

Longcroft Wind Farm: Technical Appendix 9.3: Wintering Bird Survey 2021-22



Report to Renewable Energy Systems Ltd

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LONGCROFT WIND FARM: WINTERING BIRD SURVEYS 2021-22

Introduction

1. This report presents the results of initial ornithological work carried out for the proposed development. This comprised a wintering bird survey to provide ornithological baseline data. It provides a winter's baseline data on the bird populations, activity and flight paths within the vicinity of the site, to inform subsequent ornithological impact assessment.
2. The surveys were designed to take into account NatureScot (SNH 2017) guidance on bird surveys for wind farms. The surveys were undertaken by Carl Mitchell, a highly experienced bird surveyor.
3. The site lies within the potential Special Protection Area (SPA) connectivity distance from the Fala Flow SPA (which lies 8km north-west from the site) and Greenlaw Moor SPA (15km south-east), Pink-footed geese are a qualifying feature for both these SPAs and have a core range of 15-20km (SNH 2013). The site is not, though, within a known goose feeding area (Mitchell 2012, SNH 2013).

Study Area

4. The site is located about 6km north from Lauder in the Scottish Borders. The wintering bird survey area was chosen to include the site, plus a 500m buffer, where access was allowed (within the two landholdings in which the site is located). The survey area covered a total area of 12.7km². It comprised predominantly upland moorland habitat, currently used mainly for rearing gamebirds for commercial shooting and for grazing sheep.

Wintering Bird Survey Methods

5. The aim of the autumn/winter field survey work was to obtain data on the ornithological importance of the site and its surrounds at that time of year, and on the flight lines of key target species. It included walkover surveys of the site and vantage point surveys of bird flight activity. Wider areas surveys for wintering waterfowl were not undertaken as there was no important waterfowl habitat within 2km of the site.

Autumn/Winter Walkover Surveys

6. Walkover mapping surveys of the wintering birds within the site and viewing out over a 500m buffer (see Figure 1). Access was not possible outside the site. The survey focused on key target species which 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).
7. As well as counting and mapping each species, the behaviour of each flock was also recorded, e.g. feeding/roosting. The surveys included work at dawn and dusk to check the area specifically for roosting hen harriers and other important raptors. Seven surveys were undertaken at approximately monthly intervals between September 2021 and March 2022 (though poor weather conditions and access restrictions meant that the February survey had to be postponed to early March).

Vantage point surveys

8. Vantage point (VP) surveys were carried out to quantify the bird numbers that could potentially be at risk of collision. Forty-two hours' surveys were undertaken between September 2021 and March 2022 from each VP. Three VPs were required to cover the site. The computer-generated viewsheds (using Global Mapper v21) are shown in Figure 1. Details of the survey times and conditions are given in Appendix 1.
9. 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.
10. 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 (<3km).
11. 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 recorded as a raw estimate, rather than being summarised to height classes. Below 10m estimates were made to 1m, between 10m and 20m to 2m, between 20m and 50m to 5m, and above 50m to 10m. 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 crossing the site that would be at risk of collision.

Wintering Bird Surveys 2021-22: Results

Autumn/winter walkover survey results

12. The bird populations found within the survey area during each of the monthly walkover surveys are summarised in Table 1. The table shows the numbers recorded during each survey, and the overall mean and peak counts. Overall, only low numbers of birds were recorded using the site during these surveys, with no notable concentrations of any important species.

Table 1. Autumn/winter bird populations recorded in the Longcroft survey area during the September 2021 - March 2022 walkover surveys.

Species	Sep	Oct	Nov	Dec	Jan	Mar A	Mar B	Mean 2021-22	Peak 2021-22
Pink-footed Goose*	0	0	0	80	0	5	6	13.0	80
Greylag Goose	226	31	31	20	19	26	70	60.4	226
Mallard	0	0	0	0	0	10	17	3.9	17
Goosander	2	1	0	0	0	0	0	0.4	2
Red Grouse	175	122	150	115	218	148	152	154.3	218
Red Kite	0	0	0	1	0	4	0	0.7	4
Goshawk	0	0	0	0	1	0	0	0.1	1

Species	Sep	Oct	Nov	Dec	Jan	Mar A	Mar B	Mean 2021-22	Peak 2021-22
Buzzard	32	21	20	21	22	17	22	22.1	32
Kestrel	1	1	0	3	0	0	1	0.9	3
Peregrine	0	0	1	0	0	1	1	0.4	1
Oystercatcher	0	0	0	0	0	0	4	0.6	4
Golden Plover	0	2	0	2	0	29	37	10.0	37
Lapwing	0	0	0	0	0	8	36	6.3	36
Snipe	0	4	0	0	0	0	0	0.6	4
Woodcock	0	0	0	1	0	0	0	0.1	1
Curlew	0	0	0	0	0	1	19	2.9	19
Lesser Black-backed Gull	0	0	1	0	0	0	0	0.1	1
Herring Gull	0	0	0	101	100	100	0	43.0	101
Great Black-backed Gull	0	0	0	0	0	4	0	0.6	4

* Pink-footed goose records were all of over-flying flocks.

Vantage Point Survey Results

13. The rates of bird flight movement observed across the survey area during the VP surveys are summarised in Table 2. This gives the flight rate per hour recorded in each month and the total number of flights recorded. Flight rates over the survey area were generally low, though did include occasional records of several key raptors (red kite, hen harrier, merlin and peregrine, and occasional flocks of pink-footed geese and golden plover).
14. Table 2 also gives the percentage of flights of each species that were recorded at rotor height (between 50m and 220m above ground level).

Table 2. Bird flight rates recorded over the Longcroft survey area during the September 2021 - March 2022 vantage point surveys. N = 42 hours total observation from each of the three VPs.

Species	Flight rate (birds/hour)							Total number of birds overflying	% flights at rotor height
	Sep	Oct	Nov	Dec	Jan	Feb	Mar		
Pink-footed Goose	2.83	10.33	7.71	0	5.68	0	0	584	38%
Greylag Goose	3.92	2.56	0.75	0	2.92	0	1.97	261	41%
Goosander	0	0	0	0	0	0	0.03	1	0%
Red Grouse	0	1.67	0	0	0	0	0	30	0%
Red Kite	0.17	0.06	0.04	0	0	0	0.07	6	33%
Hen Harrier	0	0	0	0	0	0	0.03	1	0%
Buzzard	2.33	0.33	0.92	0.40	0.22	0.50	0.10	71	52%
Kestrel	0	0.06	0.04	0	0	0	0.03	3	0%

Species	Flight rate (birds/hour)							Total number of birds overflying	% flights at rotor height
	Sep	Oct	Nov	Dec	Jan	Feb	Mar		
Merlin	0	0.06	0	0	0.03	0	0	2	0%
Peregrine	0	0.06	0.08	0	0	0.17	0	4	50%
Golden Plover	0	1.22	6.67	0	5.27	0	0.95	376	35%
Lapwing	0	0	0	0	0	0	2.07	61	75%
Snipe	0.25	0	0	0	0	0	0	3	0%
Curlew	0	0	0	0	0	0	0.03	1	0%
Lesser Black-backed Gull	0	0	0.04	0	0	0	0	1	100%
Herring Gull	0	0	1.50	1.60	9.49	7.00	0.03	386	79%
Great Black-backed Gull	0	0	0.04	0	0	0	0	1	100%

Conservation Evaluation of Wintering Bird Populations

15. The conservation value of the wintering bird populations was determined using the criteria specified in Table 3 (from Percival 2007) and is summarised in Table 4. This includes the criteria adopted by NatureScot 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). Regional (Natural Heritage Zone, NHZ) populations were taken from Wilson *et al.* (2015). The site is located within NHZ 20, the 'Border Hills'. In addition, listing on Annex 1 of the EU Birds Directive, Schedule 1 of the Wildlife and Countryside, UK Biodiversity Action Plan [BAP] priority species and Scottish BAP species were all considered in the evaluation process.

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

Conservation Value	Definition
VERY HIGH	Cited interest of SPAs, Special Area of Conservation (SAC) and Site of Special Scientific Interest (SSSI). 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).

Conservation Value	Definition
LOW	Any other species of conservation interest, e.g. species listed on the Birds of Conservation Concern not covered above. Scottish BAP species (if not covered above).

Table 4. Conservation evaluation of the wintering bird populations in the survey area, 2021-22.

Species	Peak count	EU Birds Dir Ann 1	W and C Act Sch 1	Red [R]/ Amber [A] List	UK BAP priority sp	Scottish BAP sp	Conservation Value
<i>Pink-footed Goose</i>	159			A			Very high
Greylag Goose	226			A			Low
Mallard	17			A			Low
Goosander	2						Nil
Red Grouse	218				✓		Medium
Red Kite	4	✓	✓			✓	High
Goshawk	1		✓				High
Buzzard	32						Nil
Kestrel	3			A		✓	Low
Merlin	1	✓	✓	R		✓	High
Peregrine	1	✓	✓			✓	High
Oystercatcher	4			A			Low
Golden Plover	42	✓				✓	High
Lapwing	36			R	✓	✓	Medium
Snipe	4			A			Low
Woodcock	1			R		✓	Low
Curlew	19			R	✓	✓	Medium
Lesser Black-backed Gull	1			A			Low
Herring Gull	101			R	✓	✓	Medium
Great Black-backed Gull	4			A			Low

Note: species in italics seen over-flying only.

Conclusions

16. The 2021-2022 wintering bird surveys found a range of wintering bird populations of conservation importance but with generally only low numbers within/in proximity to the site in numerical terms and/or in the context of their regional (NHZ) populations. Key wintering bird populations recorded included:

- **Over-flying Pink-footed Geese** - pink-footed geese were occasionally seen over-flying through the winter (Figure 2) (nine flocks in total). None were seen on the ground during any of the surveys. The only impact of the development on this species would be collision risk, which, given the numbers observed, would unlikely to be significant. There was no evidence of any clear link to the Fala Flow or Greenlaw Moor SPAs.
- **Red Kite** - there were occasional records of this species (six during the VP surveys and five during the walkover surveys, see Figure 3), including flights over the site, but no evidence that the site was of particular importance.
- **Red Grouse** – the site supports a high resident population of red grouse for commercial shooting. These birds were distributed widely across all of the higher heather-dominated habitat within the survey area, with no notable concentrations (Figure 4)
- **Golden Plover** - there were occasional records through the winter (and most frequently in early spring), but numbers recorded were low (peak 42) (Figure 5).

- **Other scarce raptors** – hen harrier, goshawk, merlin and peregrine were all recorded during the winter surveys, but only infrequently in low numbers (VP survey flight lines shown in Figure 6). No evidence was found of any raptor night roosts in the survey area. There was no indication that the survey area was important to any of these species.
17. Overall, the wintering bird survey results did not indicate any specific ornithological issues that would require taking into account in the design process, or which would be likely to result in any significant impact from a wind farm at this location.

References

Drewitt, A.L., Whitehead, S. and Cohen, S. 2020. Guidelines for the Selection of Biological SSSIs. Part 2: Detailed Guidelines for Habitats and Species Groups. Chapter 17: Birds (Version 1.1). Joint Nature Conservation Committee, Peterborough.

Frost, T.M., Calbrade, N.A., Birtles, G.A., Hall, C., Robinson, A.E., Wotton, S.R., Balmer, D.E. and Austin, G.E. 2021. Waterbirds in the UK 2019/20: The Wetland Bird Survey. BTO/RSPB/JNCC. Thetford.

Gilbert, G., D. W. Gibbons, and J. Evans. (1998). Bird Monitoring Methods: a manual of techniques for key UK species. RSPB /BTO/WWT/JNCC/ITE/The Seabird Group.

Mitchell, C. 2012. Mapping the distribution of feeding Pink-footed and Iceland Greylag Geese in Scotland. pp. 108. Slimbridge: Wildfowl & Wetlands Trust / Scottish Natural Heritage Report.

Percival, S.M. 2007. Predicting the effects of wind farms on birds in the UK: the development of an objective assessment methodology. Birds and Wind Farms: risk assessment and mitigation (ed. M. de Lucas, Janss, G.F.E. and Ferrer, M.). Quercus, Madrid.

Scottish Natural Heritage. 2013. Assessing connectivity with Special Protection Areas (SPAs). Guidance. pp. 3pp.

Scottish Natural Heritage 2017. Recommended bird survey methods to inform impact assessment of onshore wind farms. SNH Guidance.

Stanbury, A., M. Eaton, N. Aebischer, D. Balmer, A. Brown, A. Douse, P. Lindley, N. McCulloch, D. Noble, and I. Win. 2021. The status of our bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain. *British Birds* 114:723-747.

Wilson, M. W., G. E. Austin, G. S., and C. V. Wernham. 2015. Natural Heritage Zone Bird Population Estimates. SWBSG Commissioned report number 1504.

Woodward, I., Aebischer, N., Burnell, D., Eaton, M., Frost, T., Hall, C., Stroud, D. and Noble, D. 2020. Population estimates of birds in Great Britain and the United Kingdom. *British Birds*, 113: 69-104.

**Longcroft Wind Farm:
Wintering Birds 2021-22**

**FIGURE 1
Wintering Bird
Survey Area and VP
Viewsheds**

- KEY:**
- VP Locations
 - ⊕ Initial Turbines
 - Contour lines
 - Viewshed VP1
 - Viewshed VP2
 - Viewshed VP3
 - Site Boundary Buffer 500m
 - Site Boundary



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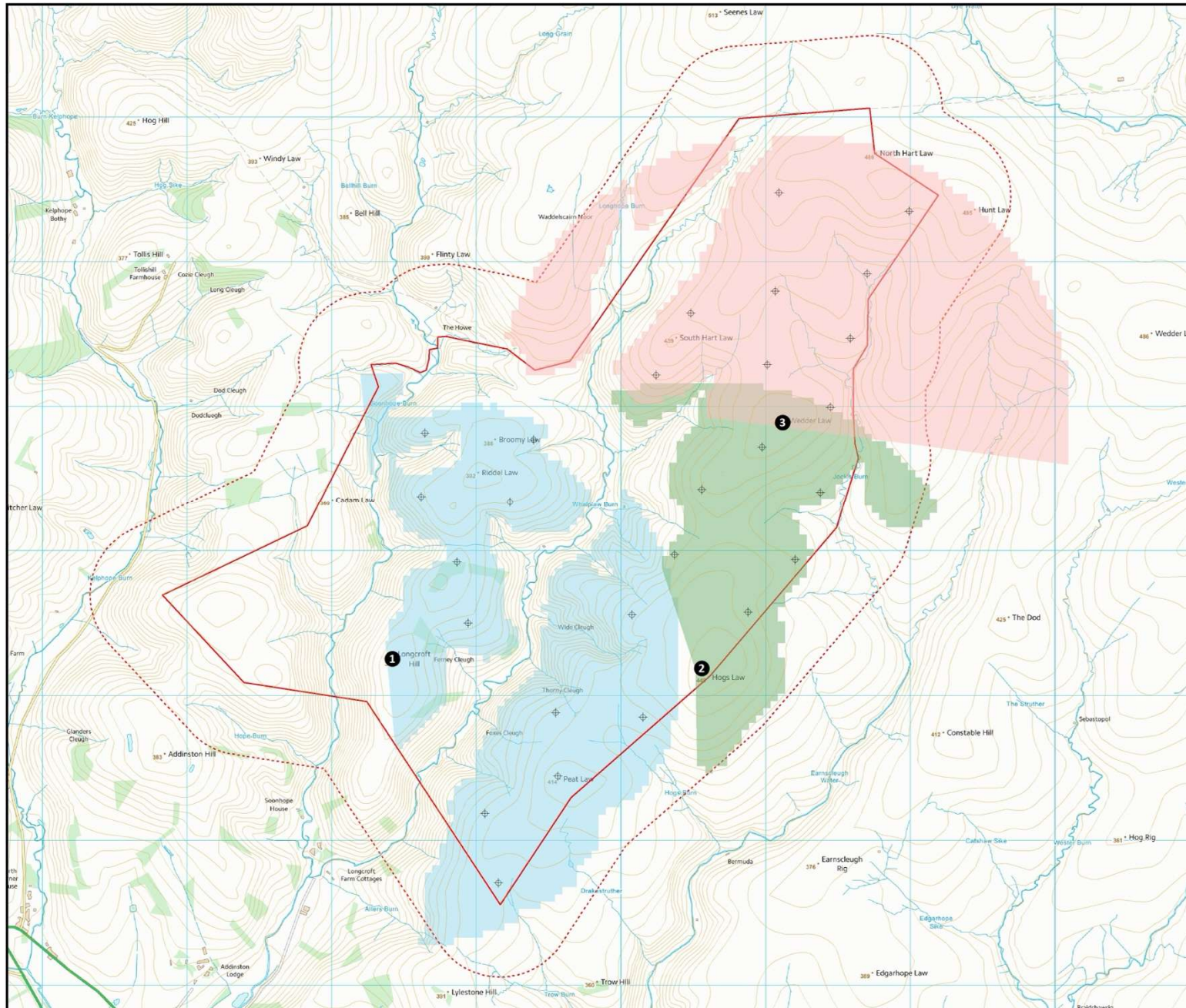
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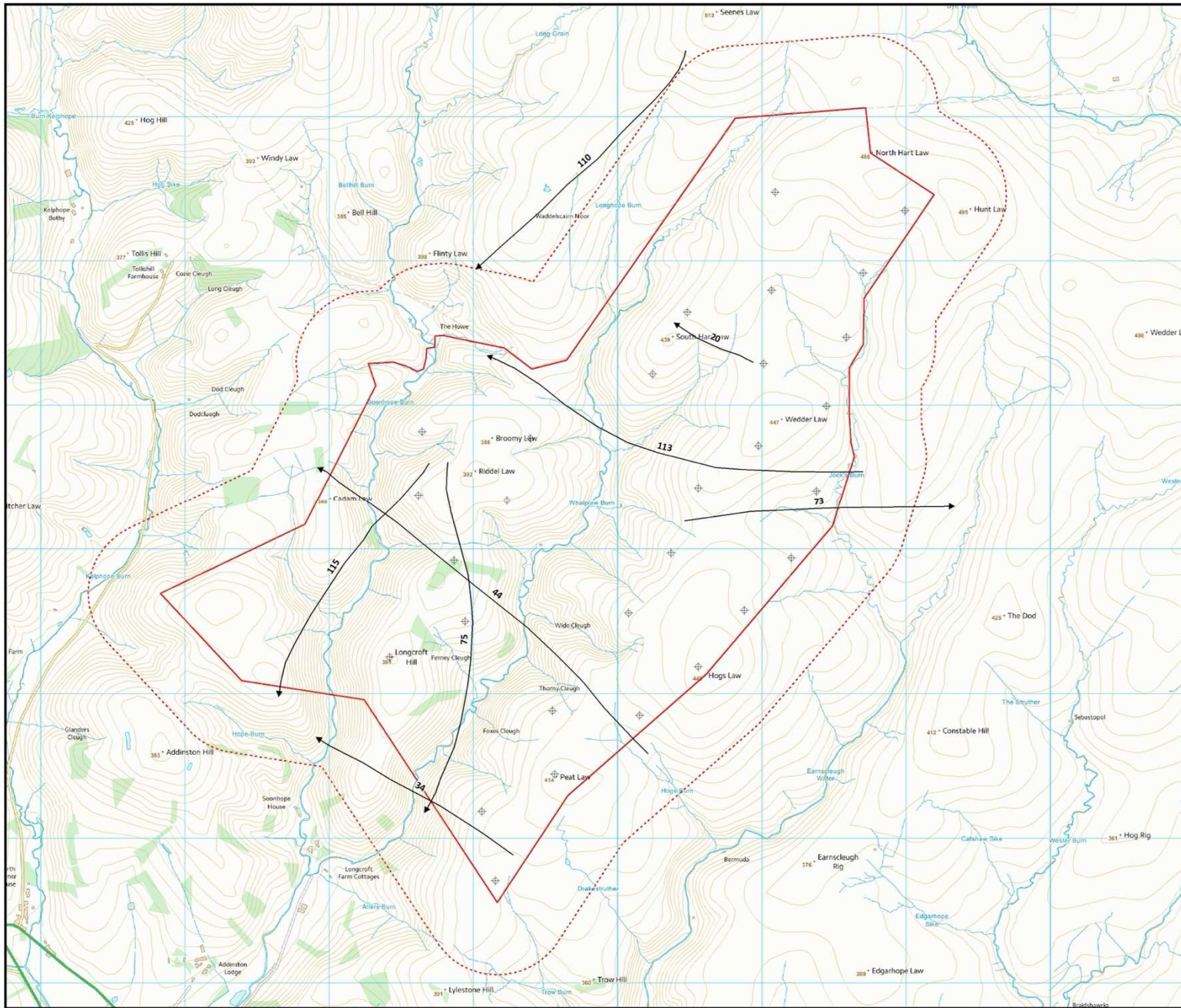
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**WINTERING BIRD
SURVEYS 2021-22**

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**Longcroft Wind Farm:
Wintering Birds 2021-22**

FIGURE 2

**VP Survey Flight Lines:
Pink-footed Goose**

KEY:

- ⊕ Initial Turbines
- Flight lines (number = flock size)
- Contour lines
- - - Site Boundary Buffer 500m
- ▭ Site Boundary



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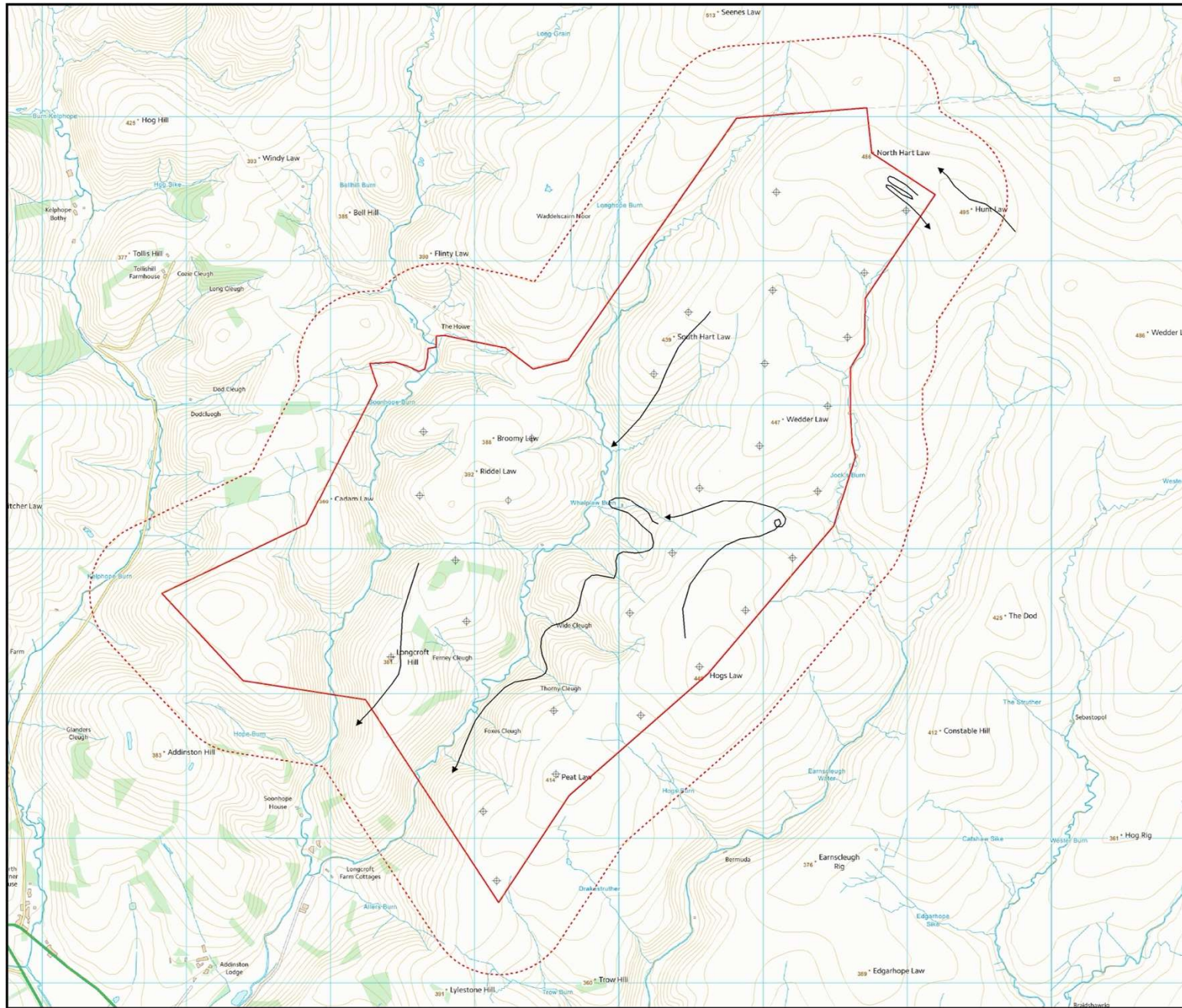
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**Longcroft Wind Farm:
Wintering Birds 2021-22**

FIGURE 3

**VP Survey Flight Lines:
Red Kite**

KEY:

- ⊕ Initial Turbines
- Flight lines
- Contour lines
- - - Site Boundary Buffer 500m
- ▭ Site Boundary



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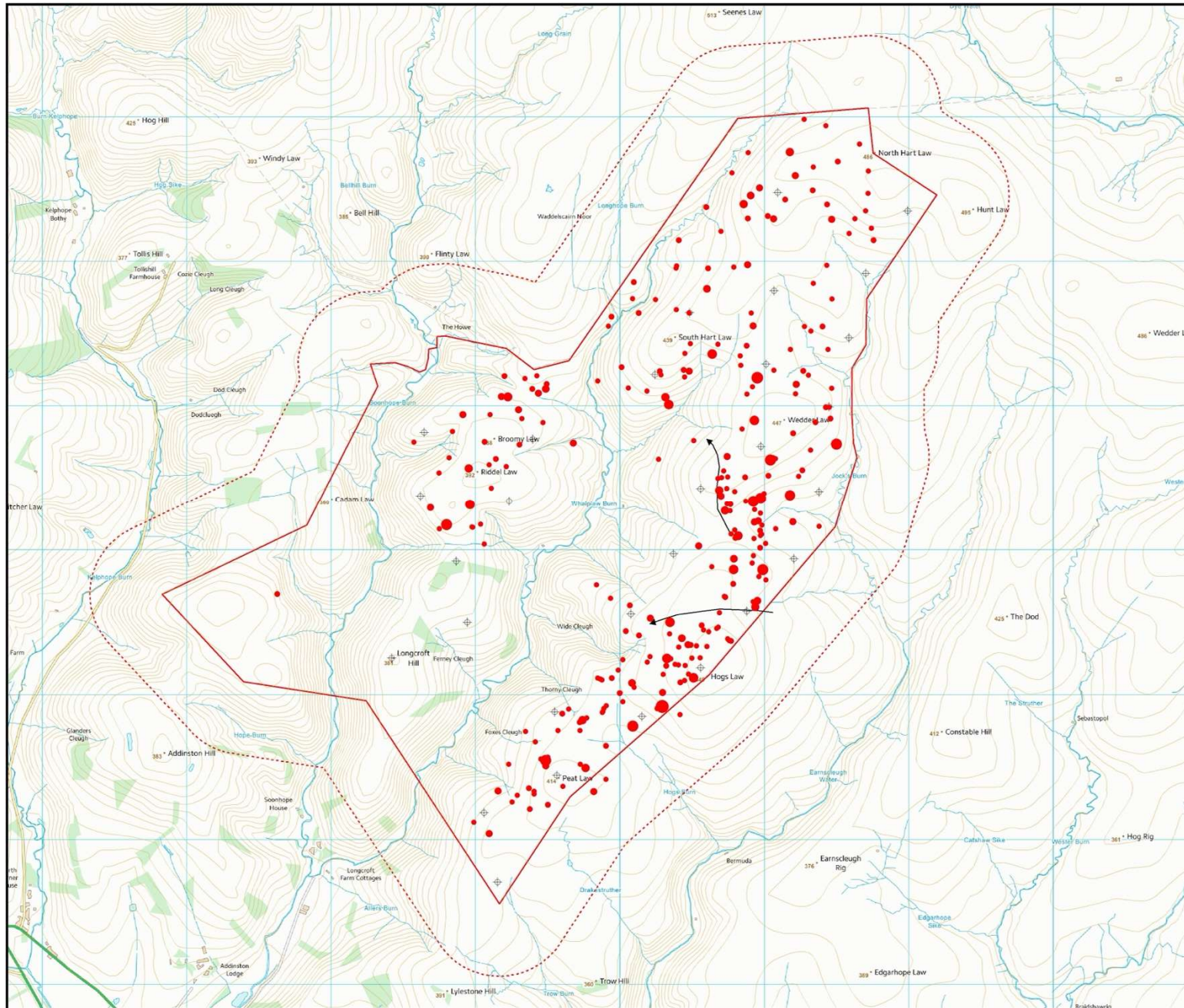
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**Longcroft Wind Farm:
Wintering Birds 2021-22**

**FIGURE 4
Walkover Records and
VP Survey Flight Lines:
Red Grouse**



KEY:

Flock

- 1
- 5
- 10

⊕ Initial Turbines

→ Flight lines

— Contour lines

--- Site Boundary Buffer 500m

▭ Site Boundary

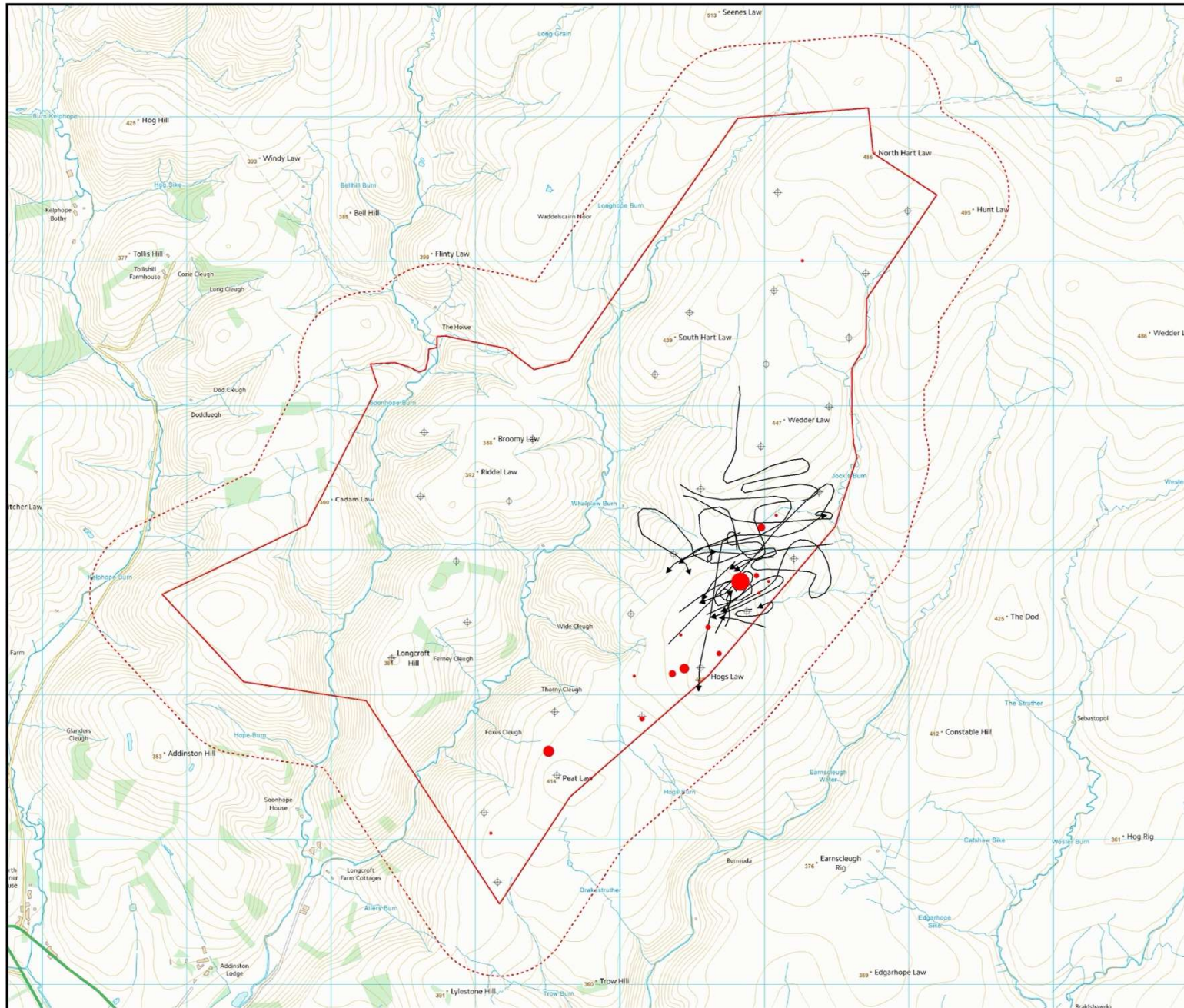


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**Longcroft Wind Farm:
Wintering Birds 2021-22**

**FIGURE 5
Walkover Records and
VP Survey Flight Lines:
Golden Plover**



- KEY:**
- Flock**
- 1
 - 5
 - 10
- ⊕ Initial Turbines
- Flight lines
- Contour lines
- Site Boundary Buffer 500m
- ▭ Site Boundary



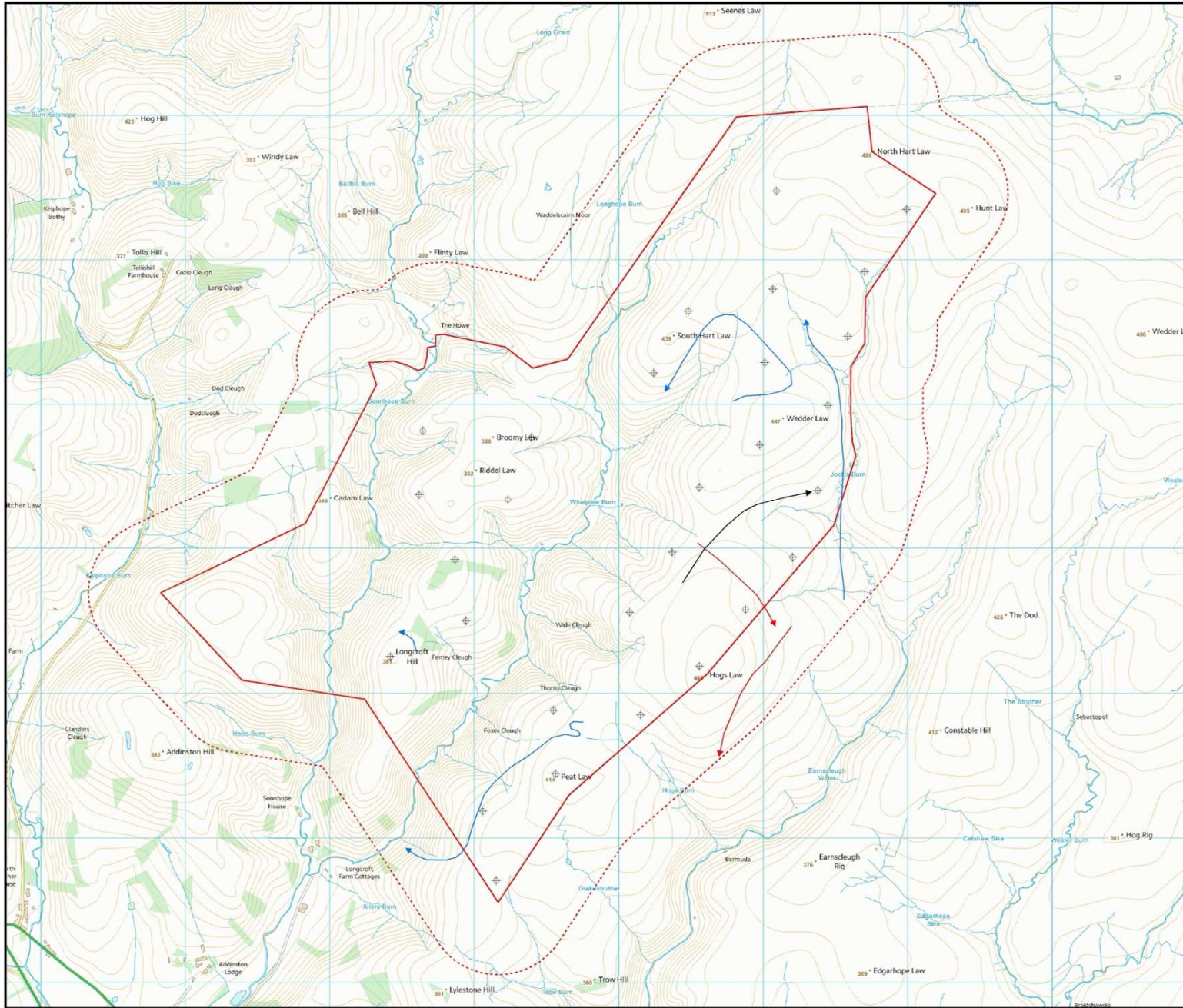
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**Longcroft Wind Farm:
Wintering Birds 2021-22**

FIGURE 6

**VP Survey Flight Lines:
other scarce raptors**

KEY:

- ⊕ Initial Turbines
- Species
- Hen Harrier
- Merlin
- Peregrine
- Contour lines
- - - Site Boundary Buffer 500m
- ▭ Site Boundary



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APPENDIX 1. VANTAGE POINT SURVEY DATA

Survey Information

Date	Vantage Point No	Start time	Finish time	Weather
15/09/2021	3	11:55	14:55	sunny, little wind, cloud 4/8, 15C, cooler, cloudier and windier in afternoon
15/09/2021	3	15:25	18:25	sunny, little wind, cloud 4/8, 15C, cooler, cloudier and windier in afternoon
30/09/2021	1	13:00	16:00	low cloud base and drizzle , wind 2 SW, cloud 8/8
30/09/2021	1	16:15	19:15	low cloud base and drizzle , wind 2 SW, cloud 8/8
03/10/2021	2	13:00	16:00	windy, cloudy 7/8, cool, 7 to 8C
10/10/2021	2	09:55	12:55	cold 6C, windy, sunny
13/10/2021	3	09:05	12:05	cold, windy, cloud 8/8
13/10/2021	3	12:35	15:35	cold, windy, cloud 8/8
17/10/2021	2	15:05	18:05	calm, little wind, 10C, cloudy
24/10/2021	2	10:15	13:15	mild, 10C, windy from SW, cloudy 8/8, rain on and off, some mist
03/11/2021	1	09:50	12:50	cold (10C, but felt like 4C in wind), cloudy 8/8, wind from north
03/11/2021	1	13:20	16:20	cold (10C, but felt like 4C in wind), cloudy 8/8, wind from north
13/11/2021	3	09:30	12:30	bright, cool (10C), wind from N, cloudy 4/8, clear and sunny, wind dropped in afternoon
13/11/2021	3	13:00	16:00	bright, cool (10C), wind from N, cloudy 4/8, clear and sunny, wind dropped in afternoon
14/11/2021	2	09:00	12:00	cloudy, cool 8C, wind from SW
21/11/2021	2	12:55	15:55	bitterly cold 4C, but with wind-chill much colder, strong wind from north, cloud 6/8, light rain from 15:05
22/11/2021	1	08:20	11:20	cold (freezing overnight), wind from NW, sunny and no cloud in morning, clouded over 7/8 in early afternoon
22/11/2021	1	11:50	14:50	cold (freezing overnight), wind from NW, sunny and no cloud in morning, clouded over 7/8 in early afternoon
12/12/2021	1	08:55	11:55	cold (5C), cloudy 8/8, wind from SW
12/12/2021	1	12:25	14:25	cold (5C), cloudy 8/8, wind from SW
15/01/2022	3	09:30	12:30	calm, little wind, overcast 8/8, cold 5C
15/01/2022	3	13:00	15:30	calm, little wind, overcast 8/8, cold 5C
16/01/2022	1	10:15	11:15	very cold with wind chill, sunny, little cloud, wind from west
16/01/2022	1	11:15	11:45	sunny, cold, wind from west, little cloud
16/01/2022	2	12:45	13:15	very cold, sunny, little cloud, wind from west
16/01/2022	2	13:15	15:30	very cold, sunny, cloud 1/8, wind from west
16/01/2022	3	14:15	14:45	bitingly cold, no cloud, wind from NW
17/01/2022	2	09:45	12:45	very cold, sunny, wind from west, no cloud
17/01/2022	3	13:15	16:15	bright, sunny, little cloud, but very cold
20/01/2022	1	12:40	13:10	sunny, cold, wind from north west, cloud 6/8
21/01/2022	1	08:50	11:50	cold and windy from west, sunny, cloud 4/8
21/01/2022	1	12:20	14:20	cold and windy from west, sunny, cloud 4/8
22/01/2022	3	09:30	12:30	very cold, strong wind from west, cloudy 8/8
23/01/2022	2	09:10	12:10	very cold, windy from west, cloud 8/8
23/01/2022	2	12:40	15:40	very cold, windy from west, cloud 8/8
25/02/2022	1	08:30	11:30	very cold, snow on ground, wind from west, cloudy in afternoon
25/02/2022	1	12:00	15:00	very cold, snow on ground, wind from west, cloudy in afternoon
01/03/2022	2	09:30	10:00	cold, windy, cloudy
01/03/2022	3	11:00	14:00	cold, breezy, sunny, wind dropped at 13:00
01/03/2022	2	14:30	17:30	cool, sunny, little wind
05/03/2022	1	08:30	11:30	bright and sunny, cloud 4/8, wind NW f2, 10C, (frost on ground first thing)
05/03/2022	1	12:00	15:00	bright and sunny, cloud 4/8, wind NW f2, 10C
14/03/2022	2	08:40	11:10	cold, cloudy 6/8, windy
14/03/2022	3	11:40	13:40	cold, windy, cloudy 8/8, showers from 12 noon often heavy
15/03/2022	2	08:35	10:05	cold in stiff breeze from south, cloudy 8/8
15/03/2022	3	10:35	11:35	cold, windy, cloudy 8/8, showers from 12 noon often heavy
15/03/2022	3	11:35	12:35	cold, cloudy 8/8, windy from south
18/03/2022	2	11:00	13:30	sunny, cloud 2/8, but cold in southerly wind
18/03/2022	3	14:30	17:30	sunny, cloud 2/8, but cold in southerly wind
19/03/2022	3	11:30	13:30	sunny, cloud 1/8, but cold in southerly wind
19/03/2022	2	14:10	15:40	sunny, cloud 1/8 but cold in strong southerly wind

Key Species Data

Date	Time	Species	Count	Direction of flight	Flight height (m)	Activity	Time bird observed (sec)	Notes
15/09/2021	13:28	KT	1	SSW	33	soar	46	undulating flight
30/09/2021	13:10	SN	2	NNW	15	fly	20	
30/09/2021	13:44	PG			100	fly		heard but not seen due to low cloud base, probably travelling N to S over VP
30/09/2021	16:37	PG	34	NW	400	fly	60	very high
30/09/2021	16:42	SN	1	SW	40	fly	20	
30/09/2021	17:29	KT	1	SSW	20	hunt	60	
03/10/2021	15:14	ML	1	SSW	9	hunt	25	but direct flight over ground
10/10/2021	12:28	PG	73	E	300	fly	45	
13/10/2021	09:10	PG	113		90		40	two flocks (68 & 45) south of VP 3
13/10/2021	13:09	KT	1		35		300	seen for approx 5 ins
13/10/2021	13:50	K	1		35		125	
17/10/2021	15:06	RG	18	W	10		15	
17/10/2021	15:12	RG	12	N	10		12	
17/10/2021	16:05	PE	1	N	75		41	direct, fast flight (not hunting)
24/10/2021	11:20	GP	22		10	circle	32	landed on hill top
03/11/2021	10:28	HG	1	NNE	105	fly	30	
03/11/2021	10:32	HG	24	N	75	fly	240	2 adults, rest immatures
03/11/2021	12:45	PE	1	SW	50	fly	51	mobbed by crow/raven male?
03/11/2021	14:49	GB	1	WNW	100	fly	51	chased by raven
13/11/2021	13:02	PG	110	SW	350	fly	125	to Fala flow
13/11/2021	13:06	PE	1		35	hunt	40	adult (chased RG)
13/11/2021	13:33	K	1	SW	35	hunt	90	flying, then hovering
14/11/2021	09:50	GP						heard only - did not see
14/11/2021	10:14	GP	22	E	43	disturbed	33	
14/11/2021	10:31	GP	68		105	disturbed	360	all heights, might include birds in 1
21/11/2021	13:45	GP	70		110		240	
22/11/2021	08:25	HG	11	SSE	70	roost flight	25	
22/11/2021	08:41	LB	1	N	70	fly	28	
22/11/2021	10:44	PG	75	S	113	fly	45	
22/11/2021	13:28	KT	1	SW	50	hunt	300	approx 5 mins
12/12/2021	14:20	HG	8	NE	55		41	following valleys
16/01/2022	10:46	HG	2	NNE	55		18	
21/01/2022	08:52	HG	76	S	110		300	4 flocks between 08:52 - 09:18 (16, 5, 11, 24)
21/01/2022	10:08	PG	44	NW	225		109	
21/01/2022	11:00	PG	115	SSW	400		41	
21/01/2022	13:38	HG	80		110	soaring	120	overhead
21/01/2022	14:02	HG	53	NNW	125	soaring	120	birds following same route north up valley, same as birds as 10?
21/01/2022	14:08	HG	60	NNW	125	soaring	80	
17/01/2022	12:20	GP	32	E	85		300	
17/01/2022	12:29	PG	20	NW	50		42	
22/01/2022	14:32	GP	8	NE	103		180	wheeling about
22/01/2022	15:21	GP	8	E	13		10	landed, same birds as 14
17/01/2022	15:19	HG	28	WNW	90	roost flight	44	to fala roost
23/01/2022	10:40	ML	1	SE	8		13	very low
23/01/2022	12:45	GP	32	NE	6		38	
23/01/2022	13:07	GP	2	WNW	3		8	
23/01/2022	13:43	GP	42		53		50	landed
23/01/2022	13:56	GP	42		40		300	
25/02/2022	08:45	HG	15	S	40	from roost	18	
25/02/2022	08:52	HG	11	S	40	from roost	21	same route as 1
25/02/2022	09:53	HG	16	S	40	from roost	62	same route as 1
25/02/2022	11:24	PE	1	NW	5	hunt	36	imm, landed on fence for 20s
01/03/2022	11:44	K	1	NW	23	hover	33	dropped out of sight onto ground
02/03/2022	09:31	GP	1	SW	5		12	
14/03/2022	08:56	HH	1	NE	8	hunt	32	female imm
14/03/2022	09:29	KT	1	NE	35	hunt	29	
14/03/2022	09:30	GP	4	SW	50	flushed	8	flushed by KT
14/03/2022	09:38	GP	2	SW	5		14	same route as 4
14/03/2022	10:28	GP	3	W	5		8	landed
05/03/2022	09:09	L	1	N	100		10	reacting to BZ in wood
05/03/2022	09:48	L	1	NNW	150		45	flying through site
05/03/2022	13:47	CU	1	S	10		13	low flight, soon lost out of sight
05/03/2022	14:08	L	29		70		60	landed
05/03/2022	14:40	L	30	NNW	15		33	probably landed
15/03/2022	08:38	GP	7	N	5		8	breeders?
15/03/2022	09:20	GP	11	NE	5		13	landed
18/03/2022	13:05	HG	1	W	120		17	
19/03/2022	14:49	GD	1	ESE	35		26	male, flying into wind
18/03/2022	14:55	KT	1	NW	90	soar	240	