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POSTER

Small wind turbines and bird activity around the South Pennine Moors Special Protection Area

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Research on the ecological effects of wind turbines has, to date, focused on wind farms with multiple large turbines. With financial incentives available within the UK for small-scale electricity generation, there is a trend towards the construction of small wind turbines (SWTs) in areas of high wind resource. The ecological effects of SWTs are not well understood, making it difficult for local authorities to make informed planning decisions. Our study was undertaken within 3 km of the South Pennine Moors Special Protection Area boundary and within the boundaries of three unitary authorities. Within this area, 80 turbines were identified as having gained planning permission. Of these, 59 were visually confirmed as built (average density 0.28 turbines per km²).

Literature on the impact of SWTs on birds is currently extremely limited, with research so far directed toward bird flight activity in close proximity to turbines. In our study, 24 of the 59 built turbines were surveyed for breeding birds using distance sampling line transects positioned along existing public rights of way. All bird sightings within 100 m of the transect line and within a 500-m radial distance (250 m for densely clustered turbines) of the turbine were recorded. Species, behaviour and group size were noted and a GPS waypoint was attributed to the observation.

The aim of this study was to investigate whether bird population density and activity varies as a function of distance from turbines. Bird locations were determined using a laser range finder and projected as a waypoint using a handheld GPS unit. As the transect lines were not straight, distance to the transect line from an observation was calculated as the shortest linear distance in place of radial distance and angle. Line transects were divided and grouped into sections based on distance from a turbine (in 100-m radial increments as concentric circles around the turbine), facilitating the comparison of bird density and activity within different distance bands around a turbine. Habitat data were also collected for each turbine distance band as a covariate.

More than 1100 bird encounters were recorded (with many records comprising multiple individuals), including over 45 species. Northern Lapwing *Vanellus vanellus*, Eurasian Curlew *Numenius arquata* and Common Skylark *Alauda arvensis* were the most numerous species of primary interest. The majority of records consisted of passerines such as Meadow Pipit *Anthus pratensis*, Common Starling *Sturnus vulgaris*, Carrion Crow *Corvus carone* and Western Jackdaw *Corvus monedula*. Data collected in 2013 will be compiled and analysed with further data

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collected in 2014. We hope to expand the number of turbines surveyed and examine the effect of localized cumulative turbine construction on bird activity.