Fair Oaks Renewable Energy Park, Nottinghamshire: Wintering Bird Survey 2021-22

Clockwise from top left: Pink-footed goose, black-headed gull, golden plover and little egret © Steve Percival

Report to Ridge Clean Energy

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June 2022

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FAIR OAKS RENEWABLE ENERGY PARK, NOTTINGHAMSHIRE: WINTERING BIRD SURVEYS 2021-22

Introduction

1. This report relates to wintering 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 wintering 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 wintering bird populations.
3. The surveys were undertaken by Mike Hoit and Keith Langdon, both highly experienced bird surveyors with over 20 years 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 ornithological influence of the proposed development, plus a wider buffer of up to 1km. he study area covered a total area of 14.2km^2 (see Figure 1) and was predominantly arable farmland.

Wintering Bird Survey Methods

5. The winter surveys included a field survey based on a simple 'look-see' method, counting the bird numbers within a pre-defined survey area (Gilbert *et al.* 1998), additional surveys at night and a vantage point survey, monitoring bird flight activity to quantify movement rates across the survey area (including daytime movements and dawn/dusk roost flights).

Field Count Surveys

6. This survey work comprised regular counts of the birds within the wintering bird survey area. Fourteen of these surveys were undertaken at approximately fortnightly intervals between September 2021 and March 2022. The counts were carried out as instantaneous counts, recording a snapshot of the birds present in each field at the time it was surveyed. One such count of each field was made each survey day, recording the numbers of all the key species present. Any additional records made outside this time were noted as supplementary records. These snapshot counts were organised to ensure that the full range of times of day were covered in each part of the survey area. The following species were recorded:
   - 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.

7. As well as counting each species, the behaviour of each flock was also recorded, e.g. feeding/roosting. Birds in flight over-flying the field during the snapshot were also recorded, together with an estimate their height and direction.

8. **Habitat/crop mapping**: mapping of the habitats and crop types available in the survey area was carried out during the first visit and then again at approximately 2-month intervals through the season, so that habitat availability could be determined and any changes during the study period taken into account.

9. **Weather**: weather conditions during all observations were recorded, and visits were made to cover a representative range of visibilities, wind speeds and directions (though avoiding extreme conditions where visibility is severely limited (i.e. fog, continuous heavy rain)).

Winter Vantage Point Surveys

10. These surveys enabled flight activity at the proposed development site to be quantified and inform the evaluation of its ornithological conservation value. A single vantage point was sufficient, and was selected using the following criteria:

    - It gave a clear view across the development, with all parts of the site within 2km of the VP visible as a minimum;
    - The area in which the development 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 each VP.

11. A total of six hours surveys per month were carried out from the VP (including roost flight observations at dawn/dusk), giving 42 hours in total over the September-March survey period. All flight lines of target species were mapped, and the flight height of each flock recorded. These covered the whole of the development site plus a 500m buffer. Target species comprised the same species as the field count surveys, as set out above. Observations were carried out throughout daylight hours but not in periods of reduced visibility (<3km).

12. 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).

13. 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 be recorded.

Wintering Bird Surveys 2021-22: Results

Autumn/winter field count survey results

14. The bird populations found within the survey area during each of the fortnightly field count surveys are summarised in Table 1. The Table shows the numbers of recorded during each survey, and the overall mean and peak counts.

Table 1. Wintering bird populations in the Fair Oaks survey area during September 2021 - March 2022.

Species	10/09/21	22/09/21	04/10/21	22/10/21	03/11/21	18/11/21	20/12/21	03/01/22	17/01/22	31/01/22	14/02/22	25/02/22	09/03/22	23/03/22	Mean 2021-22	Peak 2021-22
Mute Swan	0	0	0	0	8	0	0	0	2	0	3	0	8	0	1.5	8
Mallard	0	0	0	0	0	0	0	0	0	0	2	0	3	0	0.4	3
Little Egret	0	0	0	0	1	2	2	0	1	0	1	0	0	2	0.6	2
Grey Heron	2	1	0	2	0	0	2	1	1	0	1	0	0	0	0.7	2
Red Kite	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1
Hen Harrier	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0.1	1
Sparrowhawk	0	0	2	0	0	0	0	0	1	0	1	0	0	0	0.3	2
Buzzard	1	2	2	2	3	3	3	1	1	1	1	1	1	5	1.9	5
Kestrel	2	1	2	2	1	2	2	2	1	3	0	1	0	1	1.4	3
Hobby	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	2
Peregrine	1	2	0	1	2	0	0	0	2	0	1	1	1	2	0.9	2
Golden Plover	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0.1	2
Lapwing	0	0	0	0	0	0	0	0	0	0	4	0	0	2	0.4	4
Green Sandpiper	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0.1	1
Common Gull	0	0	0	0	2	1	3	0	1	1	0	5	0	0	0.9	5
Herring Gull	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0.1	1
Black-headed Gull	5	0	4	0	35	78	31	0	98	4	0	30	275	0	40.0	275

Winter Vantage Point Survey Results

15. 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 in each month and the total number of flights recorded.

Table 2. Bird flight rates recorded over the Fair Oaks Renewable Energy Park survey area during September 2021-March 2022 vantage point surveys. N = 42 hours total observation from the single VP.

Species	Flight rate (birds/hour)							Total number of birds overflying
	Sep	Oct	Nov	Dec	Jan	Feb	Mar	
Mute Swan	0.2	0.0	0.0	0.0	0.3	0.0	0.0	3
Pink-footed Goose	0.0	10.8	0.0	0.0	0.0	0.0	0.0	65
Greylag Goose	0.0	1.2	0.0	0.0	2.2	0.0	0.5	23
Mallard	0.0	0.0	0.0	0.0	0.0	0.7	1.0	10
Cormorant	0.5	0.0	0.2	0.0	0.3	0.2	0.0	7
Little Egret	0.0	0.0	0.2	0.7	0.5	0.5	0.8	16
Grey Heron	0.3	0.2	0.3	0.2	0.3	0.0	0.2	9
Red Kite	0.3	0.0	0.0	0.0	0.0	0.0	0.0	2
Marsh Harrier	0.2	0.0	0.0	0.0	0.0	0.0	0.0	1
Hen Harrier	0.0	0.0	0.3	0.0	0.5	0.0	0.0	5
Sparrowhawk	0.2	0.0	0.2	0.2	0.3	0.0	0.0	5
Buzzard	1.7	0.3	1.0	0.2	0.5	0.7	0.5	29
Kestrel	1.5	0.8	2.2	0.3	0.7	0.2	0.3	36
Hobby	0.7	0.0	0.0	0.0	0.0	0.0	0.0	4
Peregrine	0.5	1.3	0.7	0.0	1.0	0.3	0.3	25
Common Gull	0.0	0.0	0.2	0.0	0.3	0.0	0.0	3
Lesser Black-backed Gull	1.3	0.3	0.8	0.0	0.2	0.3	0.0	18
Herring Gull	0.3	0.0	0.2	0.2	2.2	0.3	0.0	19
Black-headed Gull	1.8	3.0	2.8	1.5	3.7	0.0	0.3	79

Conservation Evaluation of Wintering Bird Populations

16. The conservation value of the wintering 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 Sites 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, NERC

Act Section 41 priority species and BAP 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 wintering bird populations in the Fair Oaks Renewable Energy Park survey area, September 2021 – March 2022.

Species	Peak count	EU Annex 1	W&C Sch 1	Red [R]/ Amber [A] List sp	NERC Act priority sp.	Conservation value
Mute Swan	8					Nil
Pink-footed Goose [R]	65			A		Medium
Greylag Goose	13			A		Low
Mallard	3			A		Low
Cormorant	2					Nil
Little Egret	2	✓				High
Grey Heron	2					Nil
Red Kite [R]	1	✓	✓			High
Marsh Harrier [R]	1	✓	✓	A		High
Hen Harrier [R]	1	✓	✓	R		High
Sparrowhawk	2			A		Low
Buzzard	5					Nil
Kestrel	3			A		Low
Hobby [R]	2		✓			High
Peregrine [R]	2	✓	✓			High
Golden Plover	2	✓				High
Lapwing	4			R	✓	Medium
Green Sandpiper [R]	1		✓	A		High
Common Gull	5			A		Low
Lesser Black-backed Gull	8			A		Low

Species	Peak count	EU Annex 1	W&C Sch 1	Red [R]/ Amber [A] List sp	NERC Act priority sp.	Conservation value
Herring Gull	8			R	✓	Medium
Black-headed Gull [R]	275			A		Medium

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

17. The key wintering birds recorded during the 2021-22 surveys were as follows:

- **Pink-footed Goose** – the only record of this species was a flock of 65 was seen migrating over the site on 4/10/21. This count though was sufficient to be classed as regionally important (>1% region), and hence medium value. The flight line is shown in Figure 2.
- **Little Egret** – this EU Annex 1 (and hence high value) species was seen regularly in small numbers (peak 2) during the field count and the VP surveys. Its flight lines and field peak counts are summarised in Figure 3. Most were recorded in the southern part of the site along the Fareham Brook.
- **Wintering waders - Golden Plover, Lapwing and Green Sandpiper** – these three waders were classed as high (EU Birds Directive Annex 1), medium (NERC priority species) and high (Wildlife and Countryside Act Schedule 1 species) value respectively. However, numbers of all three species were low, with peak counts of only 2, 4 and 1 respectively and no records at all from the VP surveys. There was no indication that the survey area was important to any of these species at this time of year.
- **Peregrine** – there were a total of 25 records of this species during the VP surveys and it was also seen regularly during the field count surveys (peak 2). Peregrine is listed on EU Birds Directive Annex 1 and Wildlife and Countryside Act Schedule 1, so is a high value species. Its flight lines are shown in Figure 4. Most of the peregrine activity was along the pylon lines, which they used regularly to perch/roost.
- **Other scarce birds of prey** – red kite, marsh harrier, hen harrier and hobby were seen over-flying the study area during the VP surveys, but only irregularly and only in small numbers – there were 2, 1, 5 and 4 records of each species respectively. All are high value as they are EU Birds Directive Annex 1/Wildlife and Countryside Act Schedule 1 species. Their flight lines are shown in Figure 2. There was no indication that the survey area was important to any of these species at this time of year.
- **Herring Gull and Black-headed Gull** – black-headed gull was recorded in regionally important numbers within the survey area and herring gull is a red-listed NERC priority species (and hence are both of medium value). They were both seen regularly over-flying the site, and additionally black-headed gulls were regularly recorded feeding within the survey area (peak 275). There was only a single record of a single herring gull during these surveys. Herring gull flight lines are shown in Figure 5, and black-headed gull flight lines in Figure 6. Figure 6 also shows the feeding distribution of black-headed gulls from the field count survey. They were widely distributed (associated particularly with field ploughing) but with few records within the site boundary – the proposed renewable energy park did not appear to be particularly important for this species.

Conclusions

18. The 2021-22 wintering bird surveys found a range of wintering bird populations of conservation importance but with generally only low numbers within/in proximity to the proposed renewable energy park in numerical terms and in the context of their regional (county) populations.

19. A range of scarce raptor species were recorded, including red kite, marsh harrier, hen harrier, hobby and peregrine. Only one of these, peregrine, was recorded frequently, primarily using the pylon lines running east-west across the site.

20. The surveys did not identify any important wintering bird populations that would likely be affected by the proposed renewable energy park, or any areas of particular importance for wintering birds that should be avoided in the site design process.

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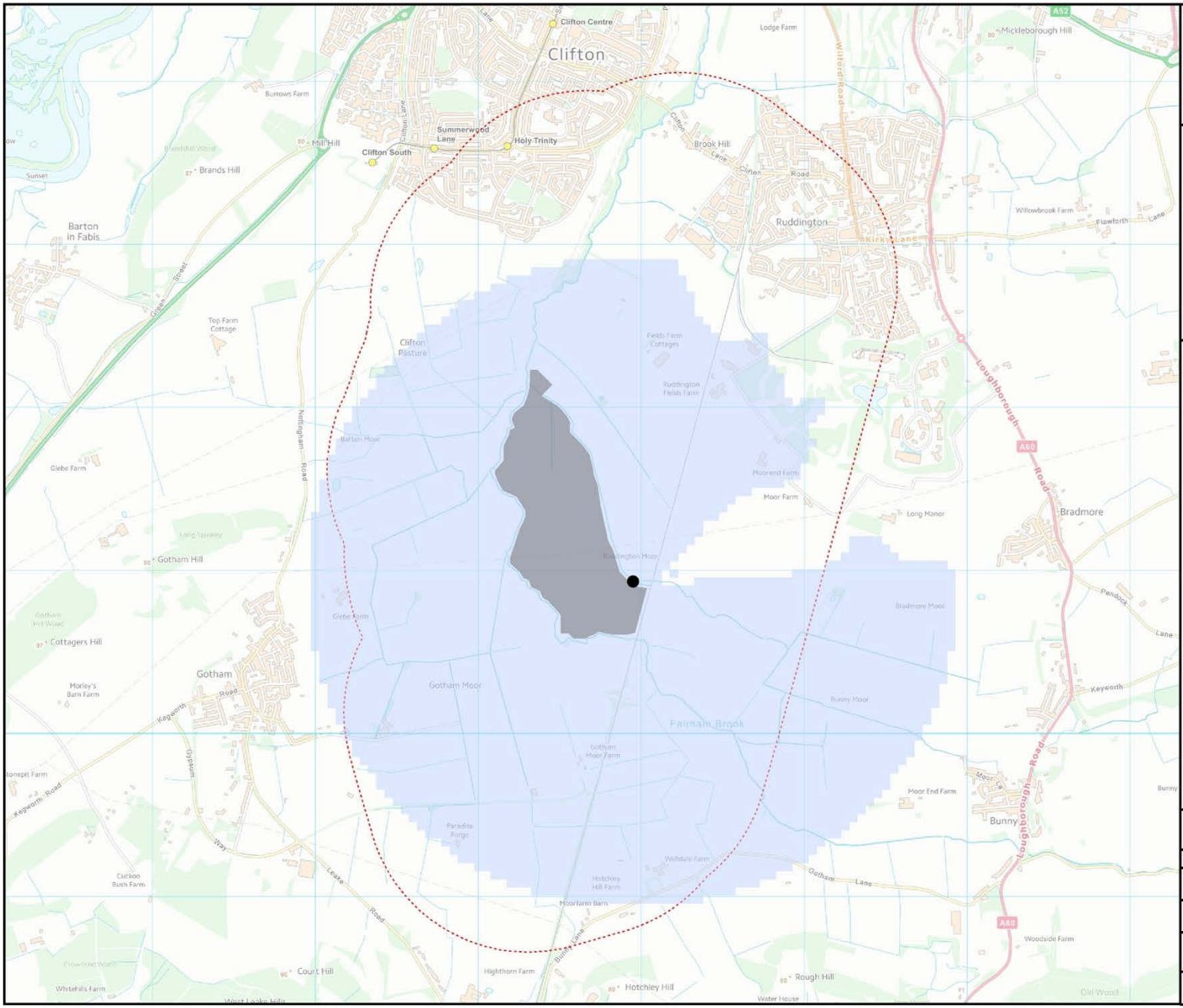

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Fair Oaks Renewable Energy Park: Wintering Bird Surveys 2021-22

FIGURE 1

Wintering Bird Survey Area

KEY:

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

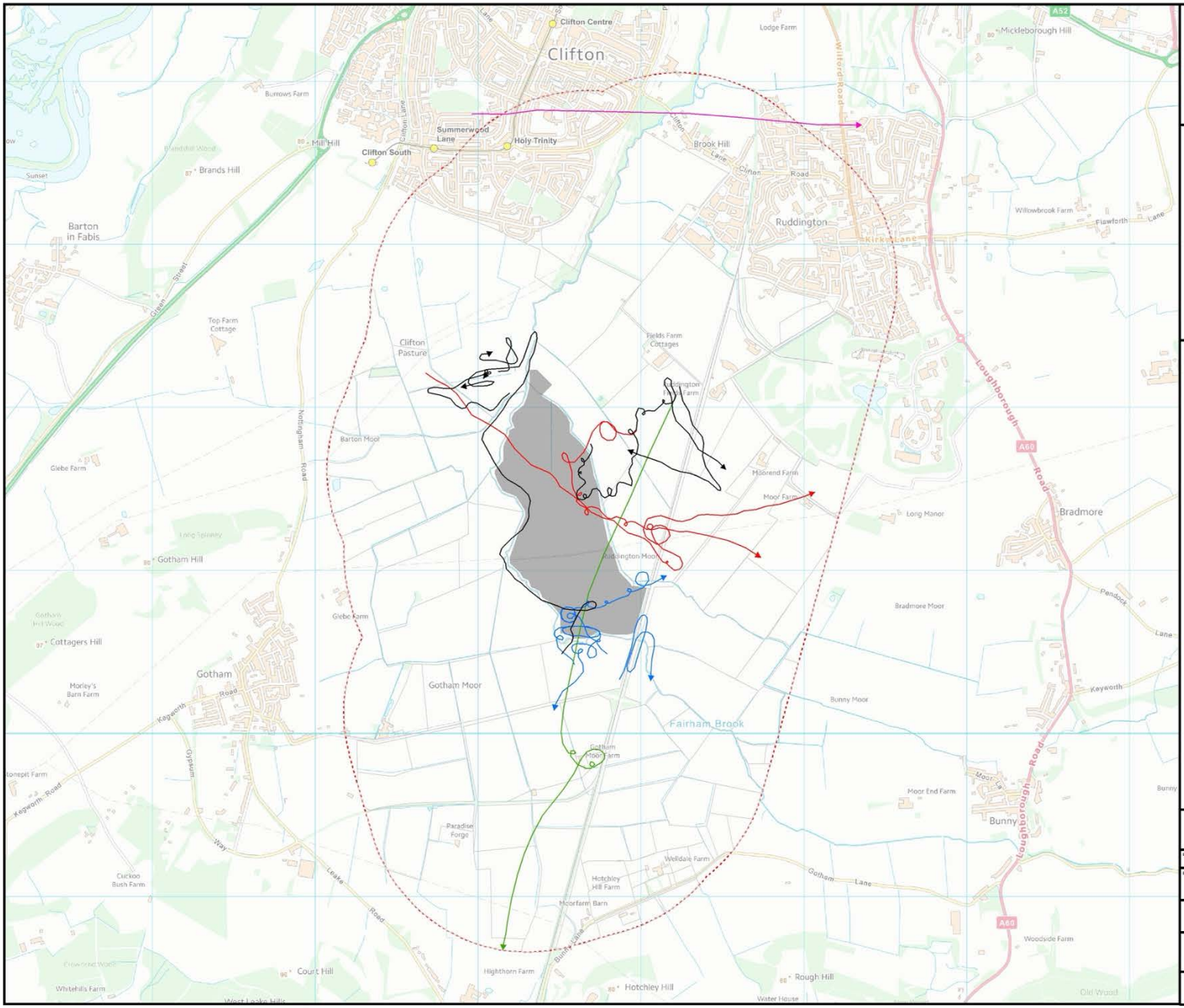
LAYOUT DWG	N/A	T LAYOUT NO.	N/A

DRAWING NUMBER

n/a

SCALE - 1:22,000 @ A3

WINTERING BIRD SURVEYS 2021-22



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Fair Oaks Renewable Energy Park: Wintering Bird Surveys 2021-22

FIGURE 2

Flight Lines: Pink-footed Goose and scarce raptors

KEY:

- Wintering Bird Survey Area
- Fair Oaks PV Panel Area

Flight lines:

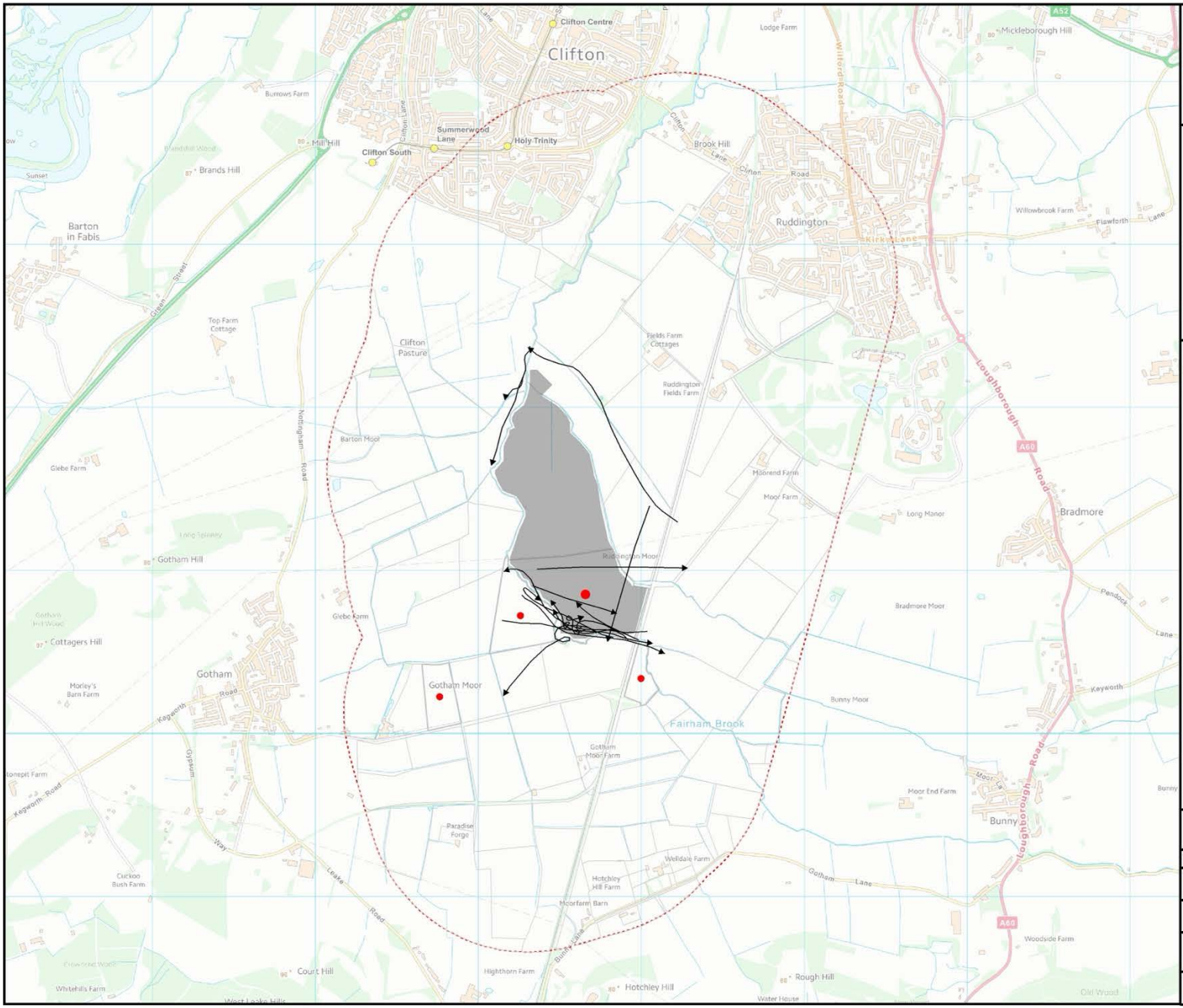
- Hen Harrier
- Hobby
- Red Kite
- Marsh Harrier
- Pink-footed Goose

LAYOUT DWG N/A | T LAYOUT NO. N/A

DRAWING NUMBER n/a

SCALE - 1:22,000 @ A3

WINTERING BIRD SURVEYS 2021-22



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Fair Oaks Renewable Energy Park: Wintering Bird Surveys 2021-22

FIGURE 3

Flight Lines and Field Peak Counts: Little Egret

KEY:

- Wintering Bird Survey Area
- Fair Oaks PV Panel Area
- Flight Lines

Field Peak Counts

- 2

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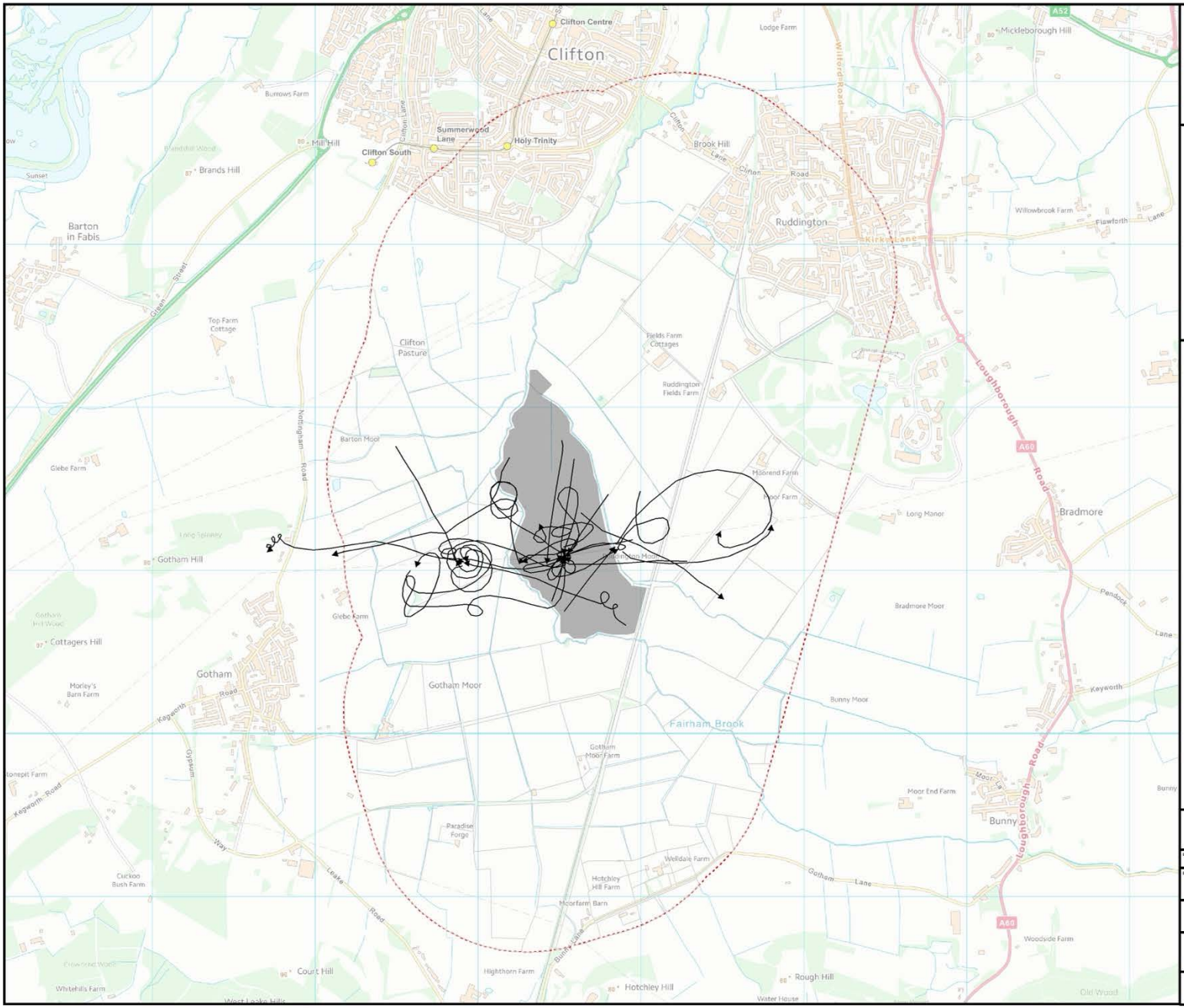
LAYOUT DWG N/A | T LAYOUT NO. N/A

DRAWING NUMBER n/a

SCALE - 1:22,000 @ A3

WINTERING BIRD SURVEYS 2021-22



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Fair Oaks Renewable Energy Park: Wintering Bird Surveys 2021-22

FIGURE 4

Flight Lines: Peregrine

KEY:

- Wintering Bird Survey Area
- Fair Oaks PV Panel Area
- Flight Lines

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LAYOUT DWG	N/A
T LAYOUT NO.	N/A
DRAWING NUMBER	n/a

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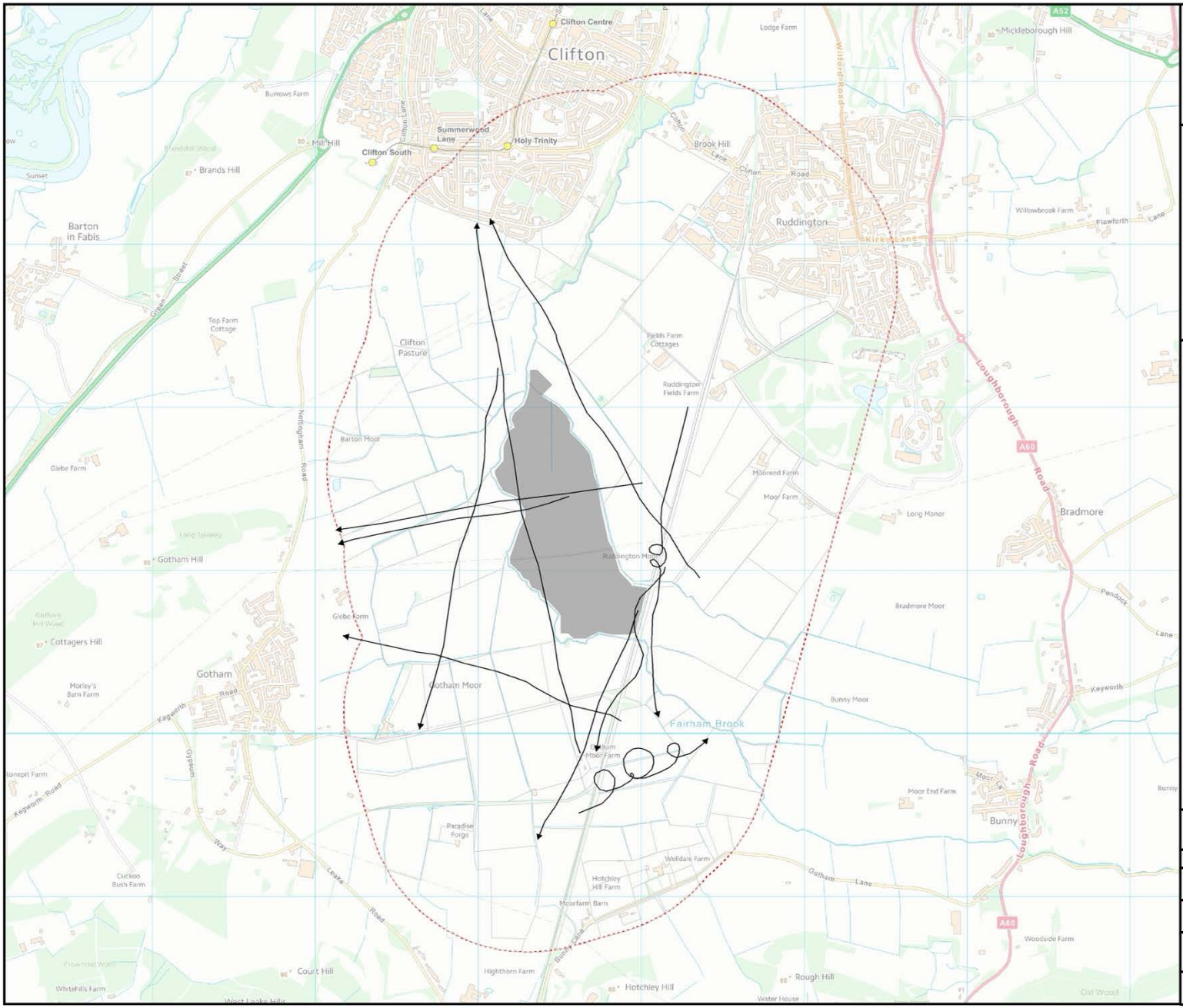
WINTERING BIRD SURVEYS 2021-22



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Fair Oaks Renewable Energy Park: Wintering Bird Surveys 2021-22

FIGURE 5

Flight Lines: Herring Gull

KEY:

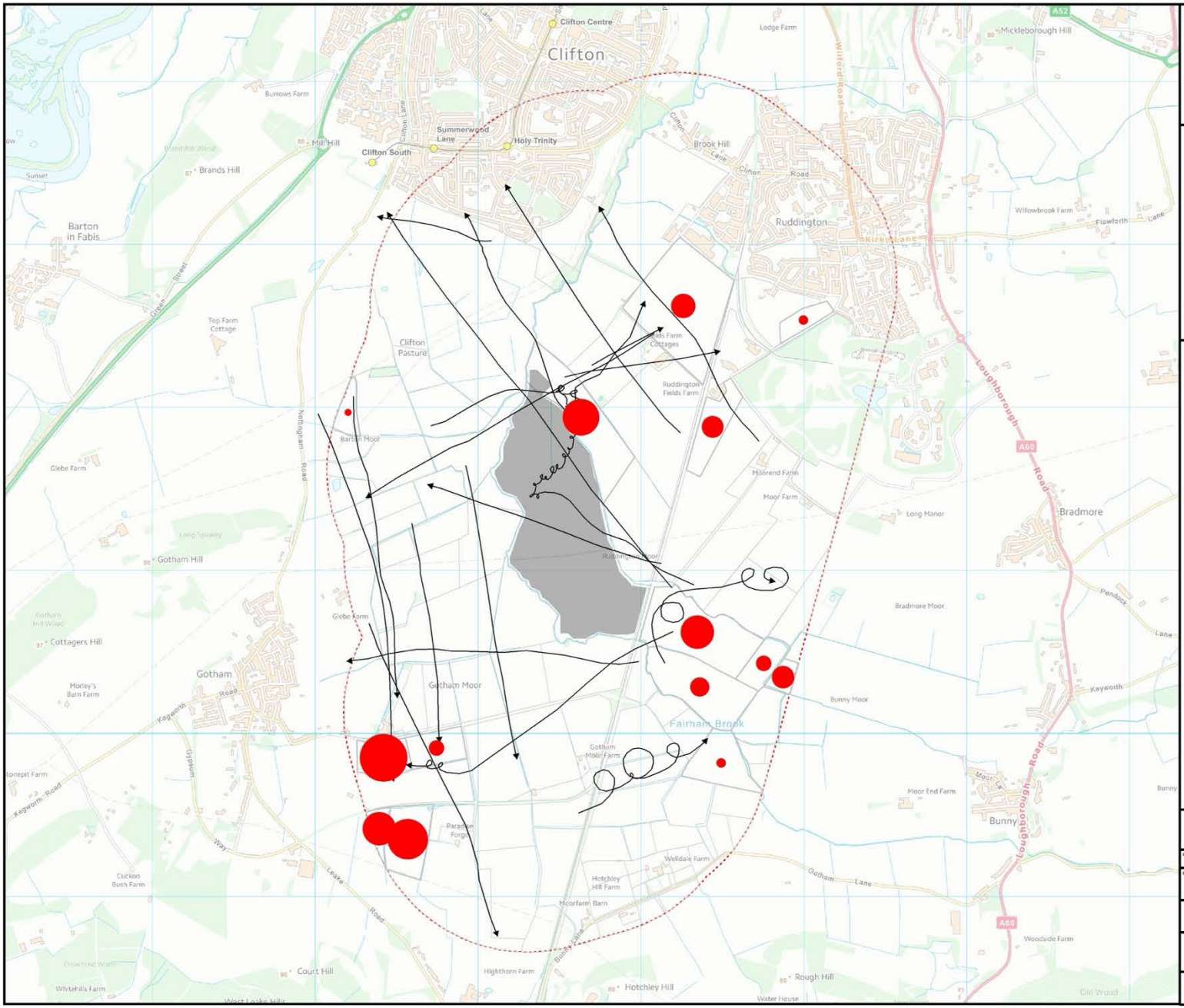
- Wintering Bird Survey Area
- Fair Oaks PV Panel Area
- Flight Lines

LAYOUT DWG N/A | T LAYOUT NO. N/A

DRAWING NUMBER n/a

SCALE - 1:22,000 @ A3

WINTERING BIRD SURVEYS 2021-22



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Fair Oaks Renewable Energy Park: Wintering Bird Surveys 2021-22

FIGURE 6

Flight Lines and Field Peak Counts: Black-headed Gull

KEY:

- Wintering Bird Survey Area
- Fair Oaks PV Panel Area
- Flight Lines

Field Peak Counts

- 1
- 5
- 10

LAYOUT DWG N/A | T LAYOUT NO. N/A

DRAWING NUMBER n/a

SCALE - 1:22,000 @ A3

WINTERING BIRD SURVEYS 2021-22