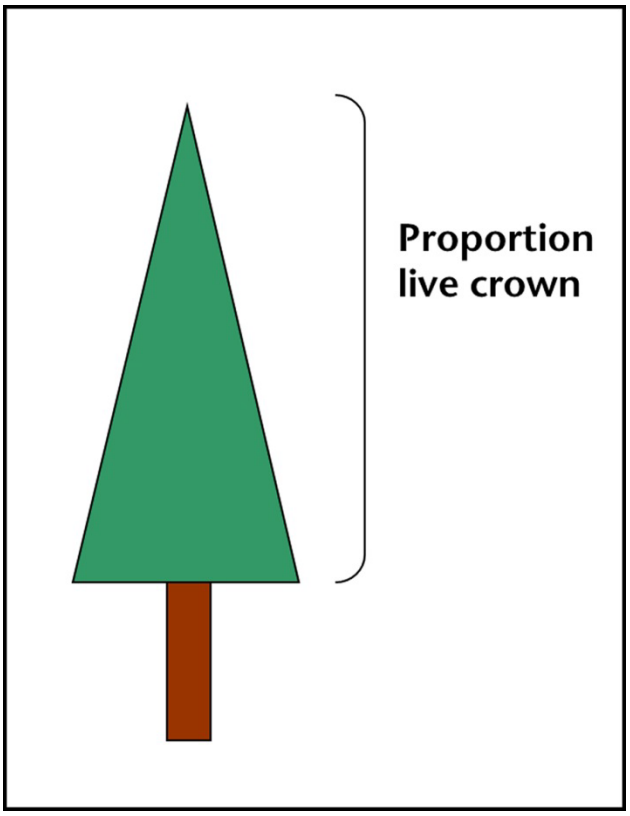

Figure 4: The live crown ratio is the proportion of the height of the tree that is green; in this case approximately 75%, or 0.75.

Determining TPA from fixed plots

Here are the steps for determining TPA from fixed plots:

1. Determine the expansion factor for plot trees (the number of trees per acre a given plot tree represents, e.g., 20 for a 1/20th acre plot).

2. Add up the total number of trees in a plot and multiply by the expansion factor to get the trees per acre represented by that plot.

3. Repeat this for the other plots in the stand
4. Add up the TPA for all plots in the stand and then divide by the number of plots to get the average trees per acre for the stand.

Example TPA calculation:

Suppose you acquired data on two 1/20th acre plots. Suppose that there were six trees in the first plot and five in the second.

1. With 1/20th acre plots, the expansion factor would be 20.

2. The TPA represented by the first plot is 6 x 20 = 120.

3. The TPA represented by the second plot is 5 x 20 = 100.

4. Adding 120 and 100 and then dividing by 2 to yields an average of 110 TPA for the whole stand.