

Fixed- & Variable-area Sampling Units

ESRM 368 – FIELD EXERCISE 3 – Due We 10 Feb 2016

- Objectives:**
1. Practice measurements for fixed area (circular) plots,
 2. Gain field experience using a prism and the Spiegel Relaskop instrument for determining “TALLY” (or “IN”) trees on variable-area plots,
 3. Practice the *walkthrough* method for treating trees near a forest edge,
 4. Calibrate one’s thumb for use as an angle-gauge,
 5. Become familiar with the care and cost of new plot measurement instruments (see www.forestry-suppliers.com or www.benmeadows.com).

FIELD WORK

Equipment: Jake staff, 100-ft cloth tape, D-tape, Spiegel Relaskop, wedge prisms (various basal area factors), Rite-In-Rain notebook, pencil, rain gear, sturdy boots or shoes.

1. [Plot centers will be assigned during lab.] At plot center, use both a 20- or 40-factor prism to project a fixed horizontal angle for selecting large (> 7.0 inches) “tally” or “in” trees; record species and DBH (nearest 0.1 inch). Record the “IN” tree counts using each BAF. Be sure to **LOOK WAY OUT** for large, distant trees that are likely to be “IN.” Verify your prism tree counts found with the Relaskop. Check at least one borderline tree (borderline “in,” that is). If no trees appear borderline, check the tree nearest the borderline condition using the appropriate Plot Radius Factor to calculate Horizontal Limiting Distance for that tree. Use the *walkthrough* method to correct for edge bias on trees near your designated *stand* boundary. Pick two trees randomly from those tallied and measure their heights.
2. At the same plot center, use a 1/30-acre circular plot (21.5 ft radius) to measure & record species and DBH for all “small” trees (to nearest 0.1 inch) on the plot. Remember to correct for slope if needed (see Exhibit 1). Use the *walkthrough* method to correct for edge bias on trees near your designated *stand* boundary.
3. Find the BAF (Basal Area Factor) of your thumb held comfortably at arm’s length by making a minimum of two calibration observations. Do this by setting up a target of known diameter in an area with unobstructed view (e.g., a lamppost or tree of known DBH). Start near the target and walk backwards until the sides of the target just “disappear” behind your thumb (i.e., the sides of your thumb are tangent to the sides of the target). Record your horizontal distance from the target (from your heels to central axis of the target). For the second calibration observation, start some distance away from the target and while looking at your thumb and the target beyond it, walk toward the target until the sides of the target appear to be tangent to the sides of your thumb. Record your horizontal distance to the target.

OFFICE WORK

One written formal lab report per crew will include the following information:

1. Find and report the cost of a jake-staff, relaskop, and glass wedge-prisms having 20-, and 40-BAF’s.
2. Estimate average tariff number from the two trees with height measurements. Summarize the *fixed*-area plot data, reporting number of trees per acre, basal area per acre, and volume per acre (all species combined).
3. Summarize the *variable*-area plot data, reporting number of trees per acre, basal area per acre, and volume per acre (all species combined). Report a 70% confidence interval for number / acre and for volume / acre.
4. Derive stand and stock tables from your fixed- and variable-plot data.

5. Report the BAF of your thumb and show all calculations for its derivation.

Exhibit 1. Fixed-area Plot Establishment on Sloping Ground

Given plot radius OR , slope distance OR' is needed.

Measure angle ROR' with clinometer in deg.

$$\frac{OR}{OR'} = \cos(\angle ROR') \Rightarrow \frac{OR}{\cos(\angle ROR')} = OR'$$

