



SIX OAKS RENEWABLE ENERGY PARK: BREEDING BIRD SURVEYS 2020

Report to Ridge Clean Energy



Steve Percival, Tracey Percival, Keith Langdon and Mike Hoit

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

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Email: steve.percival@ecologyconsult.co.uk



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SIX OAKS RENEWABLE ENERGY PARK: BREEDING BIRD SURVEYS 2020

INTRODUCTION

1. This report presents the results of bird survey work at the proposed Six Oaks Renewable Energy Park, Cambridgeshire, undertaken during the breeding season to provide ornithological baseline data for the proposed development. It provides baseline data on the breeding bird populations, activity and flight paths within the vicinity of the proposed development site to inform subsequent ornithological impact assessment.
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 designed to take into account Natural England (NE) standing advice¹ and Scottish Natural Heritage (2017) guidance. The surveys were undertaken by Keith Langdon and Mike Hoit, both highly experienced bird surveyors.

STUDY AREA

4. The site is located approximately 9km east of Cambridge, in Cambridgeshire. The breeding bird survey area was chosen to include all areas within the potential zone of ornithological influence of the renewable energy park and a buffer around that to be contextual information on the area's breeding birds. The survey area covered a total area of 6.9km² (see Figure 1). It is predominantly open arable farmland and lies mainly within the 'East Anglian Chalk' NE Natural Area.

¹<https://www.gov.uk/guidance/wild-birds-surveys-and-monitoring-for-onshore-wind-farms>





BREEDING BIRD SURVEY METHODS

Core Breeding Bird Surveys

5. The main breeding bird surveys are following the standard Common Birds Census methodology with four surveys undertaken at approximately monthly intervals during April-July 2020. They were carried out on 21 April, 12 May, 10 June and 7 July 2020.
6. All bird locations and behaviour were mapped to 1:10,000 scale, using the standard 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 survey route was plotted onto the survey map as it was carried out. 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.

Raptor and Owl Breeding Surveys

8. As the survey area may be used by a range of scarce raptors and owls, species-specific surveys of a wider buffer of up to 2km around the proposed development site was undertaken for key species during April-August 2020. These surveys comprised walkovers (where access was allowed and where potentially suitable breeding habitat for these species was present) supplemented by a series of mini-VPs (shorter watches from additional vantage points) to cover other areas, to detect displaying or nesting behaviour during the breeding season of raptor species in accordance with methods described in Gilbert et al. (1998) and Hardey et al. (2013). These surveys recorded all Schedule 1 and Annex I raptor species including hobby, peregrine and barn owl. This included five survey visits, undertaken on 21 April, 26 May, 25 June, 22 July and 18 August 2020.

Breeding Season Vantage Point Surveys

9. These surveys enabled flight activity at the proposed development site to be quantified and inform the project impact assessment (SNH 2017). A single vantage point was sufficient, which gave a clear view over the proposed development site to a maximum 2km viewing distance (see Figure 1), looking forward from the VP (i.e. no need to look behind). A total of 36 hours surveys were carried out from the VP (including roost flight observations at dawn/dusk), over the April-September 2020 survey period (surveys were continued through to September to give a full year of survey data in combination with the winter survey data). All flight lines of target species were mapped, and the flight height of each flock recorded. Target species comprised:
 - 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.
10. The VP was selected using the following criteria:
- It gave a clear view across the development site, with all of the site within 2km of the VP visible as a minimum;
 - The survey area 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.
11. All key birds seen were recorded, irrespective of their distance from the vantage point. 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 was recorded every 30 seconds. The activity during each flight (e.g. striking prey, displaying, food passing) was also recorded.



BREEDING BIRD SURVEYS 2020: RESULTS

14. The breeding bird populations recorded in the survey area on each visit are summarised in Table 1, which gives the estimated number of breeding pairs recorded during each survey visit and the overall breeding population estimate for each species. A single record in potentially suitable breeding habitat on a single visit was considered sufficient to indicate a potential breeding attempt.

TABLE 1. Breeding bird numbers in the core Six Oaks survey area recorded during April-July 2020. Numbers given are the number of breeding pairs recorded on each survey visit, the overall number of breeding pairs and the number of pairs within the proposed development.

Species	15 April	8 May	4 June	5 July	Number of breeding pairs (survey area)	Number of pairs within development site
Red-legged Partridge	4	3	0	0	6	1
Grey Partridge	1	3	2	1	4	1
Quail	0	1	4	4	6	2
Pheasant	2	1	0	2	4	0
Buzzard	1	0	1	3	3	0
Kestrel	1	1	0	0	1	0
Hobby	0	0	1	0	1	0
Lapwing	1	0	0	0	1	0
Stock Dove	0	1	8	4	8	0
Woodpigeon	34	4	24	31	54	3
Green Woodpecker	0	0	0	1	1	0
Great Spotted Woodpecker	0	0	0	1	1	0
Skylark	40	51	58	55	76	16
Yellow Wagtail	2	1	4	9	15	5
Pied Wagtail	0	0	0	1	1	0
Wren	2	6	4	8	10	0
Duncock	6	9	3	7	14	1
Robin	3	5	2	5	8	2
Blackbird	3	7	8	10	15	3
Song Thrush	0	0	2	1	2	0
Mistle Thrush	0	0	0	1	1	0
Blackcap	9	3	2	1	12	0
Lesser Whitethroat	4	3	1	0	6	1
Whitethroat	11	25	16	17	36	11
Chiffchaff	2	0	0	2	3	0
Goldcrest	0	1	2	1	2	0
Long-tailed Tit	0	1	1	0	1	0
Blue Tit	2	2	4	1	5	1
Great Tit	0	0	3	2	5	0



Species	15 April	8 May	4 June	5 July	Number of breeding pairs (survey area)	Number of pairs within development site
Jay	0	0	1	0	1	0
Magpie	0	3	0	1	3	0
Carrion Crow	5	4	5	6	12	2
House Sparrow	0	0	1	1	2	0
Chaffinch	11	13	7	6	21	3
Goldfinch	4	4	4	7	12	3
Linnet	14	13	7	11	26	8
Bullfinch	0	0	0	1	1	0
Yellowhammer	8	14	21	17	31	9
Reed Bunting	2	8	10	11	18	10
Corn Bunting	2	13	8	8	20	2

15. No additional breeding species were recorded during the wider area raptor and owl surveys.

Vantage Point Survey Results

16. The rates of bird flight movement observed across the survey area during the vantage point surveys from the single VP are summarised in Table 2. This gives the monthly mean flight rates observed, and the total number of flights recorded during the survey period.

TABLE 2. Bird flight rates recorded over the Six Oaks breeding bird survey area during April – September 2020 vantage point surveys. N = 36 hours total observation (6 hours/month).

Species	Flight rate (birds/hour)						Total number of flights
	Apr	May	Jun	Jul	Aug	Sep	
Mallard	0.0	0.5	0.0	0.0	0.0	0.0	3
Grey Heron	0.0	0.0	0.0	0.0	0.2	0.0	1
Red Kite	0.0	0.7	0.0	0.3	0.2	0.0	7
Sparrowhawk	0.0	0.3	0.0	0.0	0.0	0.0	2
Buzzard	1.3	5.0	1.0	7.0	1.3	2.5	109
Kestrel	0.2	1.8	0.5	1.7	0.0	1.8	36
Hobby	0.0	1.0	0.5	0.2	0.0	0.0	10
Peregrine	0.0	0.0	0.0	0.0	0.3	0.0	2
Curlew	0.0	0.2	0.0	0.0	1.3	0.0	9
Lesser Black-backed Gull	1.7	29.3	0.5	0.3	42.5	62.7	822
Herring Gull	0.0	9.5	0.0	0.0	0.0	0.0	57
Black-headed Gull	0.0	0.2	0.0	0.0	0.2	0.0	2





Conservation Evaluation of Breeding Bird Populations

17. The conservation value of the breeding bird populations was determined using the criteria specified in Table 3 (from Percival 2007). This includes the criteria adopted by Natural England in Guidelines for Selection of Biological 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.

Sensitivity	Definition
VERY HIGH	Cited interest of SPAs, 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), red-listed species of conservation concern.
LOW	Any other species of conservation interest, e.g. species listed on the Birds of Conservation Concern not covered above. Local BAP species (if not covered above).

18. The conservation value of the breeding bird populations observed in the Six Oaks survey area during the breeding bird surveys has been summarised in Table 4 below. This included two high sensitivity species (quail and hobby) that are a Wildlife and Countryside Act Schedule 1 species, twelve medium sensitivity species (NERC Act priority/red listed species of conservation concern; grey partridge, lapwing, skylark, yellow wagtail, dunnock, song thrush, house sparrow, linnets, bullfinch, yellowhammer, reed bunting and corn bunting), and five low sensitivity species.





TABLE 4. Conservation evaluation of the breeding bird populations in the Six Oaks survey area.

Species	Peak breeding pairs (total)	Breeding pairs (development site)	W and C Act Sch 1	Red [R]/ Amber [A] List	NERC priority sp	Value
Red-legged Partridge	6	1				Nil
Grey Partridge	4	1		R	✓	Medium
Quail	6	2	✓	A		High
Pheasant	4	0				Nil
Buzzard	3	0				Nil
Kestrel	1	0		A		Low
Hobby	1	0	✓			High
Lapwing	1	0		R	✓	Medium
Stock Dove	8	0		A		Low
Woodpigeon	54	3		A		Low
Green Woodpecker	1	0				Nil
Great Spotted Woodpecker	1	0				Nil
Skylark	76	16		R	✓	Medium
Yellow Wagtail	15	5		R	✓	Medium
Pied Wagtail	1	0				Nil
Wren	10	0		A		Low
Duncock	14	1		A	✓	Medium
Robin	8	2				Nil
Blackbird	15	3				Nil
Song Thrush	2	0		A	✓	Medium
Mistle Thrush	1	0		R		Low
Blackcap	12	0				Nil
Lesser Whitethroat	6	1				Nil
Whitethroat	36	11				Nil
Chiffchaff	3	0				Nil
Goldcrest	2	0				Nil
Long-tailed Tit	1	0				Nil
Blue Tit	5	1				Nil
Great Tit	5	0				Nil
Jay	1	0				Nil
Magpie	3	0				Nil
Carrion Crow	12	2				Nil
House Sparrow	2	0		R	✓	Medium
Chaffinch	21	3				Nil





Species	Peak breeding pairs (total)	Breeding pairs (development site)	W and C Act Sch 1	Red [R]/ Amber [A] List	NERC priority sp	Value
Goldfinch	12	3				Nil
Linnet	26	8		R	✓	Medium
Bullfinch	1	0		A	✓	Medium
Yellowhammer	31	9		R	✓	Medium
Reed Bunting	18	10		A	✓	Medium
Corn Bunting	20	2		R	✓	Medium

19. The distributions of the breeding birds of conservation value within the survey area in April-July 2020 are shown on Figures 2 to 10. The more abundant species (i.e. 10 or more records) have been presented separately for clarity.
- Woodpigeon (Figure 2) were widely distributed but with most breeding records in areas with more trees/scrub habitat.
 - Skylark (Figure 3) were abundant and evenly distributed across most of the open arable habitats across the survey area, including within the proposed development site.
 - Yellow wagtail (Figure 4) were also found widely on arable land across the survey area (though at lower density), including within the proposed development site.
 - Wren (Figure 5) were breeding in scrub and hedgerows across the survey area, with none recorded within the proposed development site itself.
 - Dunnock (Figure 6) was another species of the hedgerow and woodland habitats.
 - Linnet (Figure 7) were widely distributed across the survey area, associated mainly with scrub and hedgerow habitats.
 - Yellowhammer (Figure 8) was another predominantly hedgerow/scrub species.
 - Reed bunting (Figure 9) were found across most of the arable land within the survey area, though with more in the central area (including within the proposed development site).
 - Corn Bunting (Figure 10) was another widely distributed open arable farmland species.
20. Other less abundant species of conservation value (Figure 11) were widely scattered across the survey area, with no particular concentrations and most recorded outside the proposed development site. The locations of the quail and hobby have not been plotted as these species are specially protected under Schedule 1 of the Wildlife and Countryside Act. Two pairs of quail were recorded within the potential impact zone of the development.
21. The evaluation of the conservation importance of the non-breeding species observed during these surveys is given in Table 5. This included two high value species (red kite and peregrine, both EU Annex 1/Wildlife and Countryside Act Schedule 1 species), three medium value (curlew and herring gull, both NERC Act priority species and lesser black-backed gull, present in regionally important numbers), and five additional low value species (through their red/amber listing). All these species were seen only infrequently in generally low numbers during the breeding bird surveys. Key species' flight lines are shown in Figures 12-14. No important concentrations of foraging or flight activity were observed.

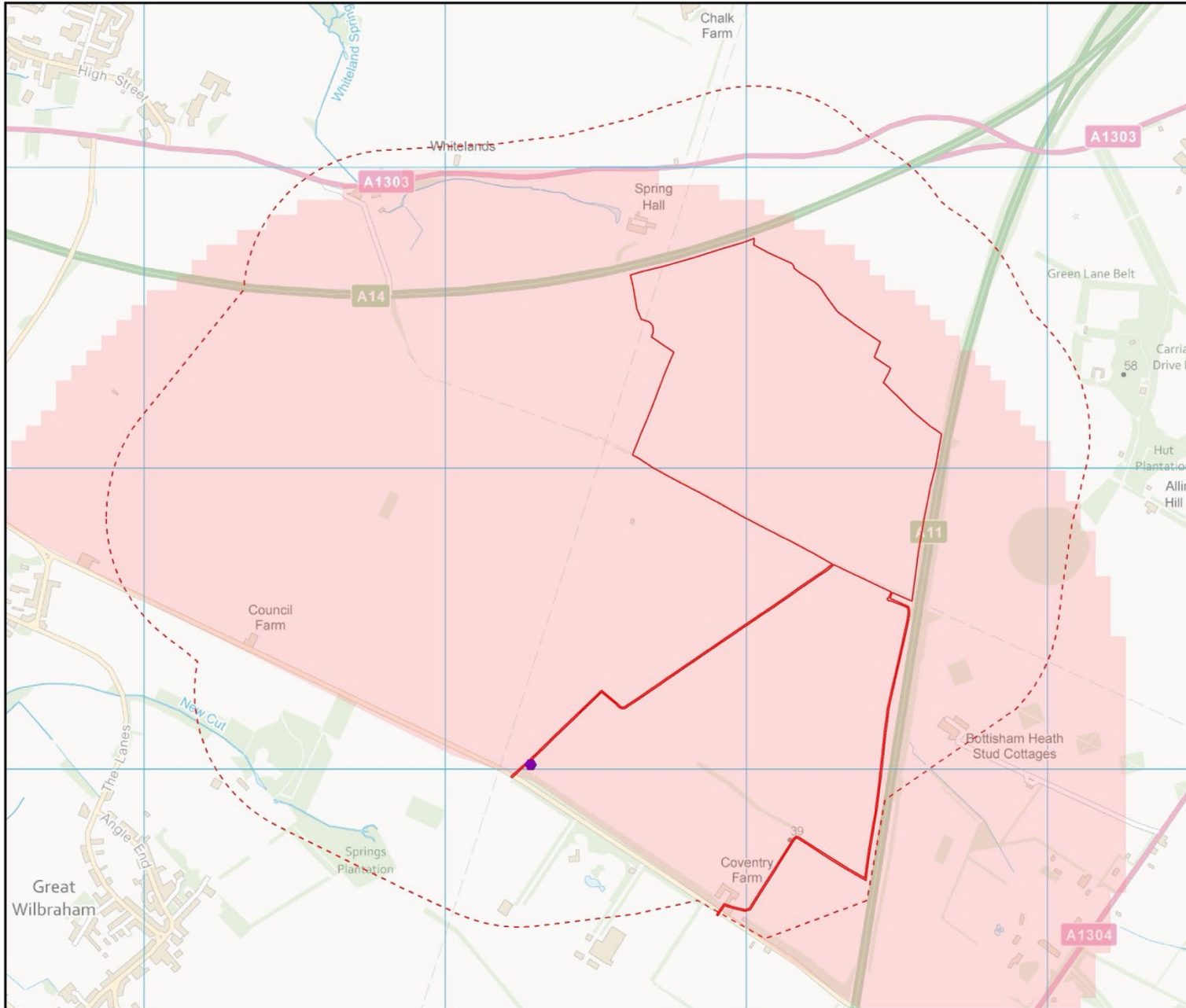




TABLE 5. Conservation evaluation of the non-breeding bird populations in the Six Oaks survey area, April-September 2020.

Species	Peak count	EU Annex 1	W and C Act Sch 1	Red [R]/ Amber [A] List	NERC priority sp	Value
Mallard	3			A		Low
Grey Heron	1					Nil
Red Kite	1	✓	✓			High
Sparrowhawk	1			A		Low
Peregrine	2	✓	✓			High
Curlew	4			R	✓	Medium
Lesser Black-backed Gull	376			A		Medium
Herring Gull	30			R	✓	Medium
Black-headed Gull	1			A		Low
Swift	40			R		Low
Swallow	3					Nil
Rook	2			A		Low






Six Oaks Renewable Energy Park

FIGURE 1

Breeding Bird Survey Area

KEY:

-  Six Oaks site boundary
-  Breeding bird survey area
-  VP Location
-  VP Viewshed (20m above ground to 2km)



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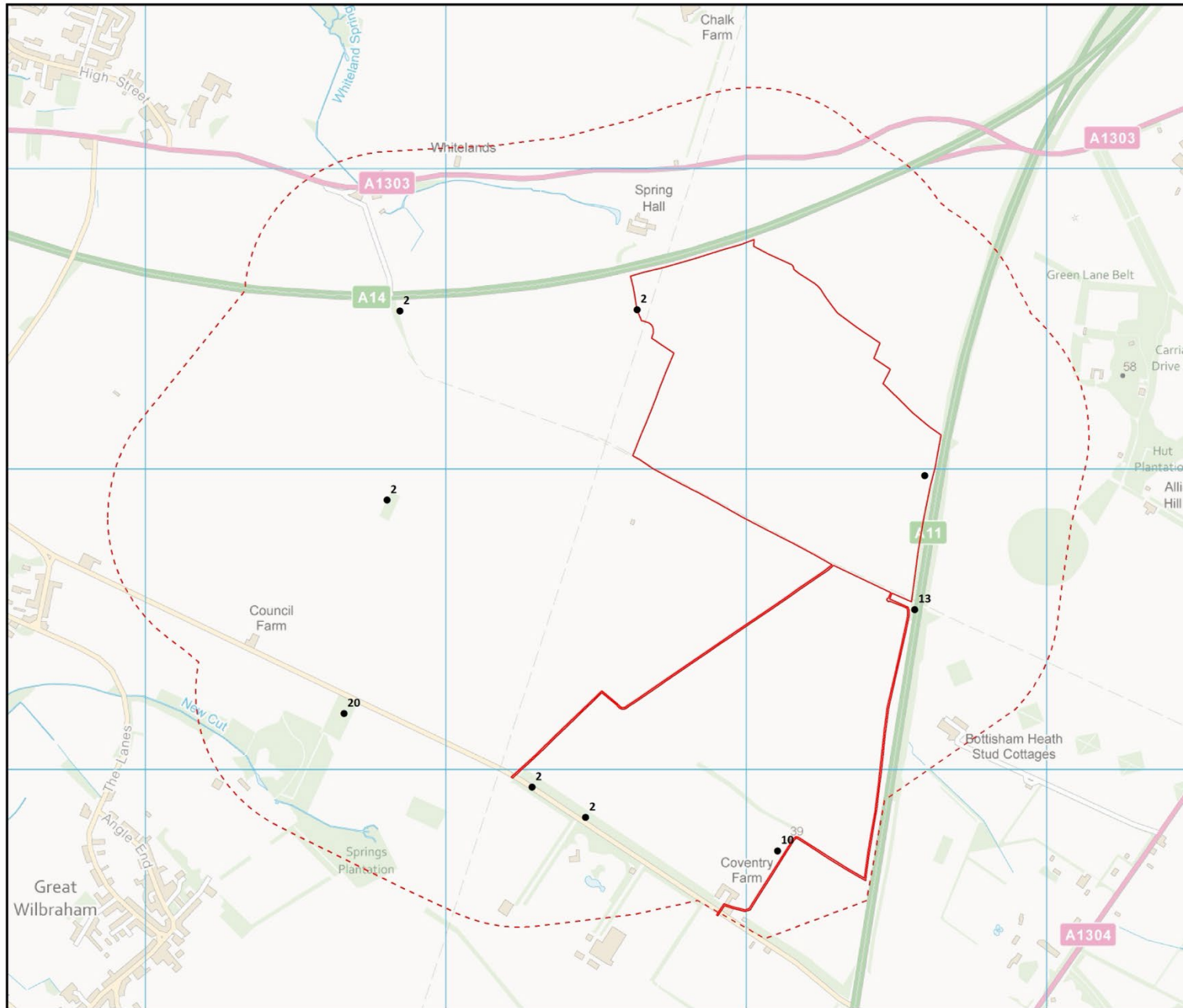
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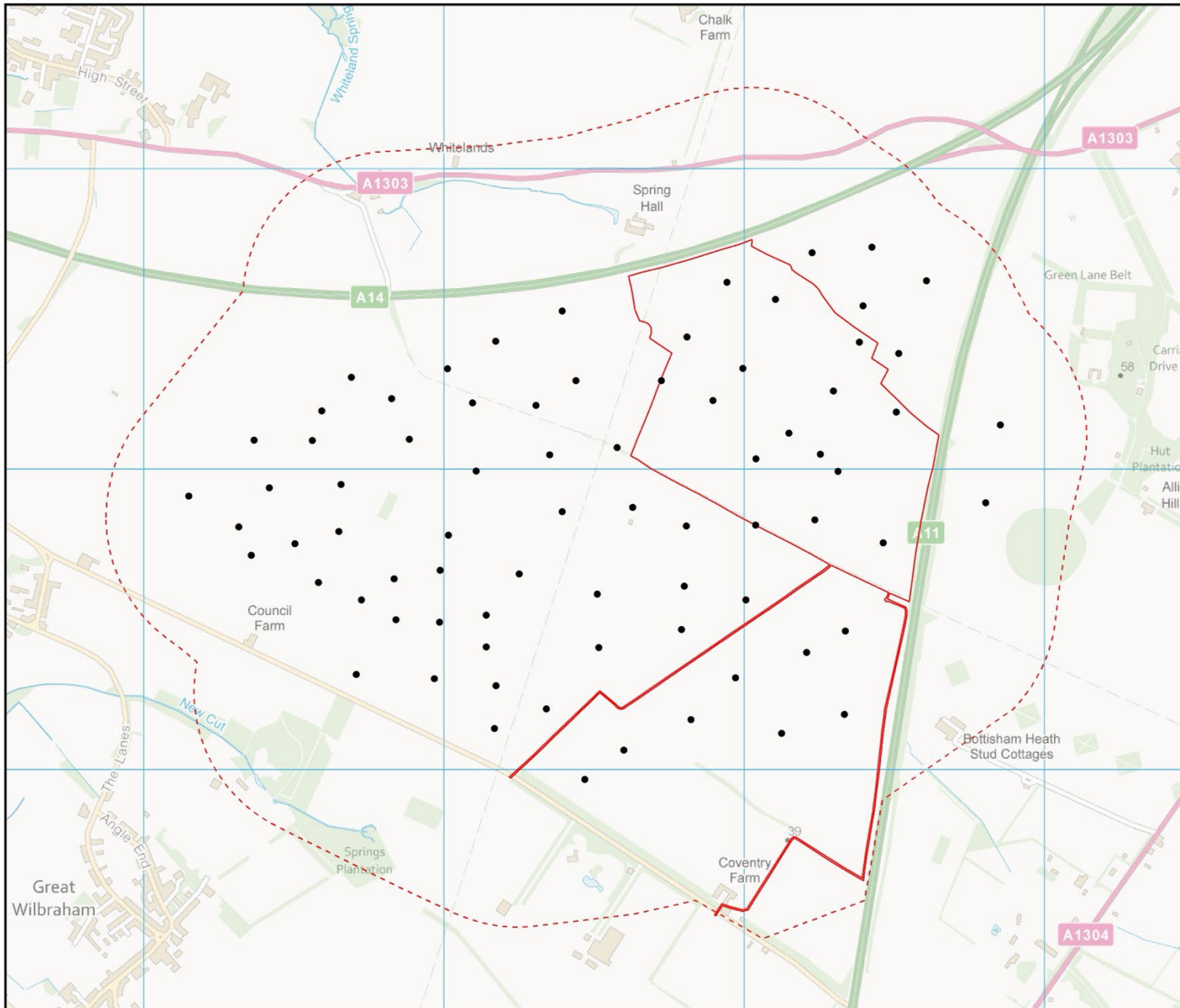
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FIGURE 2
Distribution of Breeding Woodpigeon, 2020

- KEY:**
- Six Oaks site boundary
 - Breeding bird survey area
 - Approx. breeding locations



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FIGURE 3
Distribution of Breeding Skylark, 2020

KEY:

- Six Oaks site boundary
- Breeding bird survey area
- Approx. breeding locations



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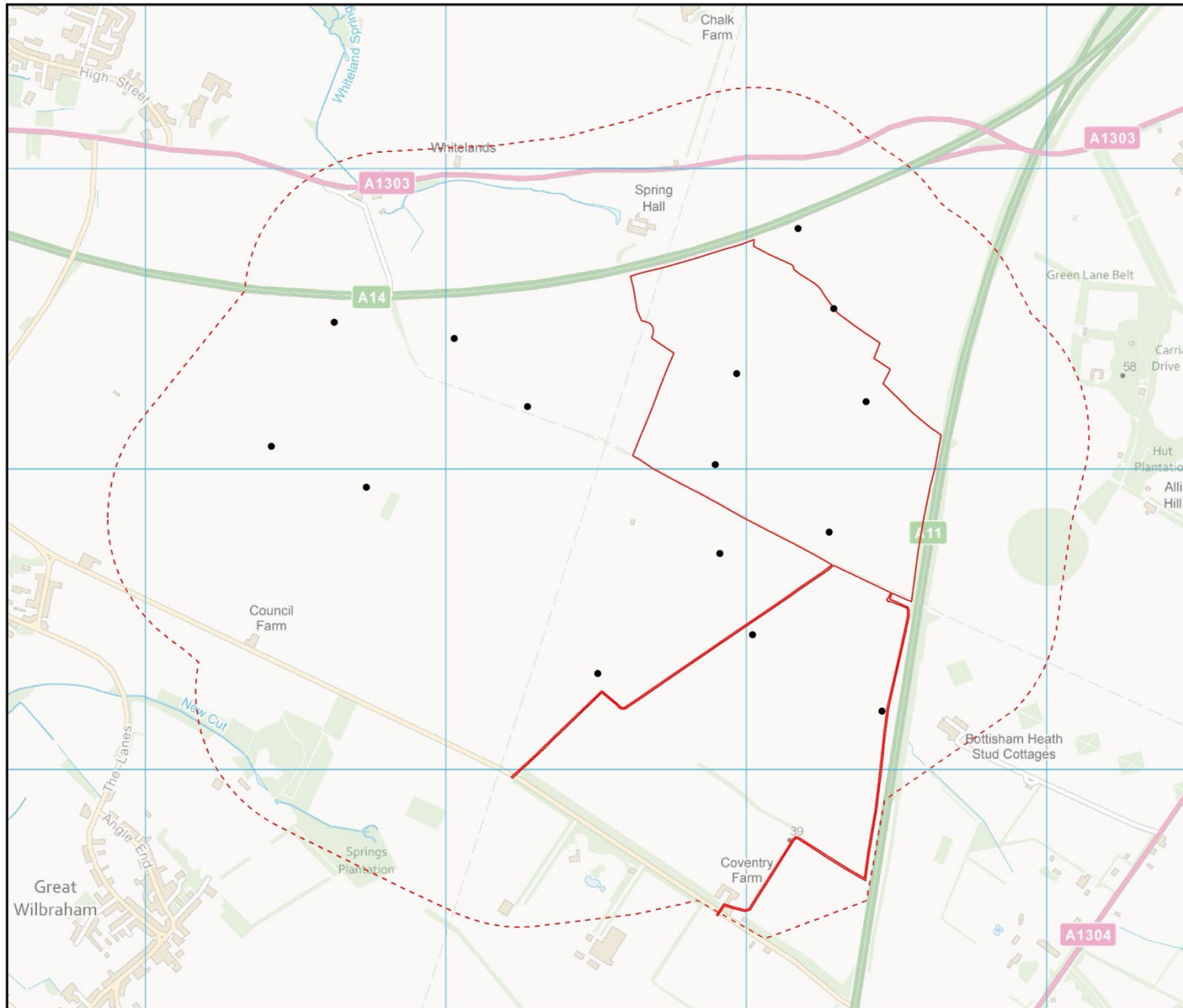
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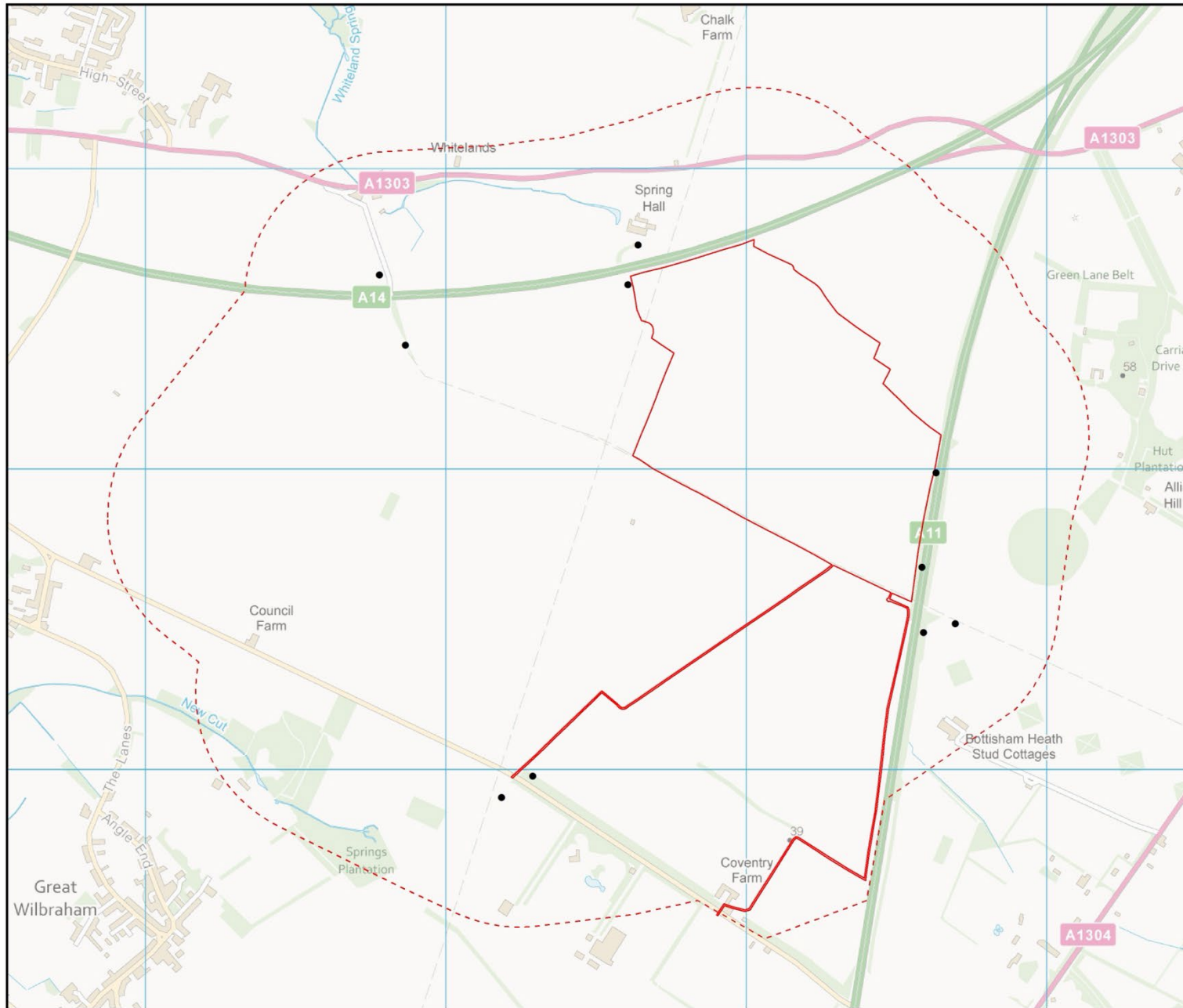
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FIGURE 4
Distribution of Breeding Yellow Wagtail, 2020

- KEY:**
- Six Oaks site boundary
 - Breeding bird survey area
 - Approx. breeding locations



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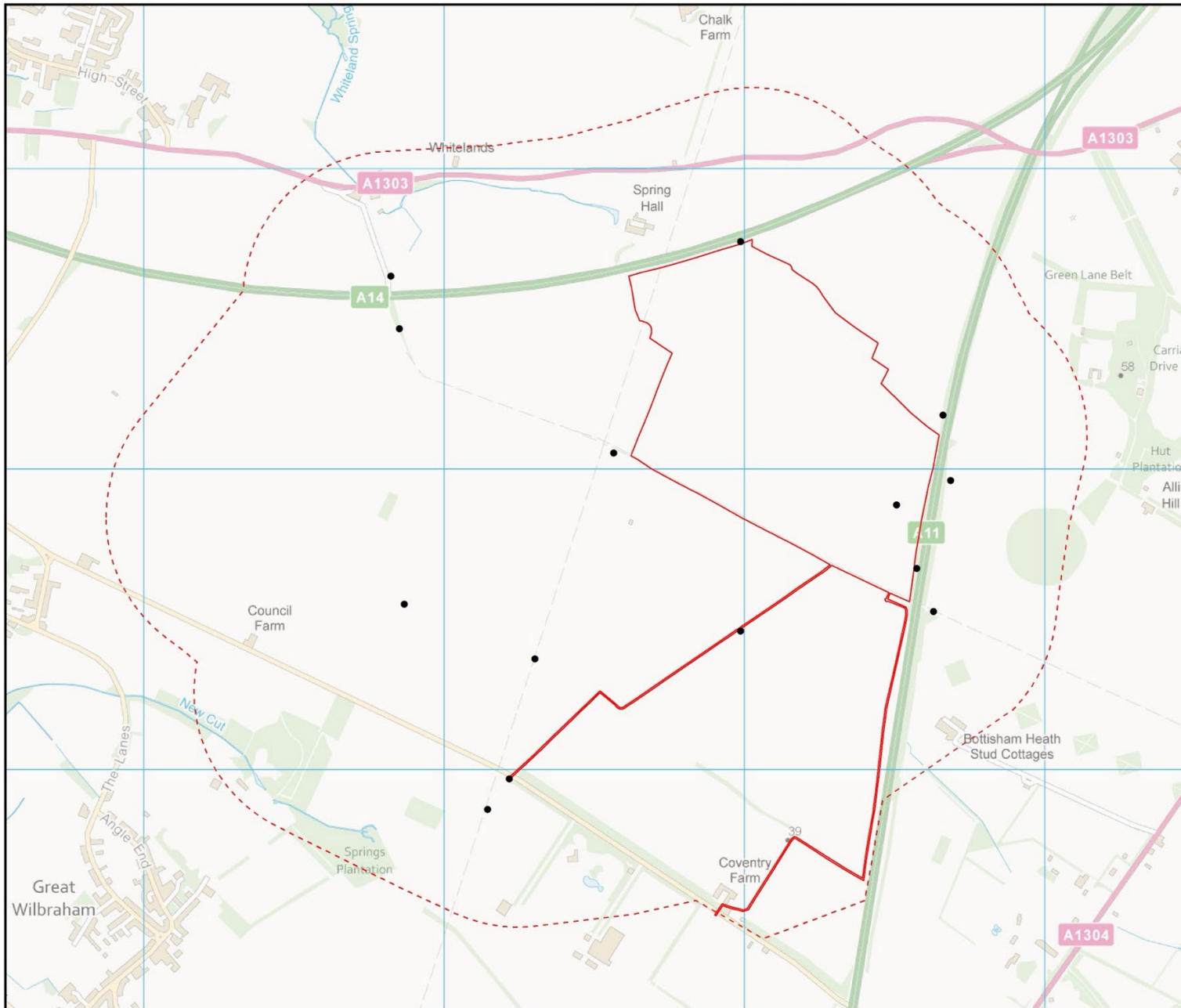
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FIGURE 5
Distribution of Breeding Wren, 2020

- KEY:**
- Six Oaks site boundary
 - Breeding bird survey area
 - Approx. breeding locations



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FIGURE 6

Distribution of Breeding Dunnock, 2020

KEY:

- Six Oaks site boundary
- Breeding bird survey area
- Approx. breeding locations



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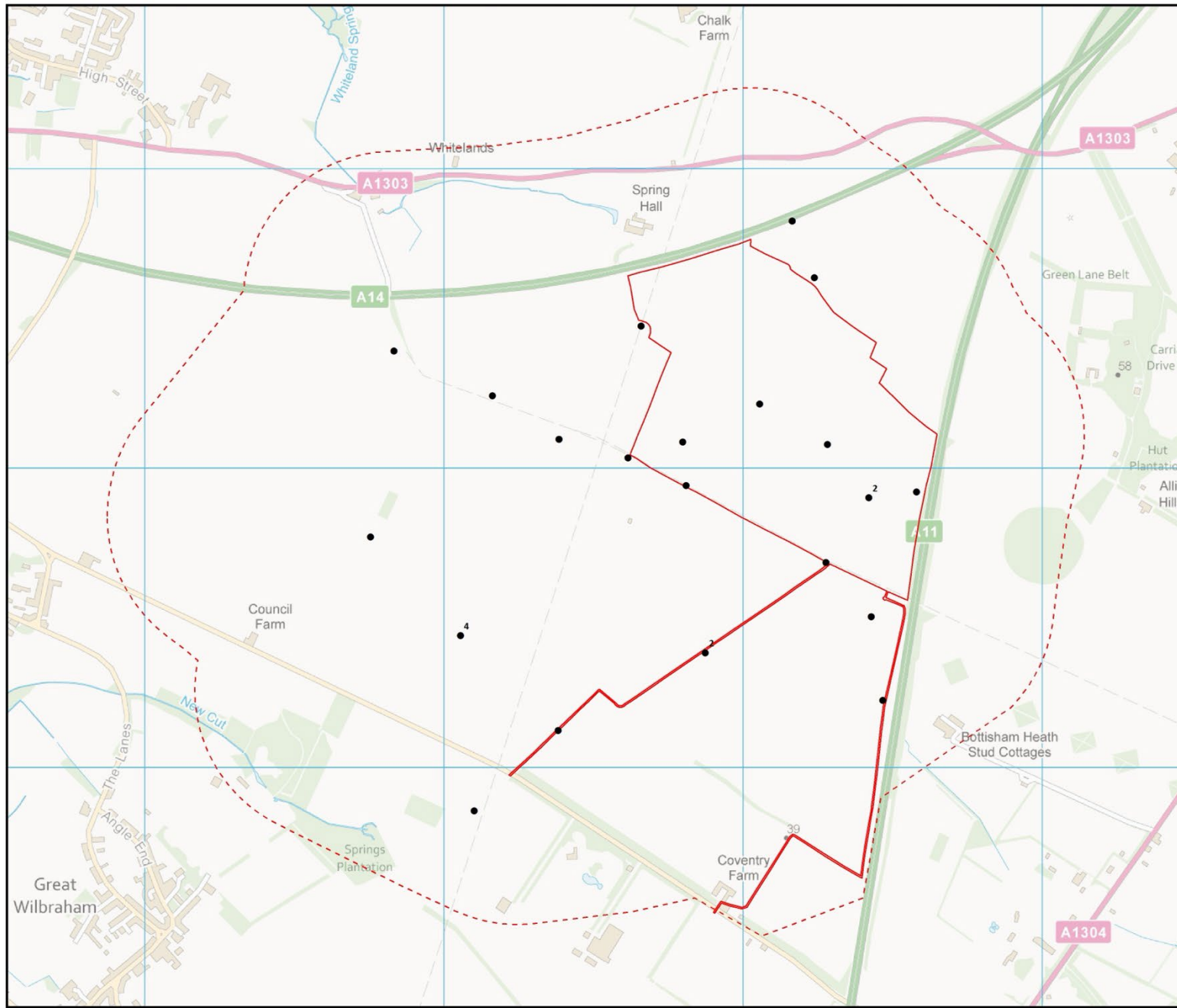
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RIDGE CLEAN ENERGY

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FIGURE 7

Distribution of Breeding Linnet, 2020

KEY:

- Six Oaks site boundary
- Breeding bird survey area
- Approx. breeding locations

Numbers = multiple pairs at single location


Ecology Consulting

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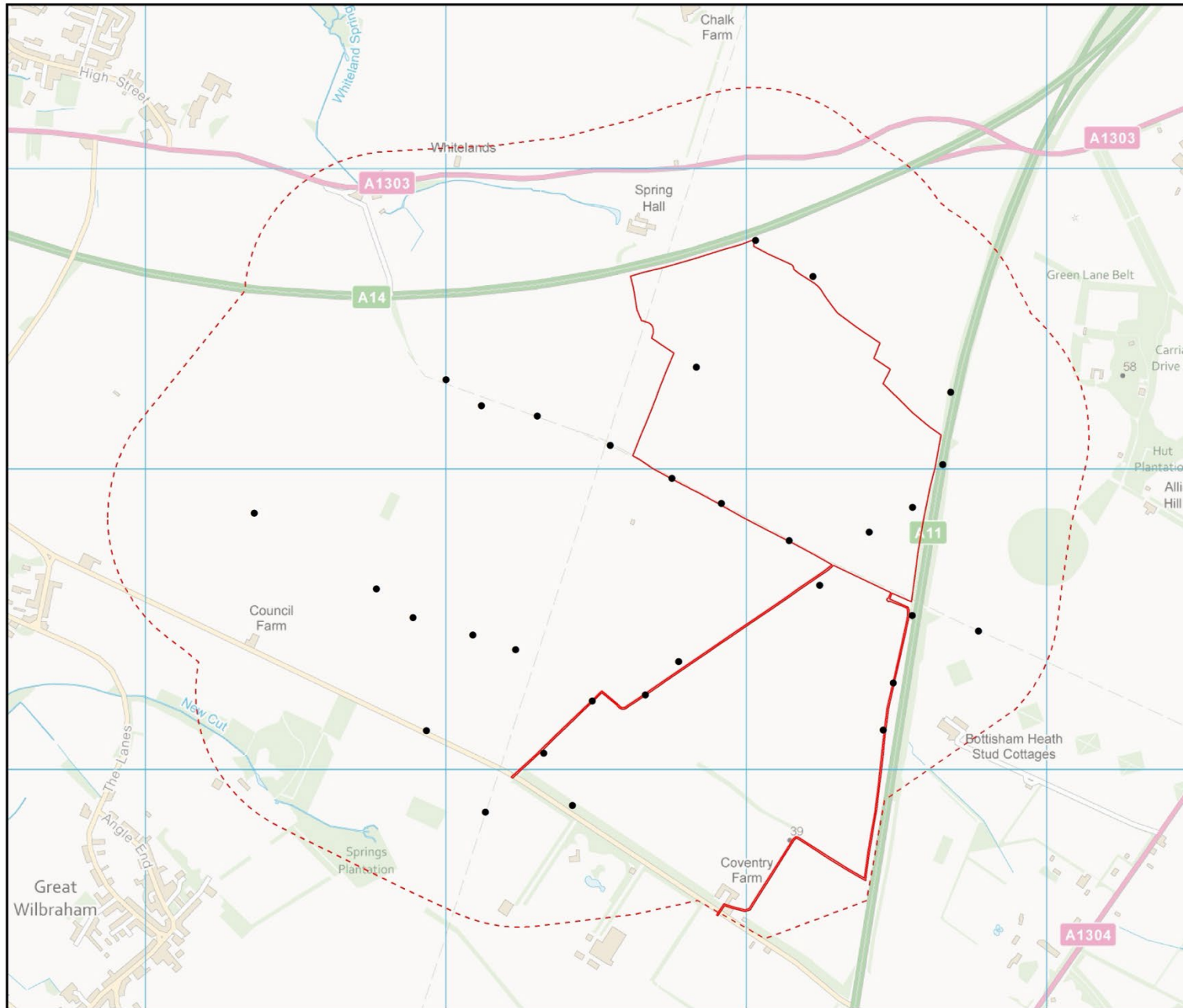
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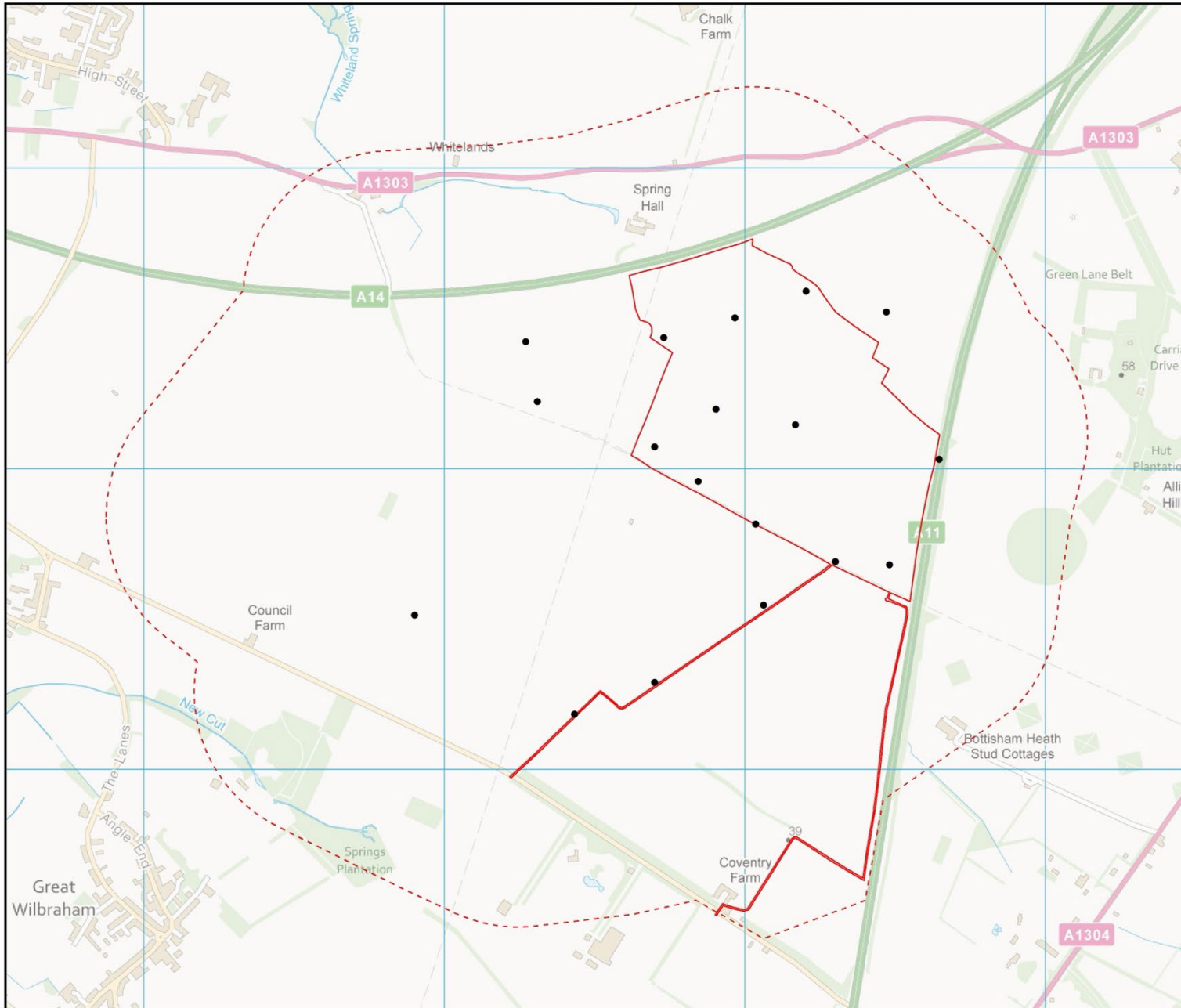
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FIGURE 8
Distribution of Breeding Yellowhammer, 2020

- KEY:**
- Six Oaks site boundary
 - Breeding bird survey area
 - Approx. breeding locations



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FIGURE 9
Distribution of Breeding Reed Bunting, 2020

KEY:

- Six Oaks site boundary
- Breeding bird survey area
- Approx. breeding locations



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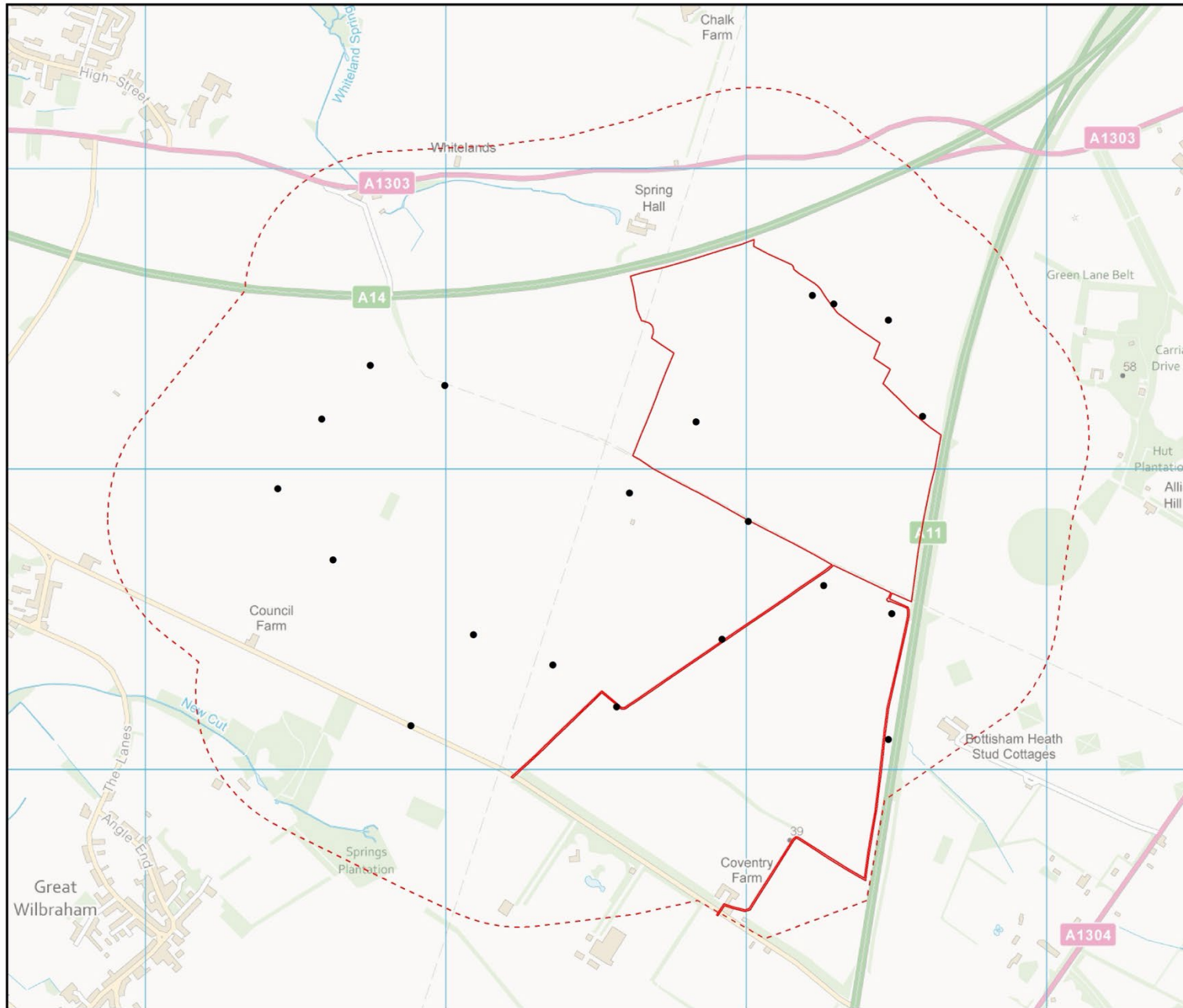
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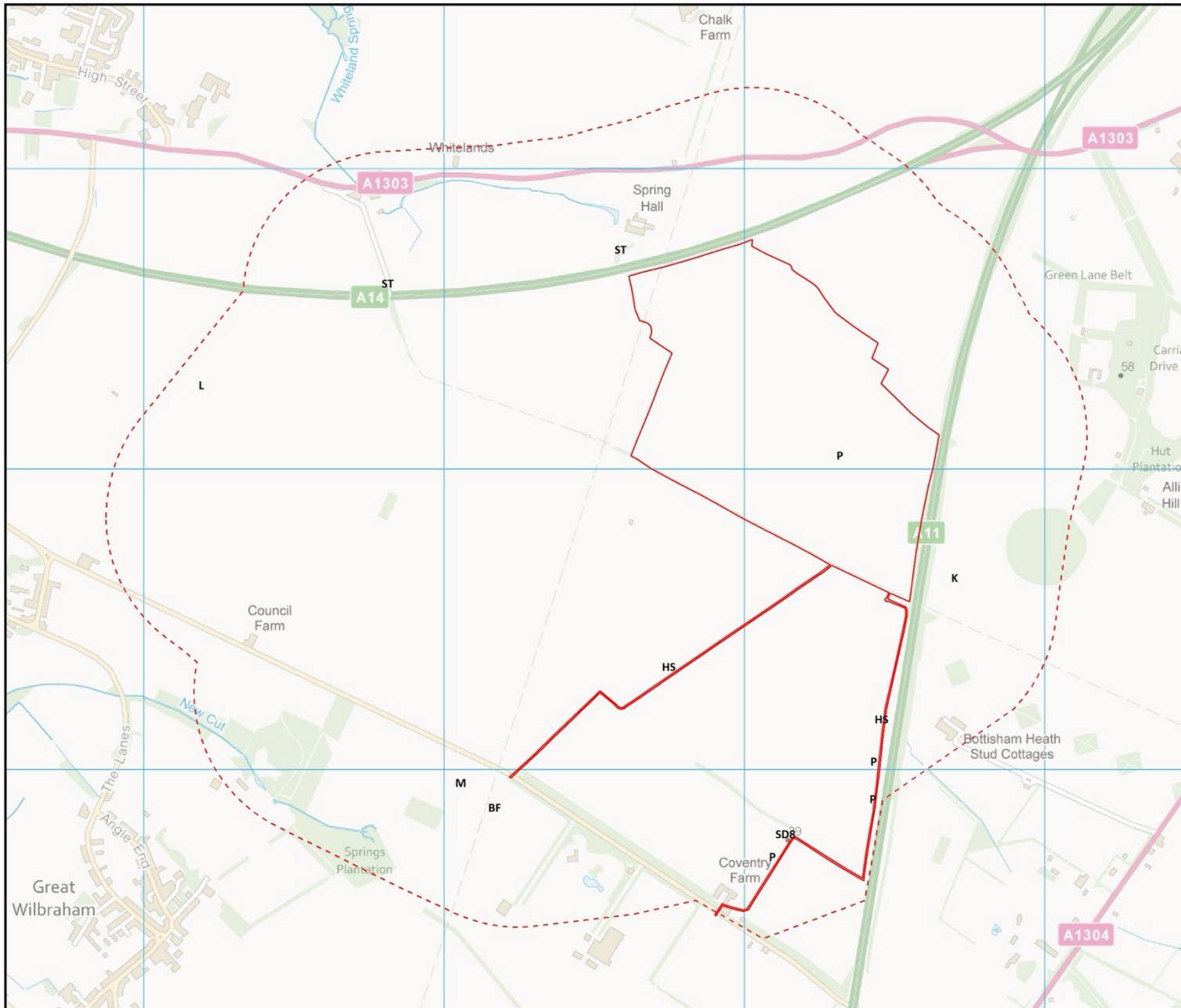
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FIGURE 10
Distribution of Breeding Corn Bunting, 2020

- KEY:**
- Six Oaks site boundary
 - Breeding bird survey area
 - Approx. breeding locations



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FIGURE 11
Distribution of Other Breeding Species, 2020

KEY:

- Six Oaks site boundary
- Breeding bird survey area

Approx. breeding locations:

- BF - Bullfinch
- HS - House Sparrow
- K - Kestrel
- L - Lapwing
- M - Mistle Thrush
- P - Grey Partridge
- SD - Stock Dove
- ST - Song Thrush



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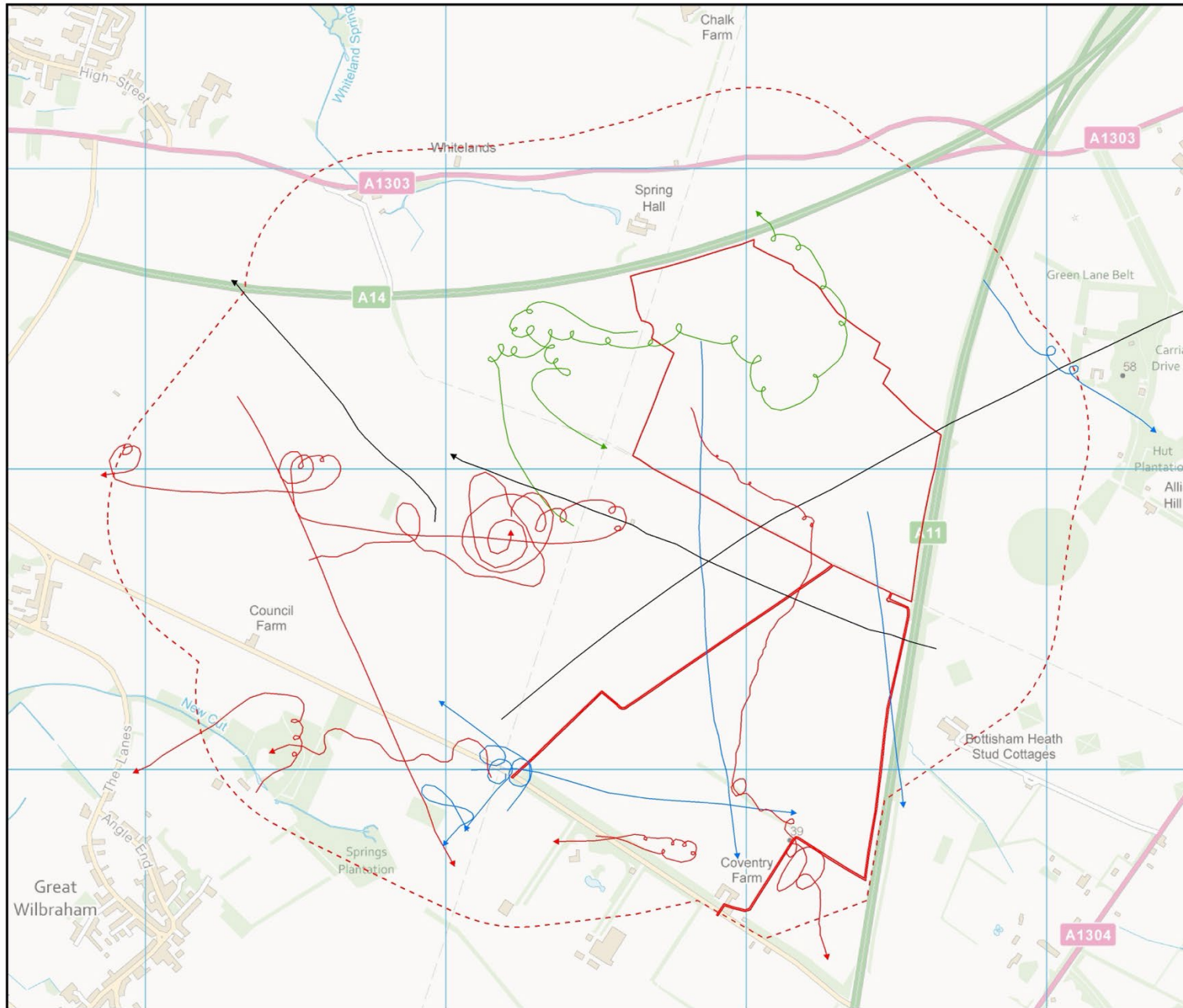
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BREEDING BIRD SURVEYS 2020

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Six Oaks Renewable Energy Park

FIGURE 12

Flight Lines of Scarce Raptors and Waders, 2020

KEY:

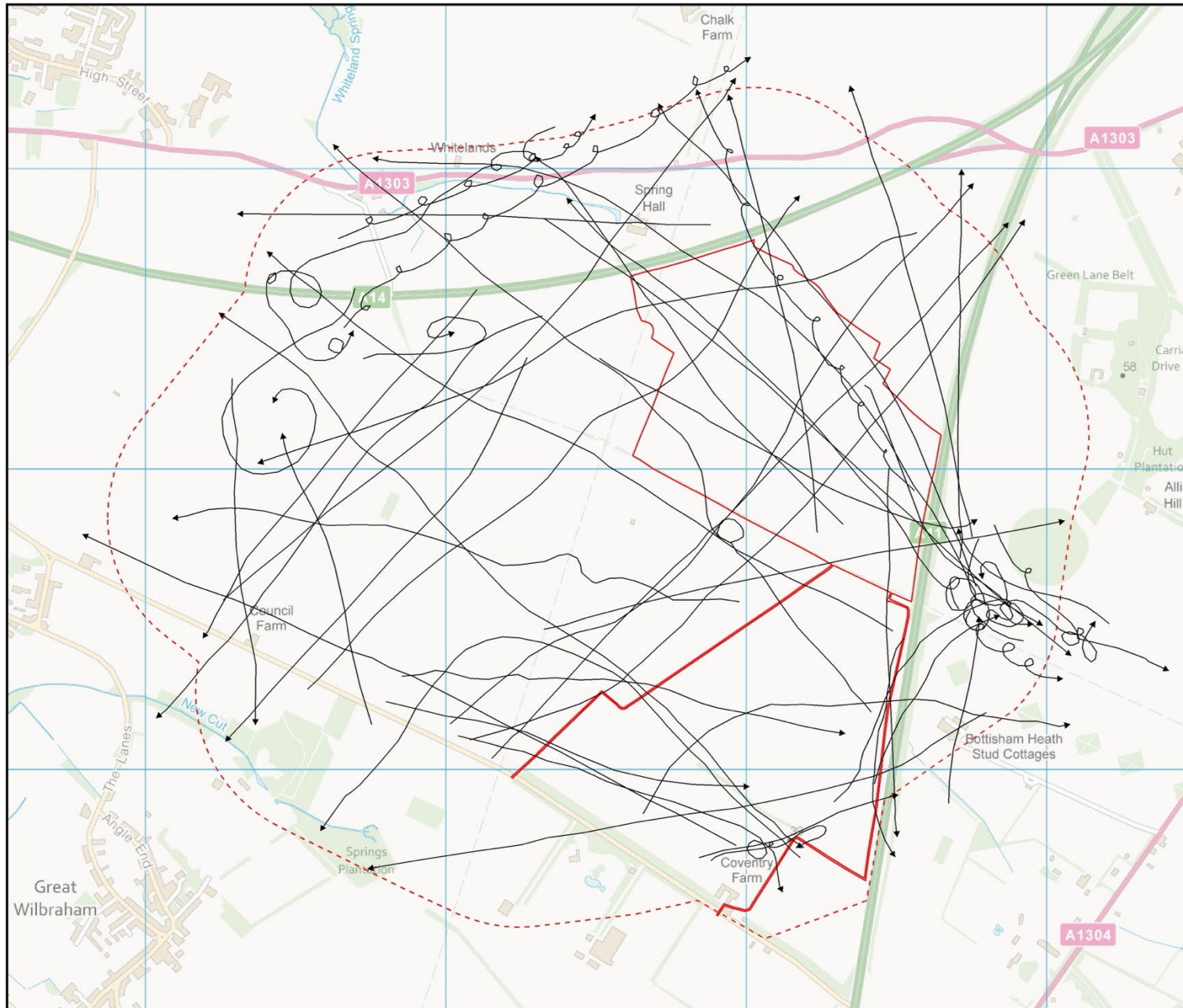
Species

- Curlew
- Hobby
- Red Kite
- Peregrine

- Six Oaks site boundary
- - - Breeding bird survey area



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DATE: N/A	SCALE: N/A
n/a	
SCALE - 1:12,000 @ A3	
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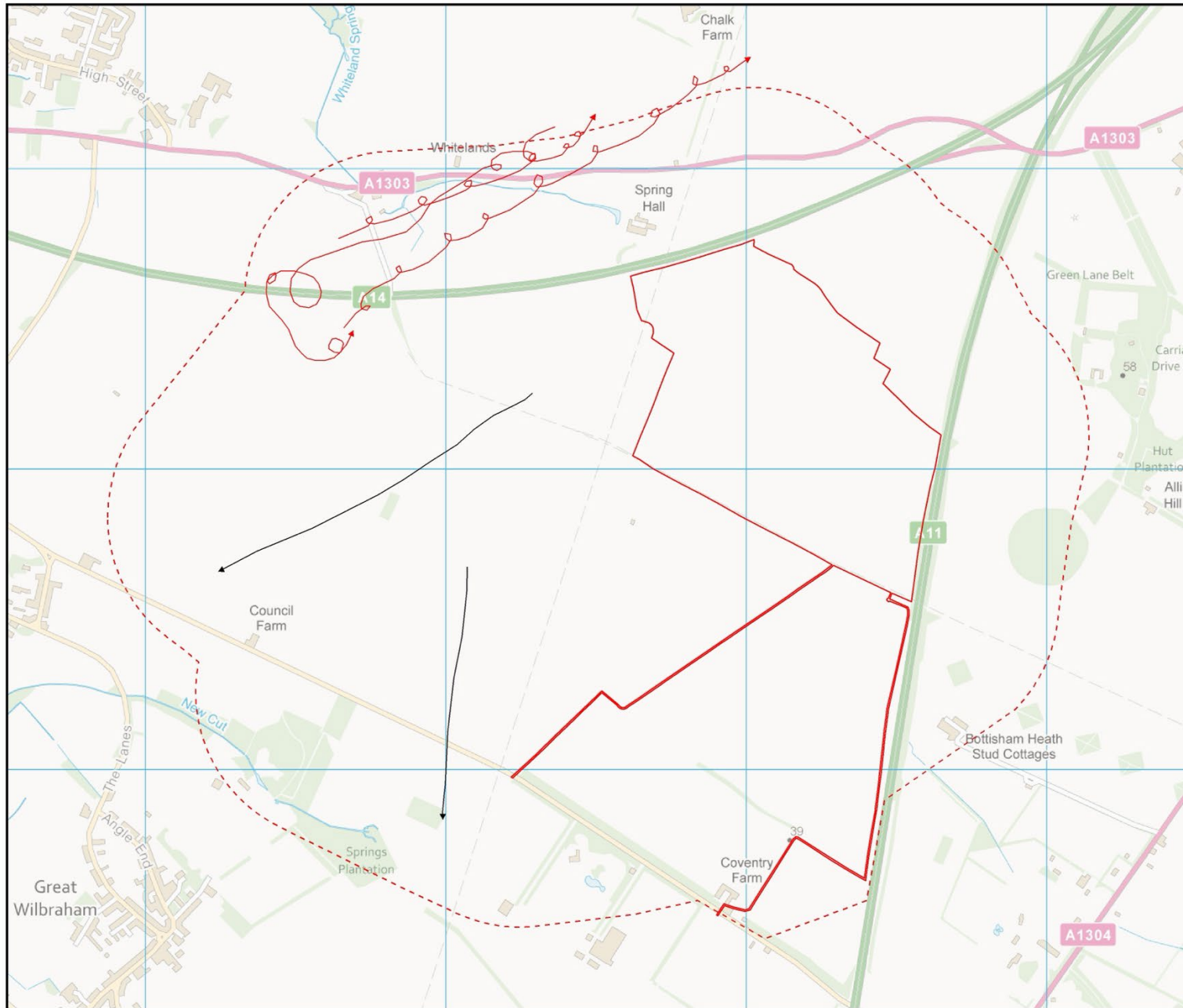
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FIGURE 13
Lesser Black-backed Gull Flight Lines, 2020

- KEY:**
- Flight Lines
 - ▭ Six Oaks site boundary
 - - - Breeding bird survey area



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FIGURE 14

Other Gull Flight Lines, 2020

KEY:

Species

- Black-headed Gull
- Herring Gull

- Six Oaks site boundary
- Breeding bird survey area



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CONCLUSIONS

22. The survey area supports a typical range of farmland breeding birds, including a range of NERC priority species. Two species specially protected under Schedule 1 of the Wildlife and Countryside Act from disturbance during breeding was found during the 2022 surveys, quail and hobby, and given the habitat present it is possible that others such as peregrine and barn owl 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 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, if any construction works were to take place at that time.
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, yellow wagtail and corn bunting. These are NERC Act Species of Principal Importance. Measures to deliver net gain for these species will be delivered as part of the Biodiversity Management Plan for the proposed Renewable Energy Park.

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