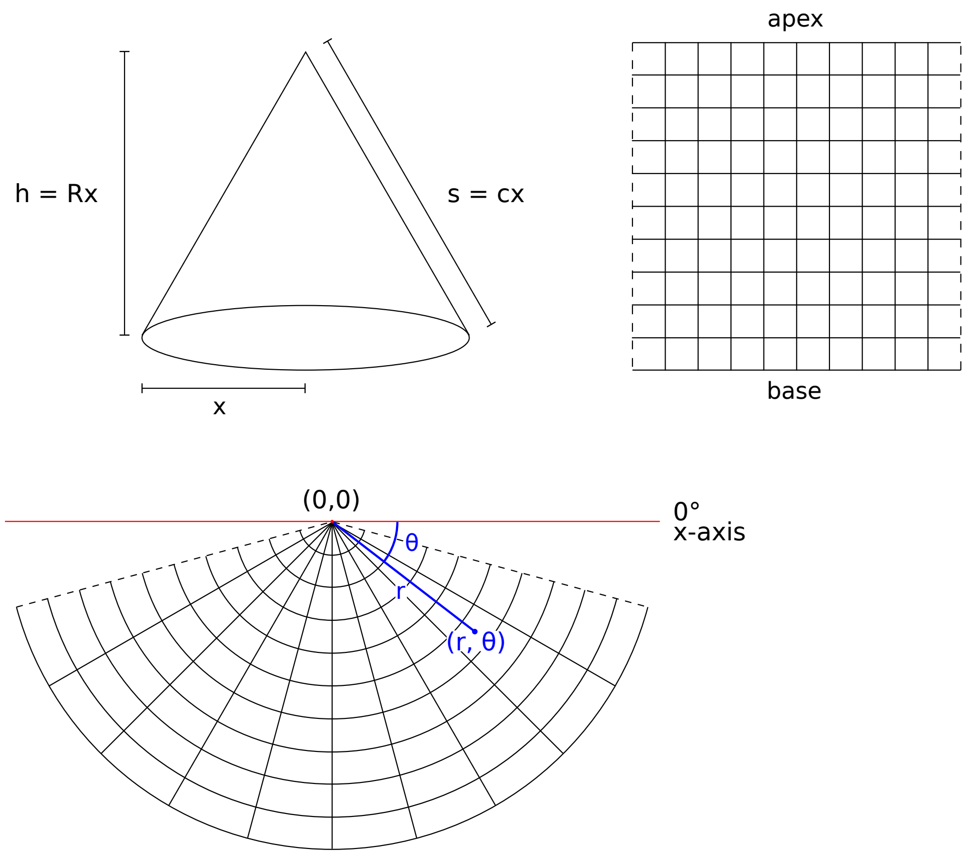
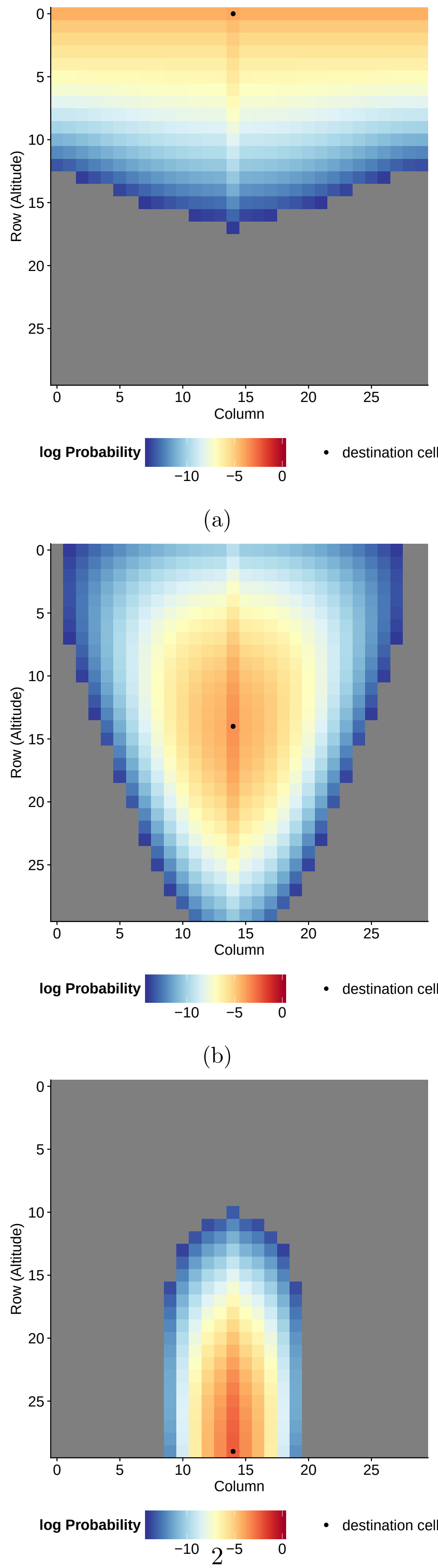


Figure 1: The model mountain is a cone. Unfurled, a cone's surface is a circle sector. The polar coordinates, r and θ, describe position on the mountain. The circle centre (mountain tip or cone apex) is the origin, (0, 0). In silico, I represent the cone's surface as a square array (grid of cells). Rows in the array are altitudinal bands, and columns, positions along a band. Row indices correspond to radial positions, and column indices, to angular positions. The array's top edge is the cone's apex (mountain tip). The cone has three parameters: base radius (x), height (h), and slant height (s).

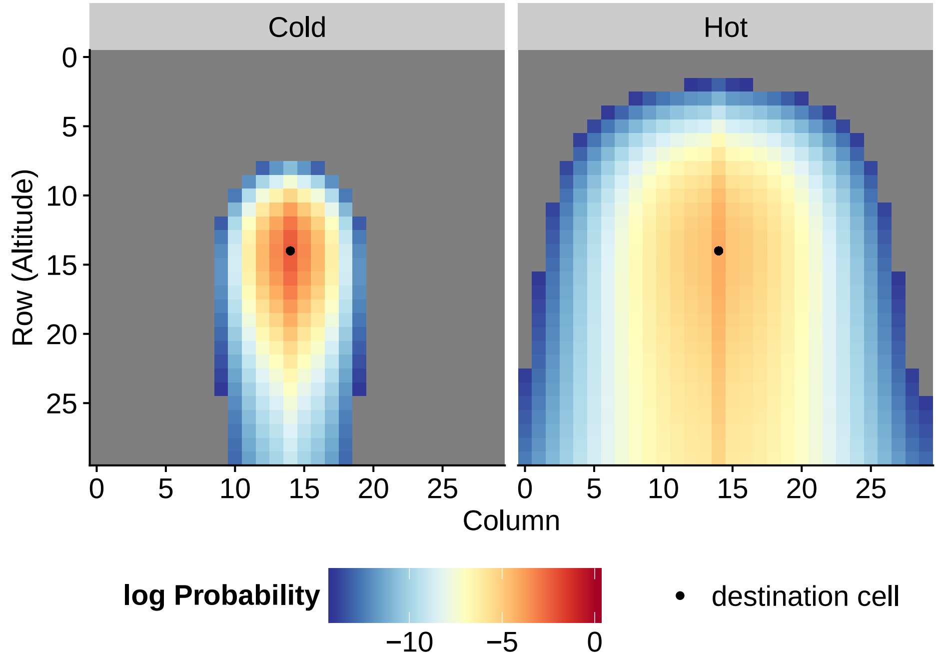


(a)

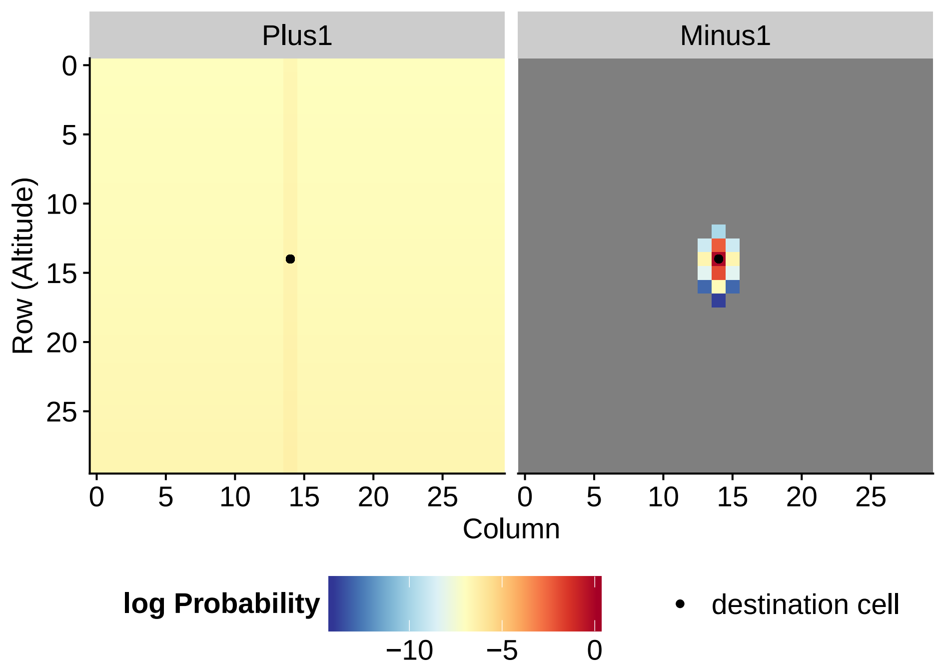
(b)

(c)

Figure 2: The effect of area without temperature. Log probability of dispersing to a destination at the top, middle, and bottom of the mountain. Grey squares represent probability $\leq 1 \times 10^{-6}$. (Temperature fixed to 15 °C; body mass 100 g.)

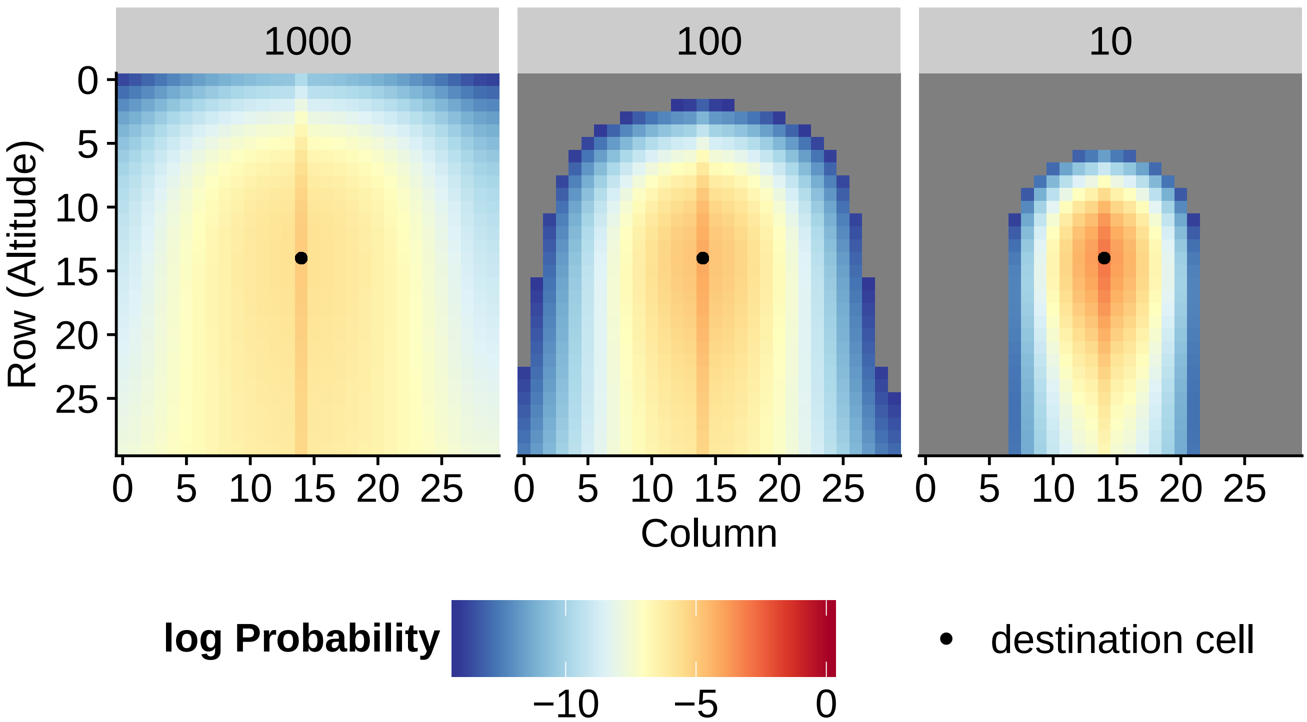


(a) The effect of adding a temperature gradient. Comparison between cold (temperate, 0-15 °C) and hot (tropical, 10-25 °C) mountains. (Body mass 100 g; area effect present).



(b) Making mountains out of molehills. Increasing/reducing the normalisation constant for dispersal by an order of magnitude. (Area and temperature effects present).

Figure 3



(a)

Figure 4: Comparison of body sizes, across two orders of magnitude. (Area and temperature effects present; 10-25 °C).

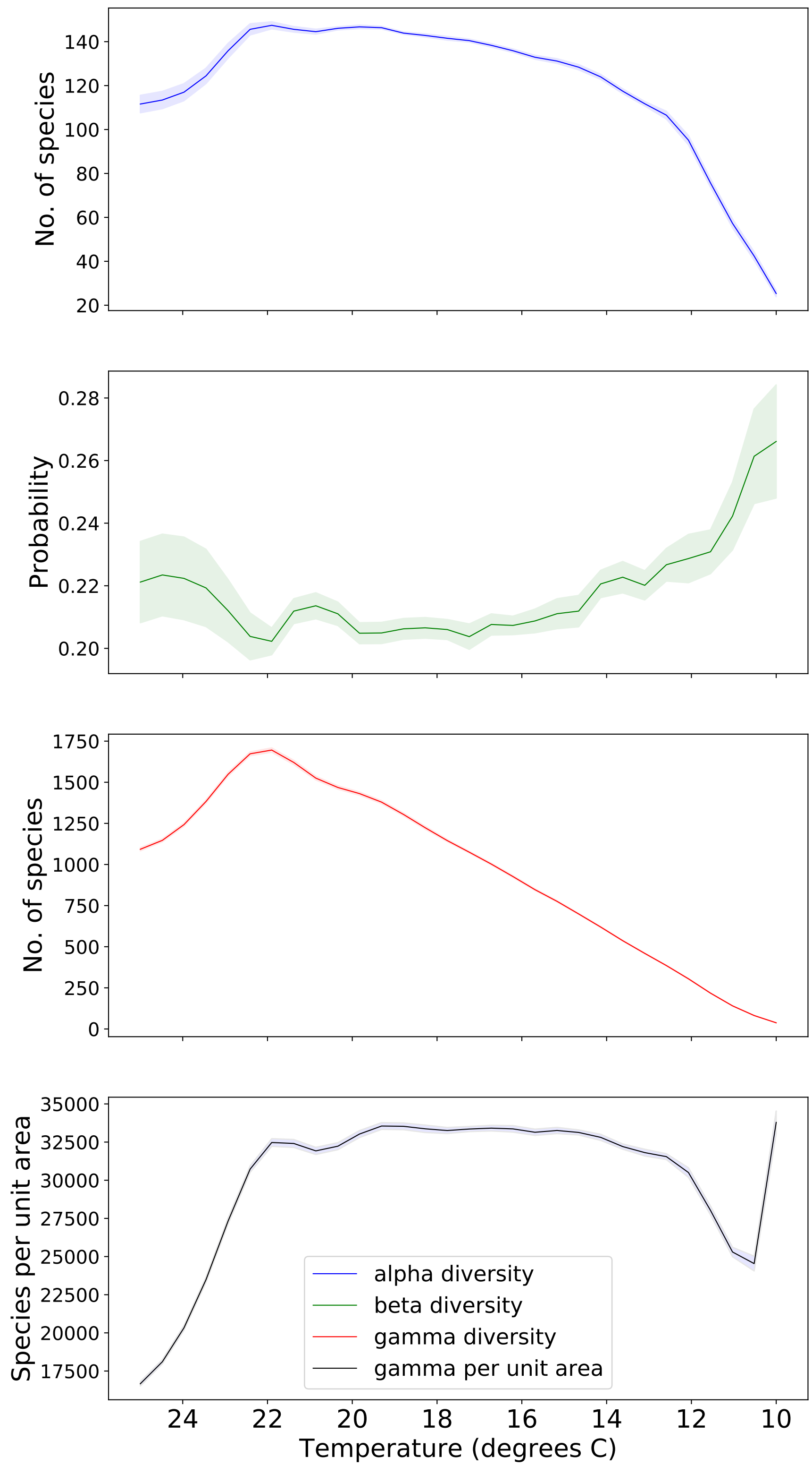


Figure 5: Altitudinal gradients of alpha, beta, and gamma species diversity. Temperature increases with decreasing altitude. Alpha diversity is the mean number of species in a fixed area (per band). Beta diversity is the probability that individuals from opposite sides of the mountain are the same species. Gamma diversity is total number of species; the black line is total number divided by band area.

T.

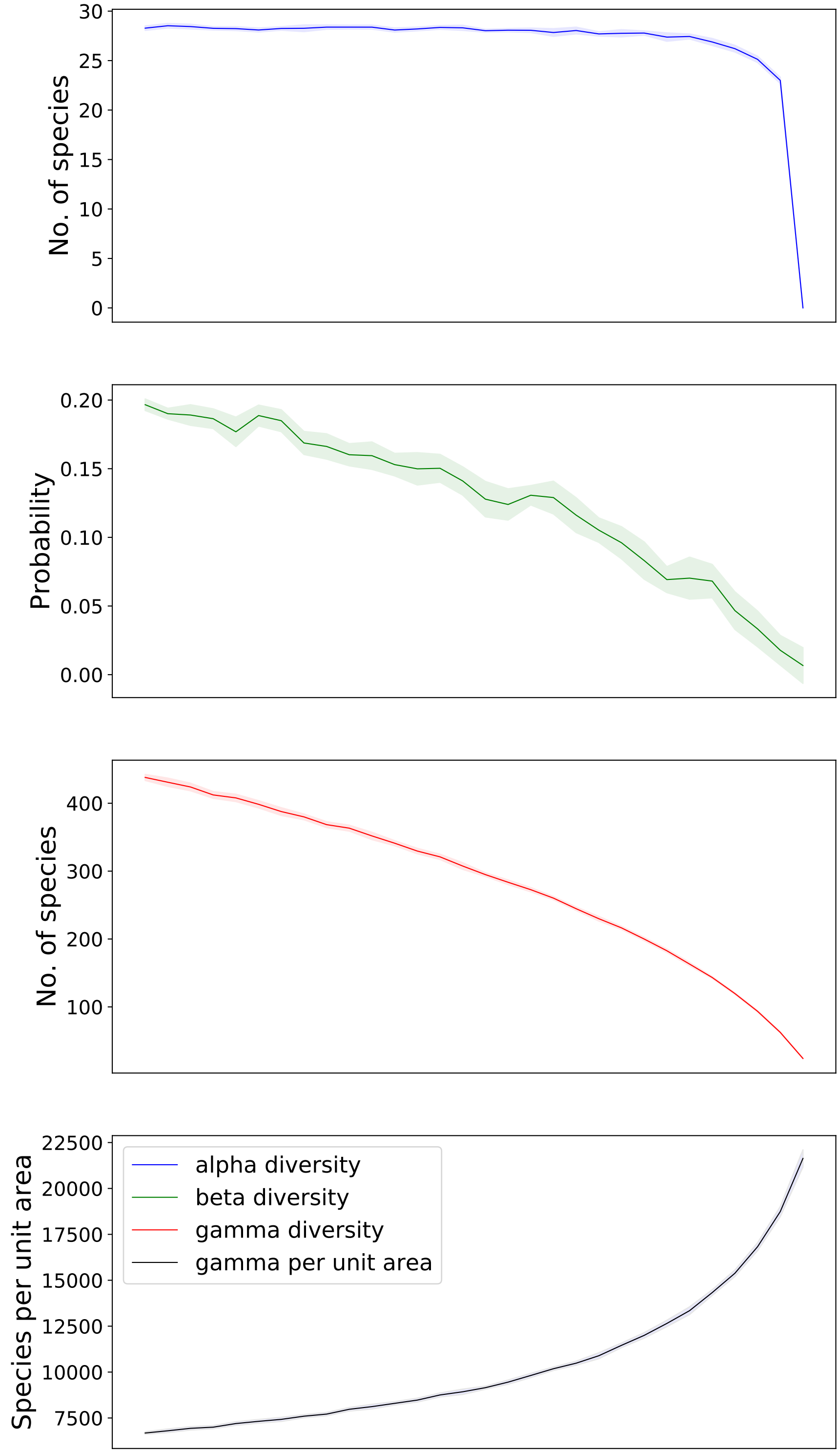


Figure 6: The effect of area without temperature. (Temperature fixed to 15 °C; body mass 100 g.)

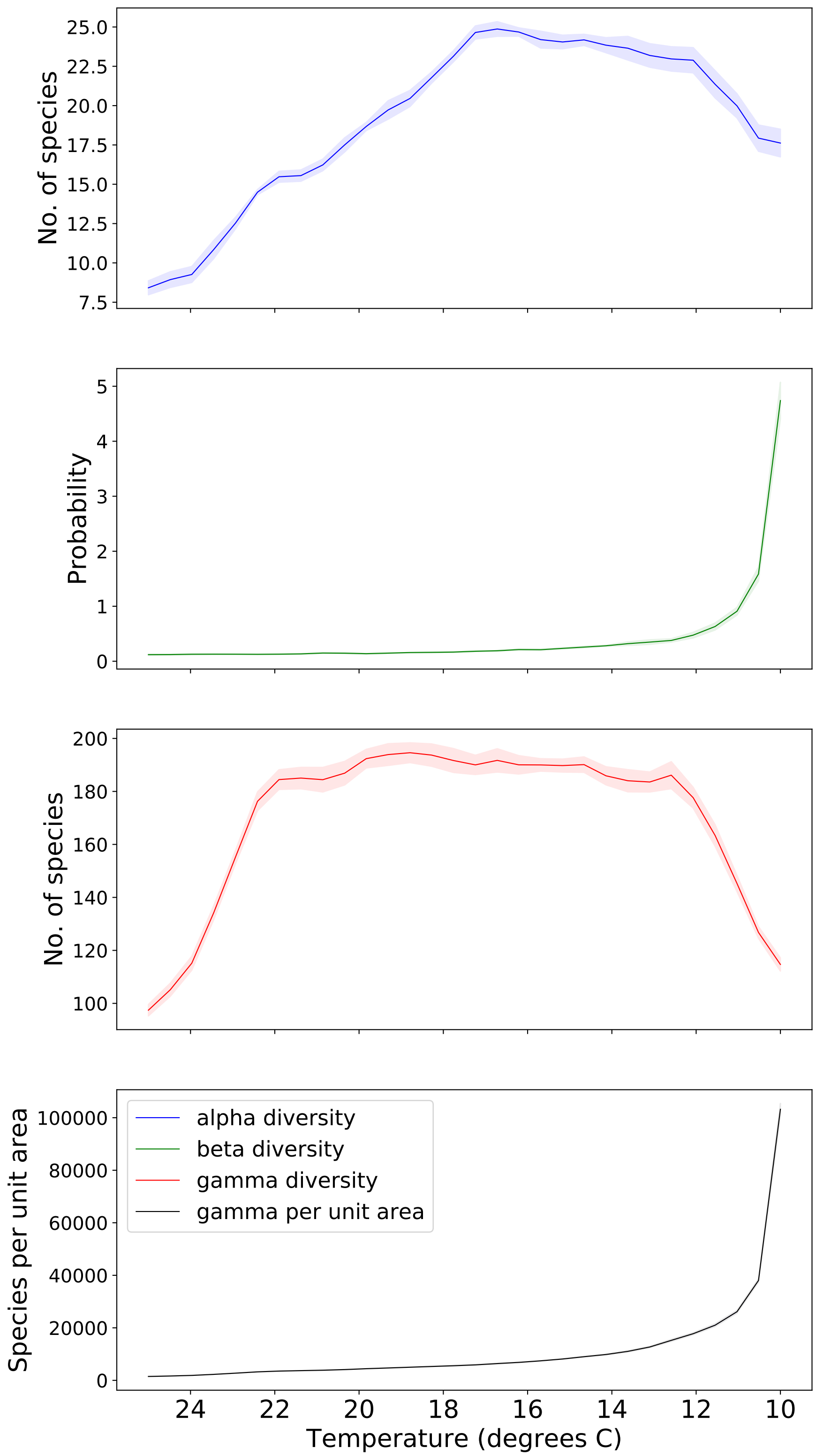


Figure 7: The effect of temperature - fixed area (system is a cylinder, not cone. Notice alpha diversity - I think the increase in diversity with temperature is either a strong edge effect (high dispersal at hot end, pushing species to the centre) or a bug - I'll look into this.