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Species-Area Curves, Neutral Models and Long Distance Dispersal (Appendices)

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Appendix F Calculating median dispersal distance

To convert L into a median dispersal distance measured in metres, we first apply the procedure described in Appendix A to obtain integer coordinates x and y for the number of grid spaces across which dispersal has occurred in each axis. We then calculate $\sqrt{x^2 + y^2}$ to obtain the true distance in grid spaces. To get the distance in metres we use the density ρ of trees in units of trees per square metre. The area of a single square in the discrete grid of our model is therefore given by ρ^{-1} and the width of a grid space is given by $\rho^{-0.5}$. We can therefore define the dispersal distance in metres by $\sqrt{\frac{x^2 + y^2}{\rho}}$. We calculate for 250,000 different instances of the random variables x and y then find the median of these 250,000 values. We found that increasing the number of trials did not yield a significantly different median dispersal distance and so 250,000 repeats is sufficient.