Approximate area of bark coverage.

There's also a simple way to approximate the area of bark coverage. For a given set of four adjacent 30-degree triangles, the approximate total area is the square of the average side length. If the average side length is 120 feet, the approximate area is *120 x 120 = 14,400* ft^2.

Here's why it works, using the transect diagram on page 3 as an example. First, view the four large triangles as being averaged so that all have equal sides. This side length then is the average of the five actual transect lengths.

To find the average side, add up the five actual transect lengths and divide by five. Call that length *a*. In the standard case, transect intervals are 15 feet, and each transect is a multiple of 15. Dividing by five means the average length always will be a whole number and a multiple of three.

As above, the area of any 30-degree triangle is $ab/4$. With equal sides, the area is $a^2/4$. Therefore, the area of the four triangles is $4 \times a^2/4$, or a^2.

In Figure 1, the average side length is 120 feet, and the estimated area is 14,400 ft^2. The actual total area of the transect diagram on page 3 was calculated to be 15,470 ft^2. The estimated area of 14,400 ft^2, is 93 % of the actual area.

If six or seven transects are present--five or six triangles--the method still can be used. Average the six or seven sides and square that length to get the area of four triangles. Then add 25% if there are five triangles, and 50% if there are six triangles, to approximate the total area.

As always, converting to acres requires dividing by 43,560 ft^2/acre: 14,400/ 43,560 = 0.3 acre.

Note that a^2 also is the area of a square with side *a*, which can be drawn superimposed on the transects for rough visual confirmation of the method. Draw the square so that two sides are the same as the outer sides of three adjacent triangles, with a common 90-degree corner.

For various reasons of geometry, this method is only an approximation. The more "even" the triangles are, the greater the accuracy of the approximation. The more "irregular" the triangles are, the less the accuracy of the approximation. Generally, the method gives a result that is within 10 % lower than the calculated area.