

Fair Oaks Renewable Energy Park, Nottinghamshire: Breeding Bird Survey 2022 Final Report



Clockwise from top left: Lapwing, Grey Partridge, Skylark and Yellowhammer © Steve Percival

Report to Ridge Clean Energy

Steve Percival, Tracey Percival, Mike Hoit and Keith Langdon

Ecology Consulting, Swallow Ridge Barn, Old Cassop, Durham DH6 4QB

Email: steve.percival@ecologyconsult.co.uk

September 2022



Table of Contents

INTRODUCTION.....	3
STUDY AREA.....	3
BREEDING BIRD SURVEY METHODS.....	3
CORE BREEDING BIRD SURVEYS.....	3
BREEDING SEASON VANTAGE POINT SURVEYS	4
BREEDING BIRD SURVEYS 2022 RESULTS	4
VANTAGE POINT SURVEY RESULTS	6
CONSERVATION EVALUATION OF BREEDING BIRD POPULATIONS	6
CONCLUSIONS.....	10
REFERENCES.....	11

FAIR OAKS RENEWABLE ENERGY PARK, NOTTINGHAMSHIRE: BREEDING BIRD SURVEYS 2022 FINAL REPORT

Introduction

1. This report relates to breeding bird survey work carried out to provide baseline data for the ecological assessment of the proposed Fair Oaks Renewable Energy Park, Nottinghamshire.
2. The specific objectives of this work were to:
 - Undertake breeding bird surveys of the proposed development site, to determine the numbers of birds present, and the flight activity of key target species.
 - Use this information to evaluate the importance of the site's breeding bird populations.
3. The surveys were undertaken by Mike Hoit and Keith Langdon, both highly experienced bird surveyors with over 20 years' experience of bird surveying for renewable energy projects each.

Study Area

4. The site is located approximately 2km south-west of Ruddington in Nottinghamshire. The survey area was chosen to include all areas within the potential zone of ecological influence of the proposed development, including up to a 500m buffer and the route of the proposed underground grid connection (where access/viewing was possible). The study area covered a total area of 6.2km² (see Figure 1) and was predominantly arable farmland.

Breeding Bird Survey Methods

Core Breeding Bird Surveys

5. The main breeding bird surveys followed the standard Common Birds Census methodology with six surveys carried out at approximately fortnightly intervals during April-July 2022, on 4 April, 10 May, 23 May, 9 June, 21 June and 8 July 2022.
6. All bird locations and behaviour were mapped to 1:10,000 scale, using the standard British Trust for Ornithology (BTO) Common Birds Census notation. All species were recorded. In addition, the survey effort per unit area was standardised to make the surveys as repeatable as possible. A route was chosen to ensure that all parts of the study area are covered to within at least 100m of the observer. The surveys avoided strong winds, heavy rain, fog and low cloud. Birds were located by walking, listening and scanning by eye and with binoculars. Standard BTO notation was used to record the birds' activities; singing, calling, carrying nest material, nests or young found, repetitively alarmed adults, disturbance displaying, carrying food or in territorial dispute.
7. The survey data were analysed to determine spatially distinct clusters of records, equivalent to breeding territories (following standard Common Birds Census methodology, Gilbert *et al.* 1998), with the number of such territories used to calculate the breeding population for each species. A record in potentially suitable breeding habitat on a single visit was considered sufficient to indicate a potential breeding attempt.

Breeding Season Vantage Point Surveys

8. These surveys enabled flight activity at the proposed development site to be quantified and inform the project impact assessment (SNH 2017). A total of 36 hours surveys were carried out from the VP (including roost flight observations at dawn/dusk and around high tide), over the April-August survey period. All flight lines of target species are being mapped, and the flight height of each flock recorded. Target species comprise:
 - All ducks, geese, swans, cormorants, herons, coot and grebes;
 - All waders (including lapwing and golden plover);
 - All birds of prey and owls;
 - Large flocks (>100 birds) of other species (except woodpigeon and rook);
 - Any other notable species.
9. A single VP gave sufficient coverage of the site and was selected using the following criteria:
 - It gave a clear view across the wind farm site, with all parts of the proposed development within 2km of the VP (i.e. within the VP viewing distance);
 - The area in which the turbine would be located plus a 500m buffer could be observed by looking in a 180° arc forward from the vantage point (i.e. no need for the observer to look behind to cover the site) - the focus of the surveys was looking into the development site from the VP.
10. Observations were carried out throughout daylight hours but not in periods of reduced visibility (<3km).
11. Vantage point surveys were carried out for a maximum of 3 hours in a single observer session. Where one surveyor carried out two three-hour blocks concurrently, there was a gap of at least 30 minutes rest period between these surveys (to follow best practice).
12. During the observation periods, all target species flights were mapped and cross-referenced to the recording form using a numbering system, and the flight height of each recorded. To estimate flight height as accurately as possible, the available reference features (e.g. existing power lines, radio masts) were used. Flight heights were recorded as accurately as possible, i.e. not summarised to height classes. Below 10m it was possible to estimate to 1m, between 10m and 20m to 2m, between 20m and 50m to 5m, and above 50m to 10m. In any case of uncertainty an estimate of the upper and lower range of height was recorded. When birds were observed over an extended period, estimates of flight height should be recorded every 30 seconds. The activity during each flight (e.g. striking prey, displaying, food passing) was also recorded.

Breeding Bird Surveys 2022 Results

13. The breeding bird populations recorded in the survey area on each visit during April – July 2022 are summarised in Table 1, which gives the estimated number of breeding pairs recorded during each survey visit and the overall breeding populations estimate.

Table 1. Breeding bird numbers in the Fair Oaks Renewable Energy Park survey area recorded during April-July 2022. Numbers given are the estimated number of breeding pairs recorded on each survey visit, and overall population estimate.

Species	4/4/22	10/5/22	23/5/22	9/6/22	21/6/22	8/7/22	Population estimate
Mute Swan	0	0	1	0	0	0	1
Gadwall	0	1	1	0	0	0	1

Species	4/4/22	10/5/22	23/5/22	9/6/22	21/6/22	8/7/22	Population estimate
Mallard	6	3	13	1	2	0	15
Red-legged Partridge	2	5	0	1	0	1	5
Grey Partridge	10	5	5	4	6	4	14
Pheasant	9	13	9	5	3	3	17
Sparrowhawk	0	0	0	1	0	0	1
Buzzard	0	1	1	2	2	1	2
Kestrel	0	0	0	1	1	2	2
Hobby	0	0	0	1	1	1	1
Moorhen	0	1	1	2	0	0	3
Lapwing	3	6	0	0	0	0	6
Feral Pigeon	3	2	5	1	3	3	6
Stock Dove	21	5	3	7	7	2	28
Woodpigeon	28	18	29	24	42	66	119
Collared Dove	0	0	0	1	0	0	1
Barn Owl	0	0	0	1	0	0	1
Tawny Owl	0	0	0	0	1	0	1
Kingfisher	0	1	0	0	0	0	1
Green Woodpecker	0	1	1	1	0	1	2
Great Spotted Woodpecker	0	1	2	1	2	1	6
Skylark	121	105	71	83	45	60	155
Swallow	0	1	3	0	1	0	5
Meadow Pipit	16	1	1	0	0	0	17
Yellow Wagtail	0	5	12	9	8	5	23
Grey Wagtail	0	1	2	0	0	2	4
Pied Wagtail	0	0	1	0	0	0	1
Wren	14	18	12	17	9	17	36
Dunnock	10	7	5	9	4	4	20
Robin	12	8	7	9	4	1	22
Blackbird	5	6	18	12	9	11	27
Song Thrush	4	1	2	4	4	6	10
Sedge Warbler	0	7	3	5	4	3	14
Reed Warbler	0	1	1	1	3	1	4
Blackcap	0	6	4	4	3	5	11
Lesser Whitethroat	0	0	1	0	0	0	1
Whitethroat	0	24	15	19	9	20	37
Chiffchaff	3	1	3	1	4	2	7
Goldcrest	0	1	0	0	1	0	1
Long-tailed Tit	1	2	1	0	1	0	3
Blue Tit	1	8	4	6	4	4	15
Great Tit	3	3	3	3	2	1	11
Magpie	4	4	6	4	6	6	14
Jackdaw	1	0	2	0	1	0	2
Carrion Crow	3	8	5	9	4	7	16
Starling	0	1	0	0	0	0	1
House Sparrow	0	2	0	1	0	3	4

Species	4/4/22	10/5/22	23/5/22	9/6/22	21/6/22	8/7/22	Population estimate
Chaffinch	8	3	5	9	2	4	15
Greenfinch	2	0	1	0	1	1	4
Goldfinch	6	9	8	12	18	10	26
Linnet	5	6	10	9	5	11	26
Bullfinch	0	1	0	0	0	0	1
Yellowhammer	14	25	11	12	16	16	36
Reed Bunting	21	20	19	25	25	34	55

Vantage Point Survey Results

14. The rates of bird flight movement observed across the survey area during the vantage point surveys are summarised in Table 2. This gives the flight rate per hour recorded for each month during April – August 2022, and the total number of flights recorded.

Table 2. Bird flight rates recorded over the Fair Oaks Renewable Energy Park survey area during April-August 2022 vantage point surveys. N = 36 hours total observation from the single VP.

Species	Flight rate (birds/hour)					Total number of birds overflying
	Apr	May	June	July	Aug	
Greylag Goose	0.7	0	0	0	0	6
Canada Goose	0.2	0	0	0	0	2
Gadwall	0	0.2	0	0	0	2
Mallard	1.3	1.1	1.1	0	0	32
Cormorant	0	0	0.1	0	0	1
Little Egret	0.2	0.9	0	0	1.0	14
Great White Egret	0.1	0	0	0	0	1
Grey Heron	0	0.5	0.4	0	0.3	10
Red Kite	0.1	0	0	0	0	1
Buzzard	1.4	0.5	0.9	0.3	1.7	33
Kestrel	0.1	0.7	0.1	1.5	0	18
Hobby	0	0.2	0.3	0.3	3.3	17
Peregrine	0.2	0	0.2	0.7	0	8
Lapwing	0.4	0	0	0	0	4
Lesser Black-backed Gull	1.1	0	0	0	0	10
Black-headed Gull	0	0	0	0.3	0	2
Raven	0	0	0.8	0	0	7

Conservation Evaluation of Breeding Bird Populations

15. The conservation value of the breeding bird populations was determined using the criteria specified in Table 3 (from Percival 2007) and is summarised in Table 4. This includes the criteria adopted by Natural England in Guidelines for Selection of Biological Site of Special Scientific Interests (SSSIs) (Drewitt *et al.* 2020), using 1% of the resource to define international and

national importance (Frost *et al.* 2021). An additional category of regional importance was assigned for species approaching the threshold for national importance and those for which the survey area held a notable concentration in a county context. A further category of 'local importance' was used for species that did not reach regional importance but were still of some ecological value. This included all species on the red or amber lists of the 'Birds of Conservation Concern' (Stanbury *et al.* 2021) that did not reach national or regional importance at the development site. National (GB) and international wintering waterfowl baseline populations have been taken from the most recently published population figures (Frost *et al.* 2021) from the national Wetland Birds Survey and other species from Woodward *et al.* (2020). In addition, listing on Annex 1 of the EU Birds Directive, Schedule 1 of the Wildlife and Countryside, and NERC Act Section 41 priority species were all considered in the evaluation process.

Table 3. Definition of terms relating to the conservation value of the ornithological receptors at the site.

Conservation Value	Definition
VERY HIGH	Cited interest of Special Protection Areas (SPAs), Special Areas of Conservation (SACs) and SSSIs. Cited means mentioned in the citation text for the site as a species for which the site is designated (SPAs/SACs) or notified (SSSIs).
HIGH	Other species that contribute to the integrity of an SPA or SSSI. A local population of more than 1% of the national population of a species. EU Birds Directive Annex 1, EU Habitats Directive priority habitat/species and/or W&C Act Schedule 1 species. Ecologically sensitive species, e.g. large birds of prey or rare birds (<300 breeding pairs in the UK).
MEDIUM	Regionally important population of a species, either because of population size or distributional context. NERC Act Section 41 priority species (if not covered above).
LOW	Any other species of conservation interest, e.g. species listed on the Birds of Conservation Concern not covered above.

Table 4. Conservation evaluation of the breeding bird populations in the Fair Oaks Renewable Energy Park survey area, April-July 2022.

Species	Breeding population	EU Annex 1	W&C Sch 1	Red [R]/ Amber [A] List sp	NERC priority sp.	Conservation value
Mute Swan	1					Nil
Gadwall	1			A		Low
Mallard	15			A		Low
Red-legged Partridge	5					Nil
Grey Partridge	14			R	✓	Medium
Pheasant	17					Nil
Sparrowhawk	1			A		Low
Buzzard	2					Nil
Kestrel	2			A		Low
Hobby	1 ^R		✓			High
Moorhen	3			A		Low
Lapwing	6 ^R			R	✓	Medium
Feral Pigeon	6					Nil

Species	Breeding population	EU Annex 1	W&C Sch 1	Red [R]/ Amber [A] List sp	NERC priority sp.	Conservation value
Stock Dove	28			A		Low
Woodpigeon	119			A		Low
Collared Dove	1					Nil
Barn Owl	1		✓			High
Tawny Owl	1			A		Low
Kingfisher	1	✓	✓			High
Green Woodpecker	2					Nil
Great Spotted Woodpecker	6					Nil
Skylark	155			R	✓	Medium
Swallow	5					Nil
Meadow Pipit	17			A		Low
Yellow Wagtail	23			R	✓	Medium
Grey Wagtail	4			A		Low
Pied Wagtail	1					Nil
Wren	36			A		Low
Dunnoch	20			A	✓	Medium
Robin	22					Nil
Blackbird	27					Nil
Song Thrush	10			A	✓	Medium
Sedge Warbler	14			A		Low
Reed Warbler	4					Nil
Blackcap	11					Nil
Lesser Whitethroat	1					Nil
Whitethroat	37					Nil
Chiffchaff	7					Nil
Goldcrest	1					Nil
Long-tailed Tit	3					Nil
Blue Tit	15					Nil
Great Tit	11					Nil
Magpie	14					Nil
Jackdaw	2					Nil
Carrion Crow	16					Nil
Starling	1			R	✓	Medium
House Sparrow	4			R	✓	Medium
Chaffinch	15					Nil
Greenfinch	4			R		Low
Goldfinch	26					Nil
Linnet	26			R	✓	Medium
Bullfinch	1			A	✓	Medium
Yellowhammer	36			R	✓	Medium
Reed Bunting	55			A	✓	Medium

Note: 'R' peak count indicates regionally important (>1% region)

16. Three high value species were recorded breeding within the survey area during the April-July 2022 surveys, hobby, barn owl and kingfisher. The hobby and barn owl nesting locations within the survey area are given in a Confidential Appendix. No specific kingfisher nest site was located but this species was seen in suitable breeding habitat along the Fareham Brook.
17. Twelve breeding species were classed as medium conservation value: grey partridge, lapwing, skylark, yellow wagtail, dunnoek, song thrush, starling, house sparrow, linnet, bullfinch, yellowhammer and reed bunting. All were classed as medium value for their listing as NERC Act Section 41 priority species. Lapwing were also breeding in sufficient numbers to be considered regionally important (>1% county population). These species are mostly farmland species that have declined widely across Britain but are still mostly common and widespread.
18. A further 12 breeding species were classed as low value, through their listing on RSPB *et al.*'s (Stanbury *et al.* 2021) red/amber lists of birds of conservation concern.
19. The distributions of the breeding birds of conservation value within the survey area in April-July 2022 are shown on Figures 2 to 15. The more abundant species (i.e. 10 or more records) have been presented separately for clarity.
 - Mallard (Figure 2) were widely distributed along the wetland habitat across the survey area, particularly along the Fareham Brook.
 - Grey partridge (Figure 3) were found widely across the whole survey area.
 - Lapwing (Figure 4) were found only in the survey area to the south of the site (with no records within the proposed development site itself). They were all recorded within two fields that had been ploughed in the spring.
 - Stock dove (Figure 5) were widely scattered over the buffer area around the proposed development site but not within the site itself. They were mainly associated with areas of trees and around farm buildings.
 - Woodpigeon (Figure 6) were found mainly in wooded areas and in more mature hedgerows, with few records from the site itself.
 - Skylark (Figure 7) were abundant across all of the open arable habitats across the survey area, including within the proposed development site.
 - Meadow pipit (Figure 8) were mainly found on grassland areas on arable margins, particularly along the Fareham Brook.
 - Yellow wagtail (Figure 9) were found widely on arable land in the buffer area but not within the proposed development site itself.
 - Wren (Figure 10) were breeding in scrub and hedgerows across the whole survey area.
 - Dunnock (Figure 11) was another species of the hedgerow and woodland habitats, with none recorded within the proposed development site itself.
 - Linnet (Figure 12) were widely distributed across the survey area, associated mainly with scrub and hedgerow habitats.
 - Yellowhammer (Figure 13) was another predominantly hedgerow/scrub species, but with records predominantly in the southern part of the survey area.
 - Reed Bunting (Figure 14) were widely distributed across the survey area, associated mainly with the wet drains but also in fields planted with rape.
20. Other less abundant species of conservation value (Figure 15) were widely scattered across the survey area, though with many associated with the wetland habitat along the Fareham Brook (including gadwall, moorhen and sedge warbler).
21. The evaluation of the conservation importance of the non-breeding species observed during these surveys is given in Table 5. This included three high value species (little egret, red kite and peregrine, EU Annex 1/Wildlife and Countryside Act Schedule 1 species), one medium

value (great white egret, present in regionally important numbers), nine additional low value species (through their red/amber listing). Their flight lines are shown in Figure 16. All these species were seen only infrequently in low numbers during the breeding bird surveys. No important concentrations of flight activity were observed.

Table 5. Conservation evaluation of the non-breeding bird populations in the Fair Oaks Renewable Energy Park survey area, April-August 2022.

Species	Peak count	EU Annex 1	W&C Sch 1	Red [R]/ Amber [A] List sp	UK BAP sp.	Conservation value
Greylag Goose	3			A		Low
Canada Goose	2					Nil
Cormorant	1					Nil
Little Egret	2	✓				High
Great White Egret	1			A		Medium
Grey Heron	1					Nil
Red Kite	1	✓	✓			High
Peregrine	2	✓	✓			High
Lesser Black-backed Gull	9			A		Low
Black-headed Gull	2			A		Low
Swift	1			R		Low
House Martin	1			R		Low
Wheatear	1			A		Low
Fieldfare	50			R		Low
Redwing	3			A		Low
Rook	50			A		Low

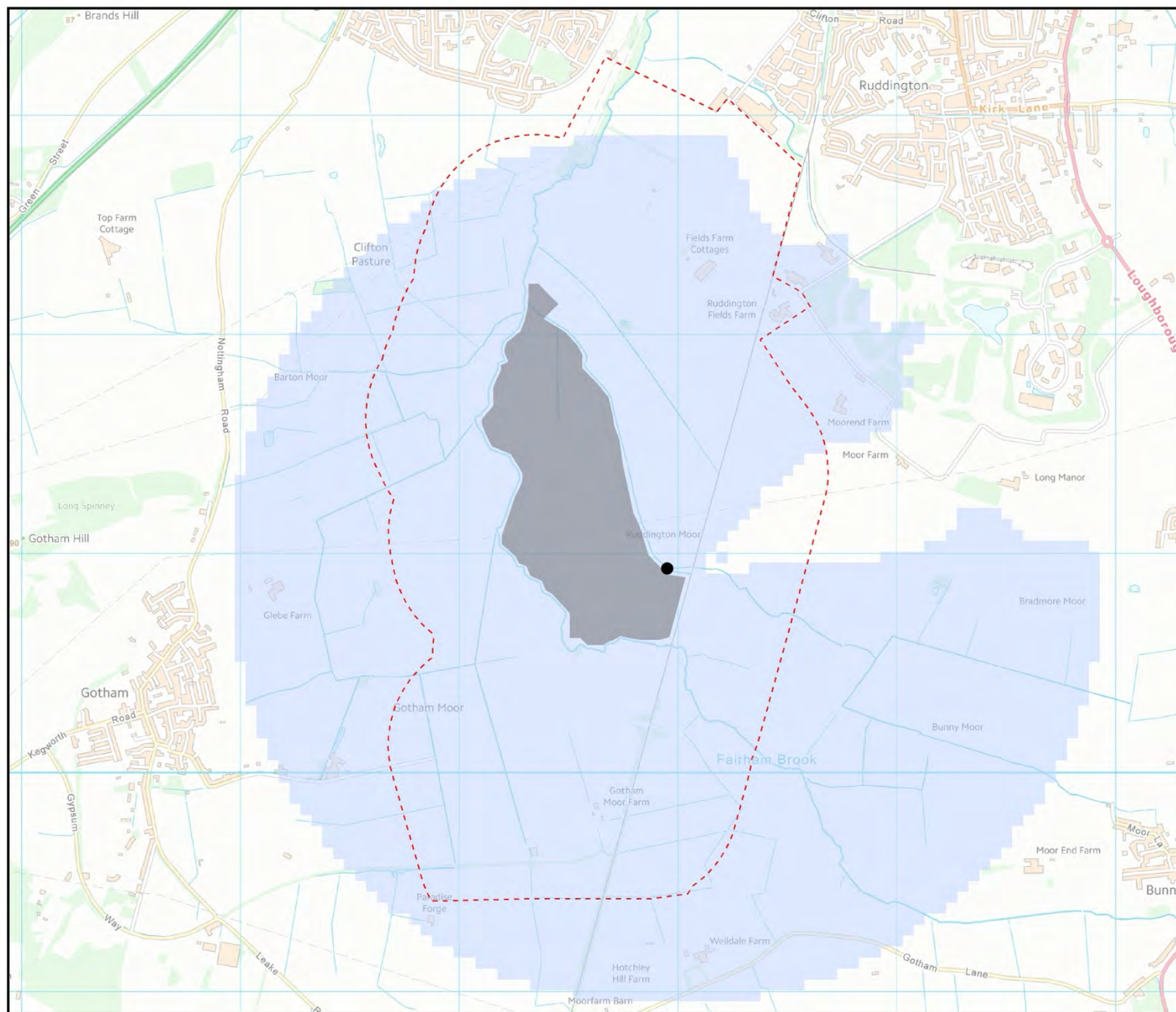
Conclusions

22. The survey area supports a typical range of farmland breeding birds, including a range of NERC priority species. Three species specially protected under Schedule 1 of the Wildlife and Countryside Act from disturbance during breeding were found during the 2022 surveys, hobby, barn owl and kingfisher, and given the habitat present it is possible that others such as peregrine and quail could breed there in the future. It would be important to ensure that no Schedule 1 species are disturbed during the breeding season, particularly during the construction phase of the development. Given the potential to breed at the proposed development site, a Breeding Bird Protection Plan (BBPP) should be developed, secured by way of planning condition and implemented. This should include further surveys for Schedule 1 species at fortnightly intervals through the breeding season (March-August) for the construction period to inform the BBPP and ensure compliance with the 1981 Wildlife and Countryside Act.
23. The BBPP should also include measures to ensure the protection of all other nesting birds. Where works affecting habitats that could be used by nesting birds must take place between March and August (inclusive), they should only be carried out following an on-site check for nesting birds by an experienced ecologist, to ensure compliance with the 1981 Wildlife and Countryside Act.
24. It is likely that some breeding birds will be displaced from the site during the operational phase by the presence of the solar panels, particular open ground species such as lapwing, skylark

and yellow wagtail. These are NERC Act Species of Principal Importance. Measures to deliver net gain for these species should be considered as part of the Biodiversity Management Plan.

References

- Drewitt, A.L., Whitehead, S. and Cohen, S. 2020. Guidelines for the Selection of Biological SSSIs. Part 2: Detailed Guidelines for Habitats and Species Groups. Chapter 17: Birds (Version 1.1). Joint Nature Conservation Committee, Peterborough.
- Frost, T.M., Calbrade, N.A., Birtles, G.A., Hall, C., Robinson, A.E., Wotton, S.R., Balmer, D.E. and Austin, G.E. 2021. Waterbirds in the UK 2019/20: The Wetland Bird Survey. BTO/RSPB/JNCC. Thetford.
- Gilbert, G., D. W. Gibbons, and J. Evans. (1998). Bird Monitoring Methods: a manual of techniques for key UK species. RSPB /BTO/WWT/JNCC/ITE/The Seabird Group.
- Hardey, J., H. Q. P. Crick, C. V. Wernham, H. T. Riley, B. Etheridge, and D. B. A. Thompson. (2009). Raptors: a field guide to survey and monitoring. 2nd Edition. The Stationary Office Ltd, Edinburgh.
- Percival, S.M. 2007. Predicting the effects of wind farms on birds in the UK: the development of an objective assessment methodology. Birds and Wind Farms: risk assessment and mitigation (ed. M. de Lucas, Janss, G.F.E. and Ferrer, M.). Quercus, Madrid.
- Scottish Natural Heritage (2017). Recommended bird survey methods to inform impact assessment of onshore wind farms. SNH Guidance.
- Stanbury, A., M. Eaton, N. Aebischer, D. Balmer, A. Brown, A. Douse, P. Lindley, N. McCulloch, D. Noble, and I. Win. 2021. The status of our bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain. British Birds 114:723-747.
- Woodward, I., Aebischer, N., Burnell, D., Eaton, M., Frost, T., Hall, C., Stroud, D. and Noble, D. 2020. Population estimates of birds in Great Britain and the United Kingdom. British Birds, 113: 69-104.



**Fair Oaks Renewable
Energy Park: Breeding
Bird Surveys 2022**

FIGURE 1
**Breeding Bird
Survey Area**

KEY:

- VP Location
- Fair Oaks PV Panel Area
- Breeding Bird Survey Area
- VP Viewshed (to 2km)



Contains Ordnance Survey OpenData
© Crown Copyright 2022.

DATE: N/A

DATE: N/A

DATE: n/a

SCALE - 1:16,500 @ A3

**BREEDING BIRD
SURVEYS 2022**

THIS DRAWING IS THE PROPERTY OF ECOLOGY
CONSULTING AND NO REPRODUCTION MAY BE
MADE IN WHOLE OR IN PART WITHOUT PERMISSION

