Northern Interior Cruising Committee

Walkthrough Method for Border Plots

P.R. Smith, RPF, ATE
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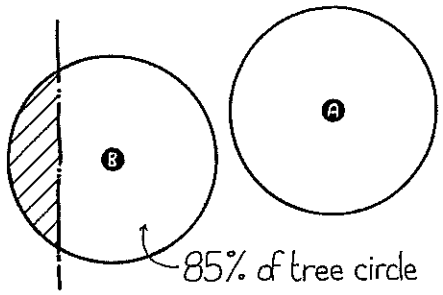
The Issue

Trees near a boundary are not sampled with the same probability as those not near a boundary, because a portion of the "tree circle" falls outside the sample area, and is therefore not available for locating a plot centre.

Illustration 1



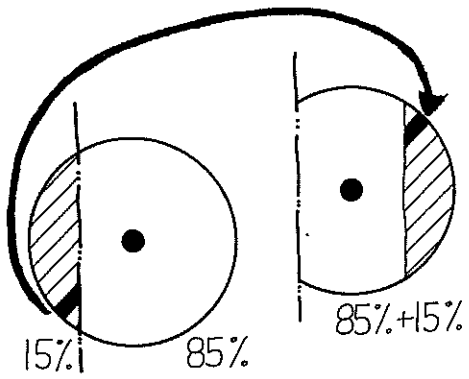
For an unbiased sample, each tree has to have an equal opportunity of being selected. In the illustration above, 100% of Tree Circle A is available for a plot centre, but only 85% of Tree Circle B is available, leaving Tree B with a lower likelihood of being sampled. This results in a bias in the sampling selection.

To resolve this bias, we can weight the value of each tree by it's sampling probability (which is a tedious and complicated task), or we can find a way to "move" into the sample area the portion of the tree circle that is outside the sample area.

One Solution: The Walkthrough Method

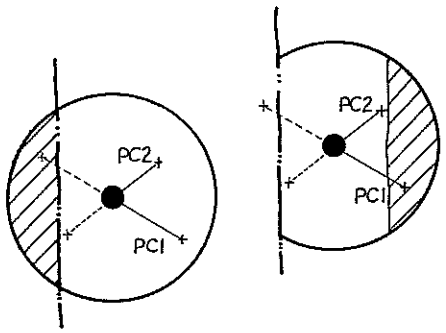
The "Walkthrough Method" accomplishes this by rotating the tree circle 180^{O} about the centre of the tree. In effect, 100% of the tree circle is now available for locating a plot centre. When the plot centre falls within the overlap area, the tree is tallied twice.

Illustration 2



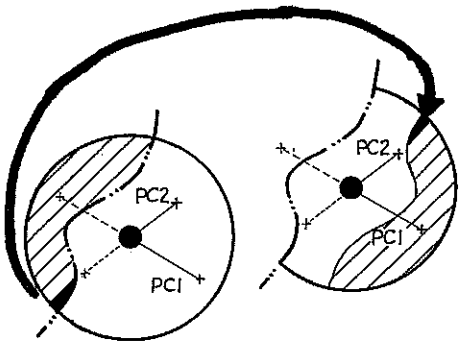
To determine whether or not the plot centre falls within the overlap area, we rotate the line from plot centre to the tree 180°about the centre of the tree. If the end of the line falls outside the boundary, we know the plot centre is within the overlap area, as in the case of Plot Centre (PC) 1, below. If the end of the line falls inside the boundary, we know the plot centre is not within the overlap area, as in the case of PC 2.

Illustration 3



This method works well with irregular boundaries.

Illustration 4



References

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Iles, Kim. 2005. A Great Practical Edge-effect Solution for Typical Cruising Situations. www.proaxis.com/~johnbell/regular/regular_online4.htm