

## The distribution of breeding birds around upland wind farms. Pearce-Higgins, Stephen, Langston, Bainbridge, Pullan & Bullman, 2009.

This paper, which appeared in the Journal of Applied Ecology in 2009, has had considerable repercussions for terrestrial wind farm schemes, predominantly those in upland habitats. It was a relatively simple study in terms of concept: twelve built wind farms were selected, habitat mosaics were mapped and accounted for (in terms of their effects on potential bird distribution), and breeding bird surveys were conducted. From the results, apparent displacement distances from operational turbines for a number of upland breeding birds were derived. The short review below reprises what the study aimed to do, what it concluded and how nature conservation consultees have responded to it.

To inform the study, nine wind farms of range 14-42 turbines were selected. These comprised many of the larger built wind farms in northern England and Scotland. At each site a 1km 'buffer' was surveyed around the wind farm, along with a control area of similar physical characteristics. A standard Brown & Shepherd survey was then carried out across each respective study area, although surveyors additionally mapped the flights of raptors, estimated their flight heights and used a bespoke system to count meadow pipits and skylarks. Account was taken in data analysis of the likely effects of the position of roads, forestry blocks and vegetation suitability on bird distribution.

Twelve species were recorded sufficiently regularly (the authors set the threshold at 50 or more sightings) to allow modelling of potential displacement effects to be undertaken. Following analysis, the authors considered the data to indicate significant displacement of a number of species: breeding curlew, golden plover and snipe (all waders), hen harrier and buzzard (raptors) and wheatear (a passerine). For hen harrier and buzzard displacement was inferred, based on the distance flying birds kept from turbines. For wader species and wheatear the conclusion was based on the apparent positions of central territory locations.

From the data the authors were able to estimate the extent to which breeding densities of the above species within 500m of a turbine might be reduced as result of wind farm operation:

- Snipe numbers were predicted to be reduced by approximately 47.5%, curlew by 42.4%, golden plover by 38.9% and wheatear by 44.4% within 500m of turbines.
- It was inferred from flight data, that foraging activity by hen harrier and buzzard within 500m of a wind farm would go down by 52.5% and 41.4% respectively.
- Curlew were reported as showing a detectable reduction in density within 800m of turbines, and the authors therefore also presented a predicted reduction of 30.4% in curlew numbers within 1km of operational wind farms.

The study concluded that it had demonstrated clear evidence of localised reductions in the densities of some upland breeding birds close to operational wind farms, and that it had been the first to attempt to quantify this effect. Other conclusions were also presented, but the paper's legacy has been the figures it presented.

### Viewpoint

Since its issue in 2009 the paper by Pearce-Higgins *et al* has been used as the basis upon which some consultees have justified requesting large scale compensation and land management initiatives for upland wind farms. Displacement of waders, particularly curlew, is often the main cited concern. Various methodological and statistical criticisms have been made of the Pearce-Higgins paper, but consultees have often ignored these as being 'predictable industry grumbling.'

Notwithstanding this, the paper is increasingly being quoted out of context, and is sometimes referenced as early in the planning process as in scoping responses

from nature conservation consultees, who treat it as a policy driver. This appears to be most frequent in Wales, where wader populations have declined hugely over the past 50 years or so, and are now heavily fragmented.

While it has been difficult, due to the lack of peer reviewed studies, to effectively counter or question the conclusions of the paper, the authors did acknowledge to an extent in their conclusions that there was a requirement for further work to verify their findings and the reasons underpinning them. Other study material is now starting to emerge, and much of this draws the conclusions of the Pearce-Higgins report into question. In particular, the recent paper detailing the results of monitoring at Beinn Tharsuinn, and a study of curlew displacement at Scottish Power wind farms (by Whitfield, Green & Fielding) appear to directly conflict with the findings of the Pearce-Higgins (2009) report. These recent papers should encourage the renewables industry to issue the results of conditioned bird monitoring studies into the public domain so that the real impact of wind farm operation on upland bird populations can be better understood.

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### References

Pearce-Higgins, J.W., Stephen, L., Langston, R.H.W., Bainbridge, I.P & Bullman, R. (2009). The distribution of breeding birds around upland wind farms. *Journal of Applied Ecology* 46: pp 1323-1331.

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