

Red Tile Wind Farm, Cambridgeshire

Post-construction breeding bird surveys 2008

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July 2009

Client: FENLAND WINDFARMS LTD.



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SUMMARY

The Red Tile wind farm has 12 x 2MW wind turbines, which have been operating since early 2007. Breeding bird surveys were carried out during April – August 2007 and 2008 to satisfy a Planning Condition that formed part of the Red Tile wind farm planning approval. This included a breeding bird survey, and specific surveys for dotterel, barn owl and quail. These surveys aimed to establish how the birds that breed in and use the area have been affected by the wind farm.

The breeding bird community within the main study area in 2007 and 2008 was very similar to that from the pre-construction baseline from 2002/03. Birds that had been present in close proximity to the wind turbine locations in the baseline year generally at least maintained their populations there after the turbines had been constructed (even within 100m of the turbines). There were some minor differences between the years but nothing that suggested there had been any significant displacement of breeding birds by the wind turbines.

There were no records of two of the key species, dotterel and quail, within the study area during 2007 or 2008, but this was not considered likely to have resulted from the presence of the wind farm.

A pair of barn owls was recorded breeding within the wind farm site in 2002 and a pair was also found breeding there in 2007 and 2008 (approximately 100m from a wind turbine), so they do not appear to have been displaced by the wind farm.

Overall, there were some minor differences between breeding bird populations recorded in the pre-construction baseline and in the post-construction surveys, but nothing that suggested there had been any significant effect on the breeding bird community.

INTRODUCTION

1. Bird surveys were commissioned by Fenland Windfarms Ltd. to satisfy a Planning Condition that formed part of the Red Tile wind farm planning approval. These surveys aimed to establish how the birds that breed in the area have been affected by the wind farm. The first season's post-construction surveys were carried out in 2007 (Percival et al. 2007). This report covers the second season's post-construction surveys.
2. The specific objectives of this work were to:
 - Undertake surveys of the breeding bird populations in and around the wind farm site;
 - Undertake specific surveys of dotterel (during their spring migration), barn owl and dotterel.
3. The main part of the analysis was to determine if the wind farm had any displacement effect on the local bird populations. If so, one would expect bird numbers to be reduced closer to the turbines. Therefore bird distributions have been compared in relation to the distance from the wind turbines, and in relation to their baseline distribution.

THE STUDY AREA

4. The Red Tile wind farm has 12 x 2MW wind turbines, which have been operating since early 2007. It is located on predominantly arable farmland, 5km south-west of Chatteris, in Cambridgeshire.
5. The main study area (all of which was covered during the baseline surveys) includes the wind farm itself and a 300m buffer around it (300m being the greatest distance at which breeding birds have been shown to be affected by existing wind farms; Percival 2005), plus an additional area adjacent that functions as a reference area to compare changes in bird densities and distribution patterns (see Figure 1). The breeding bird study area covered a total area of 4.7km². Most (4km²) of this study area was surveyed in 2002, though a small part (0.7km²) was not covered in that year but a single visit was made in June 2003. As a result the bird numbers in this area at this time may have been slightly underestimated.
6. The study area is predominantly arable farmland, with crops including winter-sown cereals, sugar beet, potatoes, peas and set-aside. The field boundaries include typical marginal vegetation, numerous wet ditches and drains, scattered bushes, trees and hedgerow remnants. Most of the ditches are cleared regularly for drainage purposes.

Breeding Bird Survey

Survey Methods

Breeding Bird Surveys

7. The main breeding bird survey was carried out using a standardised timed method, essentially a walkover survey following the methodology of the Common Birds Census (Gilbert *et al.* 1998). In order to keep the survey methodology consistent with the pre-construction surveys two survey visits were made, the first on 15 April and the second on 4 June 2008. All bird locations and behaviour were mapped to 1:10,000 scale, using the standard Common Birds Census notation. Supplementary behavioural observations and notes were made to determine breeding locations as accurately as possible. The area was subdivided into half-kilometre square areas. Birds were recorded systematically for 20-25 minutes in each of these areas, standardising the search effort per unit area. The surveys were carried out between 08:30 and 18:00 hours, avoiding strong winds, heavy rain, fog and low cloud. Birds were located by walking, listening and scanning by eye and with binoculars. Birds were considered to be breeding if singing, displaying, carrying nest material, nests or young found, repetitively alarmed adults, disturbance displaying, carrying food or in territorial dispute.
8. The survey data were used to obtain population estimates for all of the bird species breeding on the site. Maps were produced of the breeding pairs recorded during each visit and these were combined to produce an estimate of the overall breeding population for each species. Pairs were considered separate from each other if greater than 1km (waterfowl and raptors), 500m (pigeons, gamebirds and crows) or 200m (all other species) apart, with this distance reflecting the relative distance that birds might move between survey visits.

Species-specific Surveys

9. As two species specially protected under Schedule 1 of the Wildlife and Countryside Act, barn owl and quail, were found breeding within the study area during the baseline studies, specific surveys of these species were undertaken following the methods recommended by RSPB (Gilbert *et al.* 1998). This included dusk surveys in April-July (for both species) and searches for signs of owl activity (particularly pellets) around potential nesting/roost sites.
10. The study area and its surrounds are known to be a regularly used spring staging area for dotterel. Little is known about whether this species may be affected by a wind farm, so a further survey specifically targeted at this species was undertaken between 1-20 May (Frost 1999). This involved an additional 2 days survey to the site during this period, searching the pea fields and any

others with sparse vegetation suitable for this species. The survey area for this work included the main monitoring area and the surrounding area in which this species has been recorded in the Warboys High Fen, Tick Fen and Ramsey Hollows areas (Frost 1999).

Survey Results

Breeding Bird Surveys

11. The breeding bird population estimates within the study area in 2008 are given in Table 1. The Table also gives the results from the previous 2002/3 (before the wind farm was constructed) and 2007 (the first post-construction survey year) surveys. Numbers are given for the whole study area, the area within 300m of the turbines (the distance used for the worst-case disturbance assessment in the Environmental Statement) and the area more than 300m from the turbines.

Table 1. Breeding bird population estimates at Red Tile, 2008, with those for the same area for 2002/03 (prior to construction of the wind farm) and 2007 (the first year's post-construction survey) given for comparison.

Species	Study Area			Within turbine 300m zone			Outside turbine 300m zone		
	2002/03	2007	2008	2002/03	2007	2008	2002/03	2007	2008
Little Grebe	0	0	1	0	0	0	0	0	1
Mute Swan	1	0	1	1	0	0	0	0	1
Teal	0	0	1	0	0	1	0	0	0
Mallard	8	9	17	6	6	10	2	3	7
Kestrel	0	0	1	0	0	1	0	0	0
Red-legged Partridge	7	10	12	5	7	7	2	3	5
Grey Partridge	2	1	5	2	1	5	0	0	0
Quail	1	0	0	1	0	0	0	0	0
Pheasant	21	11	17	14	6	8	7	5	9
Moorhen	4	1	2	3	1	2	1	0	0
Lapwing	0	2	0	0	0	0	0	2	0
Snipe	0	0	1	0	0	0	0	0	1
Stock Dove	6	13	12	4	12	11	2	1	1
Woodpigeon	22	13	32	19	0	17	3	13	15
Turtle Dove	1	0	0	0	0	0	1	0	0
Collared Dove	0	0	2	0	0	0	0	0	2
Barn Owl	1	1	1	1	1	1	0	0	0
Little Owl	0	1	1	0	1	0	0	0	1
Skylark	62	63	55	44	37	34	18	26	21
Swallow	0	1	1	0	0	1	0	1	0
Meadow Pipit	16	7	16	13	7	14	3	0	2
Yellow Wagtail	14	33	35	21	20	24	-7	13	11
Pied Wagtail	4	5	6	0	3	5	4	2	1
Wren	5	2	3	20	0	1	-15	2	2
Dunnock	1	1	0	0	0	0	1	1	0
Robin	1	0	0	0	0	0	1	0	0
Blackbird	2	1	3	2	0	2	0	1	1

Species	Study Area			Within turbine 300m zone			Outside turbine 300m zone		
	2002/03	2007	2008	2002/03	2007	2008	2002/03	2007	2008
Sedge Warbler	8	36	2	5	16	2	3	20	0
Reed Warbler	34	30	27	27	17	14	7	13	13
Whitethroat	2	3	1	1	2	1	1	1	0
Magpie	2	1	1	0	0	0	2	1	1
Jackdaw	2	0	1	1	0	0	1	0	1
Carrion Crow	2	5	6	0	2	2	2	3	4
Starling	1	1	1	1	0	0	0	1	1
House Sparrow	2	11	0	0	5	0	2	6	0
Chaffinch	1	2	2	0	0	1	1	2	1
Greenfinch	2	0	0	1	0	0	1	0	0
Goldfinch	1	2	0	1	0	0	0	2	0
Linnet	2	5	7	1	3	2	1	2	5
Reed Bunting	39	28	25	25	17	18	14	11	7
Corn Bunting	14	28	22	9	22	18	5	6	4

12. The breeding bird populations within the study area were similar in 2002/03, 2007 and 2008. The area within 300m of the wind turbines has continued to support a similar breeding bird community to that it held prior to construction. The distributions of the breeding birds within the study area are shown in Figures 1 to 11, with the maps for the pre-construction and post-construction years presented side by side for comparison. The more abundant species have been presented separately for clarity.
13. The distributions of the more abundant breeding birds (those with a sufficient population size to give a meaningful results, taken as those with at least 7 independent locations in the years being compared) in relation to the wind turbines were investigated further by analysing the distance from each breeding pair location to the nearest turbine location in the two years. If any of these birds were avoiding the turbines, then one would expect a greater distance from the turbines in 2007 and 2008 after the wind farm had been constructed. The results of these analyses are summarised in Table 2, which gives the mean distance to the nearest turbines for each species for the two years. The Table also gives the results of the statistical (one-way analysis of variance) analysis of these data, with a null hypothesis of no difference between the years. The F-statistic from the analysis, the degrees of freedom (a measure of the sample size) and the probability associated with the test are given. A probability of less than 0.05 would be required to reject the null hypothesis (i.e. to conclude that there was a significant difference across the years). All of these species showed no statistically significant difference in the mean distance to the nearest turbine across the three years.

Table 2. Mean closest turbine distances to breeding birds recorded at Red Tile, 2008, with those for the same area for 2002/03 (prior to construction of the wind farm) and 2007 given for comparison.

Species	Mean distance to nearest turbine (m)			F-statistic	Degrees of freedom	Probability
	2002/3	2007	2008			
Mallard	230	293	337	0.65	2, 28	0.53
Red-legged partridge	297	314	361	0.13	2, 26	0.88
Pheasant	328	344	452	0.81	2, 46	0.45
Skylark	321	359	336	0.29	2, 177	0.75
Yellow wagtail	295	370	250	2.15	2, 79	0.12
Meadow pipit	223	183	193	0.29	2, 36	0.75
Reed warbler	276	317	341	0.44	2, 86	0.65
Reed bunting	306	367	297	0.62	2, 89	0.54
Corn bunting	278	287	206	0.65	2, 59	0.53

14. The distributions of the five more abundant open ground species, skylark, yellow wagtail, reed warbler, reed bunting and corn bunting in relation to the distance from the wind turbines are summarised in Figures 12 to 16 respectively. Skylark (Figure 12) numbers and distribution were similar across the three years. Yellow wagtail (Figure 13) numbers were higher in 2007 and 2008, with the increase occurring across the study area and showing no particular relationship to the proximity to the wind turbines (though numbers within 200m of the turbines were higher in 2008). Reed warbler (Figure 14) numbers were slightly lower in the two post-construction years – in 2008 this was particularly the case within 100m of the wind turbines. However the overall spatial distribution of this species was more probably a result of current drain management (to which this species can be sensitive) than the presence of the wind turbines. Reed bunting (Figure 15) numbers were also lower in two post-construction years than the previous baseline and there was a marked decline within 100m of the wind turbines in 2008 (though not in 2007), but this reduction took place generally both in proximity to and further from the wind turbines. Corn bunting (Figure 16) numbers were higher in 2007 and 2008 with the increase occurring across the study area and showing no particular relationship to the proximity to the wind turbines (though numbers were relatively high in the 200m zone in 2007 and within 100m of the turbines in 2008).
15. Overall, no evidence has been found from the 2007 and 2008 survey data of any statistically significant effects on the local breeding bird populations that is likely to be linked to the presence of the wind farm. There has not been any major change in the breeding bird community, and no significant population reduction through displacement. Indeed several species were more abundant after the construction of the wind turbines. The two years post-construction monitoring have both shown that the local breeding bird community has been largely unaffected by the wind turbines. It is certainly very clear that the worst-case assumption made in the ES, that birds would be displaced to 300m from the turbines was not a reasonable worst-case.

Species-Specific Surveys

Dotterel Baseline Conditions in 2002/3

16. The wind farm lies adjacent to an area identified by RSPB as an 'amber zone' (Lucking 2004), because of the small numbers of dotterel that it supports during the spring migration period (late April/May). This species is a scarce passage migrant in the region, using traditional stopover sites on their way to their breeding grounds in the Scottish Highlands and Scandinavia. Though they use the same general areas each year, their distribution within these is very much influenced by the cropping pattern; they have a strong preference for open ground and most frequently use newly planted pea fields.
17. The distribution of dotterel in the region was reviewed by Frost (1999), from which it is clear that the Warboys High Fen area is a frequently-used stopover site, with a peak count of up to 15 individuals. A flock of 18 was seen within the study area during the 2002 surveys. Thus even though the wind farm site lies outside the RSPB amber zone, it was used by migrant dotterel in nationally/regionally important numbers on some occasions.

Dotterel Survey Results 2007 and 2008

18. No dotterel were observed in the main study area during any of the 2007 or 2008 surveys, nor in the wider area. Records of spring staging birds in the whole of Cambridgeshire were very scarce in 2007 and 2008: in 2008 a single at Black Bush (3km NW from the Glassmoor wind farm) and 3 near Litlington on the southern edge of the county. None had been reported at all in the county in 2007, and none within 5km of the wind farm site in 2006 (source: Cambridge Bird Club). Only 6 had been reported in that area in 2005 (Clark 2006). It would appear therefore that there has been a general decline in this species' use of this whole region prior to the construction of the wind farm.

Barn Owl Baseline Conditions in 2002/3

19. A pair of barn owls was found breeding within the study area in 2002 (less than 200m from the nearest proposed wind turbine location). Their precise location has been kept confidential in order to protect them from persecution, but was within the wind farm site.


Barn Owl Survey Results 2007 and 2008

20. A pair of barn owls was found breeding in 2007 and 2008, in the same location as that found in 2002 (approximately 100m from a wind turbine). It would appear therefore that this local pair has not been displaced by the wind farm, maintaining a breeding pair within the wind farm.

Quail Baseline Conditions in 2002/3

21. A single male quail was seen and heard calling during the second of the 2002 breeding bird surveys, at a location within the wind farm site, providing strong evidence of breeding activity.

Quail Survey Results 2007 and 2008

22. No quail were seen or heard during any of the 2007 or 2008 surveys, though this is not unusual given this species high variability in numbers in Britain between years and general lack of site fidelity (Wallace 1998).
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Conclusions

23. The 2007 and 2008 data showed no statistically or biologically significant effects on the breeding bird populations in comparison with those from the 2001 pre-construction baseline. Birds that had been present in close proximity to the wind turbine locations in the baseline year generally at least maintained their populations there after the turbines had been constructed (even within 100m of the turbines).
24. There were no records of two key species recorded during the baseline surveys, dotterel and quail within the study area during 2007 or 2008. There is no evidence, however, that either of these has been displaced by the wind farm, as neither was found in the wider area around the site either.
25. A pair of barn owls was recorded breeding within the wind farm site in 2002 and a pair was also found breeding there in 2007 and 2008, so they do not appear to have been displaced by the wind farm.
26. Overall, there were some minor differences between breeding bird populations recorded in the pre-construction baseline and in the first of the post-construction surveys, but nothing that suggested there had been any significant displacement of breeding birds from around the wind turbines at all.

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