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BSG TECHNICAL REVIEW

ARE BREEDING EURASIAN CURLEW *NUMENIUS ARQUATA* DISPLACED BY WIND ENERGY DEVELOPMENTS?

A paper by Whitfield, Green & Fielding (Natural Research)

Eurasian Curlew (Numenius arquata)

This paper, issued in August 2010, summarises curlew monitoring work undertaken at five wind farm sites: Hadyard Hill (South Ayrshire), Dun Law (Scottish Borders & Lothians), Caton Moor (Lancashire), Black Law (Lanarkshire & Lothians) and Carno (Powys). The scale of the wind farms studied ranged from 10 (Caton) to 56 turbines (Carno), with the more recently constructed projects such as Hadyard Hill (built in 2005) having the larger machines with greater hub height and rotor diameter. Basic turbine parameters are given in the paper. Two reference sites were also surveyed, Ewe Hill and Whitelee, both in south-west Scotland.

All wind farms monitored had baseline pre-construction data available, with some also having information for a control area, thus enabling Before-After-Control-Impact (BACI) studies to be undertaken. These are of particular value as they allow external factors potentially affecting the numbers and densities of breeding birds to be taken into account when interpreting the results of monitoring work.

The aims of the monitoring study were to identify whether:

1. There was evidence of an immediate effect of turbine construction i.e. a reduction in the number of territories close to turbines and a change in spatial distribution as a result of initial operation;

2. There was a gradual displacement effect attributable to wind farms as site faithful birds that died were lost to the population and were not replaced (a scenario that would ultimately result in a distribution over time similar to that for scenario 1 above); and

3. Hatching success decreased close to turbines due to greater disturbance (an effective reduction in habitat quality)

The sites considered were characterised by a range of typical upland habitats including improved pasture, acid and marshy grassland, valley mire and blanket bog (these occurred as mosaics at some of the sites). Surveys at the wind farm sites were conducted over a minimum of 4 breeding seasons, although 7 years of data was collected at Black Law. The reference sites were surveyed over 6 and 4 breeding seasons respectively.

The wind farm sites were surveyed using the standard (2 visit) Brown & Shepherd survey technique, with additional (non-standard) targeted effort to pinpoint curlew nest sites and determine breeding success. Notable survey findings were as follows:

- At Hadyard Hill curlew density declined during the study, but numbers were very low and this decline was considered to be within normal inter-annual variation (and corresponded closely to variation at one of the control sites);
- At Dunlaw there was no evidence of a change in the number of curlew territories pre- and post-construction, or of a change in the position of territories as a result of turbine placement. There was also no evidence of short or medium term displacement effects or of a change in hatching success;
- At Caton Moor curlew were noted as having moved closer to turbine locations following repowering in 2006;
- At Black Law there was a decline in curlew numbers, but this was predominantly outside the turbine array and therefore not consistent with displacement as a result of turbine operation;
- At Carno the results were less straightforward to interpret. An initial assessment might suggest that displacement has occurred since construction, but the on-going decline of curlew in Wales has resulted in areas of suitable habitat outside wind farms being unoccupied, with birds retreating to the best quality (wetter) habitats where breeding persists.

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As wind turbines tend to be located in the drier areas of moorland (due to engineering and ecological considerations), this may have resulted in an apparent decline in numbers close to turbines.

However turbines close to areas of bog continue to be within curlew territories, suggesting declines are unrelated to turbine placement.

The study concluded that at four of the five sites there was no suggestion that curlew were displaced as a result of turbine operation, while at the fifth site results were inconclusive. In fact, at two wind farms curlew territories were found to be closer to turbines during operation than prior to construction, and at Black Law three central territory locations were within 200m of turbine locations.

On-going declines in curlew numbers at the national level were reflected with decreased numbers over time at most of the sites surveyed (including the reference site at Ewe Hill). The value of long term data sets in interpreting the monitoring data was clearly illustrated: gradual declines were identified in wider populations across the survey areas, and these might otherwise have been attributed to the wind farm if too limited a survey area had been sampled, or if snapshot surveys had been conducted in only one year pre- and post-construction.

The authors also discuss the potential reasons why their study found no evidence of displacement of curlew while that of Pearce-Higgins et al (2009) concluded that significant displacement effects occur at distances of up to 800m from wind farms. The difference was mainly attributed to a statistical anomaly in the Pearce-Higgins data. While debate over statistics is beyond the scope of this non-technical review, it would appear reasonable that displacement effects would primarily be expected very close to and within the wind farm if they were to occur. The Pearce-Higgins paper relies heavily on data for birds breeding a considerable distance from wind farm sites in reaching its conclusions.

Viewpoint

So what should the industry and other stakeholders take from this recent paper?

- It is an uncomplicated and robust study conducted at a number of wind farm sites over a considerable time period that shows no clear evidence of displacement of curlew.
- In combination with the recent paper on golden plover densities increasing in proximity to the Beinn Tharsuinn Wind Farm and evidence collected by Fielding & Haworth (2010) suggesting there has been no displacement of golden plover as a result of the operation of Farr Wind Farm, it strongly suggests that the conclusions of the 2009 paper by Pearce-Higgins et al. need to be looked at critically when considering the requirements of upland birds near wind farms.
- It shows the value in collecting several years of data pre- and post-construction in order to be in a better position to interpret the results of monitoring studies.
- It should act as encouragement to developers to undertake robust post-construction monitoring studies, and to issue the results of these into the public domain. The findings of such studies are likely to have a bearing on the ease of consent for future schemes.
- Finally, it also provides developers and their consultants with a basis to determine whether consultee requests are proportionate with regard to compensatory habitat management for waders.

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