



TORFICHEN WIND FARM: BREEDING BIRD SURVEYS 2022

Report to Renewables Energy Systems Ltd



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November 2022

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Cover photos:

Top left – Black grouse, male © Steve Percival

Top right – Curlew, adult. © Steve Percival





TORFICHEN WIND FARM: BREEDING BIRD SURVEYS 2022

INTRODUCTION

1. This report presents the results of breeding bird survey work for the proposed Torfichen wind farm, at (hereafter referred to as the 'Proposed Development'). It provides a second year of 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, following previous surveys in 2021 (Percival *et al.* 2021). The same survey methodologies were used as in the previous year.
2. The specific objectives of this work were to:
 - Undertake breeding bird surveys of the proposed development site and its surrounds, 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 have been designed with reference to current NatureScot survey guidance on bird surveys for wind farms (SNH 2017). The surveys were undertaken by Tom Lowe and Stuart Piner, both highly experienced bird surveyors.
4. All details of the nesting locations of species specially protected from disturbance under Schedule 1 of the Wildlife and Countryside Act, so should remain confidential following NatureScot guidance (SNH 2016). They are reported separately in the confidential Technical Appendix 9.8.

STUDY AREA

5. The site is located approximately 4 km south of Gorebridge and 9.5 km south-east of Penicuik, within the northern edge of the Moorfoot Hills in the Midlothian Council (MC) area. The breeding bird survey area was chosen to include all areas within the possible zone of ornithological influence of the Proposed Development. This included the Proposed Development site, plus a 500 m buffer for the main breeding bird surveys (the core survey area, following NatureScot guidance, SNH 2017) and a 2 km buffer for the key species surveys (the wider survey area), where access was possible and where there was potentially suitable habitat. The extents of these areas are shown in **Figure 1**. The main core survey area covered a total area of 18.1 km² and the wider survey area 49.9 km². It comprised predominantly upland moorland habitat, currently used mainly for grazing sheep and deer, with agriculturally improved grassland on the lower ground in the northern part of the site. It lies mainly within the 'Border Hills' NatureScot Natural Heritage Zone (NHZ20), though the northern edge of the survey area is within the 'Eastern Lowlands' (NHZ16).





BREEDING BIRD SURVEY METHODS

Core Breeding Bird Surveys

6. The main breeding bird walkover survey followed the standard moorland survey method (Brown and Shepherd 1993) but with two additional visits as recommended in current NatureScot guidance (SNH 2017, Calladine *et al.* 2009). They commenced in April and continued through to July, and were done between 8:30 hours and 18:00 hours. The survey dates were 18-20 April, 17-18 May, 6-7 June and 11-12 July 2022. These surveys covered all of the open (i.e. non-forested) habitat within a buffer zone of 500 m around the developable area where access/viewing was possible.
7. 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, recording systematically for approximately 2 hours per km². A route was chosen to ensure that all parts of the study area were covered to within about 100 m of the observer, where access was possible. The survey route was plotted onto the survey map as it was carried out.
8. 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 will be 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.
9. The survey data were analysed to determine spatially distinct clusters of records, equivalent to breeding territories (following Brown and Shepherd 1993), with the number of such territories used to calculate the breeding population for each species (Gilbert *et al.* 1998). 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

10. As the survey area was considered likely, given its location and the habitats present, to be used by a range of scarce raptors, raptor surveys were undertaken during April-August 2022. Raptor surveys comprised walkovers where access was allowed (within the site land ownership), supplemented by a series of mini-Vantage Points (VPs) (shorter watches from additional VPs) to cover other areas (looking out from the site itself), to detect displaying or nesting behaviour during the breeding season of raptor species following the methods described in Gilbert *et al.* (1998) and Hardey *et al.* (2013) where access allowed. Surveys recorded all Schedule 1 and Annex I raptor and owl species. This included five surveys visits, undertaken on 18-22 April, 18-19 May, 6-7 June, 11-13 July and 15-17 August.

Black Grouse Survey

11. Black grouse surveys were undertaken following the methods outlined in Gilbert *et al.* (1998). All suitable black grouse habitat from within the site boundary (to which access was restricted) was surveyed during April - mid-May. Surveys were carried out on 19-22 April and 18-19 May. Areas of suitable habitat outwith the site to which access was not possible were scanned with binoculars from the site boundary, from publicly accessible locations and from suitable VPs within the site. A three-visit survey was undertaken as follows:
 - Visit 1: site visit to assess habitat for black grouse suitability;





- Visit 2: areas of suitable habitat with the potential to support lekking black grouse were visited twice on different mornings to establish presence/absence; and
- Visit 3: any locations where black grouse were recorded as present during the second visit were revisited in order to provide an accurate count of the number of lekking birds present. The survey was undertaken one hour prior to dawn until one hour after dawn.

Vantage Point Surveys

12. VP surveys were carried out to determine bird flight activity within the Proposed Development site to assess collision risk. The surveys quantified the bird numbers that could potentially be at risk of collision (including roost flight observations at dawn/dusk). All flight lines of target species were mapped, and the flight height of each flock recorded. Target species included all EU Birds Directive Annex 1 species, Wildlife & Countryside Act (1981) Schedule 1 species and Red-listed birds of Conservation Concern (Stanbury *et al.* 2021), as per NatureScot (SNH 2017).
13. The specific aim of the VP surveys was to collect data on key target species flight activity to enable estimates to be made of:
 - The time spent flying over the survey area
 - The relative use made of different parts of the survey area
 - The proportion of flying time spent at different elevations above the ground.
14. Three VPs were used to cover the Proposed Development site (at the same three locations as used for the previous breeding and winter surveys). The computer-generated viewsheds (using Global Mapper v21) are shown in **Figure 1**. For each VP, 36 hours' VP surveys from each VP (as set out in NatureScot guidance) were carried out, spread evenly across the breeding season.
15. All key target species flights (and any other species of specific nature conservation interest) were recorded, irrespective of their distance from the VP. Observations were carried out throughout daylight hours but not in periods of severely reduced visibility (<3 km).
16. During the VP surveys all key target species flights were mapped and cross-referenced to a standard recording form using a numbering system, and the flight height of each recorded. To estimate flight height as accurately as possible available reference structures were used. Heights were estimated as accurately as possible and recorded as a raw estimate, rather than being summarised to height classes. Below 10 m estimates were made to 1 m, between 10 and 20 m to 2 m, between 20 m and 50 m to 5 m, and above 50 m to 10 m. When birds were observed over an extended period, estimates of flight height were recorded every 30 seconds. The activity during each flight was also recorded. Particular attention was paid to any observations of birds at rotor height.



BREEDING BIRD SURVEYS 2022: RESULTS

17. 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.

TABLE 1. Breeding bird numbers in the core Torfichen survey area recorded during April-July 2022. Numbers given are the number of breeding pairs recorded on each survey visit, and the overall number of breeding pairs.

Species	April	May	June	July	Estimated number of breeding pairs
Mute Swan	1	0	0	0	1
Greylag Goose	8	3	1	2	8
Canada Goose	1	1	0	1	2
Shelduck	1	1	3	0	2
Teal	0	1	1	1	1
Mallard	2	3	2	1	4
Tufted Duck	2	3	3	2	4
Red Grouse	6	4	2	5	8
Black Grouse	0	1	1	0	1
Red-legged Partridge	4	3	2	1	6
Pheasant	13	18	9	4	27
Little Grebe	1	1	1	1	1
Buzzard	6	9	12	15	17
Kestrel	3	0	1	0	3
Moorhen	0	0	1	3	3
Coot	0	1	0	0	1
Oystercatcher	0	7	10	6	13
Golden Plover	1	0	0	0	1
Lapwing	36	40	26	4	45
Snipe	22	14	12	3	28
Curlew	30	51	61	9	57
Common Sandpiper	0	0	0	2	2
Redshank	2	1	1	0	2
Black-headed Gull	380	380	260	0	380
Feral Pigeon	0	2	3	1	4
Stock Dove	0	0	1	0	1
Woodpigeon	274	194	278	188	594
Collared Dove	0	0	0	1	1
Cuckoo	0	1	1	0	2
Great Spotted Woodpecker	1	2	6	0	8
Skylark	329	385	375	157	520
Sand Martin	24	16	1	4	24

Species	April	May	June	July	Estimated number of breeding pairs
Swallow	1	1	6	8	13
House Martin	0	0	2	1	2
Meadow Pipit	661	440	770	589	1040
Grey Wagtail	1	0	2	3	5
Pied Wagtail	9	5	4	10	21
Wren	40	29	41	62	90
Dunnock	7	2	9	5	18
Robin	40	27	41	13	56
Redstart	1	2	1	0	3
Whinchat	0	3	1	0	3
Stonechat	0	7	10	4	16
Wheatear	17	14	0	1	26
Blackbird	12	20	22	5	35
Song Thrush	6	12	15	3	24
Mistle Thrush	3	7	11	2	14
Grasshopper Warbler	0	0	0	1	1
Sedge Warbler	0	3	0	3	4
Blackcap	0	2	1	0	2
Whitethroat	0	1	0	0	1
Chiffchaff	8	6	9	5	13
Willow Warbler	47	70	65	10	101
Goldcrest	14	10	23	14	38
Spotted Flycatcher	0	1	0	0	1
Long-tailed Tit	1	0	0	0	1
Blue Tit	7	2	6	1	11
Great Tit	2	1	4	3	8
Coal Tit	34	17	7	23	51
Treecreeper	0	1	0	0	1
Jay	1	0	1	2	4
Magpie	0	5	4	0	6
Jackdaw	4	14	14	4	22
Rook	55	1	0	0	55
Carrion Crow	17	23	22	12	37
Raven	0	1	0	0	1
Starling	5	2	7	2	12
House Sparrow	2	1	6	5	8
Tree Sparrow	0	0	0	2	2
Chaffinch	75	91	109	23	132
Goldfinch	3	6	4	6	13
Siskin	16	16	9	12	33
Linnet	1	3	5	5	10
Lesser Redpoll	17	8	13	21	41
Common Crossbill	1	2	2	4	7

Species	April	May	June	July	Estimated number of breeding pairs
Bullfinch	0	0	1	1	2
Yellowhammer	0	3	3	2	4
Reed Bunting	10	15	10	23	45

18. The distributions of the breeding birds of conservation importance within the survey area in 2022 are shown on **Figures 2 to 13**. The more abundant species (i.e. 10 or more breeding pairs) of conservation value have been presented separately for clarity.
- **Oystercatcher (Figure 2)** – were found mostly on the lower ground on the northern and western sides of the survey area.
 - **Lapwing (Figure 3)** - the two main areas used by this species were the western edge of the survey area in the vicinity of Gladhouse Reservoir, and on the moorland fringe in the north-eastern part. A similar distribution pattern was found in the previous year.
 - **Snipe (Figure 4)** – this species was found mainly in the central part of the survey area, with fewer on the higher moorland to the south and they were largely absent from the areas of more improved agricultural grassland in the north.
 - **Curlew (Figure 5)** – were abundant over most of the survey area, though at lower density in the areas of more improved agricultural grassland in the north (as found in 2021).
 - **Other breeding waders (Figure 6)** - three further species of waders were recorded breeding within the core breeding bird survey area in lower numbers: golden plover, redshank and common sandpiper. The common sandpipers were both found on the edge of Gladhouse Reservoir, two redshank were found on the south-west edge of the survey area (with an additional pair just outside the survey area to the north-west), and the single pair of golden plover was on moorland in the central part of the site.
 - **Skylarks (Figure 7)** and **Meadow Pipit (Figure 8)** were both abundant over all the open moorland habitat within the survey area, though with less on the lower areas of more agriculturally-improved grassland in the north of the survey area.
 - **Wren (Figure 9)** were largely restricted to the woodland habitat but were abundant where this was found.
 - **Dunnock (Figure 10)** was another predominantly woodland species.
 - **Wheatear (Figure 11)** was an open ground species scattered across most of the survey area.
 - **Song Thrush, (Figure 12), Mistle Thrush (Figure 13) Willow Warblers (Figure 14)** and were all widely distributed but largely restricted to the woodland habitats.
 - **Starling (Figure 15)** were associated predominantly with the more agriculturally-improved areas on the lower ground in the north and western parts of the survey area.
 - **Linnet (Figure 16)** and **Lesser Redpoll (Figure 17)** were two further species found mainly associated with woodland and scrub habitats but with a wide distribution.
 - **Reed Bunting (Figure 18)** were distributed widely across the survey area's open habitats (particularly the moorland and other wetter habitats).
19. Other less abundant species of conservation importance (**Figure 19**) were found mainly in the fringes of the survey area and mostly associated with woodland habitats, with no important concentrations

noted and few within the Proposed Development site itself. Of note in a regional context is the black-headed gull breeding colony on the southern edge of the survey area. The 380 pairs breeding at that site are sufficient to be considered of regional importance (313 pairs had been recorded in that colony in 2021).

20. Additional species seen during the breeding bird surveys but not showing any evidence of breeding within the survey area included (peak counts): pink-footed goose (75), peregrine (1), common gull (3), lesser black-backed gull (126), herring gull (4), great black-backed gull (2), swift (11) and fieldfare (8).

Black Grouse Survey Results

21. Two black grouse lekking areas were located during the surveys, the main one on the south-eastern edge of the core survey area (peak count five males), and a second smaller lek (with only single lekking males) within the site at its western end (plus an alternative lekking location 900m south from that during the April survey). The lek counts are summarised in **Table 2**. Their locations are shown in **Figure 20**, together with the other black grouse records during the surveys. The results were very similar to those from the previous year, when up to 7 males were observed lekking at the main site and 1-2 at the other site.

TABLE 2. Black grouse lek counts at Torfichen, 2022

Lek	Date	Number of males
Main (SE)	21/4/22	3
	18/5/22	5
	19/5/22	4
	7/6/22	3
Western	22/4/22	1
	15/5/22	1

Raptor and Owl Survey Results

22. **Osprey** – details of this species' breeding location (in the wider area) are given in **Technical Appendix 9.8 (Confidential)**. Flight activity over the site itself was very infrequent, with only single flight recorded during the VP surveys (**Figure 26**).
23. **Barn Owl** – one pair was breeding in the wider survey area - details are given in **Technical Appendix 9.8 (Confidential)**. There were no records within the core survey area during the breeding bird or VP surveys.
24. **Goshawk** – this species was occasionally recorded during the VP surveys and is likely to have bred nearby (though not within the core survey area). Further details (including its flight lines) are given in **Technical Appendix 9.8 (Confidential)**.
25. **Red Kite** - there were two records of this species seen overflying during the VP surveys (see **Figure 26**), but no evidence of breeding within the core or the wider survey area.
26. **Hen Harrier** – there was a single record during the VP surveys (**Figure 26**), but no evidence of breeding within the core or the wider survey area.
27. **Marsh Harrier** – there was a single record during the VP surveys (**Figure 26**), but no evidence of breeding within the core or the wider survey area.



- 28. **Peregrine** - there was a single record of this species overflying during the core breeding bird surveys, one during the wider area surveys and three during the VP surveys (see **Figure 26**), but no evidence of breeding within the core or the wider survey area.
- 29. **Merlin** - there were three records of this species seen overflying during the VP surveys (see **Figure 26**), but no evidence of breeding within the core or the wider survey area.
- 30. **Short-eared Owl** – there was a single record during the VP surveys (**Figure 26**), but no evidence of breeding within the core or the wider survey area in 2022.

Vantage Point Survey Results

- 31. The rates of bird flight movement observed across the survey area during the VP surveys from the three VPs are summarised in **Table 3**. This gives the monthly mean flight rates observed, and the total number of flights recorded during the survey period. Key species flight lines are shown in **Figures 21-26**. **Table 3** also gives the percentage of flights of each species that were recorded at rotor height (between 30 m and 180 m above ground level).

TABLE 3. Bird flight rates recorded over the Torfichen breeding bird survey area during April – August 2022 vantage point surveys. N = 36 hours total observation at each of three VPs.

Species	Flight rate (birds/hour)					Total number of flights	% flights at rotor height
	Apr	May	Jun	Jul	Aug		
Pink-footed Goose	0.05	0	0	0	0	1	100%
Greylag Goose	1.33	0.43	0.42	0.67	1.62	95	21%
Shelduck	0	0.19	0	0	0	4	0%
Teal	0	0.14	0.08	0	0	5	0%
Mallard	0.24	0	0.08	0	0	7	0%
Black Grouse	0.05	0	0	0	0	1	0%
Red Kite	0.05	0.05	0	0	0	2	100%
Marsh Harrier	0	0	0	0	0.05	1	0%
Hen Harrier	0	0	0.04	0	0	1	0%
Goshawk	0.05	0.05	0	0.10	0	4	0%
Sparrowhawk	0.14	0.14	0.13	0.10	0	11	27%
Buzzard	1.62	1.81	2.00	1.38	0.81	166	46%
Osprey	0	0	0	0.05	0	1	100%
Kestrel	0.71	0.24	0.63	0.48	0.81	62	13%
Merlin	0.05	0	0	0	0.10	3	0%
Peregrine	0.14	0	0	0	0	3	100%
Oystercatcher	0	0.05	0.96	0.76	0	40	12%
Lapwing	3.00	6.00	5.38	0.90	4.57	433	4%
Snipe	0.48	0.19	0.67	0.05	0	31	33%
Curlew	5.38	5.48	6.21	1.05	0	399	12%
Redshank	0	0.05	0	0	0	1	100%
Common Gull	0	0	0.08	0.19	4.24	95	58%
Lesser Black-backed Gull	2.48	6.71	3.46	1.76	2.81	372	55%





Species	Flight rate (birds/hour)					Total number of flights	% flights at rotor height
	Apr	May	Jun	Jul	Aug		
Herring Gull	0.24	1.67	0.42	0.05	1.33	79	53%
Great Black-backed Gull	0.10	0	0.04	0	0	3	33%
Little Gull	0	0.05	0	0	0	1	0%
Black-headed Gull	88.2	31.0	0	0.19	0.14	2509	84%
Short-eared Owl	0.05	0	0	0	0	1	0%

32. Overall flight activity was generally similar to that observed during the 2021 surveys. Key species' flight lines are mapped in **Figures 20-26**.
33. **Greylag goose** flight activity (**Figure 21**) was widely distributed over the survey area, though with more in the western part, in proximity to Gladhouse Reservoir.
34. **Oystercatcher** (**Figure 22**) flight activity was widespread but concentrated in their main breeding areas in the northern and western parts of the survey area.
35. **Lapwing** flights (**Figure 23**) were similarly concentrated around their two main breeding areas (the western edge of the survey area in the vicinity of Gladhouse Reservoir, and on the moorland fringe in the north-eastern part).
36. **Snipe** flights (**Figure 24**) were recorded mainly in the central part of the survey area.
37. **Curlew** flight activity was widespread across most of the survey area (though largely absent from the northern edge), reflecting their abundance and their wide breeding distribution (**Figure 25**).
38. Scarce raptors (**osprey, red kite, marsh harrier, hen harrier, merlin, peregrine** and **short-eared owl**) were only seen very infrequently (**Figure 26**), and no particular concentrations of activity were apparent.
39. Given the high numbers of breeding black-headed gulls it was not possible to individually plot all of their flight lines, but **Figure 27** summarises their main flight routes (taken from a sample of flights that were mapped). There was a marked decline in flight activity in June/July surveys, coincident with the desertion of the breeding colony (following breeding failure).

Conservation Evaluation of Breeding Bird Populations

40. The conservation value of the breeding bird populations was determined using the criteria specified in **Table 4** (from Percival 2007). This includes the criteria adopted by NatureScot in Guidelines for Selection of Biological Sites of Special Scientific Interest (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 (>1%) in a NHZ context (Wilson *et al.* 2015). 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 v.5' (Stanbury *et al.* 2021) that did not reach national or regional importance at the Proposed 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 UK/Scottish





Biodiversity Action Plan (BAP) priority species were all considered in the evaluation process. The results are summarised in Table 5 for birds breeding within the survey area and **Table 6** for the non-breeding birds.

TABLE 4. Definition of terms relating to the conservation value of the ornithological receptors at the site.

Sensitivity	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. UK BAP 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. Scottish BAP priority species (if not covered above).

TABLE 5. Conservation evaluation of the breeding bird populations in the Torfichen survey area, 2021 and 2022.

Species	Breed- ing pairs 2021	Breed- ing pairs 2022	>1% NHZ	EU Ann 1	W and C Act Sch 1	Red [R]/ Amber [A] List	UK BAP priority sp	Scottish BAP sp	Conservation Value
Mute Swan	1	1							Nil
Greylag Goose ²	25	8				A			Low
Canada Goose	0	2							Nil
Shelduck	0	2				A			Low
Teal ³	2	1				A			Low
Mallard	6	4				A			Low
Tufted Duck	4	4							Nil
Red Grouse ¹	18	8					✓		Medium
Black Grouse ³	1 (8)	1 (6)	✓			R	✓	✓	Medium
Red-legged Partridge	1	6							Nil
Quail	1	0			✓	A			High
Pheasant	20	27							Nil
Little Grebe ³	1	1							Nil





Species	Breed- ing pairs 2021	Breed- ing pairs 2022	>1% NHZ	EU Ann 1	W and C Act Sch 1	Red [R]/ Amber [A] List	UK BAP priority sp	Scottish BAP sp	Conservation Value
Osprey ⁴	0	(1)	✓	✓	✓	A			High
Buzzard ²	13	17							Nil
Kestrel	4	3				A		✓	Low
Moorhen	1	3				A			Low
Coot	0	1							Nil
Oystercatcher ²	7	13				A			Low
Golden Plover ²	2	2		✓				✓	High
Lapwing	33	45				R	✓	✓	Medium
Snipe ²	27	28	✓			A			Medium
Curlew ²	87	57	✓			R	✓	✓	Medium
Common Sandpiper ²	0	2				A			Low
Redshank ²	3	2				A			Low
Black-headed Gull	313	380	✓			A			Medium
Feral Pigeon	0	4							Nil
Stock Dove	0	1				A			Low
Woodpigeon	99	594				A			Low
Collared Dove	0	1							Nil
Cuckoo ^{2,5}	2	2				R	✓	✓	Medium
Long-eared Owl	1	0	✓						Medium
Short-eared Owl ^{3,5}	(1)	0	✓	✓		A		✓	High
Barn Owl	0	(1)			✓				High
Great Spotted Woodpecker	1	8							Nil
Skylark	327	520				R	✓	✓	Medium
Sand Martin	3	24							Nil
Swallow	9	13							Nil
House Martin	0	2				R			Low
Tree Pipit	2	0				R	✓	✓	Medium
Meadow Pipit	450	1040				A			Low
Grey Wagtail ²	0	5				A			Low
Pied Wagtail	3	21							Nil
Wren	16	90				A			Low
Dunnock	5	18				A	✓		Medium
Robin	21	56							Nil





Species	Breed- ing pairs 2021	Breed- ing pairs 2022	>1% NHZ	EU Ann 1	W and C Act Sch 1	Red [R]/ Amber [A] List	UK BAP priority sp	Scottish BAP sp	Conservation Value
Redstart	1	3							Nil
Whinchat ²	3	3				R			Low
Stonechat ²	5	16							Nil
Wheatear ¹	22	26				A			Low
Blackbird	14	35							Nil
Song Thrush	16	24				A	✓	✓	Medium
Mistle Thrush	12	14				R			Low
Grasshopper Warbler	0	1				R	✓	✓	Medium
Sedge Warbler	0	4				A			Low
Blackcap	0	2							Nil
Whitethroat	0	1							Nil
Chiffchaff	4	13							Nil
Willow Warbler	35	101				A			Low
Goldcrest	7	38							Nil
Spotted Flycatcher	1	1				R	✓	✓	Medium
Long-tailed Tit	0	1							Nil
Blue Tit	5	11							Nil
Great Tit	5	8							Nil
Coal Tit	9	51							Nil
Treecreeper	0	1							Nil
Jay	0	4							Nil
Magpie	2	6							Nil
Jackdaw	12	22							Nil
Rook	65	55				A			Low
Carrion Crow	38	37							Nil
Raven ³	5	1							Nil
Starling	1	12				R	✓		Medium
House Sparrow	0	8				R	✓	✓	Medium
Tree Sparrow	0	2				R	✓	✓	Medium
Chaffinch	50	132							Nil
Goldfinch	2	13							Nil
Siskin	5	33						✓	Low
Linnet	3	10				R	✓	✓	Medium
Lesser Redpoll	3	41					✓	✓	Medium





Species	Breed- ing pairs 2021	Breed- ing pairs 2022	>1% NHZ	EU Ann 1	W and C Act Sch 1	Red [R]/ Amber [A] List	UK BAP priority sp	Scottish BAP sp	Conservation Value
Common Crossbill	2	7			✓				High
Bullfinch	0	2				A	✓	✓	Medium
Yellowhammer	0	4				R	✓	✓	Medium
Reed Bunting	8	45				A	✓	✓	Medium

Note: superscripts indicate contribution to the JNCC breeding bird assemblage score for the main habitat within the survey area, 'Upland moorland and grassland with waterbodies'.

Numbers in brackets refer to breeding records in the wider survey area.

41. Two high value species were recorded breeding within the core breeding bird survey area during 2022, golden plover and common crossbill, and a third was recorded there in 2021 (quail). One further high value species was breeding in the wider 2 km buffer in 2021 (short-eared owl) and two in 2022 (osprey and barn owl).
42. Twenty-two breeding species were classed as medium conservation value over the two years: red grouse, black grouse, lapwing, snipe, curlew, black-headed gull, long-eared owl, cuckoo, skylark, tree pipit, dunnoek, song thrush, grasshopper warbler, spotted flycatcher, starling, house sparrow, tree sparrow, linnets, lesser redpoll, bullfinch, yellowhammer and reed bunting. All were classed as medium value because they occurred at the site in regionally important numbers (>1% NHZ population: snipe, curlew, black-headed gull and long-eared owl) and/or for their listing on the UK BAP list of priority species. They are mostly farmland species that have declined widely across Britain but are still common and widespread.
43. A further 21 breeding species were classed as low sensitivity, through their listing on RSPB *et al.*'s (Stanbury *et al.* 2021) amber lists of birds of conservation concern and/or the Scottish Biodiversity List.
44. The overall conservation value of the breeding bird community, measured from the core survey data as the breeding bird assemblage score, was 46. This is above the threshold for national importance (40) for the main habitat within the survey area, 'Upland moorland and grassland with water bodies' (Drewitt *et al.* 2020). The core survey area therefore supports a nationally important breeding bird community.
45. The evaluation of the conservation importance of the non-breeding species observed during these surveys is given in **Table 6**. This included one very high value species (pink-footed goose, linked to the Gladhouse Reservoir and Fala Flow SPAs – see previous winter report (Percival *et al.* 2022) for a more detailed assessment of this wintering species), nine high value species (red kite, marsh harrier, hen harrier, goshawk, osprey, merlin, peregrine, whimbrel and little gull), all EU Annex 1/Wildlife and Countryside Act Schedule 1 species), one medium value (herring gull, a UK BAP priority species), 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.

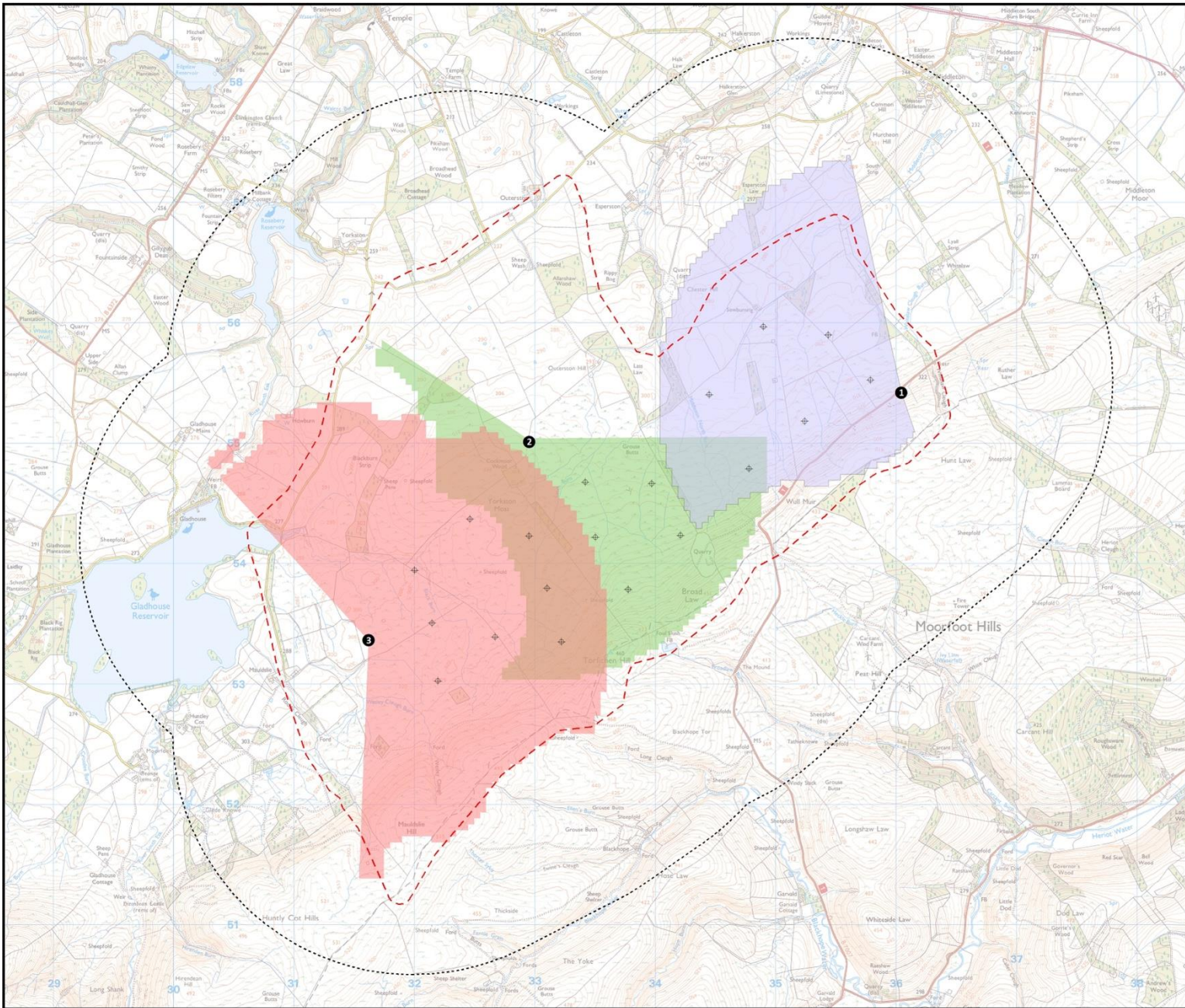




TABLE 6. Conservation evaluation of the non-breeding bird populations in the Torfichen survey area, 2021 and 2022.

Species	Peak count 2021	Peak count 2022	EU Ann 1	W and C Act Sch 1	Red [R]/ Amber [A] List	UK BAP priority sp	Scottish BAP sp	Conservation Value
Pink-footed Goose	0	75			A			Very high
Cormorant	8	0						Nil
Grey Heron	1	1						Nil
Red Kite	1	1	✓	✓			✓	High
Marsh Harrier	0	1	✓	✓	A		✓	High
Hen Harrier	0	1	✓	✓	R		✓	High
Goshawk	0	2		✓				High
Osprey	0	1	✓	✓	A		✓	High
Merlin	0	1	✓	✓	R		✓	High
Peregrine	1	1	✓	✓			✓	High
Whimbrel	1	0		✓	R			High
Common Gull	0	23			A			Low
Lesser Black-backed Gull	41	126			A			Low
Herring Gull	106	16			R	✓	✓	Medium
Great Black-backed Gull	1	2			A			Low
Little Gull	0	1	✓	✓				High
Swift	0	11			R		✓	Low
Fieldfare	0	8			R			Low





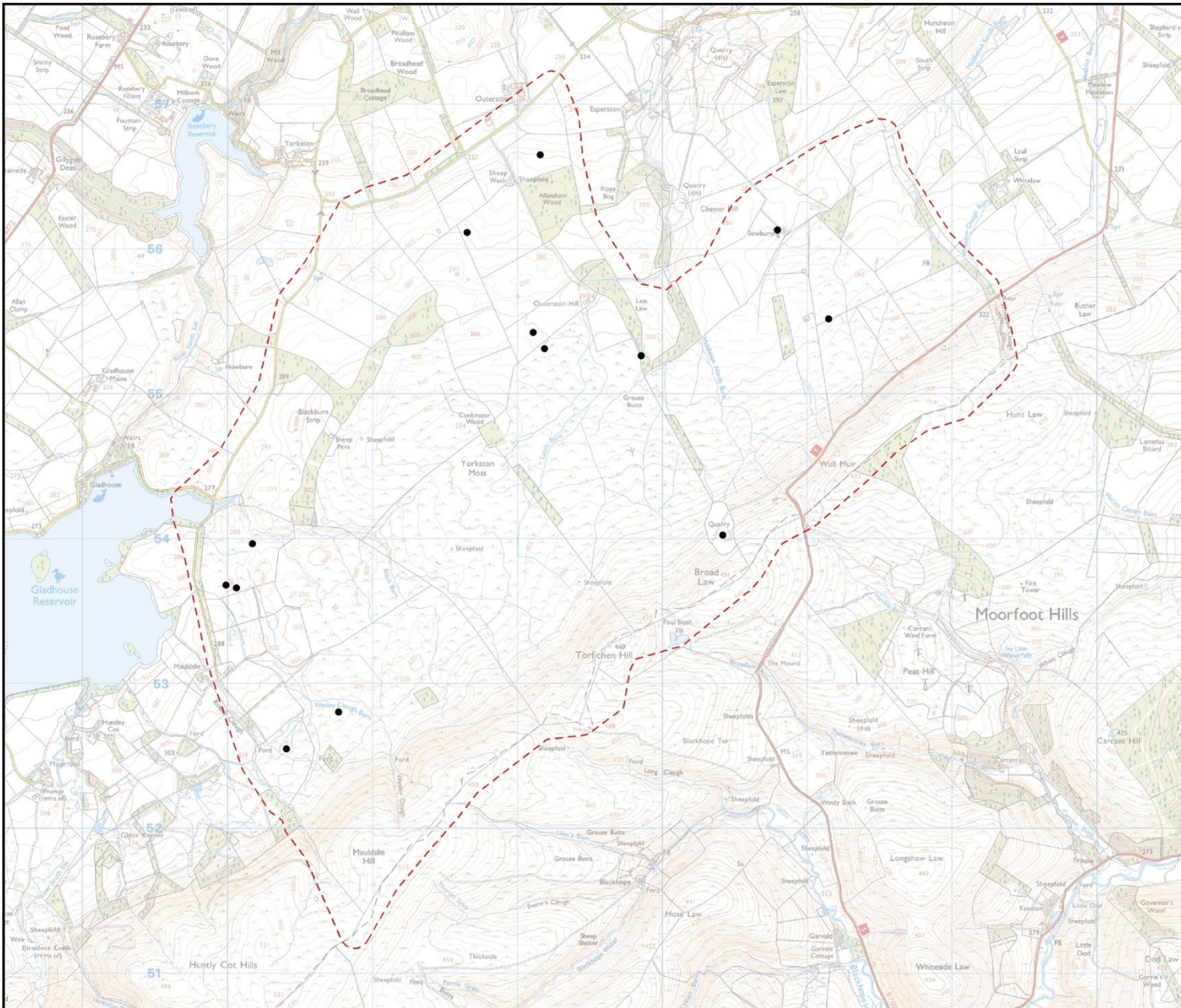
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Wind Farm**

**FIGURE 1
Breeding Bird
Survey Areas
and VP Viewsheds**

- KEY:**
- ⊕ Turbine locations (scoping)
 - VP locations
 - - - Core breeding bird survey area
 - VP1 viewshed
 - VP3 viewshed
 - VP2 viewshed
 - - - Wider Survey Area



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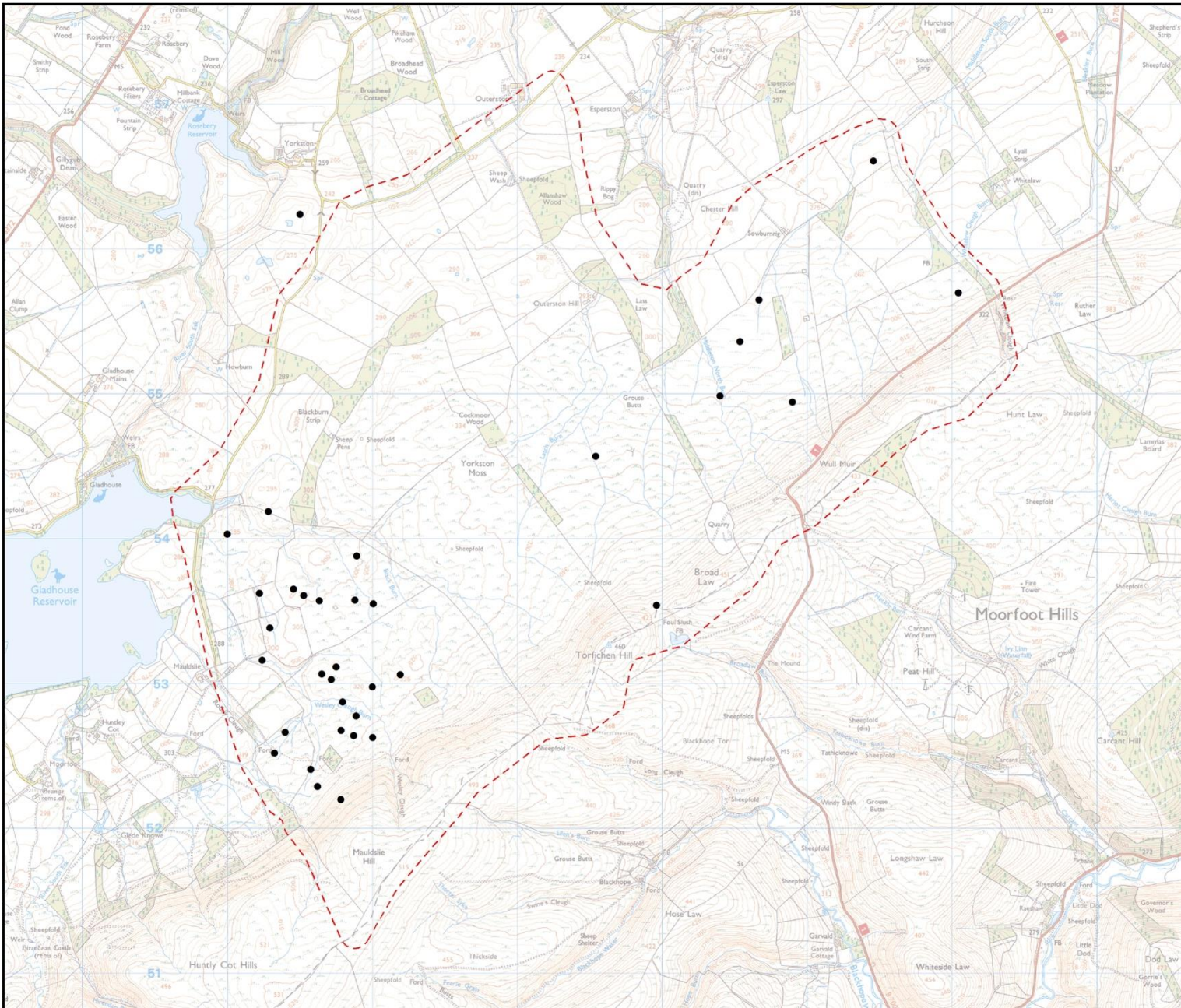
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FIGURE 2
**Breeding Distribution
of Oystercatcher, 2022**

- KEY:**
- Approx. breeding location
 - Core breeding bird survey area



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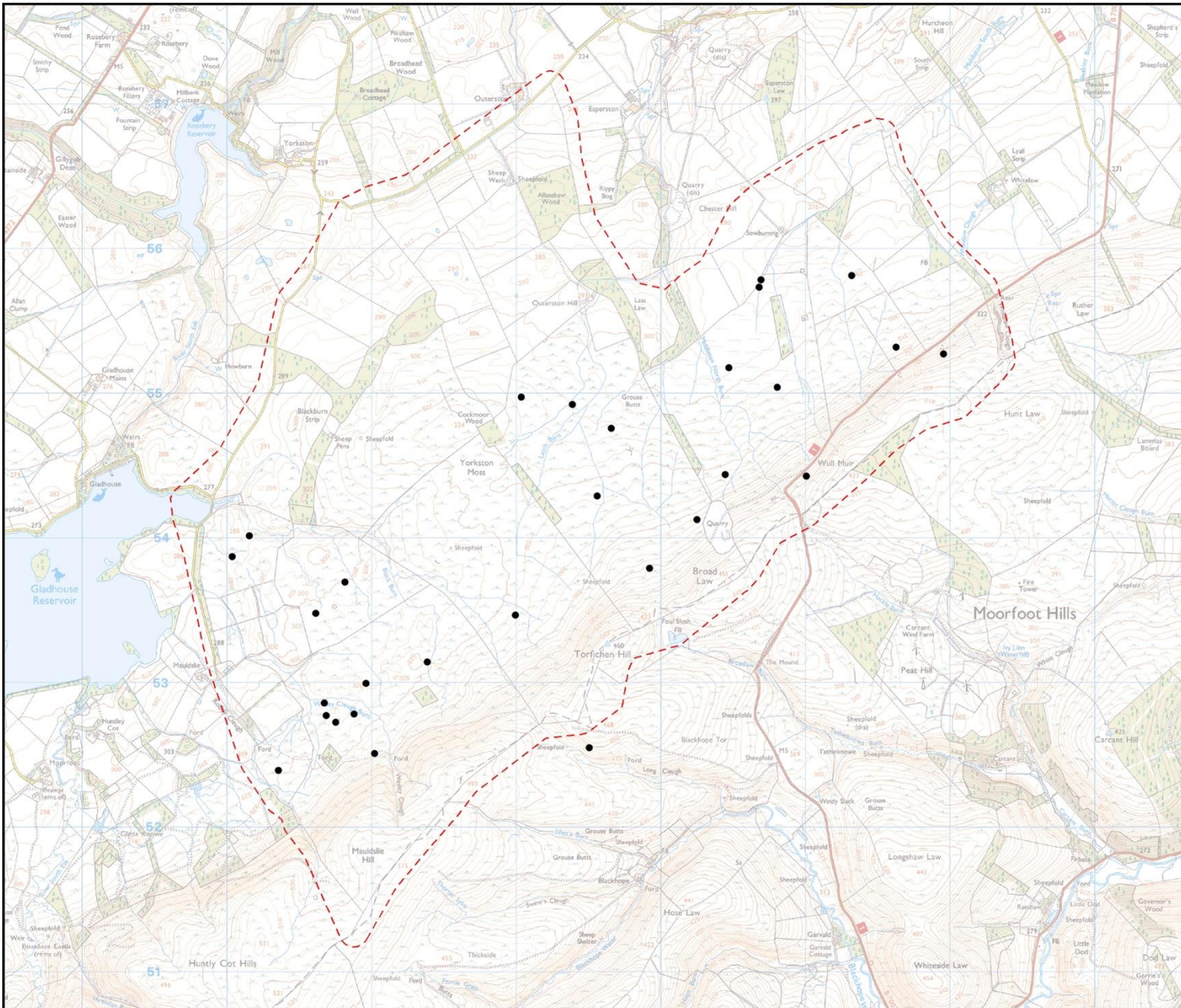
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**FIGURE 3
Breeding Distribution
of Lapwings, 2022**

- KEY:**
- Approx. breeding location
 - Core breeding bird survey area



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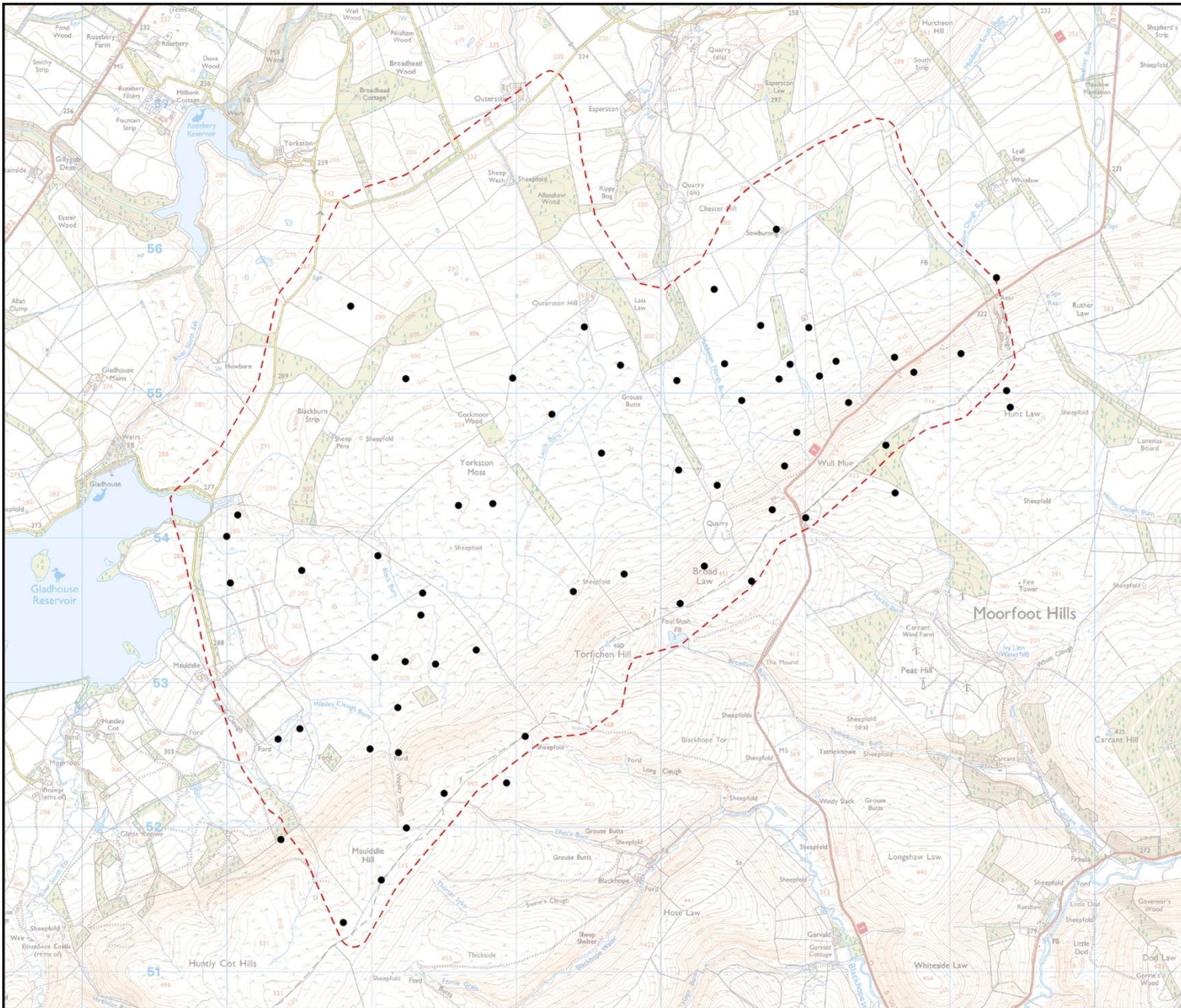
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**FIGURE 4
Breeding Distribution
of Snipe, 2022**

- KEY:**
- Approx. breeding location
 - Core breeding bird survey area



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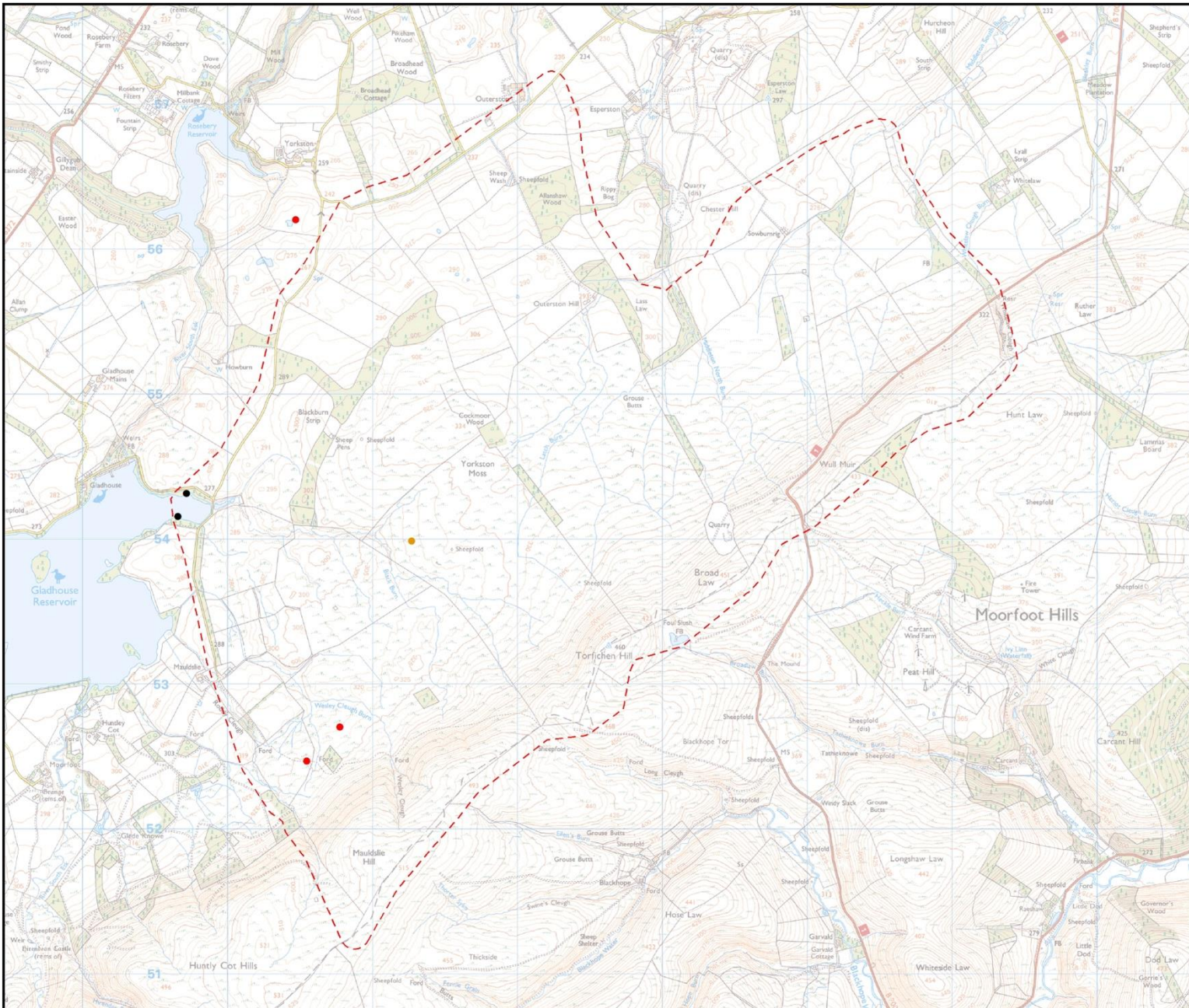
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**FIGURE 5
Breeding Distribution
of Curlew, 2022**

- KEY:**
- Approx. breeding location
 - Core breeding bird survey area



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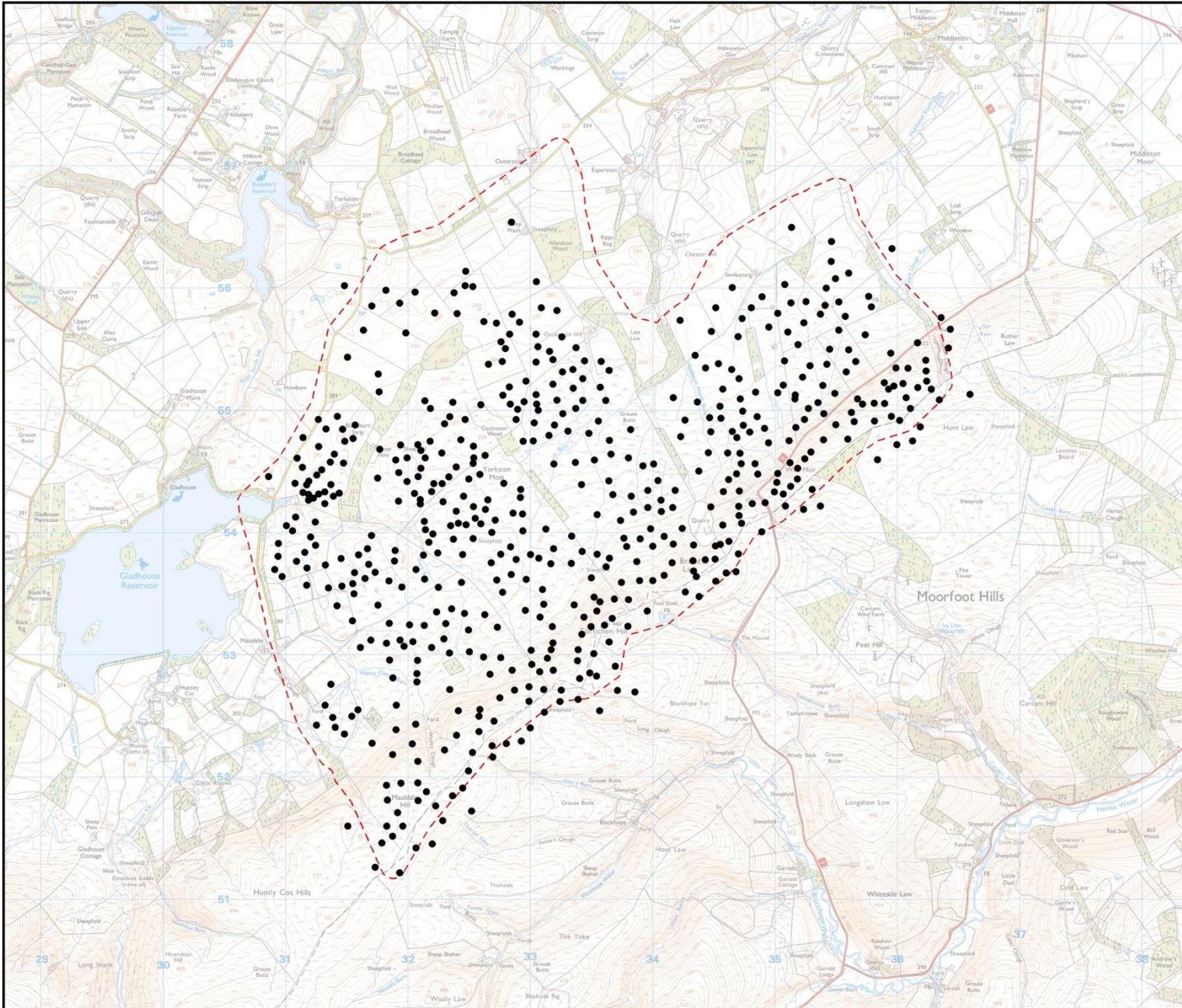
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FIGURE 6
**Breeding Distribution
of Other Waders, 2022**

- KEY:**
- Species**
- Common Sandpiper
 - Golden Plover
 - Redshank
 - Core breeding bird survey area



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FIGURE 7

**Breeding Distribution
of Skylark, 2022**

KEY:

- Approx. breeding location
- Core breeding bird survey area



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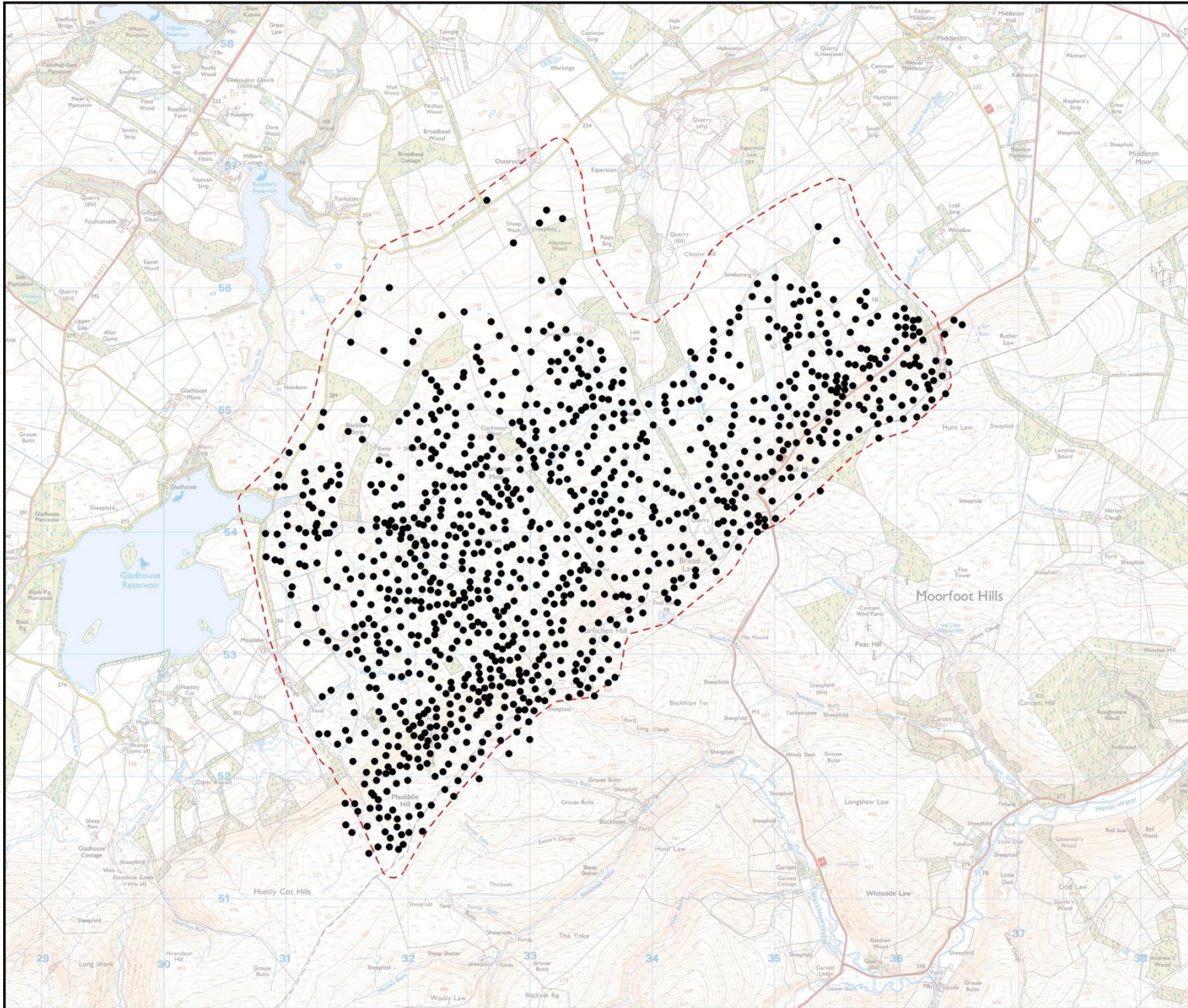
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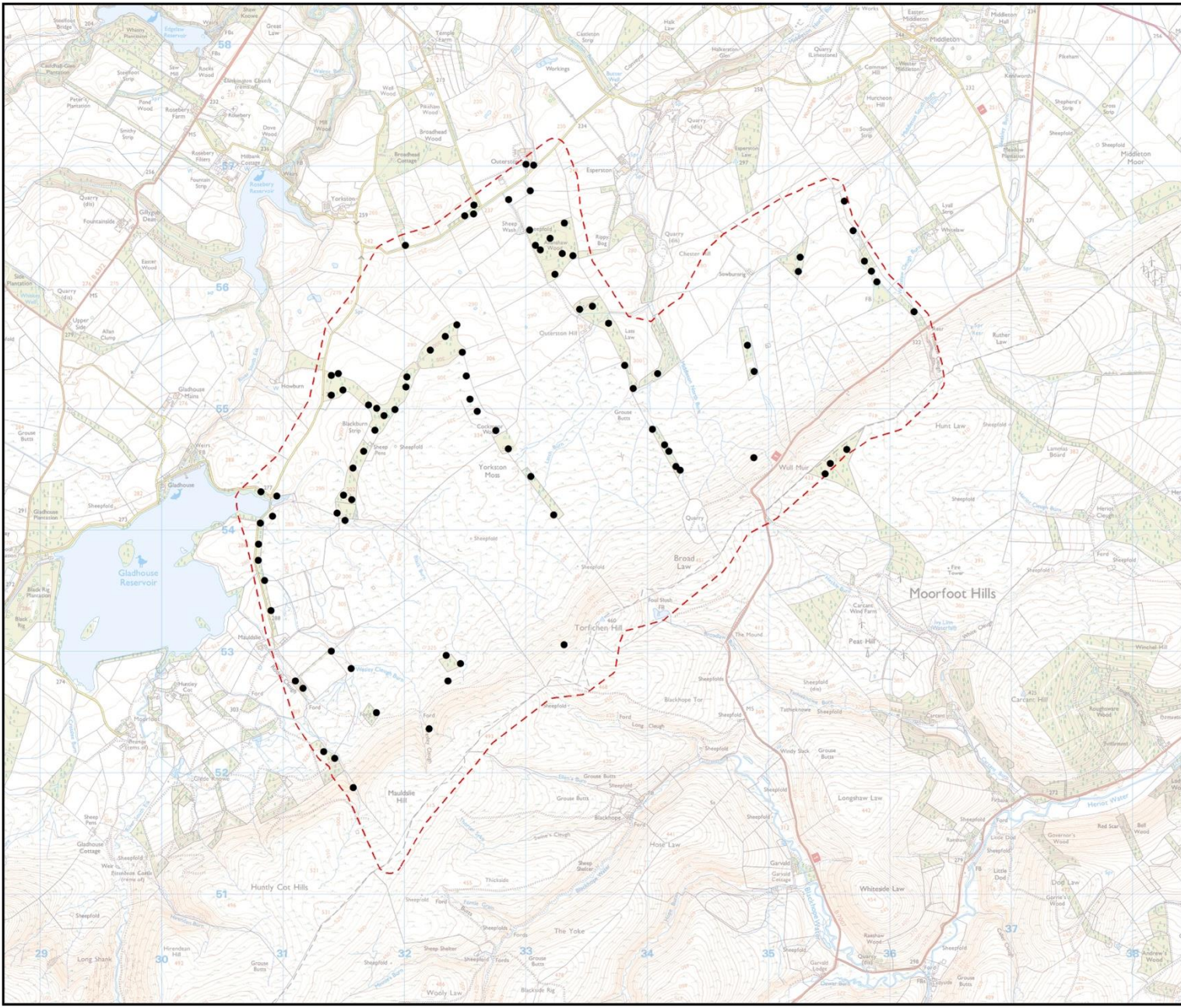
FIGURE 8

**Breeding Distribution
of Meadow Pipit, 2022**

- KEY:**
- Approx. breeding location
 - - - Core breeding bird survey area



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FIGURE 9

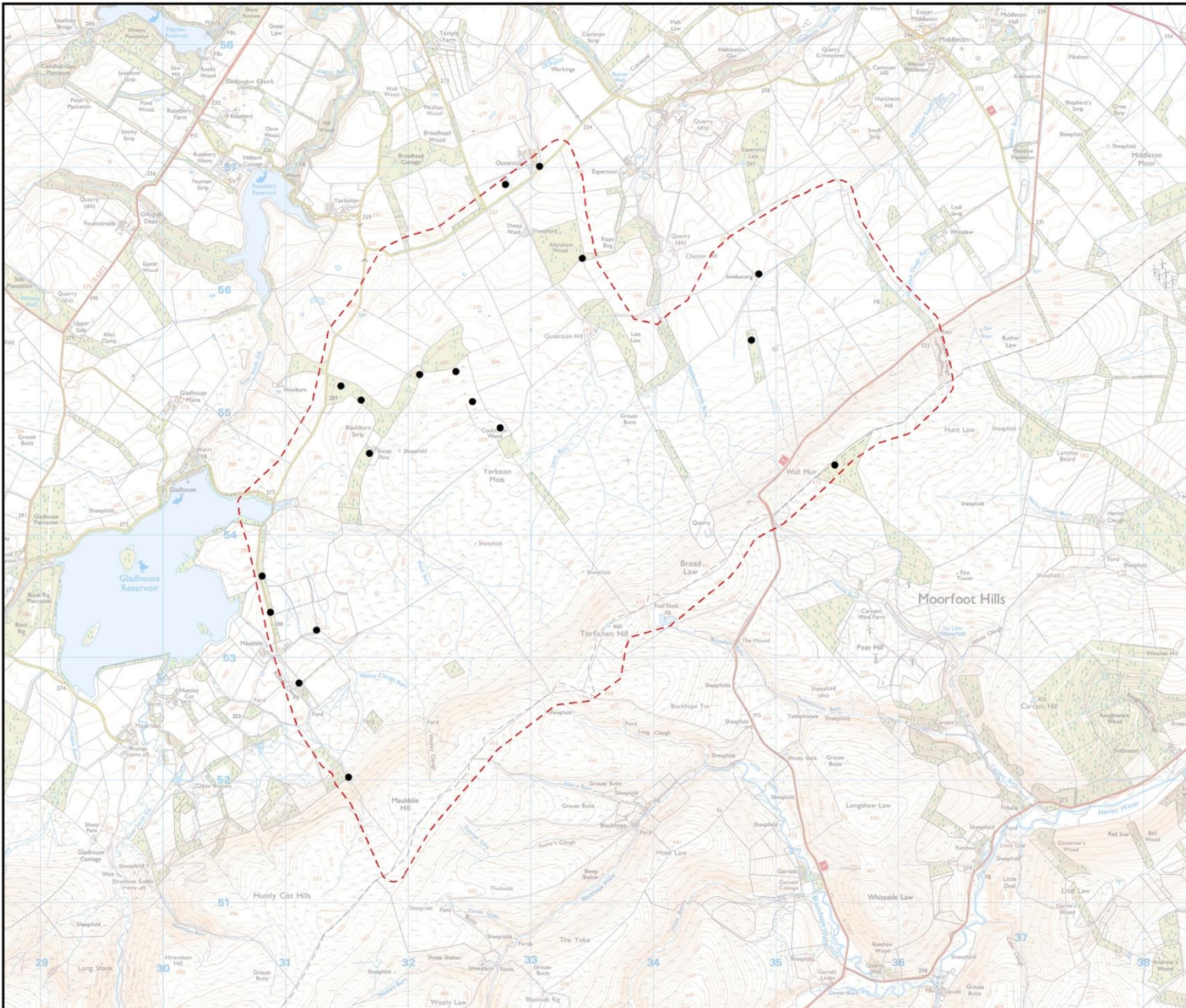
**Breeding Distribution
of Wren, 2022**

KEY:

- Approx. breeding location
- ▭ Core breeding bird survey area



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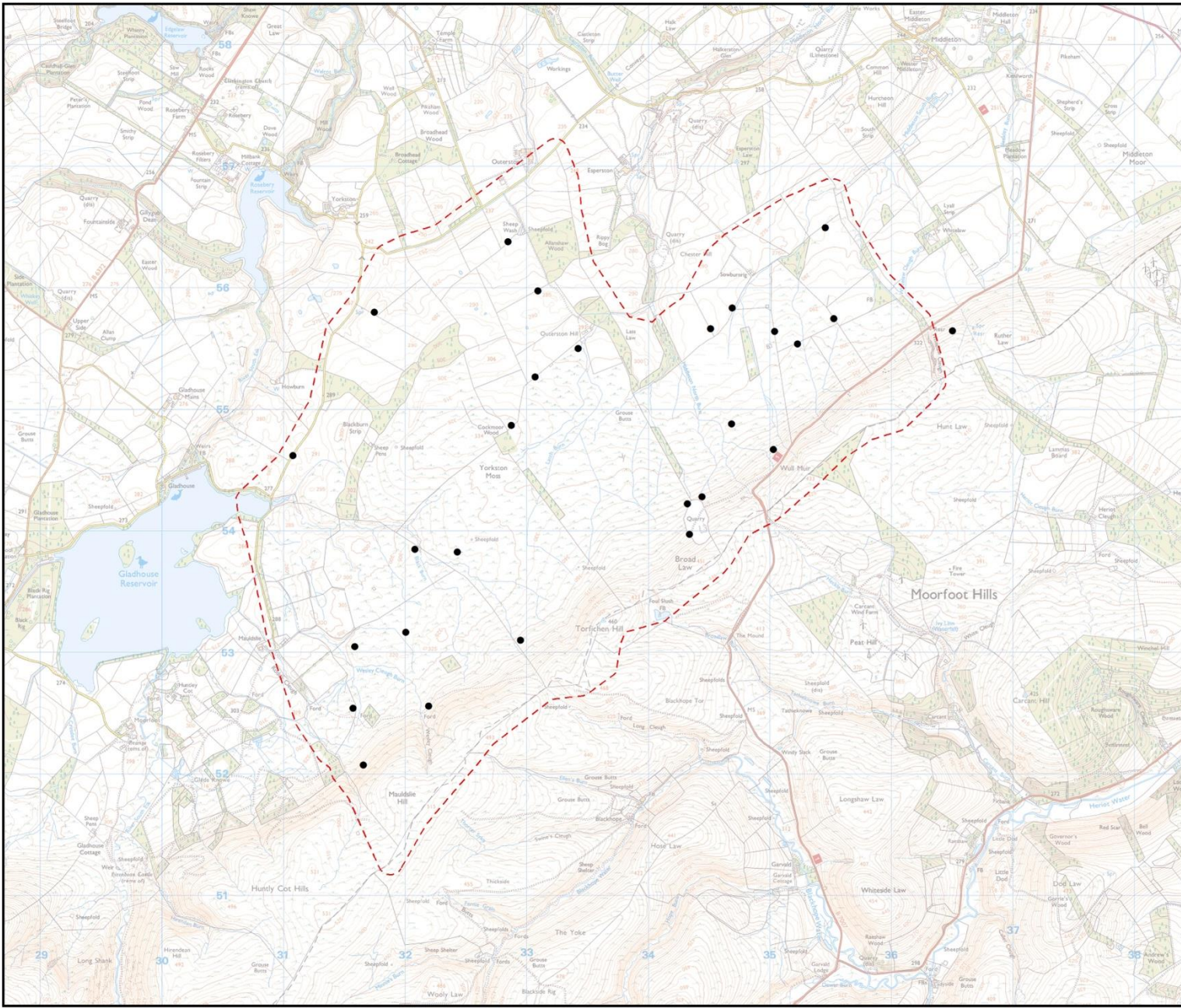
FIGURE 10

**Breeding Distribution
of Dunnock, 2022**

- KEY:**
- Approx. breeding location
 - Core breeding bird survey area



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FIGURE 11

**Breeding Distribution
of Wheatear, 2022**

KEY:

- Approx. breeding location
- ▭ Core breeding bird survey area



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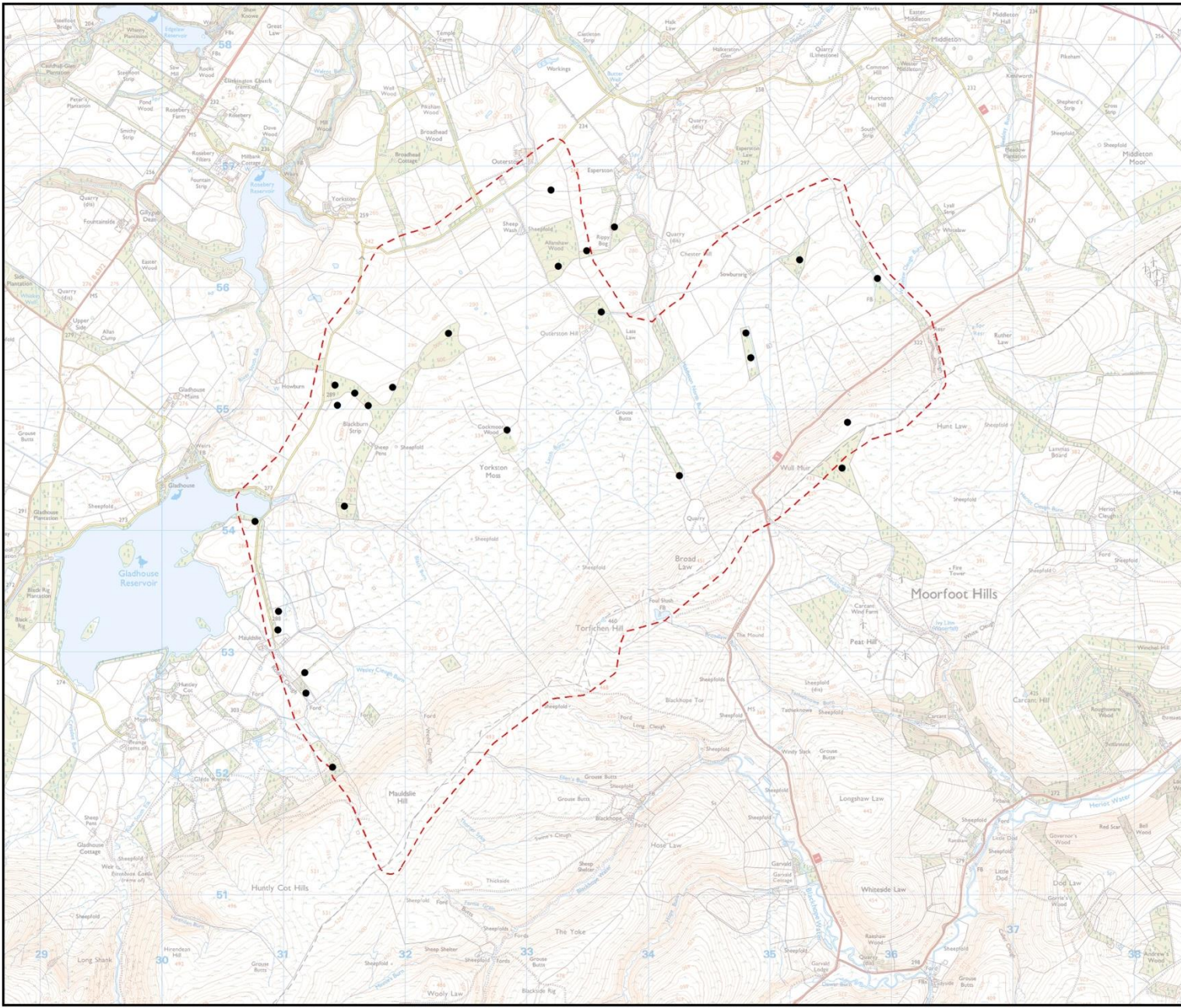
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FIGURE 12

**Breeding Distribution
of Song Thrush, 2022**

- KEY:**
- Approx. breeding location
 - Core breeding bird survey area



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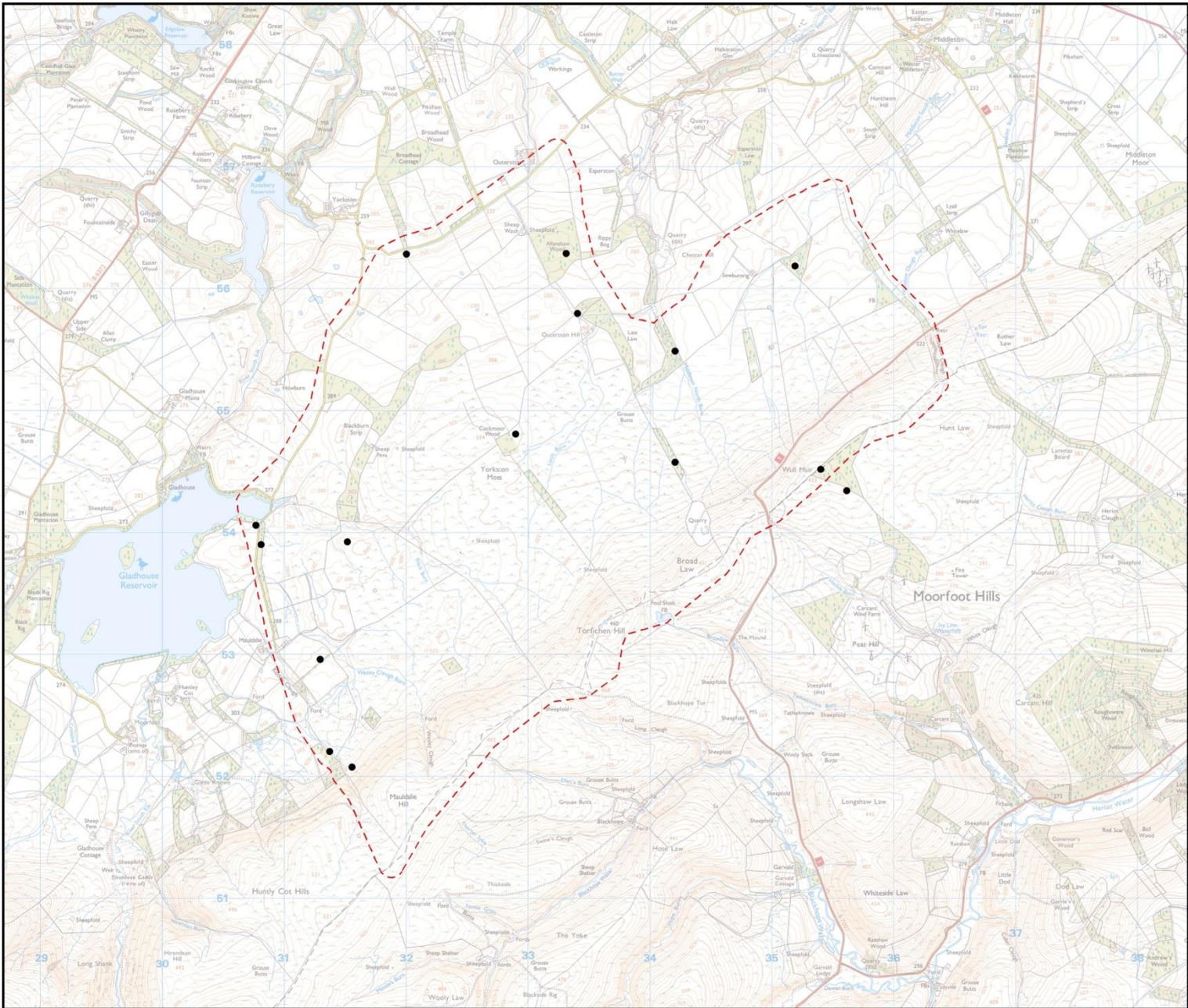
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FIGURE 13

**Breeding Distribution
of Mistle Thrush, 2022**

KEY:

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- Core breeding bird survey area



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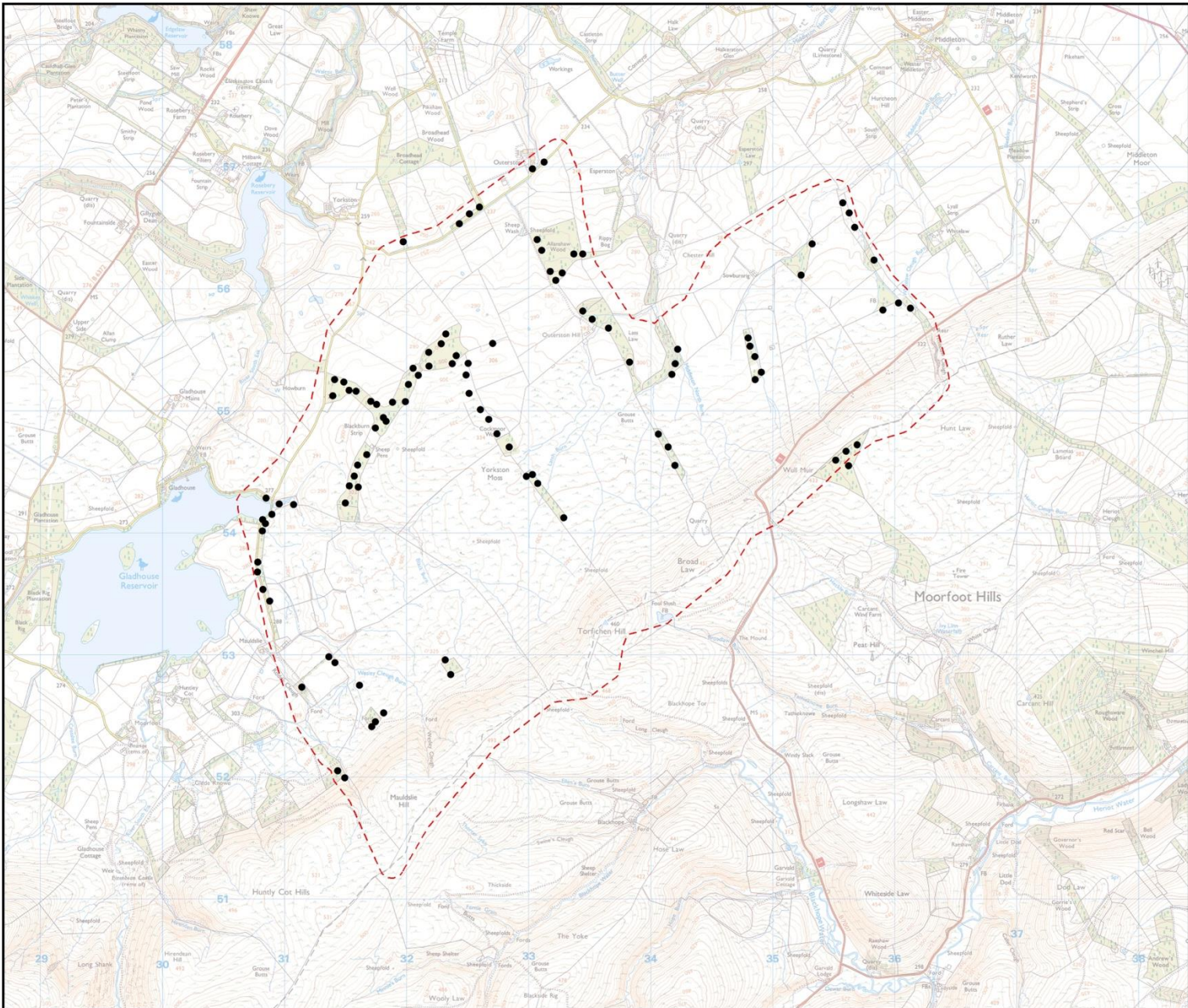
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FIGURE 14

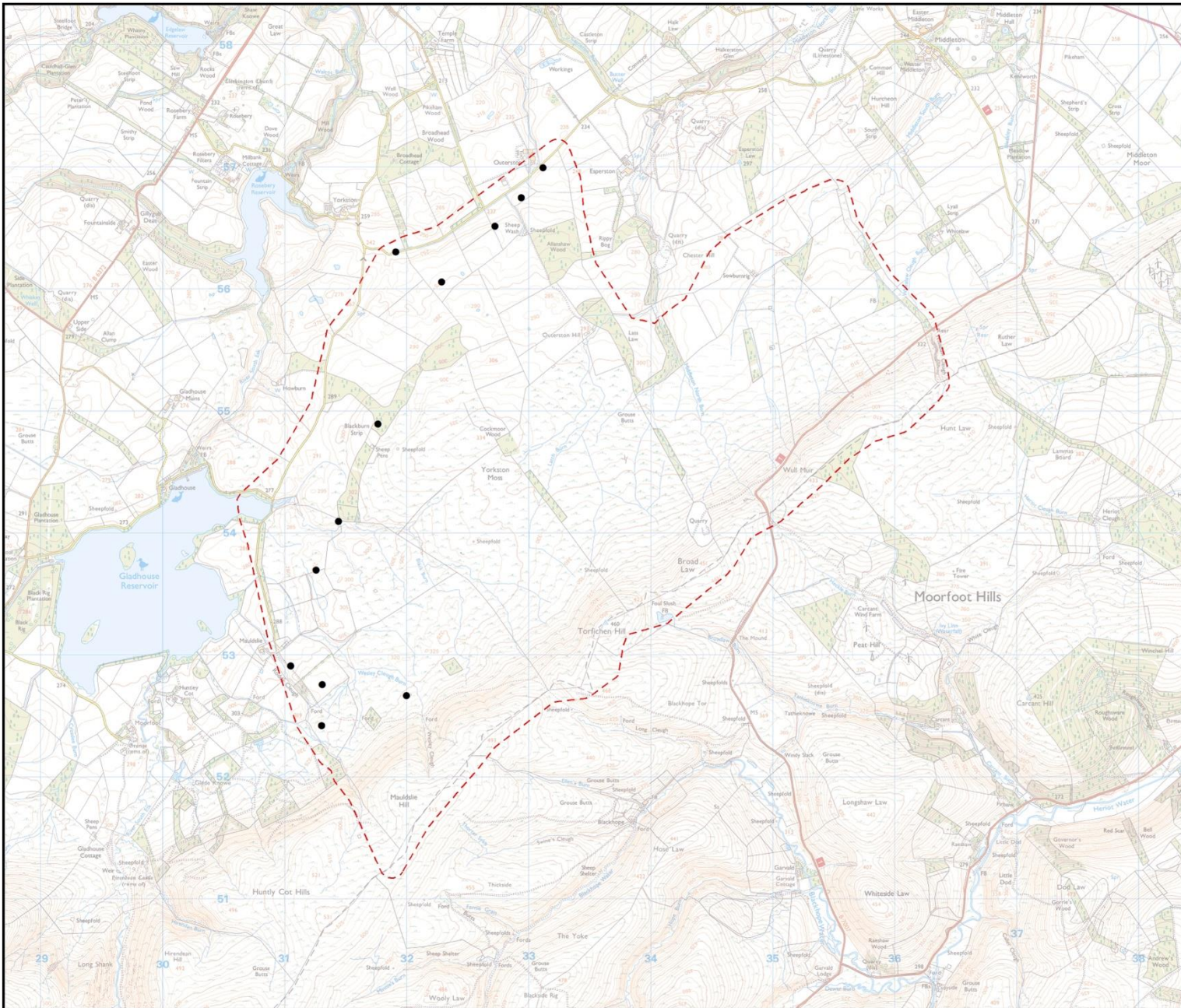
**Breeding Distribution
of Willow Warbler, 2022**

KEY:

- Approx. breeding location
- Core breeding bird survey area



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FIGURE 15

**Breeding Distribution
of Starling, 2022**

KEY:

- Approx. breeding location
- Core breeding bird survey area



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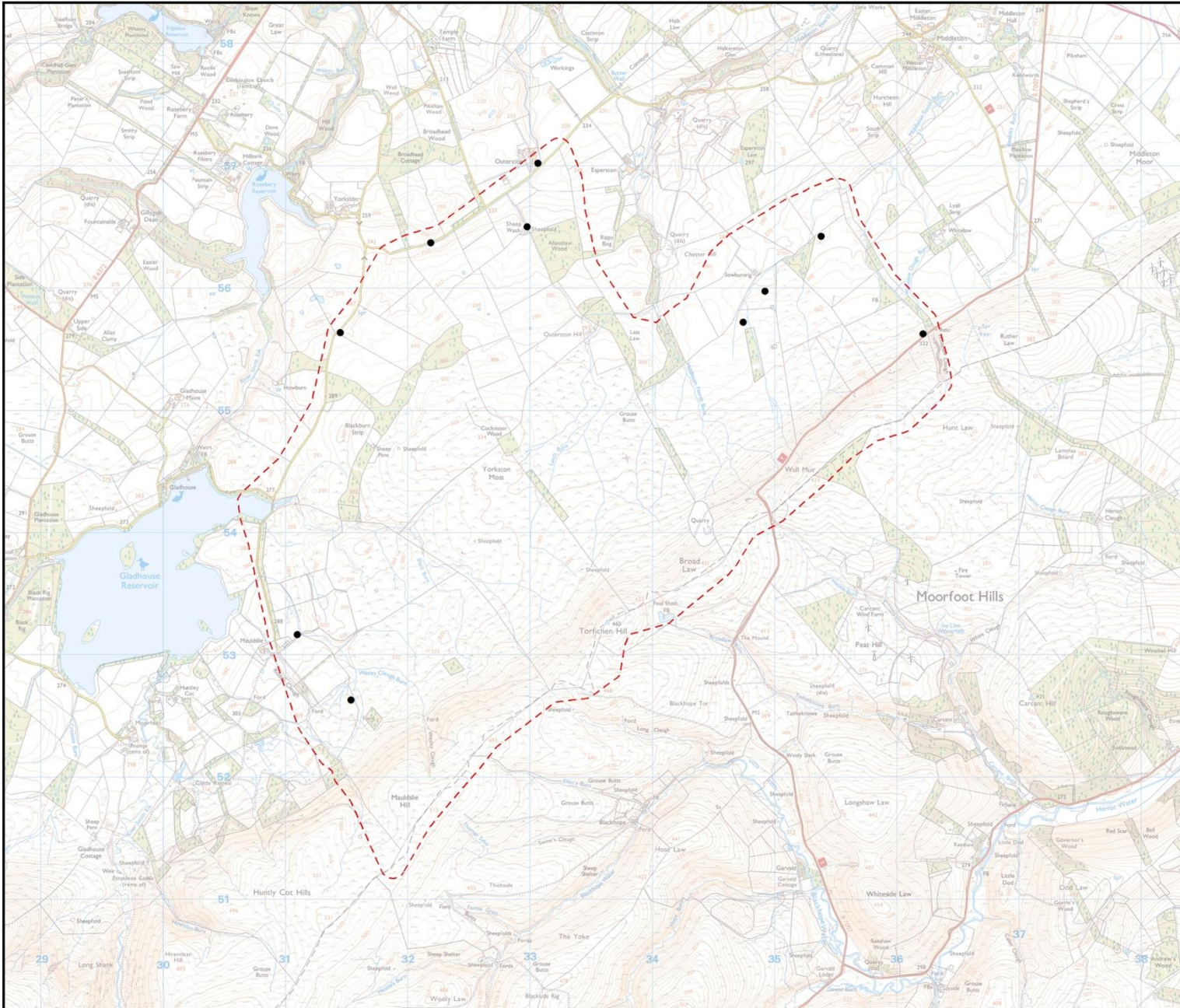
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FIGURE 16

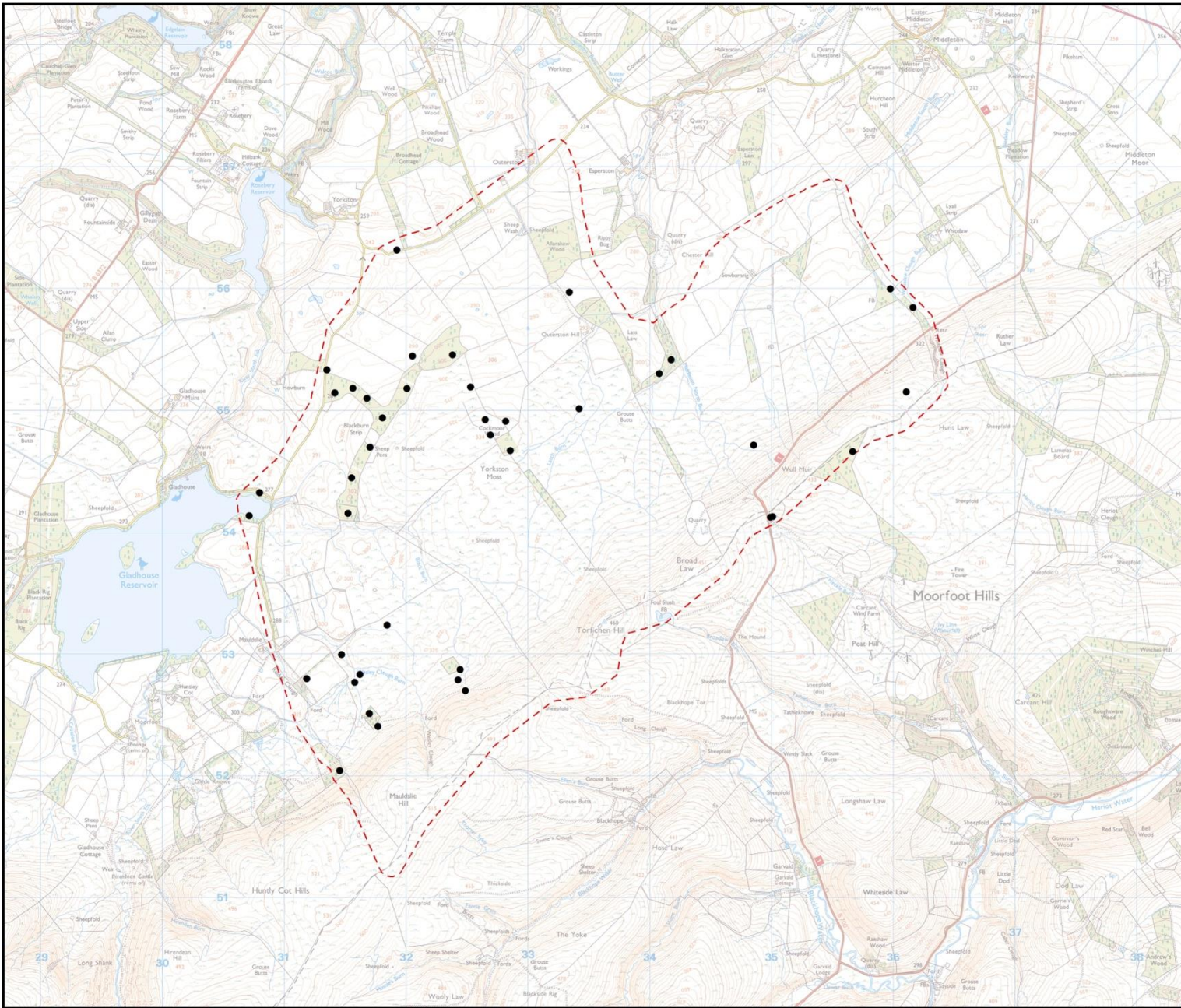
**Breeding Distribution
of Linnet, 2022**

KEY:

- Approx. breeding location
- Core breeding bird survey area



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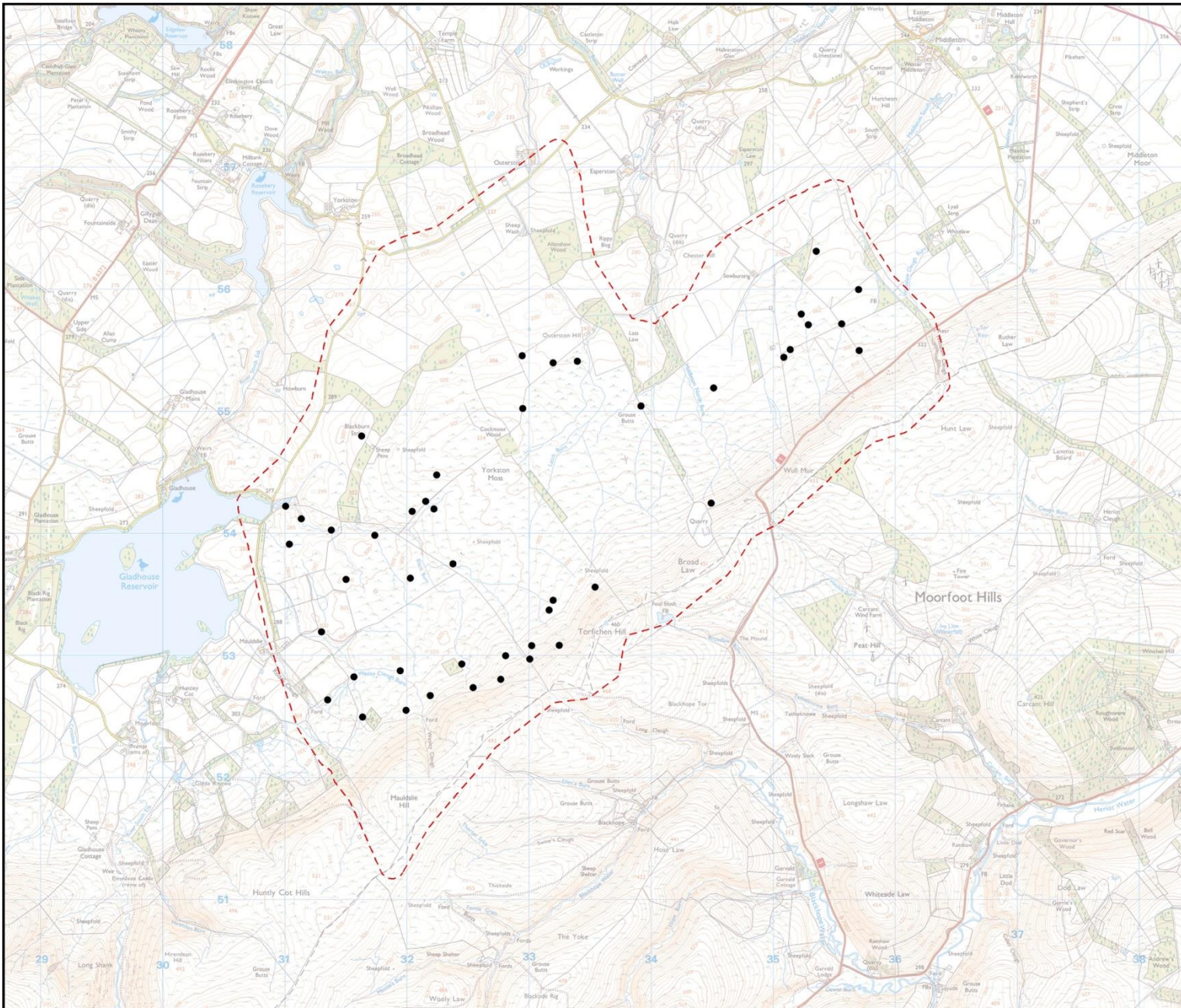
FIGURE 17

**Breeding Distribution
of Lesser Redpoll, 2022**

- KEY:**
- Approx. breeding location
 - Core breeding bird survey area



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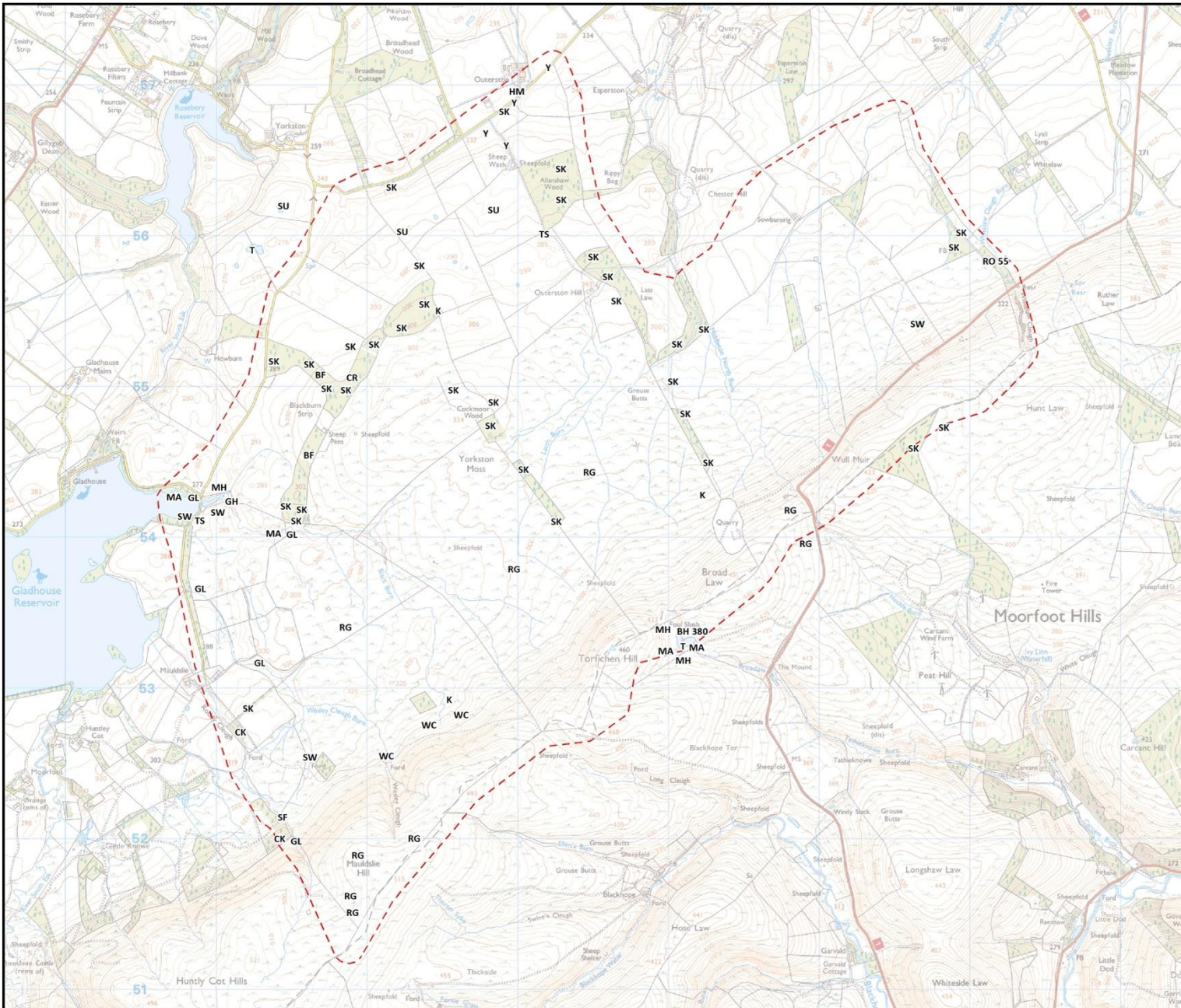
FIGURE 18

**Breeding Distribution
of Reed Bunting, 2022**

- KEY:**
- Approx. breeding location
 - Core breeding bird survey area



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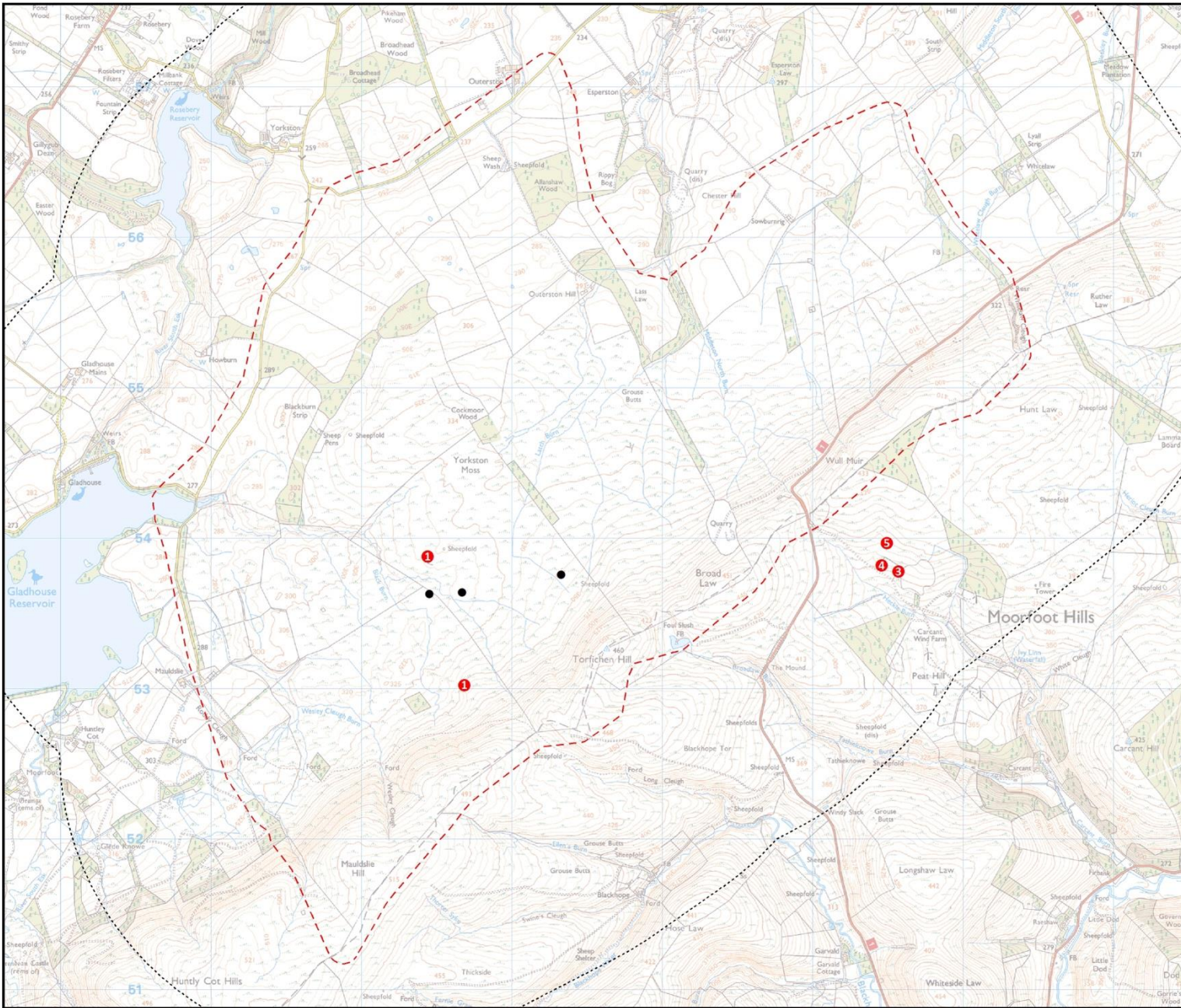
FIGURE 19

**Breeding Distribution
of Other Species, 2022**

- KEY:**
- Core breeding bird survey area
 - Approx. breeding location
 - BF - Bullfinch
 - BH - Black-headed Gull
 - CK - Cuckoo
 - GH - Grasshopper Warbler
 - GL - Grey Wagtail
 - HM - House Martin
 - K - Kestrel
 - MA - Mallard
 - MH - Moorhen
 - RG - Red Grouse
 - RO - Rook
 - SF - Spotted Flycatcher
 - SK - Siskin
 - SU - Shelduck
 - SW - Sedge Warbler
 - T - Teal
 - TS - Tree Sparrow
 - WC - Whinchat
 - Y - Yellowhammer



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FIGURE 20

**Black Grouse Leks and
Additional Records, 2022**

- KEY:**
- Black Grouse Leks (peak males)
 - Additional Black Grouse Records
 - - - Core breeding bird survey area
 - - - Wider Survey Area



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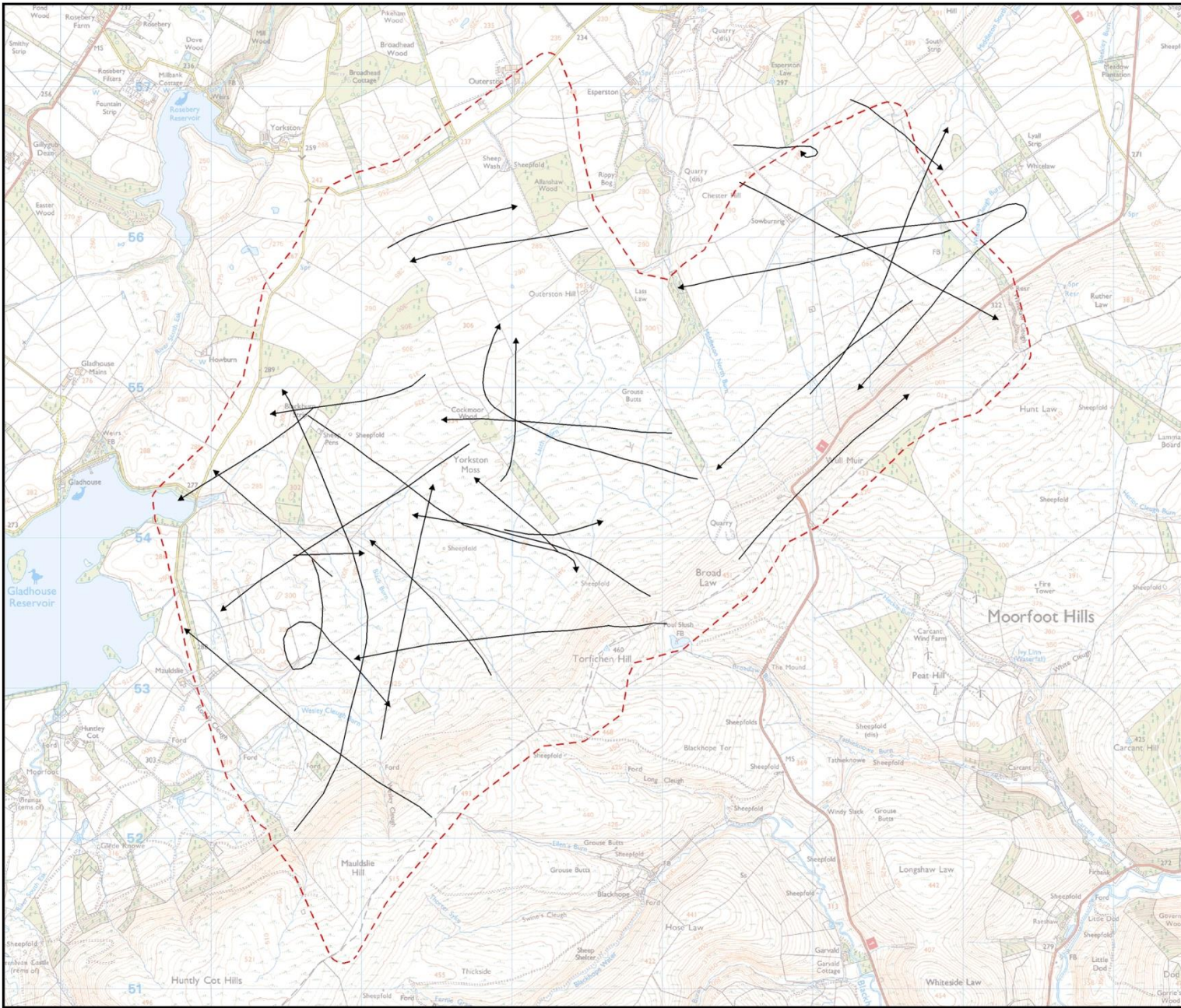
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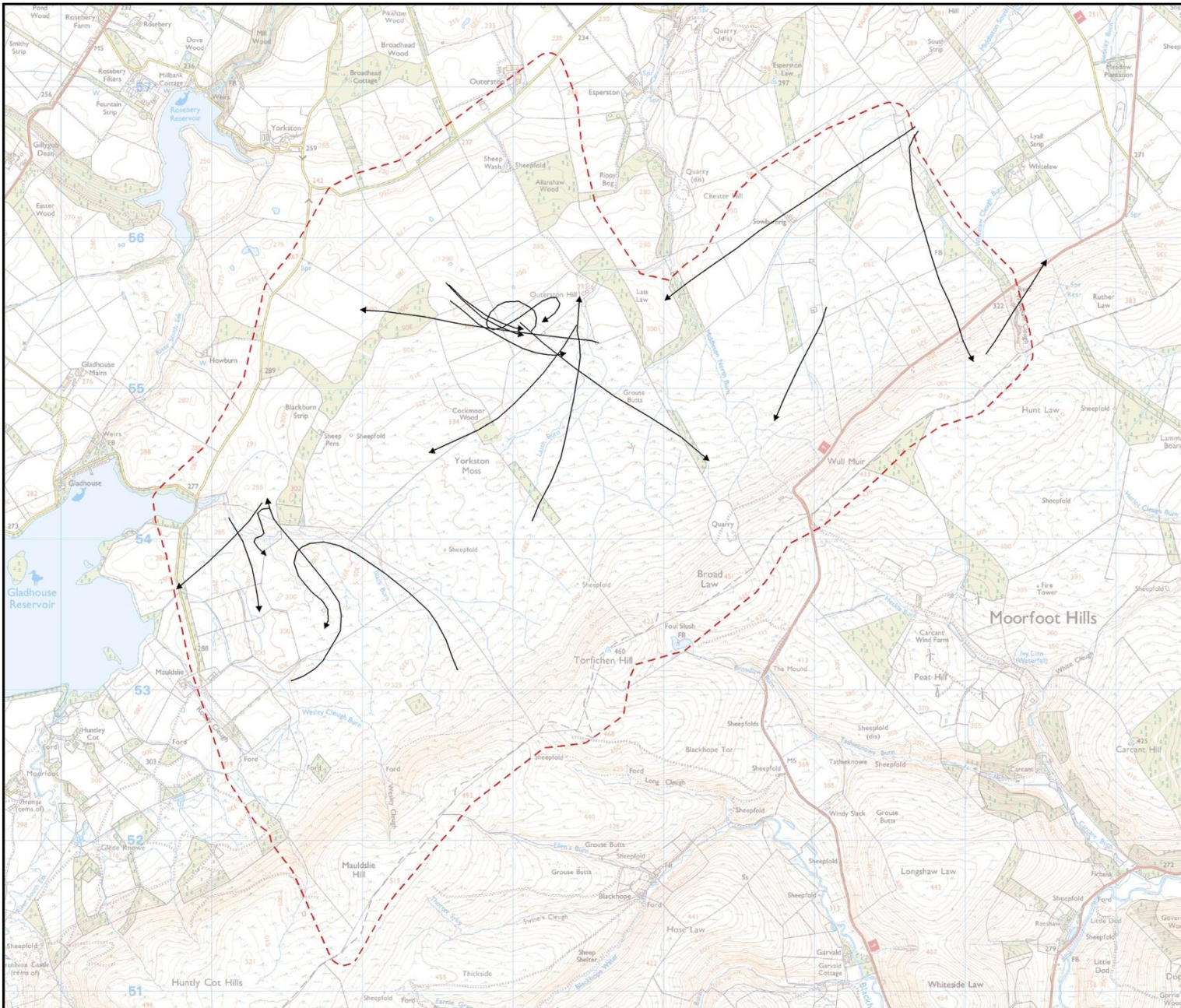
FIGURE 21

**VP Survey Flight Lines:
Greylag Goose, 2022**

- KEY:**
- Flight lines
 - - - Core breeding bird survey area



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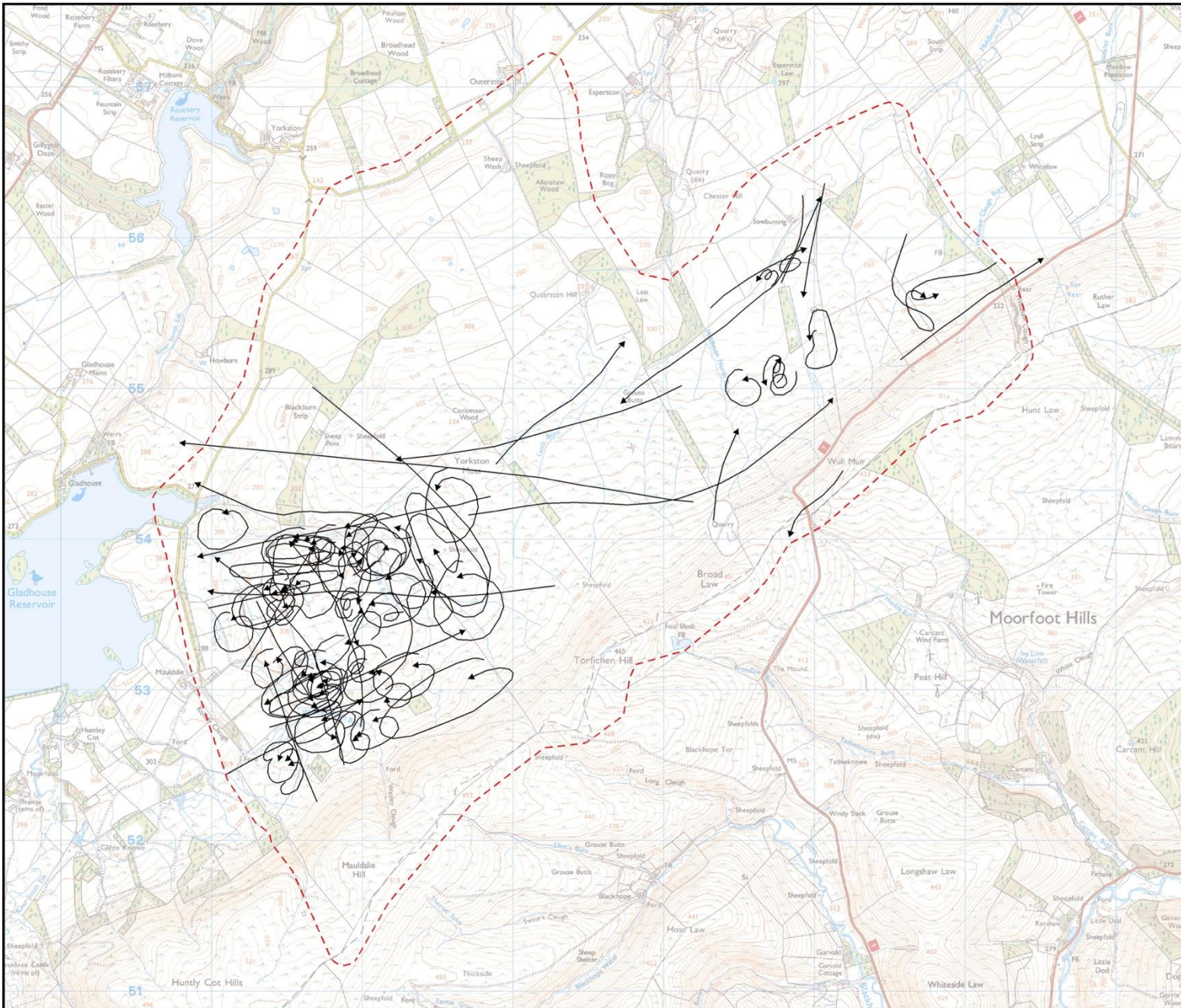
FIGURE 22

**VP Survey Flight Lines:
Oystercatcher, 2022**

- KEY:**
- Flight lines
 - - - Core breeding bird survey area



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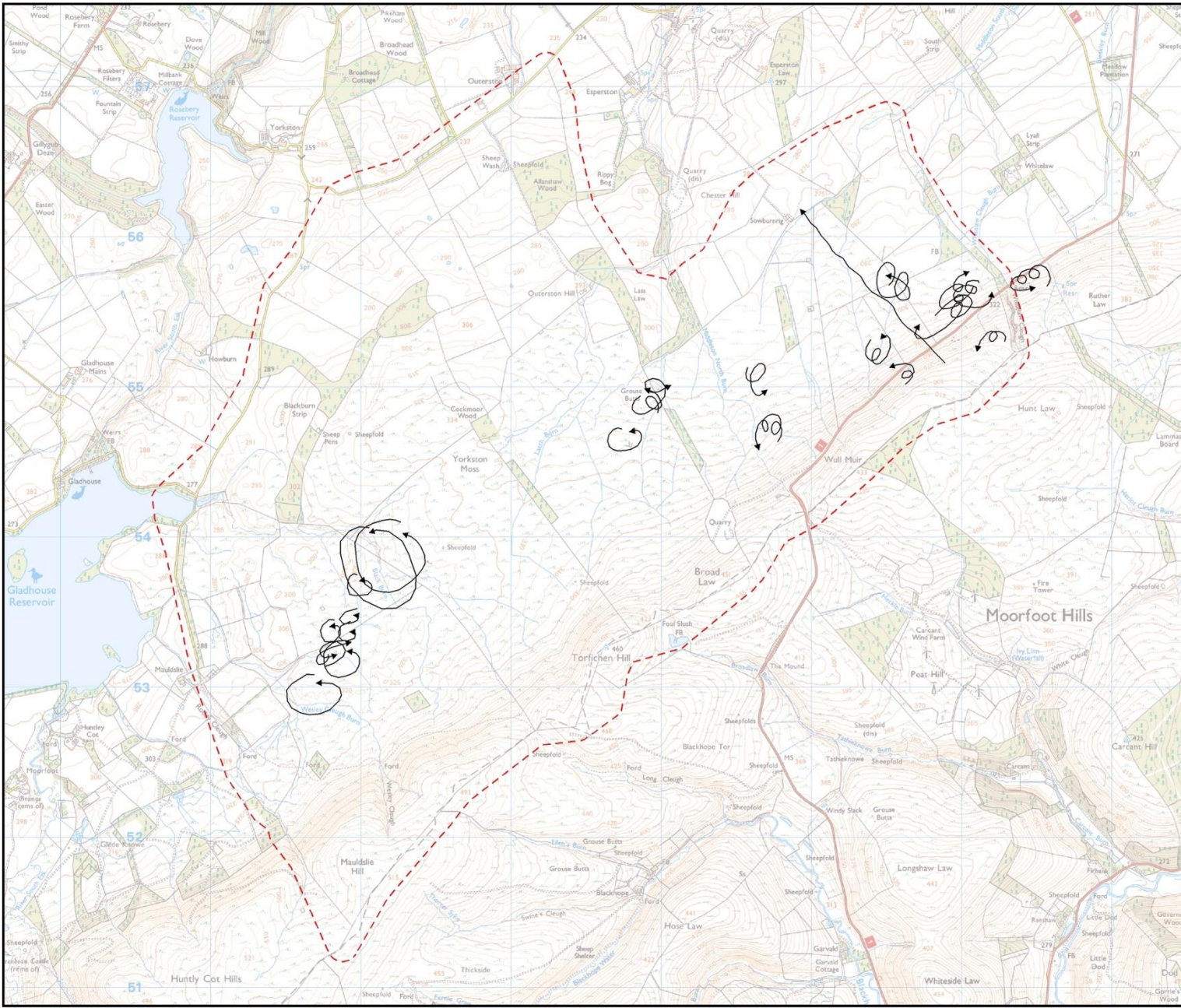
FIGURE 23

**VP Survey Flight Lines:
Lapwing, 2022**

- KEY:**
- Flight lines
 - - - Core breeding bird survey area



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FIGURE 24

**VP Survey Flight Lines:
Snipe, 2022**

- KEY:**
- Flight lines
 - - - Core breeding bird survey area



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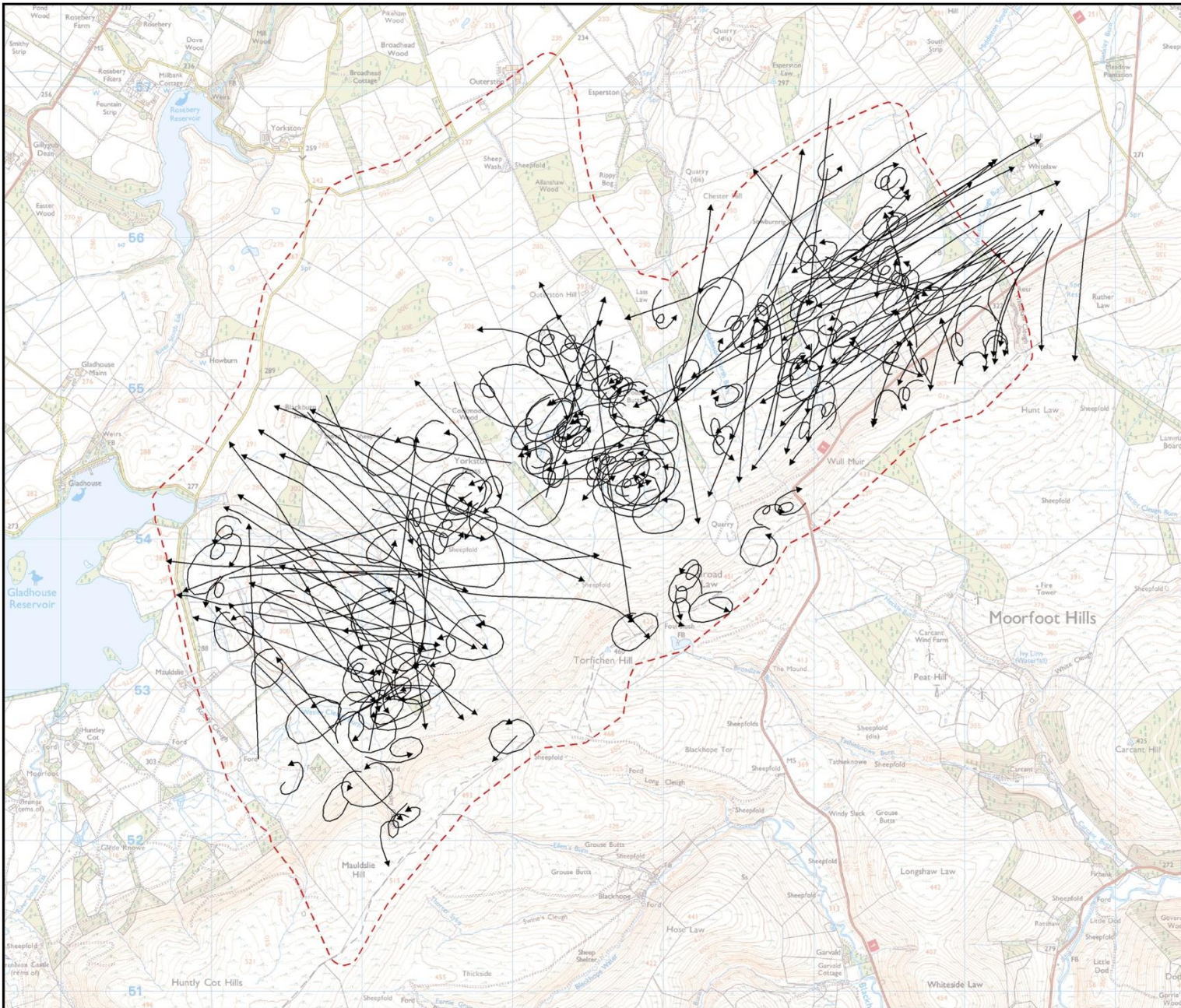
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**BREEDING BIRD
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FIGURE 25

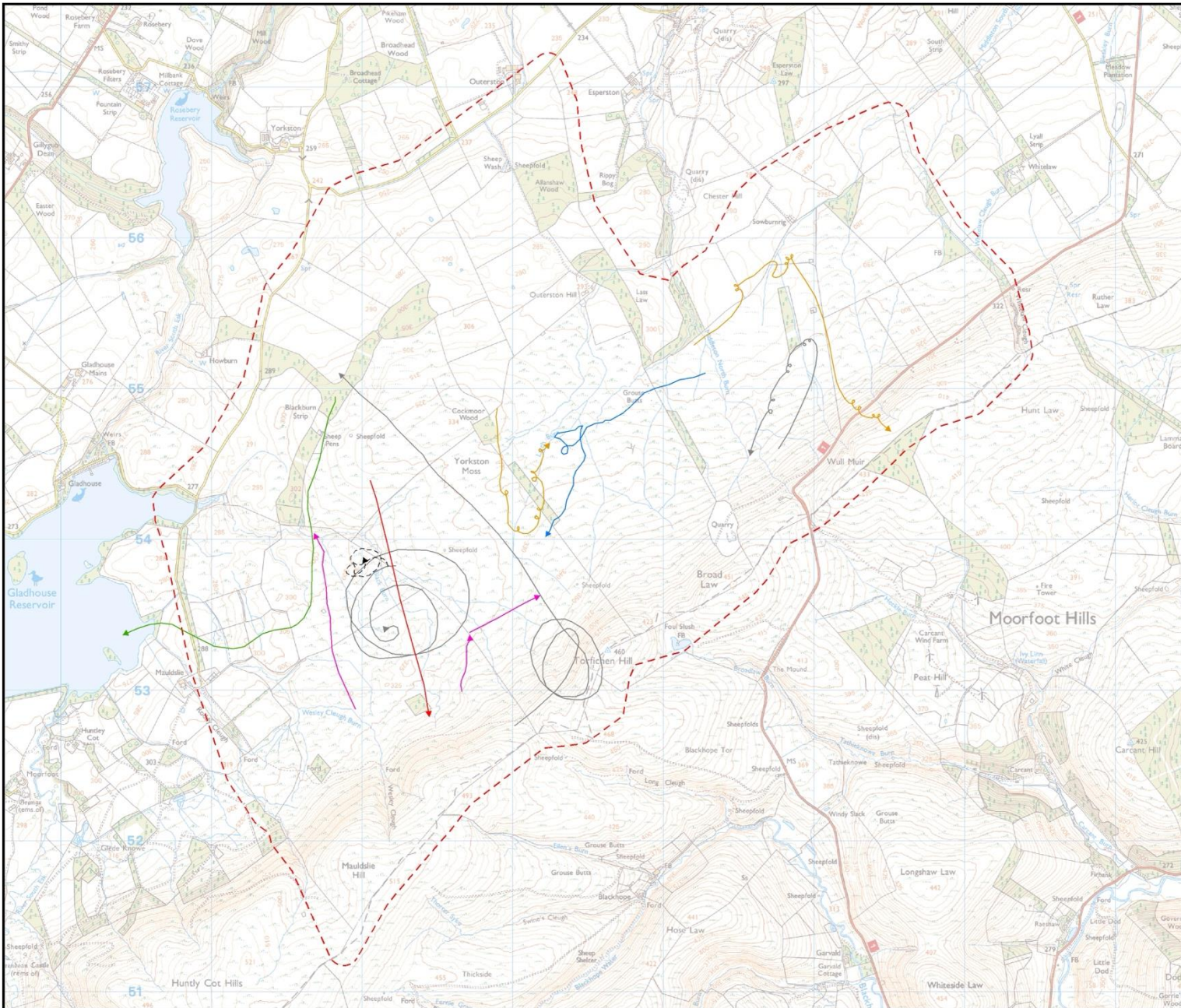
**VP Survey Flight Lines:
Curlew, 2022**

KEY:

- Flight lines
- - - Core breeding bird survey area



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DRAWING NAME: TH2022-1	
SCALE - 1:24,000 @ A3	
BREEDING BIRD SURVEYS 2022	
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**Torfichen Hill
Wind Farm**

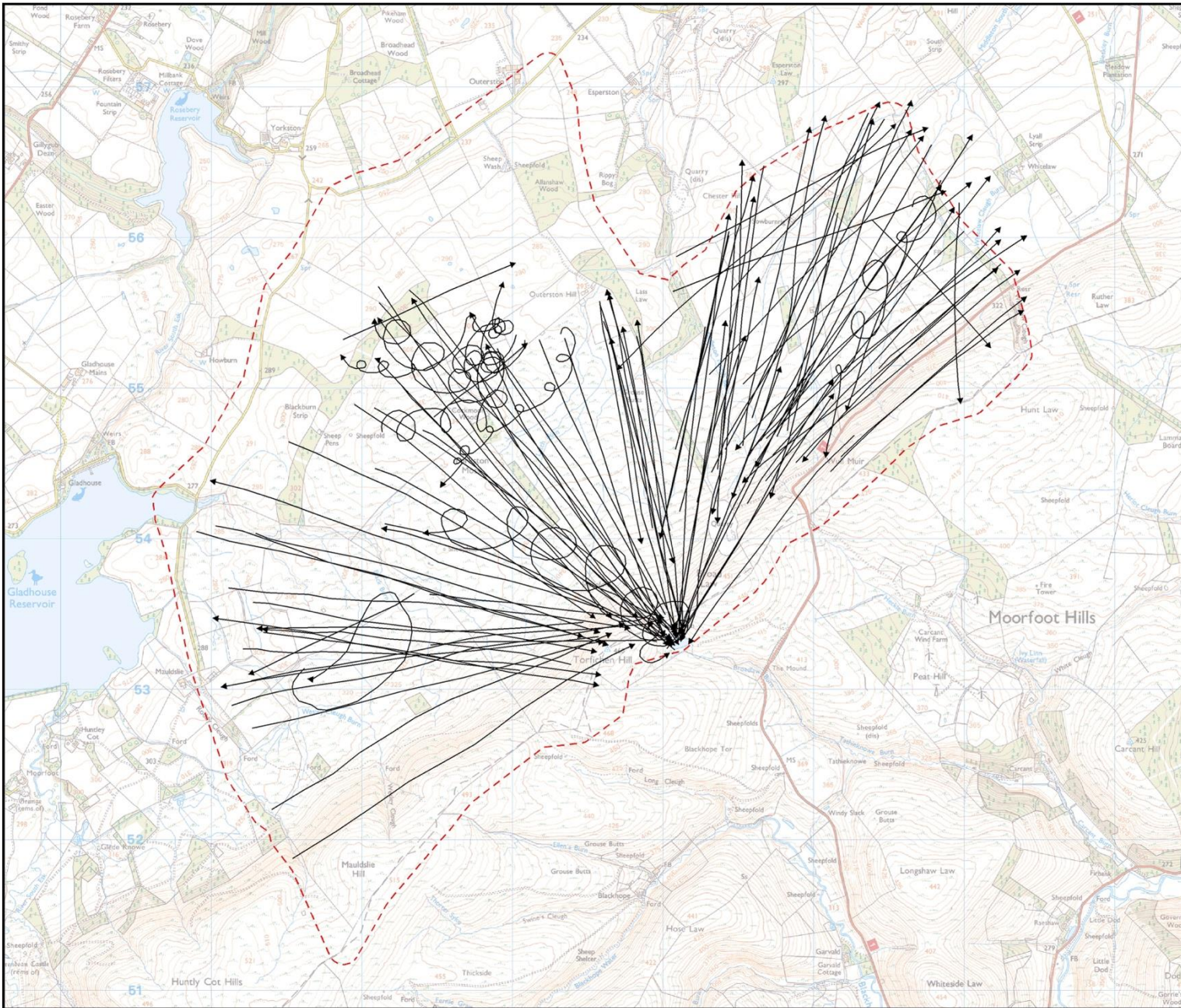
FIGURE 26

**VP Survey Flight Lines:
Scarce Raptors, 2022**

- KEY:**
- Core breeding bird survey area
- Flight lines:**
- Hen Harrier
 - Red Kite
 - Merlin
 - Marsh Harrier
 - Osprey
 - Peregrine
 - Short-eared Owl



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**Torfichen Hill
Wind Farm**

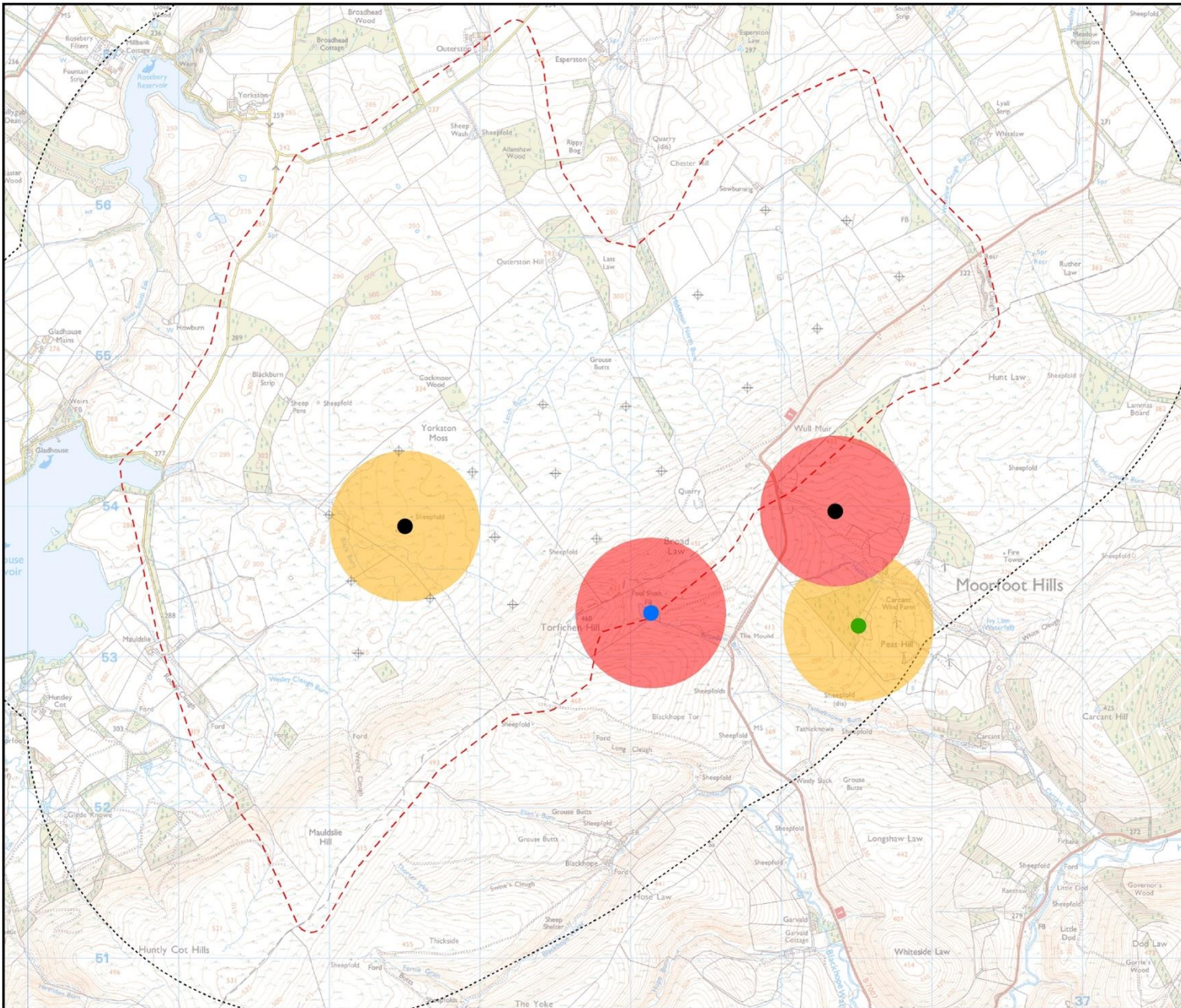
FIGURE 27

**VP Survey Flight Lines:
Black-headed Gull, 2022**

- KEY:**
- Flight lines
 - - - Core breeding bird survey area



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LOT/NO. 000	N/A
LOT/NO. 001	N/A
DRAWING NUMBER TH2022-1	
SCALE - 1:24,000 @ A3	
BREEDING BIRD SURVEYS 2022	
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**Torfichen Hill
Wind Farm**

FIGURE 28

**Proposed Ornithological
Constraints (Breeding
2021 and 2022)**

- KEY:**
- ⊕ Proposed turbines (scoping)
 - - - Core Breeding Bird Survey Area
 - - - Wider Survey Area
- Constraint**
- Black Grouse lek
 - Black-headed Gull colony
 - Short-eared Owl nest
- Buffer:**
- Recommended
 - Essential



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PROJECT NO: N/A	DRAWING NO: N/A
DRAWING TITLE: TH2021-1	
SCALE - 1:24,000 @ A3	
BREEDING BIRD SURVEYS 2021	
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CONCLUSIONS

46. The 2021 and 2022 breeding bird surveys have found that the Torfichen survey area supports a range of upland breeding species of national importance. This included regionally important numbers of black grouse, snipe, curlew, black-headed gull, short-eared owl and long-eared owl. Most of these were found on the periphery of the site and should be largely avoided in the site design, though the site itself did hold high densities of breeding snipe and curlew.
47. Two species specially protected from disturbance under Schedule 1 of the 1981 Wildlife and Countryside Act were found breeding in the core survey area, quail (2021 only) and common crossbill (2021 and 2022). Further details of these species' locations are given in **Technical Appendix 9.8 (Confidential)**. Two EU Annex 1 species were also breeding in the area, golden plover (2 pairs within the core area in 2021, a single pair in 2022) and short-eared owl (one pair in the 2km buffer).
48. The main target species at risk of collision would be the high densities of breeding waders using the site, particularly lapwing and curlew. Raptor flight activity over the site at rotor height (other than buzzard) occurred at only a very low level.
49. Careful site design and appropriate mitigation should be applied. Preliminary spatial constraints identified within the current site boundary in relation to breeding birds comprised (see **Figure 28**):
 - **Black grouse** – a 500m buffer was proposed in the 2021 report (Percival *et al.* 2021) around the two lek sites (after Ruddock and Whitfield 2007). One of these (on the SE edge of the survey area) held more grouse (peak seven males in 2021, 5 in 2022), and implementing this buffer is considered essential to avoid potentially significant impacts. The smaller lek (peak two males in 2021) within the proposed wind farm site was used less frequently, and though it was used in both 2021 and 2022, there was only a single lekking male seen there in 2022. As a precautionary measure, it is recommended that the 500m buffer should be applied to this lek as well if it can be accommodated within the site design.
 - **Black-headed gull** (regionally important breeding colony) - 500m buffer proposed around the main colony, both to reduce disturbance of the colony but particularly to reduce collision risk (where flight activity is more concentrated in proximity to the colony). This colony held regionally important numbers in both 2021 and 2022.
 - **Short-eared owl** – a 500m buffer around the nest site used in 2021 was proposed (after Ruddock and Whitfield 2007), though it was noted in the 2021 report that this species can move between years. There was no evidence of this species breeding at this or any other site in the survey area in 2022, consistent with the between-year variability, so it may not be necessary to implement this buffer.
50. It is not considered necessary to implement any buffers for either of the two Schedule 1 species breeding in the survey area. Quail are highly variable in their breeding locations between years. Common crossbill are unlikely to be affected as a forest species (unless any felling of trees were required).
51. Given the widespread distribution of curlew across the site in both years, it will be difficult to avoid this species in the design process, so alternative mitigation measures, e.g. habitat enhancement away from the wind farm, are likely to be required.



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Appendix 1. Vantage Point Survey Data

Survey Information

Date	Vantage Point No	Start time	Finish time	ObsTime	Weather	Observer
21/04/2022	2	08:45	11:45	03:00	8-6/8 cloud, 2-3 NE wind, good - vey good vis	Stuart Piner
21/04/2022	2	12:15	15:15	03:00	4-6/8 cloud, 2-4 NE wind, very good vis	Stuart Piner
21/04/2022	2	15:45	16:45	01:00	2/8 cloud, 3-4 NE wind, excellent vis	Stuart Piner
22/04/2022	1	08:30	09:30	01:00	7-8/8 cloud, 3 ENE wind, good vis	Stuart Piner
22/04/2022	3	12:20	13:20	01:00	3/8 cloud, 3 NE wind, excellent vis	Stuart Piner
26/04/2022	3	16:00	19:00	03:00	8-4/8 cloud, 3-2 E-NE wind, excellent vis	Stuart Piner
26/04/2022	1	16:20	19:20	03:00	cloud 7/8, wind NE 2, 8C, vis very good	Tom Lowe
26/04/2022	3	19:30	20:30	01:00	8/8 cloud, 2 NE wind, excellent vis	Stuart Piner
27/04/2022	1	05:20	08:20	03:00	cloud 8/8, wind NNE 1, 14C, vis very good	Tom Lowe
27/04/2022	3	05:45	07:45	02:00	8/8 cloud, 1-2 E wind, very good vis	Stuart Piner
18/05/2022	1	07:30	10:30	03:00	1-4/8 cloud, 4-5 SW wind, very good vis	Stuart Piner
18/05/2022	3	07:30	09:30	02:00	cloud 2/8, wind SSW 4, 11C, vis very good	Tom Lowe
18/05/2022	1	13:40	16:40	03:00	4-6/8 cloud, 3-4 S wind, very good vis	Stuart Piner
18/05/2022	3	13:25	15:55	02:30	cloud 5/8, wind SSW 4, 16C, vis very good	Tom Lowe
18/05/2022	3	16:25	18:55	02:30	cloud 5/8, wind SSW 4, 17C, vis very good	Tom Lowe
18/05/2022	1	17:10	18:10	01:00	4-6/8 cloud, 3-2 S-SSW wind, very good vis	Stuart Piner
19/05/2022	2	07:35	09:35	02:00	cloud 2/8, wind SW 3, 10C, vis excellent	Tom Lowe
19/05/2022	2	10:05	12:35	02:30	cloud 4/8, wind SW 3, 13C, vis very good	Tom Lowe
19/05/2022	2	13:05	15:35	02:30	cloud 4/8, wind SW 3, 14C, vis very good	Tom Lowe
06/06/2022	3	19:30	20:30	01:00	6/8 cloud, 2 NE wind, excellent vis	Stuart Piner
07/06/2022	2	07:00	09:00	02:00	cloud 8/8, wind NNE 2, 9C, vis excellent	Tom Lowe
07/06/2022	2	09:30	11:30	02:00	cloud 8/8, wind NE 1, 10C, vis excellent	Tom Lowe
07/06/2022	1	14:40	17:40	03:00	cloud 5/8, wind NE 1, 16C, vis very good	Tom Lowe
07/06/2022	3	14:30	17:00	02:30	6-3/8 cloud, 2-3 ESE - SE wind, excellent vis	Stuart Piner
07/06/2022	2	17:45	20:45	03:00	2/8 cloud, 2-3 SE - ESE wind, excellent vis	Stuart Piner
07/06/2022	2	21:15	22:15	01:00	2/8 cloud, 2-1 ENE wind, excellent vis	Stuart Piner
08/06/2022	1	09:10	12:10	03:00	cloud 8/8, wind E 3, 10C, vis good, rain clearing	Tom Lowe
08/06/2022	1	12:40	14:40	02:00	cloud 8/8, wind ESE 2, 12C, vis very good	Tom Lowe
08/06/2022	3	09:10	12:10	03:00	8/8 cloud, 3-4 ESE wind, ok - good vis, brief periods of rain	Stuart Piner
08/06/2022	3	12:40	14:10	01:30	7-8/8 cloud, 3-4 SE wind, good vis	Stuart Piner
11/07/2022	3	14:20	16:20	02:00	cloud 8/8, wind SW 3, 22C, vis very good	Tom Lowe
11/07/2022	3	16:50	18:50	02:00	cloud 8/8, wind SSW 3, 20C, vis very good	Tom Lowe
11/07/2022	3	19:20	22:20	03:00	cloud 8/8, wind SSW 3, 19C, vis very good	Tom Lowe
11/07/2022	1	14:20	17:20	03:00	8/8 cloud, 3 SW wind, very good vis	Stuart Piner
11/07/2022	1	17:50	20:50	03:00	8/8 cloud, 1-3 SW wind, very good vis	Stuart Piner
11/07/2022	1	21:20	22:20	01:00	8/8 cloud, 3-4 SW wind, very good vis	Stuart Piner
12/07/2022	2	13:15	16:15	03:00	8/8 cloud, 3 WSW wind, very good vis	Stuart Piner
12/07/2022	2	16:45	19:45	03:00	8-5/8 cloud, 3 WSW-W wind, very good vis	Stuart Piner
12/07/2022	2	20:15	21:15	01:00	3/8 cloud, 3 W wind, very good vis	Stuart Piner
15/08/2022	3	10:50	13:50	03:00	8/8 cloud, 1-2 NE wind, very good - ok vis, brief rain shower	Stuart Piner
15/08/2022	3	14:20	17:20	03:00	8/8 cloud, 1-2 NE wind, ok vis, light rain during most of VP period	Stuart Piner
15/08/2022	3	17:50	18:50	01:00	8/8 cloud, 2 ENE - NE wind, ok - good vis, light rain on and off	Stuart Piner
15/08/2022	1	19:20	21:20	02:00	8/8 cloud, 1 ENE wind, good - ok vis	Stuart Piner
16/08/2022	2	05:15	08:15	03:00	8/8 cloud, 1 NE wind, ok vis, light rain	Stuart Piner
16/08/2022	2	08:45	11:45	03:00	8/8 cloud, ok vis, 1 NE-N wind, light rain	Stuart Piner
16/08/2022	2	12:15	13:15	01:00	8/8 cloud, 1 N wind, ok - good vis, light rain then fine	Stuart Piner
16/08/2022	1	14:00	16:00	02:00	8/8 cloud, 1-2 N - NE wind, very good vis	Stuart Piner
17/08/2022	1	05:15	08:15	03:00	8-6/8 cloud, 2-1 NE wind, very good vis	Stuart Piner

TORFICHEN WIND FARM: BREEDING BIRD SURVEYS 2022

Survey Data

VP	Date	Time	Species	Count	Direction of flight	Flight height (m)	Activity	Time bird observed (sec)	Notes
2	21/04/2022	08:45	CU	2		13	display	270	
2	21/04/2022	08:46	GJ	2	WNW	13		110	
2	21/04/2022	08:53	CU	2		0	display	1500	
2	21/04/2022	09:31	PE	1		175		720	adult
2	21/04/2022	09:47	CU	2		15	display	7080	on and off until VP end
2	21/04/2022	09:55	GJ	1	NNE	23		50	
2	21/04/2022	10:14	CU	1	SSE	30		75	
2	21/04/2022	10:23	CU	1	NNE	20		90	
2	21/04/2022	11:13	CU	2		15	display	1920	until VP end
2	21/04/2022	12:18	CU	1		15	display	2700	
2	21/04/2022	12:26	L	1	WSW	30		130	
2	21/04/2022	12:55	L	2	N	30		40	
2	21/04/2022	13:08	CU	2		15		660	
2	21/04/2022	13:15	GI	1	NE	25		20	adult male
2	21/04/2022	13:29	CU	2		20		1200	mobbed BZ
2	21/04/2022	13:38	CU	1	SSE	25		150	
2	21/04/2022	13:44	CU	2		25		210	mobbed RN
2	21/04/2022	14:27	CU	2		20		2100	
2	21/04/2022	15:05	L	1	NE	15		130	
2	21/04/2022	15:51	CU	2		20	display	1800	
2	21/04/2022	16:34	CU	2		15	display	660	until VP end
1	22/04/2022	08:40	L	2		20	display	150	
1	22/04/2022	08:44	CU	1	WSW	5		30	
1	22/04/2022	08:58	CU	2		15	display	720	
1	22/04/2022	09:10	CU	1	NNW	8		25	
1	22/04/2022	09:11	CU	1	NNW	8		25	second bird
1	22/04/2022	09:20	L	2	NE	13		70	
3	22/04/2022	12:20	L	1		13	display	2100	
3	22/04/2022	12:25	L	1		10	display	1560	
3	22/04/2022	12:27	L	2		10	display	960	
3	22/04/2022	12:27	CU	2		15		1020	
3	22/04/2022	12:36	L	1		10	display	1800	
3	22/04/2022	12:46	CU	1	E	2	display	90	
3	22/04/2022	12:51	SN	1		10	display	40	
3	22/04/2022	13:03	L	8	ENE	10		50	
3	22/04/2022	13:08	L	1		15		720	until VP end
3	22/04/2022	13:18	L	1		10		120	until VP end
3	26/04/2022	16:00	L	2		10		1500	
3	26/04/2022	16:04	CU	1		15	display	1200	
3	26/04/2022	16:04	L	2		15		2220	
3	26/04/2022	16:31	L	1	N	13		60	
3	26/04/2022	16:42	CU	1	SE	5		140	
3	26/04/2022	16:42	CU	1		5		30	
3	26/04/2022	16:58	L	2		15	display	600	
3	26/04/2022	16:58	CU	1		10	display	1200	
3	26/04/2022	17:00	L	2		10		1800	
3	26/04/2022	17:02	CU	1	SW	5		15	
3	26/04/2022	17:03	CU	1	WNW	8		70	
3	26/04/2022	17:05	L	2		10		960	
3	26/04/2022	17:06	CU	1	NNE	15		150	
3	26/04/2022	17:13	L	1	NE	8		40	landed
3	26/04/2022	17:14	L	1	NNW	15		40	landed
3	26/04/2022	17:21	CU	1		15		50	mobbed BZ
3	26/04/2022	17:28	CU	1	NW	15		130	
3	26/04/2022	17:31	L	2		10		2100	
3	26/04/2022	17:33	CU	1	N	10		90	
3	26/04/2022	17:44	CU	2	SE	3		90	
3	26/04/2022	17:44	CU	1		10		540	
3	26/04/2022	17:53	L	2		10		960	
3	26/04/2022	17:55	GJ	4	NW	5		35	flew from field
3	26/04/2022	18:02	CU	2	NW	10	display	90	
3	26/04/2022	18:11	PE	1	NW	80		360	
3	26/04/2022	18:22	L	1		10		90	
3	26/04/2022	18:30	L	2		10		1800	until VP end
3	26/04/2022	18:47	CU	1	SE	2		40	
3	26/04/2022	18:50	SN	1		5		45	
1	26/04/2022	16:20	CU	1	circle	15	display	250	landed
1	26/04/2022	16:52	CU	2	circle	10	display	160	landed

TORFICHEN WIND FARM: BREEDING BIRD SURVEYS 2022

VP	Date	Time	Species	Count	Direction of flight	Flight height (m)	Activity	Time bird observed (sec)	Notes
1	26/04/2022	16:56	KT	1	NE	55	hunt	1320	2cy
1	26/04/2022	17:01	PE	1	NNE	90	soar	540	damaged left wing
1	26/04/2022	17:02	CU	1	circle	35	display	180	
1	26/04/2022	17:04	CU	1	circle	28	display	130	
1	26/04/2022	17:14	CU	1	SSE	23	display	120	
1	26/04/2022	17:18	CU	1	circle	20	display	130	landed
1	26/04/2022	17:25	CU	1	NNE	10	display	100	landed
1	26/04/2022	17:38	CU	1	NE	5	feed	30	landed
1	26/04/2022	17:46	L	1	circle	13	display	100	
1	26/04/2022	18:02	CU	3	ENE	60		140	
1	26/04/2022	18:08	CU	1	SW	20	feed	130	
1	26/04/2022	18:22	CU	1	NNE	50		170	
1	26/04/2022	18:32	CU	2	NE	60		130	
1	26/04/2022	18:45	CU	1	SSW	100		120	
1	26/04/2022	19:00	CU	1	circle	25	display	60	
1	26/04/2022	19:08	L	4	circle	23	display	270	
1	26/04/2022	19:15	CU	1	NE	35	feed	140	
3	26/04/2022	19:30	L	2		10		1500	
3	26/04/2022	19:46	L	2		10		1500	
3	26/04/2022	19:49	GJ	2	E	3		30	
3	26/04/2022	19:52	L	1	SE	10		30	
3	26/04/2022	19:54	CU	1	NW	8		30	
3	26/04/2022	20:05	L	3		10		1200	
3	26/04/2022	20:12	L	2		10		600	
3	26/04/2022	20:14	GJ	1	NW	50		120	
3	26/04/2022	20:17	SE	1		3		140	landed in ditch
3	26/04/2022	20:18	CU	1	ESE	5		30	
3	26/04/2022	20:25	GJ	4	ESE	8		30	
1	27/04/2022	05:25	CU	1	circle	20	display	120	landed
1	27/04/2022	05:34	CU	1	circle	23	display	200	
1	27/04/2022	05:37	CU	1	SSW	60	feed	70	
1	27/04/2022	05:42	CU	1	circle	28	display	50	
1	27/04/2022	05:47	CU	1	SSW	70	feed	110	
1	27/04/2022	05:47	CU	1	circle	23	display	170	
1	27/04/2022	05:55	CU	2	NNW	10	display	100	landed
1	27/04/2022	06:11	SN	1	circle	35	display	180	
1	27/04/2022	06:15	CU	1	circle	15	display	130	landed
1	27/04/2022	06:17	CU	2	circle	28	display	110	
1	27/04/2022	06:18	CU	3	circle	18	display	120	
1	27/04/2022	06:24	GJ	2	ENE	8		150	
1	27/04/2022	06:32	CU	1	circle	55	display	150	
1	27/04/2022	06:42	CU	2	circle	20	display	220	
1	27/04/2022	06:48	SN	1	circle	30	display	100	
1	27/04/2022	06:52	GJ	2	NNE	5		170	
1	27/04/2022	06:53	SN	1	circle	15	display	100	landed
1	27/04/2022	07:10	L	1	circle	18	display	120	
1	27/04/2022	07:11	CU	2	circle	10	display	110	landed
1	27/04/2022	07:16	CU	4	circle	20	display	130	
1	27/04/2022	07:35	CU	1	circle	15	display	120	landed
1	27/04/2022	07:38	CU	1	circle	15	display	100	landed
1	27/04/2022	07:40	CU	1	circle	25	display	50	
1	27/04/2022	07:41	CU	2	NNE	90	feed	110	
1	27/04/2022	07:50	SN	1	circle	25	display	270	
1	27/04/2022	07:55	CU	1	circle	20	display	180	landed
1	27/04/2022	08:01	SN	3	circle	40	display	250	
1	27/04/2022	08:05	SN	1	circle	20	display	480	
1	27/04/2022	08:05	PG	1	SSE	60		100	
1	27/04/2022	08:12	CU	3	circle	30	display	240	
3	27/04/2022	05:45	CU	1		10	display	2700	
3	27/04/2022	05:46	CU	1	NW	13		40	
3	27/04/2022	05:52	GJ	2	NNE	15		120	
3	27/04/2022	05:59	CU	2		8	display	1800	
3	27/04/2022	05:59	CU	2		8	display	1140	
3	27/04/2022	06:15	CU	1	NE	5	display	40	
3	27/04/2022	06:27	L	2		8		3600	
3	27/04/2022	06:40	GJ	1	WSW	20		40	
3	27/04/2022	06:49	CU	1	SE	33		110	
3	27/04/2022	06:53	GJ	3	SSE	8		270	
3	27/04/2022	07:02	CU	1	NE	13		40	
3	27/04/2022	07:06	CU	1	WNW	5		25	
3	27/04/2022	07:07	GJ	1	NW	3		60	
3	27/04/2022	07:10	GJ	1	NW	5		40	
3	27/04/2022	07:21	BK	1	SE	4		50	male flew from lek
3	27/04/2022	07:26	L	2		8		900	
3	27/04/2022	07:30	CU	1		10	display	600	
3	27/04/2022	07:32	GJ	2	SW	10		90	
3	27/04/2022	07:33	CU	1	SSE	13		70	
3	27/04/2022	07:44	ML	1	NNW	9	direct flight	160	mobbed by MP
1	18/05/2022	07:31	CU	1		5		210	mobbed C

TORFICHEN WIND FARM: BREEDING BIRD SURVEYS 2022

VP	Date	Time	Species	Count	Direction of flight	Flight height (m)	Activity	Time bird observed (sec)	Notes
1	18/05/2022	07:40	GJ	2	SE	15		100	
1	18/05/2022	08:09	GJ	2	WSW	20		90	
1	18/05/2022	08:19	CU	2	SE	5		65	flew between fields
1	18/05/2022	08:21	CU	2		10		660	
1	18/05/2022	08:21	CU	1		10		540	
1	18/05/2022	08:27	CU	1	NW	10		90	
1	18/05/2022	09:19	CU	1	SW	3		40	
1	18/05/2022	09:23	CU	2	NNE	8		40	
1	18/05/2022	10:03	CU	1	NW	8		25	
1	18/05/2022	10:26	CU	1	SSW	5		70	landed
3	18/05/2022	07:34	CU	1	circle	16	display	100	
3	18/05/2022	07:37	L	1	circle	10	display	80	
3	18/05/2022	07:38	CU	1	circle	8	display	80	
3	18/05/2022	07:43	L	1	circle	8	display	90	
3	18/05/2022	07:45	GJ	2	ESE	15	feed	130	landed
3	18/05/2022	07:47	CU	1	circle	11	display	140	
3	18/05/2022	07:49	CU	1	circle	20	display	150	
3	18/05/2022	07:50	CU	1	circle	20	display	140	
3	18/05/2022	07:53	CU	1	circle	13	display	120	
3	18/05/2022	07:56	LU	1	ENE	12		110	2cy
3	18/05/2022	07:58	L	1	circle	10	display	120	
3	18/05/2022	07:59	CU	1	WSW	6	feed	40	landed
3	18/05/2022	08:02	L	3	circle	8	display	660	
3	18/05/2022	08:04	L	1	circle	11	display	420	
3	18/05/2022	08:05	CU	1	circle	16	display	180	
3	18/05/2022	08:07	CU	1	circle	10	display	130	landed
3	18/05/2022	08:08	L	3	circle	13	display	250	
3	18/05/2022	08:11	L	4	circle	13	display	270	
3	18/05/2022	08:12	L	3	circle	8	display	180	
3	18/05/2022	08:15	L	1	circle	6	display	120	
3	18/05/2022	08:19	CU	3	circle	11	display	150	
3	18/05/2022	08:26	CU	1	SSE	15	from feed	200	landed
3	18/05/2022	08:31	L	2	circle	8	display	120	
3	18/05/2022	08:33	L	6	circle	9	display	100	
3	18/05/2022	08:35	CU	1	circle	16	display	240	
3	18/05/2022	08:48	L	2	circle	8	display	140	
3	18/05/2022	08:53	L	6	circle	8	display	120	
3	18/05/2022	09:03	CU	1	circle	9	display	80	
3	18/05/2022	09:07	L	6	circle	10	display	400	
3	18/05/2022	09:11	L	2	circle	6	display	120	landed
3	18/05/2022	09:19	L	2	circle	7	display	100	
3	18/05/2022	09:25	L	2	circle	8	display	100	
3	18/05/2022	09:26	L	4	circle	13	display	240	
3	18/05/2022	09:28	L	3	circle	13	display	110	
1	18/05/2022	14:02	CU	1		25		150	
1	18/05/2022	14:26	CU	1		10		270	
1	18/05/2022	14:46	CU	1		15		240	
1	18/05/2022	15:00	CU	1	SE	10		30	
1	18/05/2022	15:19	CU	1		15		90	
1	18/05/2022	16:10	CU	1	SW	14		40	
3	18/05/2022	13:36	CU	1	circle	15	display	100	
3	18/05/2022	13:39	CU	1	circle	14	display	90	
3	18/05/2022	13:40	L	4	circle	10	display	200	
3	18/05/2022	13:53	L	1	circle	10	display	90	
3	18/05/2022	13:59	L	2	circle	8	display	120	
3	18/05/2022	14:00	CU	1	circle	10	display	110	
3	18/05/2022	14:02	SN	1	circle	18	display	80	
3	18/05/2022	14:06	L	3	circle	8	display	120	
3	18/05/2022	14:12	L	2	circle	5	display	150	
3	18/05/2022	14:14	CU	1	WNW	21	feed	120	
3	18/05/2022	14:21	RK	1	circle	40	display	130	
3	18/05/2022	14:23	CU	1	circle	10	display	120	
3	18/05/2022	14:28	CU	1	WNW	15	feed	150	
3	18/05/2022	14:35	L	4	circle	15	display	240	
3	18/05/2022	14:38	L	2	circle	11	display	120	
3	18/05/2022	14:42	L	4	circle	8	display	200	
3	18/05/2022	14:49	CU	1	WSW	20	feed	80	
3	18/05/2022	15:01	L	2	circle	8	display	130	
3	18/05/2022	15:05	CU	1	WSW	18	feed	130	
3	18/05/2022	15:20	L	4	circle	16	display	200	
3	18/05/2022	15:31	L	3	circle	10	display	90	
3	18/05/2022	15:40	L	4	circle	10	display	150	
3	18/05/2022	15:42	L	4	circle	10	display	180	
3	18/05/2022	15:50	CU	1	circle	23	display	230	
3	18/05/2022	16:28	L	3	circle	13	display	180	
3	18/05/2022	16:33	L	4	circle	8	display	150	

TORFICHEN WIND FARM: BREEDING BIRD SURVEYS 2022

VP	Date	Time	Species	Count	Direction of flight	Flight height (m)	Activity	Time bird observed (sec)	Notes
3	18/05/2022	16:35	CU	1	circle	20	display	120	
3	18/05/2022	16:42	L	2	circle	10	display	100	
3	18/05/2022	16:44	L	3	circle	8	display	150	
3	18/05/2022	16:48	GI	1	S	18	hunt	210	2cy
3	18/05/2022	16:49	CU	2	circle	20	display	120	mobbing GI
3	18/05/2022	16:49	L	3	circle	20	display	60	mobbing GI
3	18/05/2022	16:49	CU	3	circle	15	display	90	mobbing GI
3	18/05/2022	16:49	L	2	circle	15	display	90	mobbing GI
3	18/05/2022	16:50	CU	3	circle	25	display	80	mobbing GI
3	18/05/2022	16:50	L	6	circle	25	display	80	mobbing GI
3	18/05/2022	16:51	CU	2	circle	10	display	80	mobbing GI
3	18/05/2022	16:55	L	3	circle	8	display	180	
3	18/05/2022	17:03	CU	2	SE	20	from feed	160	landed
3	18/05/2022	17:14	CU	1	circle	15	display	120	
3	18/05/2022	17:17	L	2	circle	8	display	150	
3	18/05/2022	17:23	CU	1	WNW	28	feed	110	
3	18/05/2022	17:29	CU	2	circle	8	display	120	
3	18/05/2022	17:50	KT	1	S	40	soar	450	
3	18/05/2022	18:17	L	3	circle	8	display	140	
3	18/05/2022	18:25	CU	1	WNW	23	feed	120	
3	18/05/2022	18:27	CU	1	circle	13	display	110	
3	18/05/2022	18:33	SN	1	circle	20	display	420	
3	18/05/2022	18:36	CU	1	SSE	31	feed	140	
3	18/05/2022	18:37	CU	1	circle	18	display	100	
3	18/05/2022	18:42	CU	23	circle	10	flushed	70	non-breeders? Off-duty birds? Landed
3	18/05/2022	18:50	CU	1	NNW	26	feed	130	
3	18/05/2022	18:52	SN	1	circle	30	display	180	
1	18/05/2022	17:25	CU	1	NNE	10		30	
1	18/05/2022	17:31	L	1	SSW	5		60	
1	18/05/2022	17:34	CU	1		5		75	
1	18/05/2022	17:52	L	1		15		180	
1	18/05/2022	17:56	CU	1		10	mobbing	90	mobbed C
1	18/05/2022	18:01	CU	1		10		40	
1	18/05/2022	18:02	CU	1		20		90	
1	18/05/2022	18:03	CU	1		10		300	
2	19/05/2022	07:44	GJ	1	WNW	30		90	
2	19/05/2022	07:53	CU	1	circle	10	display	60	
2	19/05/2022	08:08	CU	1	circle	13	display	70	chasing crow
2	19/05/2022	08:10	CU	1	circle	8	display	50	landed
2	19/05/2022	08:14	CU	1	circle	10	display	70	landed
2	19/05/2022	08:28	CU	1	circle	15	display	150	
2	19/05/2022	08:36	CU	1	NNW	5	feed	50	landed
2	19/05/2022	08:48	CU	1	circle	8	display	200	
2	19/05/2022	08:52	CU	2	circle	16	display	150	
2	19/05/2022	08:55	CU	1	circle	10	display	100	landed
2	19/05/2022	09:03	SN	1	Circle	15	display	90	landed
2	19/05/2022	09:05	CU	1	circle	8	display	80	landed
2	19/05/2022	09:08	CU	1	circle	5	display	50	landed
2	19/05/2022	09:19	GJ	2	ENE	25		40	
2	19/05/2022	10:21	CU	1	circle	8	display	70	landed
2	19/05/2022	10:45	CU	1	circle	18	display	70	
2	19/05/2022	10:48	CU	1	circle	6	display	120	
2	19/05/2022	10:49	CU	1	circle	5	display	150	landed
2	19/05/2022	11:09	CU	1	circle	10	display	100	
2	19/05/2022	11:21	CU	1	circle	8	display	90	landed
2	19/05/2022	13:32	L	1	SW	10		40	
2	19/05/2022	13:50	CU	1	circle	8	display	80	
2	19/05/2022	14:06	CU	1	circle	20	mobbing	60	
2	19/05/2022	14:30	CU	1	circle	10	display	80	
2	19/05/2022	15:22	CU	1	circle	18	display	240	
3	06/06/2022	19:30	L	1		10		660	
3	06/06/2022	19:34	CU	1		13	display	40	
3	06/06/2022	19:35	L	2		10		90	
3	06/06/2022	19:36	L	9	WNW	20		110	
3	06/06/2022	19:39	CU	1		15	display	90	
3	06/06/2022	19:39	CU	1		10	display	30	
3	06/06/2022	19:42	CU	1	NE	33	display	150	
3	06/06/2022	19:46	CU	1		10	display	30	
3	06/06/2022	19:47	L	1		10		60	
3	06/06/2022	19:48	SN	1		15	display	150	
3	06/06/2022	19:48	CU	2		15	display	60	
3	06/06/2022	19:48	L	1		10		420	
3	06/06/2022	19:49	L	1		10		360	
3	06/06/2022	19:52	CU	1		10		150	mobbed LB

TORFICHEN WIND FARM: BREEDING BIRD SURVEYS 2022

VP	Date	Time	Species	Count	Direction of flight	Flight height (m)	Activity	Time bird observed (sec)	Notes
3	06/06/2022	19:53	CU	1		10	display	40	
3	06/06/2022	19:54	CU	1		10	display	60	
3	06/06/2022	19:59	CU	1		15		150	mobbed LB
3	06/06/2022	19:59	SN	1		30	display	540	
3	06/06/2022	20:00	CU	1		15	display	45	
3	06/06/2022	20:01	CU	1		10	display	360	
3	06/06/2022	20:06	SN	2		25	display	1440	until VP end
3	06/06/2022	20:08	L	1		10		60	
3	06/06/2022	20:08	CU	1		10	display	60	
3	06/06/2022	20:09	CU	1		10	display	45	
3	06/06/2022	20:11	CU	2		10	display	90	
3	06/06/2022	20:11	CU	1		10	display	60	
3	06/06/2022	20:14	L	2		20		360	
3	06/06/2022	20:15	CU	1		15	display	60	
3	06/06/2022	20:15	L	1		10		45	
3	06/06/2022	20:16	CU	1		15	display	45	
3	06/06/2022	20:20	CU	1		10	display	60	
3	06/06/2022	20:24	L	2		10		270	
3	06/06/2022	20:25	L	1	NNW	20		90	
3	06/06/2022	20:25	CU	1		15	display	60	
3	06/06/2022	20:26	CU	1		10	display	25	
3	06/06/2022	20:30	CU	1		10	display	60	until VP end
2	07/06/2022	07:02	CU	1	circle	8	display	80	
2	07/06/2022	07:22	CU	2	circle	10	display	120	
2	07/06/2022	07:30	GJ	2	WNW	50		110	
2	07/06/2022	07:34	CU	1	circle	10	display	120	
2	07/06/2022	07:42	CU	2	circle	15	display	130	
2	07/06/2022	07:58	L	3	ENE	55	feed	170	
2	07/06/2022	08:02	CU	1	circle	8	display	100	
2	07/06/2022	08:27	CU	2	circle	10	display	160	
2	07/06/2022	08:36	GJ	4	NE	28		120	
2	07/06/2022	08:42	GJ	2	WSW	40		70	
2	07/06/2022	08:48	CU	1	circle	13	display	280	
2	07/06/2022	09:30	CU	1	circle	8	display	200	
2	07/06/2022	09:33	CU	1	circle	10	display	150	landed
2	07/06/2022	09:54	SN	1	circle	25	display	200	
2	07/06/2022	10:09	CU	1	SSW	20	display	90	
2	07/06/2022	10:14	CU	1	circle	13	display	120	
2	07/06/2022	11:02	CU	1	circle	8	display	110	
2	07/06/2022	11:09	CU	1	circle	13	display	120	
2	07/06/2022	11:11	CU	1	circle	10	display	250	landed
2	07/06/2022	11:22	CU	2	SW	8	display	180	
2	07/06/2022	11:26	CU	2	circle	25	display	230	
1	07/06/2022	14:47	CU	1	WSW	35	from feed	150	
1	07/06/2022	14:52	CU	2	circle	15	display	70	reacted to BZ
1	07/06/2022	15:06	CU	1	WSW	15	from feed	100	landed
1	07/06/2022	15:10	CU	1	circle	13	display	100	
1	07/06/2022	15:50	CU	2	ENE	20	feed	140	to silage field
1	07/06/2022	16:10	CU	1	NE	18	feed	100	
1	07/06/2022	16:25	CU	1	SW	25	from feed	50	
1	07/06/2022	16:31	CU	1	WSW	18	from feed	120	landed
1	07/06/2022	16:38	CU	1	SSW	33	from feed	60	
1	07/06/2022	16:59	CU	1	ENE	40	feed	150	
1	07/06/2022	17:01	CU	1	NE	35	feed	120	
1	07/06/2022	17:11	CU	1	ENE	33	feed	140	
1	07/06/2022	17:13	CU	1	WSW	20	from feed	150	
1	07/06/2022	17:22	CU	1	SSW	23	from feed	60	
1	07/06/2022	17:25	L	3	ENE	13	feed	80	
1	07/06/2022	17:29	CU	1	SSW	20	from feed	60	
1	07/06/2022	17:30	CU	2	SSW	35	from feed	170	
1	07/06/2022	17:35	CU	1	circle	23	display	120	
3	07/06/2022	14:30	L	1		10		720	
3	07/06/2022	14:33	CU	1		15		150	
3	07/06/2022	14:34	CU	2		15		1200	
3	07/06/2022	14:37	CU	1		15		960	
3	07/06/2022	14:43	L	3		8		3000	
3	07/06/2022	14:48	L	1		8		90	
3	07/06/2022	15:15	CU	2		15		120	
3	07/06/2022	15:28	CU	2		10		720	
3	07/06/2022	15:33	L	1		10		90	
3	07/06/2022	15:35	CU	2		15		150	
3	07/06/2022	15:44	L	1		8		360	
3	07/06/2022	15:58	L	10		8		40	landed
3	07/06/2022	16:36	CU	1	SE	5		40	
3	07/06/2022	16:49	L	1		3		15	



TORFICHEN WIND FARM: BREEDING BIRD SURVEYS 2022

VP	Date	Time	Species	Count	Direction of flight	Flight height (m)	Activity	Time bird observed (sec)	Notes
3	07/06/2022	16:51	L	2		5		540	until VP end
2	07/06/2022	17:49	CU	1		13		540	
2	07/06/2022	18:04	CU	1	SW	20		70	landed
2	07/06/2022	18:05	CU	1		10		40	flushed by 2
2	07/06/2022	18:09	CU	1		10		3000	
2	07/06/2022	18:27	CU	1		10		150	
2	07/06/2022	18:40	CU	2		10		270	
2	07/06/2022	18:42	CU	1	W	8		40	
2	07/06/2022	18:51	CU	1	NW	8		30	
2	07/06/2022	18:58	CU	1		25		60	
2	07/06/2022	19:01	CU	1	SSE	20		40	dropped from view
2	07/06/2022	19:04	CU	1	WSW	3		30	mobbed C
2	07/06/2022	19:10	CU	1	SE	2		30	
2	07/06/2022	19:10	CU	1	SSE	3		30	
2	07/06/2022	19:11	CU	1		8	display	90	
2	07/06/2022	19:15	CU	1		10		960	
2	07/06/2022	19:23	CU	1		10		1200	
2	07/06/2022	19:45	CU	1		10		900	
2	07/06/2022	19:56	CU	1	NE	15		30	landed
2	07/06/2022	19:59	CU	1		10		360	
2	07/06/2022	20:15	CU	1	NW	5		40	
2	07/06/2022	20:41	CU	1		10		90	
2	07/06/2022	21:35	CU	1		10		2100	
2	07/06/2022	22:00	SN	1		20	display	900	until VP end
2	07/06/2022	22:01	CU	1		15		120	
1	08/06/2022	09:41	CU	1	WSW	30	from feed	130	
1	08/06/2022	09:59	SN	1	circle	30	display	120	
1	08/06/2022	10:15	SN	1	circle	33	display	450	
1	08/06/2022	10:25	CU	1	ENE	35	feed	120	
1	08/06/2022	10:33	CU	1	WSW	13	feed	110	
1	08/06/2022	10:34	CU	2	circle	13	display	90	
1	08/06/2022	10:44	CU	1	SSW	30	from feed	50	
1	08/06/2022	10:50	GJ	2	WSW	5		120	had been in field since at least 09:10
1	08/06/2022	10:56	SN	2	NE	25	display	230	landed
1	08/06/2022	11:00	CU	1	ENE	30	feed	130	
1	08/06/2022	11:09	CU	3	SW	33	from feed	170	
1	08/06/2022	11:14	CU	2	WSW	40	from feed	160	
1	08/06/2022	11:25	CU	1	SW	15	from feed	70	
1	08/06/2022	11:26	SN	1	circle	28	display	150	
1	08/06/2022	11:30	CU	1	WSW	33	from feed	140	
1	08/06/2022	11:39	CU	1	SW	15	from feed	110	
1	08/06/2022	11:47	CU	2	circle	15	display	80	
1	08/06/2022	11:57	CU	1	NNW	18	display	130	
1	08/06/2022	12:04	L	1	SSW	8		110	juv, fledged juv, landed
1	08/06/2022	12:59	CU	1	WSW	30	from feed	150	
1	08/06/2022	13:06	L	6	ENE	10	feed	60	landed
1	08/06/2022	13:18	CU	2	circle	8	display	80	landed
1	08/06/2022	13:22	CU	1	circle	13	display	70	
1	08/06/2022	13:49	CU	1	WSW	25	from feed	150	
1	08/06/2022	14:00	CU	1	SW	23	from feed	50	
1	08/06/2022	14:12	L	6	WSW	10	feed	55	landed
1	08/06/2022	14:27	CU	2	NNE	35		140	landed
1	08/06/2022	14:29	CU	1	ENE	28	feed	80	
3	08/06/2022	09:10	L	1		10		600	
3	08/06/2022	09:12	CU	1		10		1320	
3	08/06/2022	09:16	SN	1		20	display	1500	
3	08/06/2022	09:17	L	3		10		1500	
3	08/06/2022	09:24	CU	1		10	display	25	
3	08/06/2022	09:35	CU	1	SE	10		130	
3	08/06/2022	09:37	CU	1		10	display	120	
3	08/06/2022	09:40	L	1	NE	5		120	
3	08/06/2022	09:46	L	20	SE	13		390	landed
3	08/06/2022	09:59	L	4		10		360	
3	08/06/2022	10:05	L	2		8		60	
3	08/06/2022	10:06	SN	1		25	display	1800	
3	08/06/2022	10:21	L	1		10		900	
3	08/06/2022	10:27	CU	1	SE	3		120	
3	08/06/2022	10:34	CU	1	SE	3		120	
3	08/06/2022	10:58	L	4		8		30	flushed by GB
3	08/06/2022	11:02	L	1		5		30	
3	08/06/2022	11:15	CU	1	SE	1		45	
3	08/06/2022	11:16	L	2		15		600	
3	08/06/2022	11:20	CU	1	WNW	1		40	
3	08/06/2022	11:22	HH	1	SSE	3		360	ringtail, faded plumage, lost to view
3	08/06/2022	11:34	CU	1	SE	33		180	

TORFICHEN WIND FARM: BREEDING BIRD SURVEYS 2022

VP	Date	Time	Species	Count	Direction of flight	Flight height (m)	Activity	Time bird observed (sec)	Notes
3	08/06/2022	11:40	SN	1		33	display	1800	until VP end
3	08/06/2022	11:41	L	1		8		90	
3	08/06/2022	11:44	SN	1		20	display	600	
3	08/06/2022	11:57	L	1		5		60	
3	08/06/2022	11:58	CU	1		10		90	
3	08/06/2022	12:00	CU	2	ESE	3		75	
3	08/06/2022	12:01	SN	1		10	display	40	
3	08/06/2022	12:02	CU	1	SE	3		60	
3	08/06/2022	12:05	CU	3	ENE	15		150	
3	08/06/2022	12:08	CU	1	ENE	35		150	
3	08/06/2022	12:09	CU	1	SSE	3		15	
3	08/06/2022	12:41	CU	1		10	display	900	
3	08/06/2022	13:02	L	1		10		90	
3	08/06/2022	13:26	CU	1	NE	10		70	
3	08/06/2022	13:30	L	18		10		300	
3	08/06/2022	13:39	L	2		5		45	
3	08/06/2022	13:40	L	2		5		1800	until VP end
3	08/06/2022	13:51	CU	2		10		1140	until VP end
3	08/06/2022	13:54	L	4		10		600	
3	11/07/2022	14:52	L	3	WSW	35		130	
3	11/07/2022	14:54	CU	2	W	18		110	ad and juv
3	11/07/2022	15:02	CU	1	SSW	30	to nest	50	landed
3	11/07/2022	16:10	L	1	W	25		150	
3	11/07/2022	17:00	CU	1	ENE	20	to nest	90	landed
3	11/07/2022	17:34	CU	1	SW	13	mobbing	140	mobbing C, landed
3	11/07/2022	20:02	GJ	6	WSW	18	roost	60	
3	11/07/2022	20:41	CU	1	ESE	50		210	
1	11/07/2022	14:22	L	15	S	23		240	
1	11/07/2022	14:57	SN	1	NW	55		150	
1	11/07/2022	18:34	CU	12	SW	90		180	
2	12/07/2022	14:26	GI	2	WSW	15		130	
2	12/07/2022	14:36	CU	2		15		50	
2	12/07/2022	14:43	CU	2		10		40	
2	12/07/2022	18:53	GJ	8	WSW	60		150	
3	15/08/2022	11:21	L	45	WNW	45		240	
3	15/08/2022	15:14	GJ	7	NNE	25		210	
3	15/08/2022	15:26	ML	1	NNE	2		20	female, landed
3	15/08/2022	15:47	ML	1	NE	3		20	flew from post, same as 12, female
3	15/08/2022	15:56	L	49	ENE	10		130	landed
3	15/08/2022	18:35	L	2		10		50	
2	16/08/2022	12:26	MR	1	WSW	5	hunt	270	juv
1	17/08/2022	05:58	GJ	3	SE	35		40	
1	17/08/2022	08:01	GJ	24	E	10		45	landed

