Evidence of forage distance limitations for small solitary bees

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Abstract. The natural distribution of ground-nesting solitary bees was investigated over three years using 300 m transects of water traps in a constrained mosaic of nesting and forage habitats at Shotover Hill, a Nature Reserve in Oxfordshire, UK. A large area of suitable nesting habitat is adjoined on three sides by floristically diverse hay meadow. This study showed that foraging females of small bee species (<1.5 mm intertegular) demonstrated a functional limitation to their homing range. The abundance of small bees declined rapidly with increasing distance from known high density nesting areas, and more rapidly than might be expected from uniform dispersal into the surrounding landscape. By modelling the occurrence of bees along each transect it was found that the probability of observing a small bee was reduced from 100% in the vicinity of the nesting habitats to 50% at a distance of 90 - 140 m and to 10% at 250 - 370 m. The result emphasises the scale on which habitat fragmentation will begin to impact upon solitary bee diversity.

For submission to European Journal of Entomology