SOUND NATIVE PLANTS

Estimating slope

Slope measurement units can be extremely confusing with a lot of similarity in terminology and little standardization regarding when a specific term is used. To clarify, there are three main ways to quantify slope. A clinometer measures the slope angle (the amount of rotation between a flat line and the gradient) in degrees. Percent slope equals rise divided by run. A slope ratio is run : rise.

An example:

A gradient has a rise of 50' over a run of 100'. A clinometer measures the slope to be 26.5˚.

For the same gradient, the percent slope would be 50% because rise = 50 and run = 100 therefore rise divided by run is 50 divided by 100 or 50%.

For the same gradient, the slope ratio would be the ratio of the run to the rise, with 100' to 50' expressed as a 2:1 ratio.

To convert a percent slope to an angle, divide the rise by the run and take the arctangent of this amount (using a calculator with the calculus function $\tan^{-1}$).

Estimation methods

If one has a contour map of the area with a scale, slope can be estimated using the following method:

1) Mark 100' on the edge of a piece of paper, using the map scale bar.
2) Place the paper scale across the steepest part of the slope on the map so the 100' measurement crosses perpendicular to the contour lines.
3) Read the difference in elevation from the lowest to the highest contour line with that 100'.
4) The difference in elevation equals the percent slope. For example, 60' elevation = 60% slope.

A quick and dirty method of estimating slope in the field is explained in "Fire Management Notes", a US Forest Service publication (http://www.fs.fed.us/fire/fmt/fmt_pdfs/049_03.pdf). Print out the diagram on page 17, punch a hole where the lines converge at top, hang a plumb bob from a string tied through the hole and sight along the top edge of the diagram parallel to the slope. Where the string lies on the diagram indicates the percent slope. The diagram is appropriate for slopes of 45˚ or less.

Using a clinometer is the easiest way to measure slope in the field, many measuring in both angle degree and percent slope units. Sight on an object similar to your height, further up the slope (sighting on a friend's head can be handy). However, clinometers are fairly expensive (on average, around $120.00). Some compasses have built-in clinometers, which are both less expensive and less accurate than clinometers with an eyepiece.