Technical Appendix 8.3

Bloch Wind Farm: Wintering Bird Survey 2020-21

Report to Renewable Energy Systems Ltd

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BLOCH WIND FARM: WINTERING BIRD SURVEYS 2020-21

Introduction

1. This report presents the results of initial ornithological work carried out for the proposed Bloch Wind Farm, Dumfries and Galloway. 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 proposed wind farm site, to inform subsequent ornithological impact assessment.
2. The surveys were designed to take into account NatureScot guidance (SNH 2017) on bird surveys for wind farms. The surveys were undertaken by Tom Lowe and Stuart Piner, both highly experienced bird surveyors.

Study Area

3. The site is located 5.5km south-west of Langholm, in Dumfries and Galloway. The wintering bird survey area was chosen to include all areas within the possible zone of ornithological influence of the proposed wind farm. This included the wind farm site, plus a 500m buffer, as used for the main breeding bird surveys (following SNH guidance, 2017). The main survey area covered a total area of 17.8km^2. It comprised predominantly upland moorland habitat, currently used mainly for grazing sheep, with the operational Solwaybank wind farm adjacent to the west (within an area of extensive conifer plantation).

Wintering Bird Survey Methods

4. The aim of the autumn/winter field survey work was to obtain data on the ornithological importance of the wind farm 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.

Autumn/Winter Walkover Surveys

5. Walkover mapping surveys of the wintering birds within the site and a 500m buffer took place in accordance with SNH guidance. The survey focused on key target species, as set out above for the VP surveys. 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. Five surveys were undertaken at approximately monthly intervals between November 2020 and March 2021 on the following dates: 16/17 November, 14/15 December 2020, 19/21 January, 26 February and 22/23 March 2021.

Vantage point surveys

6. Vantage point (VP) surveys were carried out to quantify the bird numbers that could potentially be at risk of collision. Thirty-six hours' surveys were undertaken between November 2019 and March 2020 from each vantage point. Three vantage points were required to cover the proposed wind farm site. The computer-generated viewsheds (using Global Mapper v21) are shown in Figure 1 of this report. Details of the survey times and conditions are given in Appendix 1.

7. 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.

8. All key target species flights (and any other species of specific nature conservation interest) were recorded, irrespective of their distance from the vantage point. Observations were carried out throughout daylight hours but not in periods of severely reduced visibility (<3km).

9. 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 10 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 wind farm site that would be at risk of collision.

Wintering Bird Surveys 2020-21: Results

Autumn/winter walkover survey results

10. 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.

Table 1. Autumn/winter bird populations recorded in the Bloch Wind Farm survey area during the November 2020 - March 2021 walkover surveys.

Species	Nov 16/17	Dec 14/15	Jan 19/21	Feb 23	Mar 22/23	Mean 2020-21	Peak 2020-21
Pink-footed Goose	0	0	0	75	0	15*	75*
Mallard	0	3	2	2	4	2.2	4
Red Grouse	6	1	6	9	2	4.8	9
Red Kite	0	0	0	1	0	0.2	1
Hen Harrier	1	1	0	3	0	1	3
Goshawk	0	0	0	3	1	0.8	3
Sparrowhawk	0	0	0	1	1	0.4	1
Buzzard	6	10	11	7	11	9	11
Kestrel	2	2	1	0	2	1.4	2
Merlin	0	2	0	0	1	0.6	2
Oystercatcher	0	0	0	2	2	0.8	2
Golden Plover	23	0	0	0	2	5	23
Lapwing	0	0	0	2	3	1	3
Jack Snipe	1	1	0	1	0	0.6	1
Snipe	7	59	15	7	3	18.2	59
Woodcock	0	0	1	0	0	0.2	1
Curlew	0	0	0	0	6	1.2	6
Common Gull	7	0	0	0	0	1.4	7
Great Black-backed Gull	0	0	1	0	0	0.2	1
Black-headed Gull	3	0	0	0	0	0.6	3

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

Vantage Point Survey Results: Autumn/Winter 2019-20

11. The rates of bird flight movement observed across the survey area during the vantage point surveys are summarised in Table 2. This gives the flight rate per hour recorded in each month and the total number of flights recorded. Flight rates over the survey area were generally low, though did include occasional records of several key raptors (red

kite, hen harrier, goshawk and merlin, and occasional larger flocks of pink-footed geese).

12. Table 2 also gives the percentage of flights of each species that were recorded at rotor height (taking rotor height conservatively as between 21m and 200m above ground level).

Table 2. Bird flight rates recorded over the Bloch Wind Farm survey area during the November 2020 - March 2021 vantage point surveys. N = 36 hours total observation from each of the three VPs.

Species	Flight rate (birds/hour)					Total number of birds overflying	% flights at rotor height
	Nov	Dec	Jan	Feb	Mar		
Pink-footed Goose	18.7	4.50	1.44	6.10	15.4	1025	90%
Greylag Goose	0	0.09	0	0	0	2	100%
Mallard	0	0	0.05	0	0	1	0%
Red Grouse	0	0.27	0	0	0	6	0%
Grey Heron	0.04	0	0	0	0.11	3	33%
Red Kite	0	0	0	0.05	0	1	0%
Hen Harrier	0.15	0.18	0.09	0.10	0.11	14	21%
Goshawk	0	0.05	0	0.25	0.22	10	40%
Sparrowhawk	0.19	0	0	0.05	0.17	9	29%
Buzzard	0.49	0.32	1.63	0.50	0.33	71	35%
Kestrel	1.13	0.59	0.70	0.55	0.11	71	10%
Merlin	0.04	0.05	0.05	0.05	0	4	25%
Oystercatcher	0	0	0	0	0.06	1	0%
Lapwing	0	0	0.19	0.55	0.22	19	29%
Jack Snipe	0	0.05	0	0	0	1	0%
Snipe	0	0.14	0	0	0	3	0%
Woodcock	0	0	0	0	0.06	3	0%
Curlew	0	0	0	0	0.78	14	50%
Common Gull	0	1.55	2.74	3.90	0	171	100%
Lesser Black-backed Gull	0	0	0.09	0	0.06	3	100%
Iceland Gull	0	0	0	0.05	0	1	100%
Herring Gull	0	0.05	10.2	29.9	0.22	822	76%
Great Black-backed Gull	0.08	0.05	0.51	0.45	0.06	24	75%
Barn Owl	0	0	0.05	0.05	0	2	0%

13. Figures 2 - 7 show the flight lines observed for key species during the VP surveys and records from the walkover surveys. Flights for all of the species shown in the Figures were widely distributed across the survey area, with no particularly notable concentrations of flight activity within any specific areas of the site.

Conservation Evaluation of Wintering Bird Populations

14. 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' (Eaton et al. 2015) that did not reach national or regional importance at the development site. National (GB) and International wintering waterfowl baseline populations have been taken from the most recently published population figures (Frost *et al.* 2021) from the national Wetland Birds Survey and other species from Woodward *et al*. (2020). In addition, listing on Annex 1 of the EU Birds Directive, Schedule 1 of the Wildlife and Countryside, 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, 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).
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 Bloch Wind Farm survey area.

Species	Peak count	EU Birds Dir Ann 1	Wildlife and Countryside Act Sch 1	Red [R]/ Amber [A] List	UK BAP priority sp	Scottish BAP sp	Conservation Value
Pink-footed Goose	*495*			*A*			*Low*
Greylag Goose	*2*			*A*			*Low*
Mallard	4			A			Low
Red Grouse	9			A	✓		Medium
Grey Heron	1						Nil
Red Kite	1	✓	✓			✓	High
Hen Harrier	3	✓	✓	R		✓	High
Goshawk	3		✓				High
Sparrowhawk	1						Nil
Buzzard	11						Nil
Kestrel	2			A		✓	Low
Merlin	2	✓	✓	R		✓	High
Oystercatcher	2			A			Low
Golden Plover	23	✓				✓	High
Lapwing	3			R	✓	✓	Medium

Species	Peak count	EU Birds Dir Ann 1	Wildlife and Countryside Act Sch 1	Red [R]/ Amber [A] List	UK BAP priority sp	Scottish BAP sp	Conservation Value
Jack Snipe	1						Nil
Snipe	59			A			Low
Woodcock	1			R		✓	Low
Curlew	6			R	✓	✓	Medium
Common Gull	7			A			Low
Lesser Black-backed Gull	2			A			Low
Iceland Gull	1			A			Low
Herring Gull	126			R	✓	✓	Medium
Great Black-backed Gull	1			A			Low
Black-headed Gull	3			A			Low
Barn Owl	1		✓			✓	High

Note: species in italics seen over-flying only.

Conclusions

15. The 2020-2021 wintering bird surveys found a range of wintering bird populations of conservation importance but with generally only low numbers within/in proximity to the proposed wind farm 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, with larger flocks observed in November and in March (Figure 2) (10 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 be unlikely to be significant.
- **Hen Harrier** - this species was regularly seen hunting over the site through the winter, with 14 flights in total (see Figure 3), though no evidence was found of any night roost in the survey area, and most flights seen were below rotor height (so collision risk would be low).
- **Goshawk** - this species was seen regularly through the surveys (10 sightings in total), in the afforested habitats around the site (and occasional flights over the site, Figure 4).
- **Merlin** - there were occasional records of this species (four during the VP surveys and three during the walkover surveys, Figure 5), including flights over the site, but no evidence that the site was of particular importance.
- **Golden Plover** - there were occasional records through the winter, in November and again in March, but numbers recorded were very low (peak 15) (Figure 6).
- **Other scarce raptors and owls** - red kite and barn owl were both recorded during the winter surveys, but only infrequently in low numbers (Figure 7). There was no indication that the survey area was important to either of these species.

16. 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.

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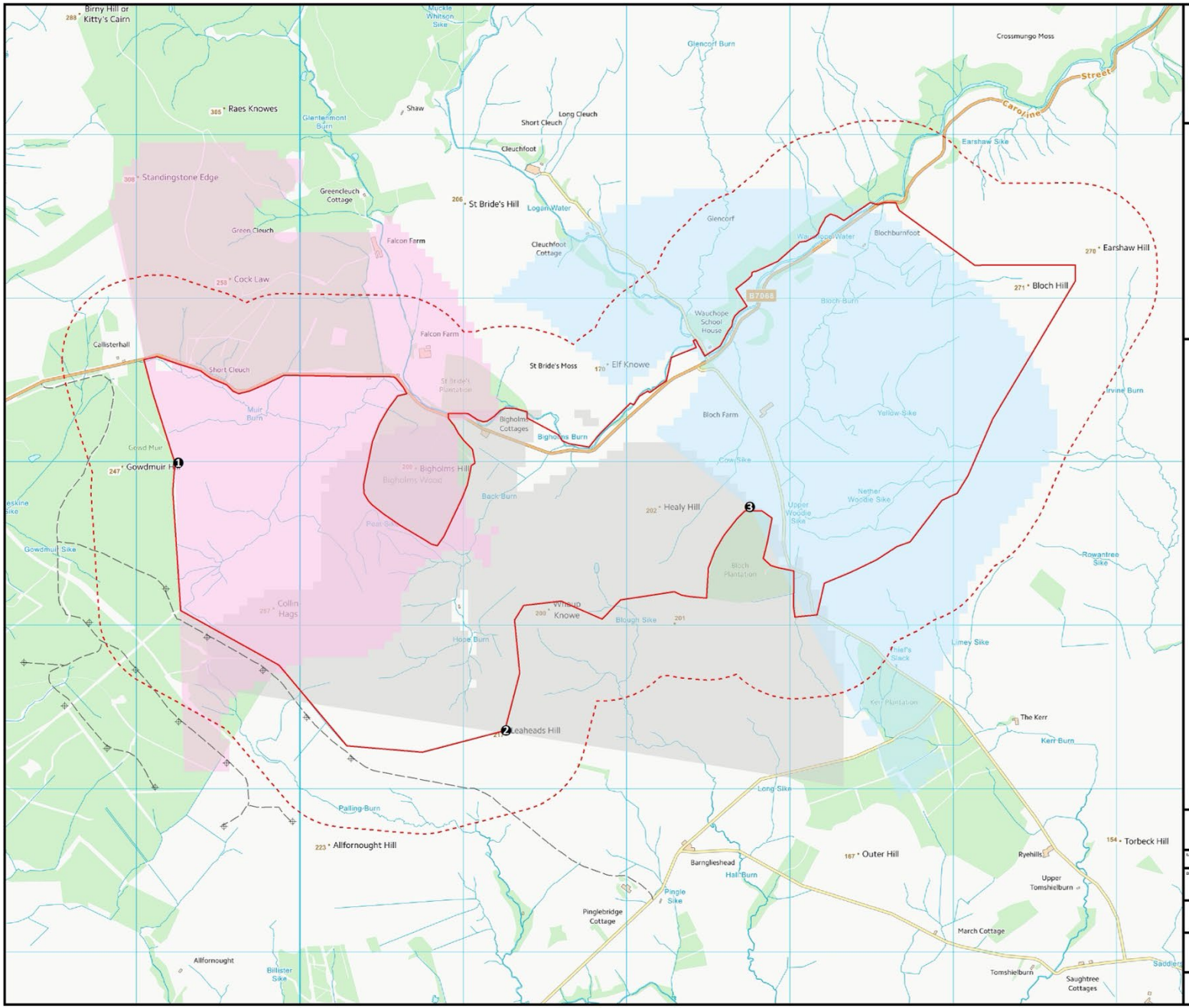

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Bloch Wind Farm

FIGURE 1

Wintering Bird Survey Areas 2020-21

KEY:

- Solwaybank Extension VPs
- Winter bird survey area
- VP1 Viewshed
- VP2 Viewshed
- VP3 Viewshed
- Solwaybank Ext Site Boundary
- Solwaybank turbines
- Solwaybank wind farm tracks

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WINTER BIRD SURVEYS 2020-21

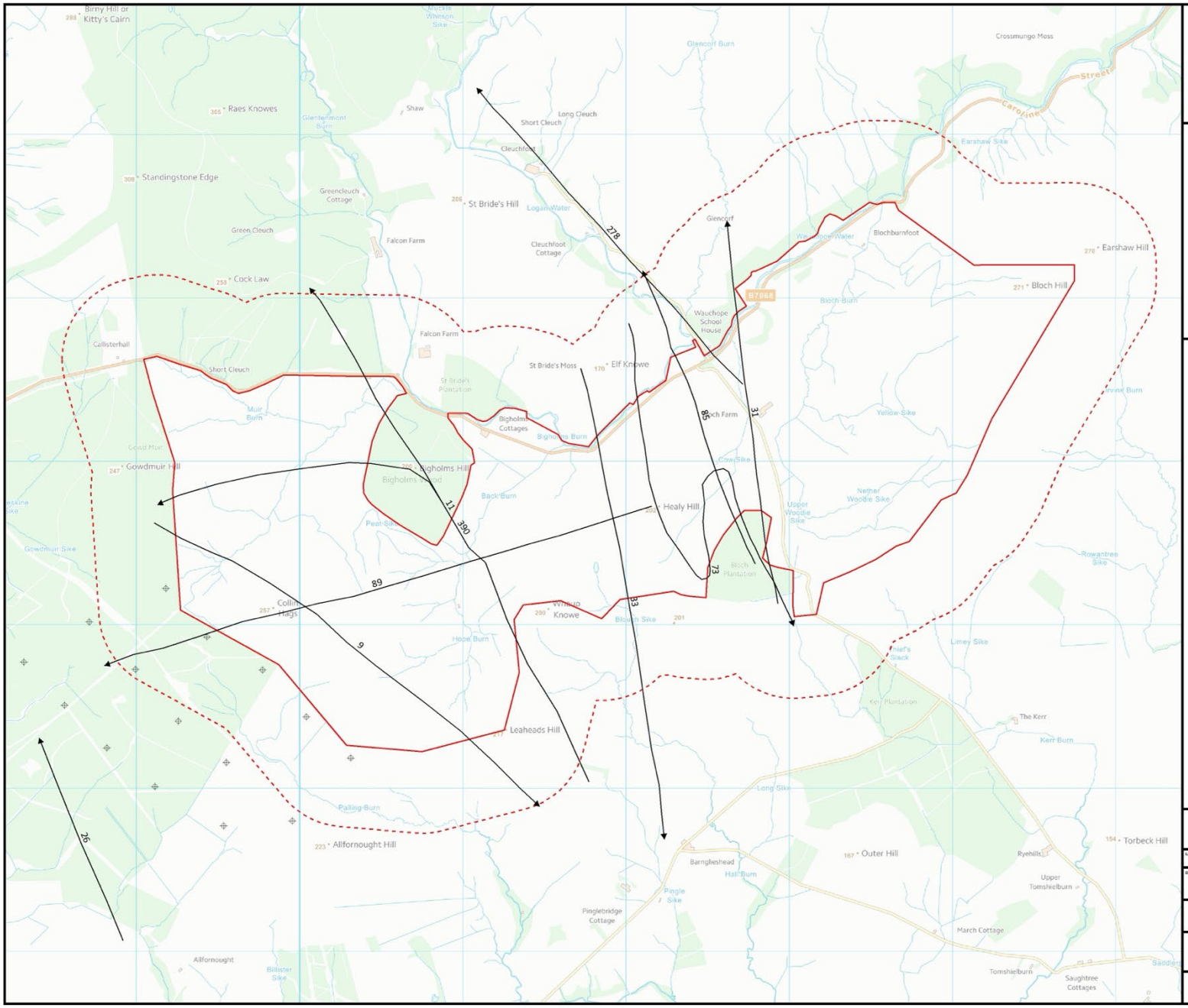

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FIGURE 2

Pink-footed Goose Flight Lines 2020-21

KEY:

- Winter bird survey area
- Site boundary
- Solwaybank turbines
- Flight lines winter 2020-21 (numbers = flock size)

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DRAWING NUMBER: SB2020-1

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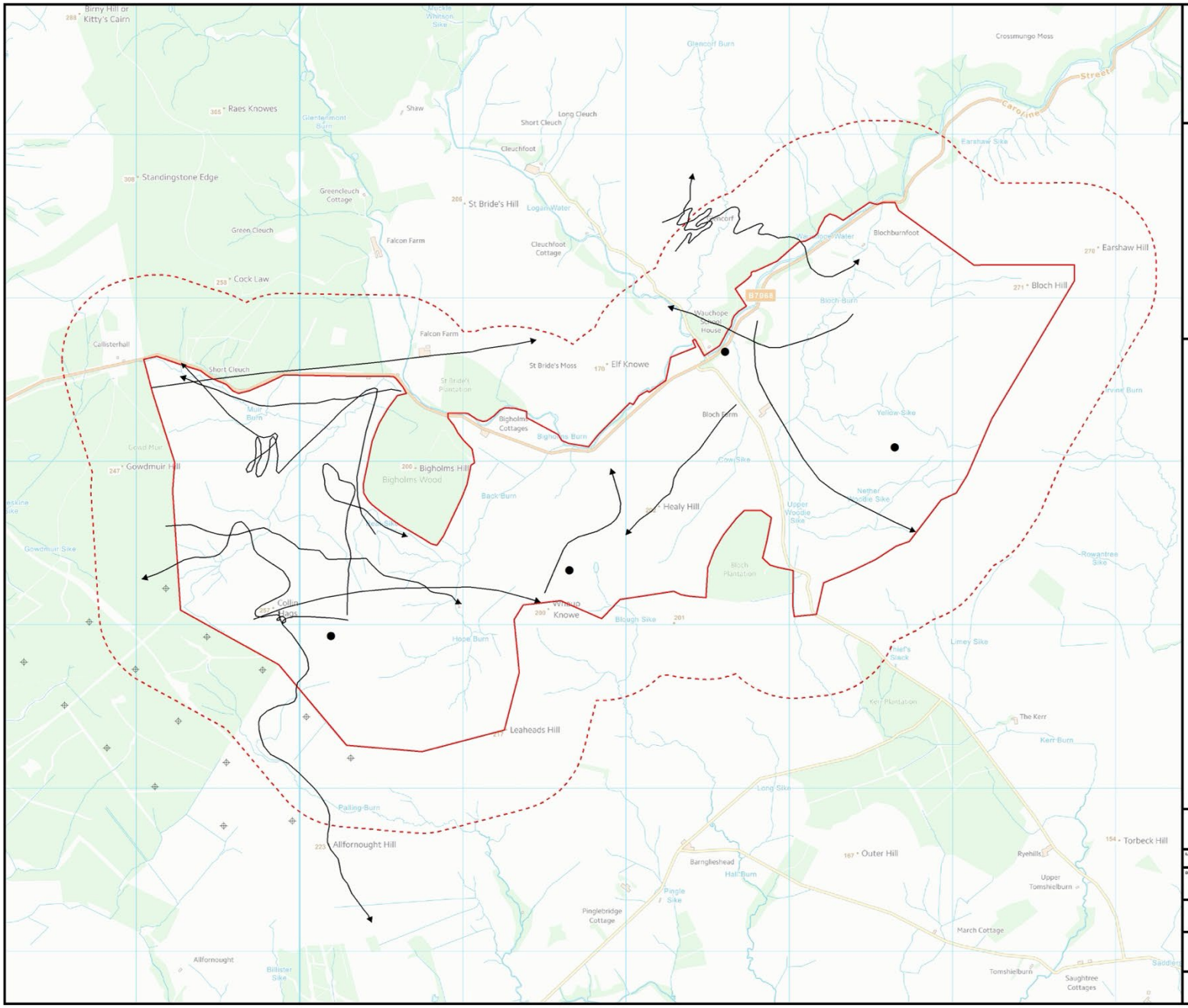

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FIGURE 3

Hen Harrier Flight Lines 2020-21

KEY:

- Flight lines winter 2020-21
- Winter walkover records 2020-21
- Winter bird survey area
- Site boundary
- Solwaybank turbines

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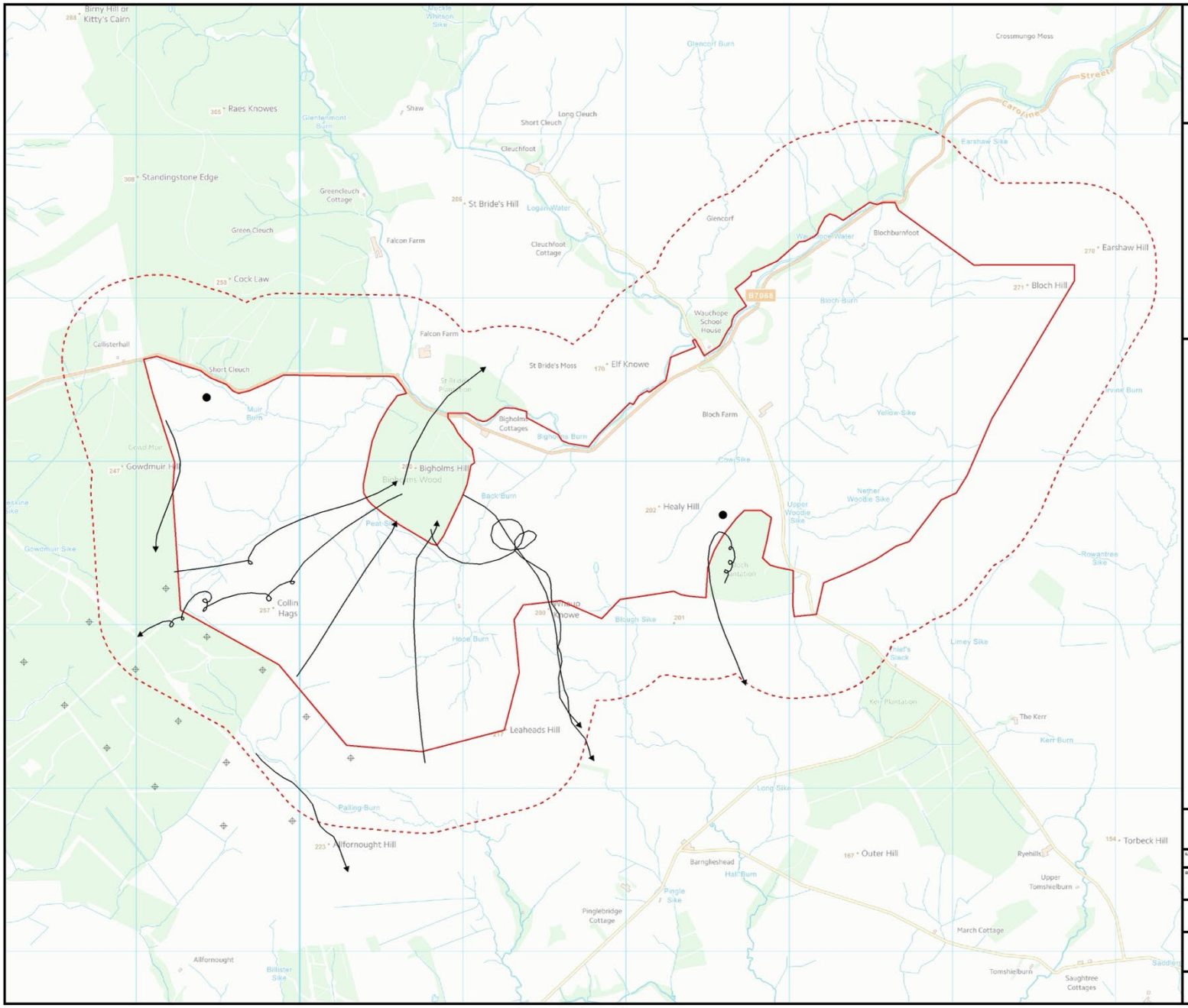

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FIGURE 4

Goshawk Flight Lines 2020-21

KEY:

- Flight lines winter 2020-21
- Winter walkover records 2020-21
- Winter bird survey area
- Site boundary
- Solwaybank turbines

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WINTER BIRD SURVEYS 2020-21

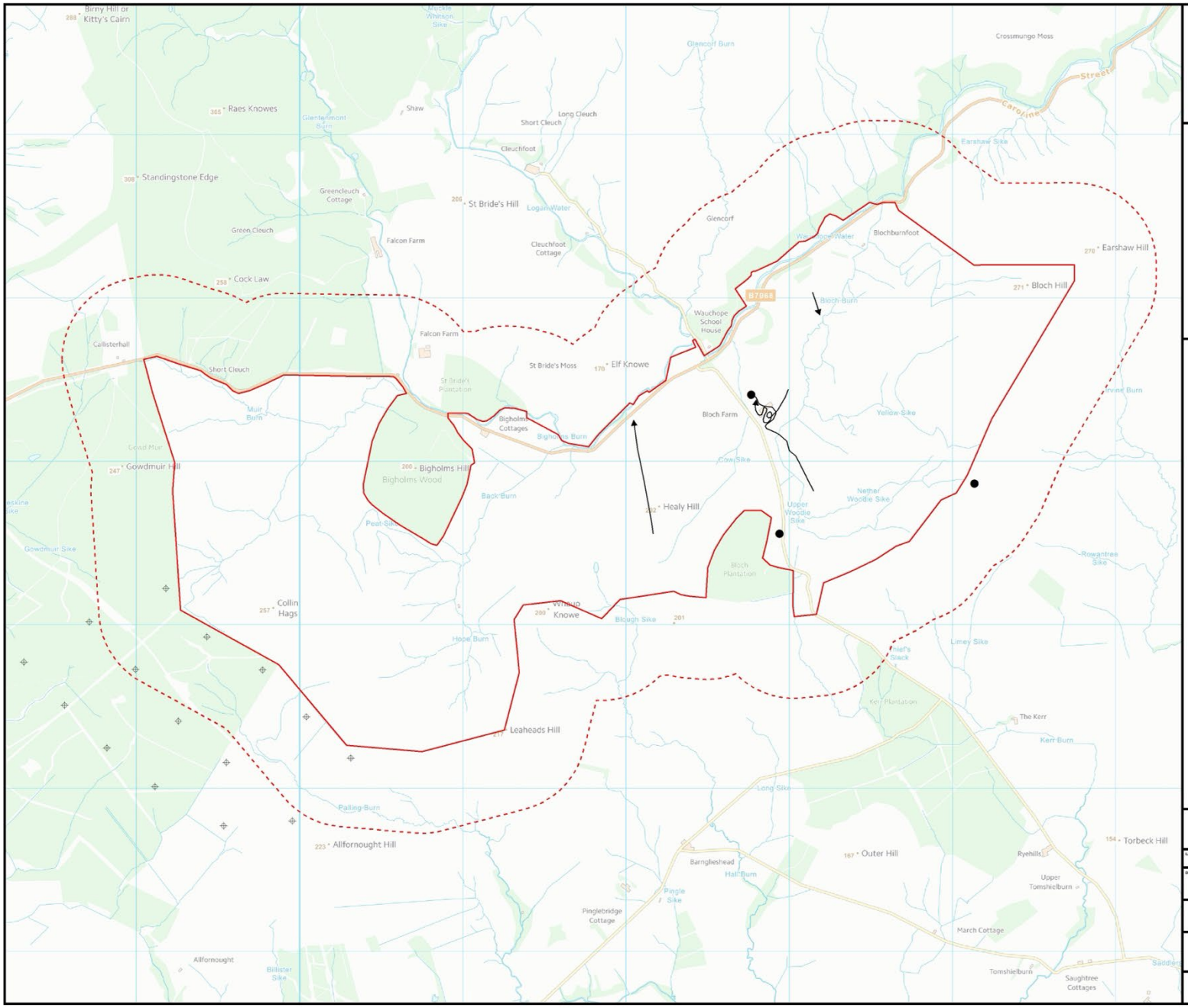

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FIGURE 5

Merlin
Flight Lines 2020-21

KEY:

- Flight lines winter 2020-21
- Winter walkover records 2020-21
- Winter bird survey area
- Site boundary
- Solwaybank turbines

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WINTER BIRD SURVEYS 2020-21

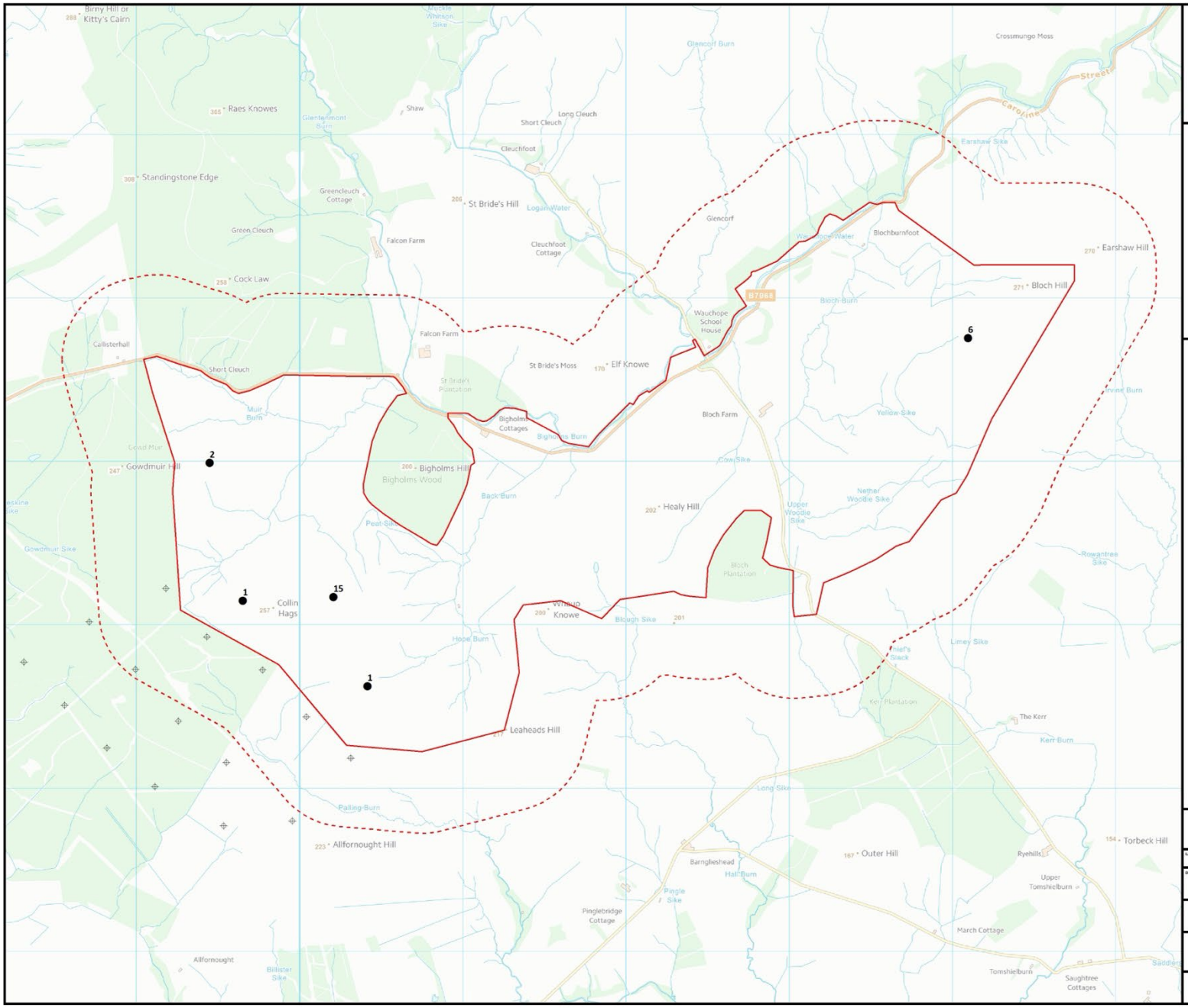

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FIGURE 6

Golden Plover Walkover Records 2020-21

KEY:

- Winter walkover records 2020-21
- Winter bird survey area
- Site boundary
- Solwaybank turbines

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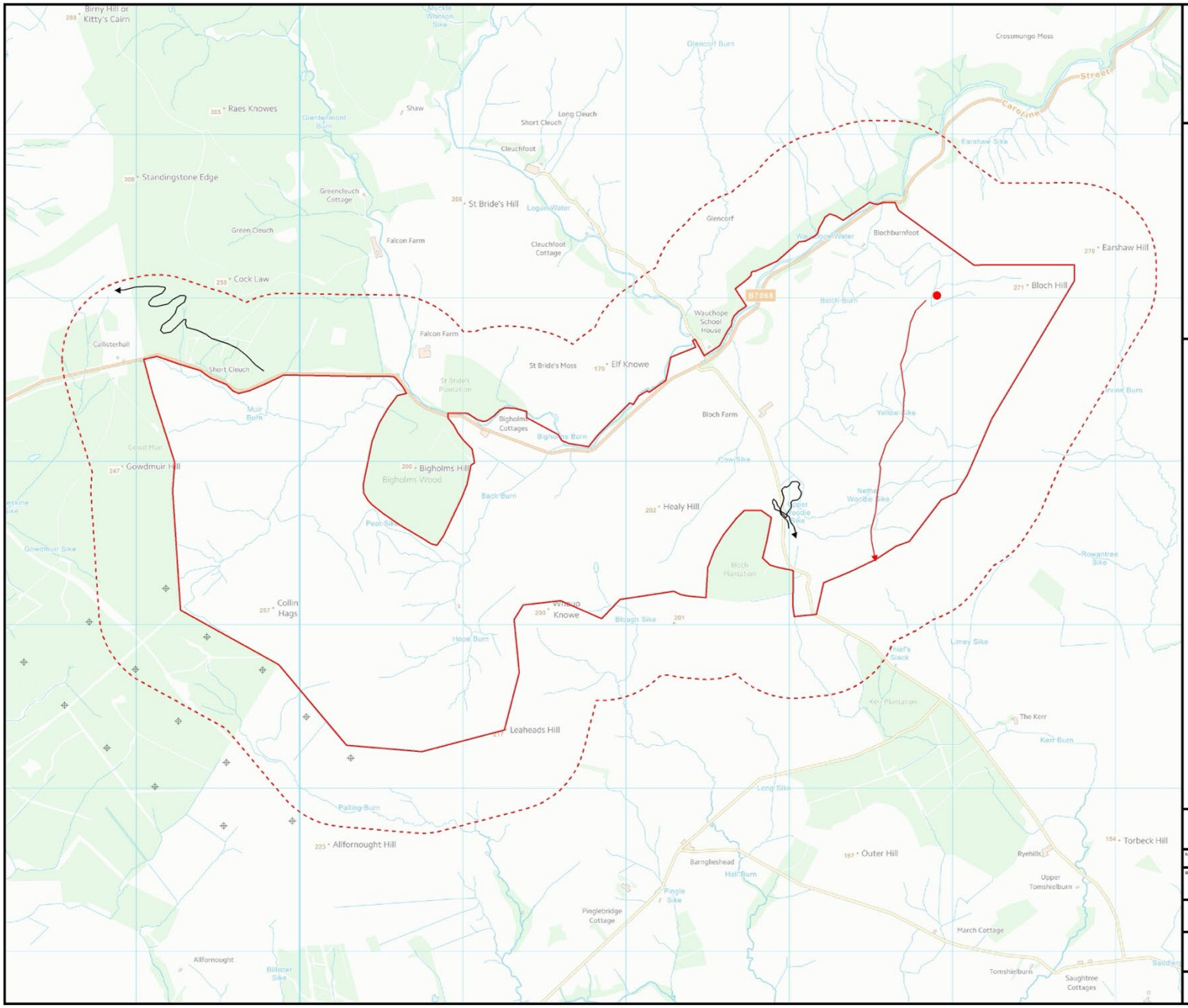
WINTER BIRD SURVEYS 2020-21



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Bloch Wind Farm

FIGURE 7

Red Kite and Barn Owl Flight Lines 2020-21

KEY:

Flight Lines:

- Barn Owl
- Red Kite
- Walkover records 2020-21 (red kite)
- Winter bird survey area
- Site boundary
- Solwaybank turbines

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LAYOUT DWG	T LAYOUT NO.
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DRAWING NUMBER: SB2020-1

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WINTER BIRD SURVEYS 2020-21

APPENDIX 1. VANTAGE POINT SURVEY DATA

Survey Information

Date	Vantage Point No	Start time	Finish time	ObsTime	Weather
02/11/2020	3	07:00	10:00	03:00	cloud 7/8, wind SW 3, 8C, vis very good
02/11/2020	3	10:30	13:30	03:00	cloud 8/8, wind WSW 2, 9C, vis very good
02/11/2020	3	14:00	17:00	03:00	cloud 4/8, wind WSW 2, 8C, vis excellent
03/11/2020	1	07:00	10:00	03:00	Cloud 3-6/8, wind W 0-1, excellent vis
03/11/2020	1	10:30	13:30	03:00	cloud 4-8/8, wind W 0-2, very good vis, c1hour of light rain
03/11/2020	1	14:00	17:00	03:00	cloud 2-6/8, wind W 0-2, excellent vis
16/11/2020	2	07:15	10:15	03:00	cloud 4-8/8, wind WSW 3, excellent vis
16/11/2020	2	10:45	13:45	03:00	cloud 6-8/8, wind WSW 3, excellent vis
16/11/2020	2	14:15	16:45	02:30	cloud 8/8, wind SSW 3, very good - ok vis
01/12/2020	1	07:45	10:45	03:00	cloud 4/8, wind 0, 0C, vis very good, frosty
01/12/2020	1	11:15	14:15	03:00	cloud 8/8, wind 0, 2C, vis very good
01/12/2020	1	14:45	16:45	02:00	cloud 8/8, wind 0, 3C, vis very good
02/12/2020	2	07:45	10:45	03:00	cloud 8/8, wind WNW 2, 6C, vis very good, showers
02/12/2020	2	11:15	14:15	03:00	cloud 4/8, wind WSW 2, 6C, vis very good
02/12/2020	2	14:45	16:45	02:00	cloud 4/8, wind WSW 2, 5C, vis very good
15/12/2020	3	08:00	11:00	03:00	cloud 7-8/8, wind S 2, very good vis, steady rain
15/12/2020	3	13:15	16:15	03:00	cloud 8/8, wind S 1-2, excellent vis, brief shower
21/01/2021	3	07:45	10:45	03:00	cloud 4-8/8, wind W 3, very good vis
21/01/2021	3	11:15	14:15	03:00	cloud 4-7/8, wind WNW 3-4, excellent vis
21/01/2021	3	15:50	16:50	01:00	cloud 2/8, wind W 3-4, excellent vis
06/01/2021	2	07:50	10:50	03:00	cloud 1/8, wind NNE 1, -2C, vis excellent
06/01/2021	2	10:50	13:50	03:00	cloud 0, wind NNE 1, 1C, vis excellent
06/01/2021	2	13:50	16:20	02:30	cloud 0, wind 0, 2C, vis excellent
07/01/2021	1	08:30	11:30	03:00	cloud 8/8, wind 0, 12C, vis good, light snow fall
07/01/2021	1	12:00	15:00	03:00	cloud 8/8, wind 0, -1C, vis good, few snow showers
07/01/2021	1	15:30	16:30	01:00	cloud 8/8, wind 0, -1C, vis very good
01/02/2021	2	07:20	10:20	03:00	cloud 6/8, wind 0, 0C, vis very good
01/02/2021	2	10:50	13:50	03:00	cloud 7/8, wind ENE 1, 2C, vis very good
01/02/2021	1	14:30	17:30	03:00	cloud 6/8, wind E 2, 2C, vis very good
03/02/2021	1	09:00	12:00	03:00	cloud 8/8, wind E 3, 0C, snow showers, vis very good
03/02/2021	3	12:30	15:30	03:00	cloud 8/8, wind ENE 3, 1C, vis very good
03/02/2021	3	16:00	17:30	01:30	cloud 8/8, wind ENE 3, 1C, vis very good, light rain
25/02/2021	3	14:25	17:25	03:00	cloud 2-6/8, wind 3 W, excellent vis
26/02/2021	3	13:45	14:15	00:30	cloud 8/8, wind 2 SW, very good vis
09/03/2021	3	06:05	09:05	03:00	cloud 8/8, wind 0, 5C, vis good
10/03/2021	1	06:05	09:05	03:00	cloud 8/8, wind WSW 2, 5C, vis excellent
10/03/2021	1	09:35	12:35	03:00	cloud 8/8, wind SW 3, 6C,vis good, light rain
22/03/2021	3	16:00	19:00	03:00	cloud 8/8, wind 3 SW, excellent vis
23/03/2021	2	12:00	15:00	03:00	cloud 8/8, wind 4 SSW, excellent vis, occasionally light drizzle
23/03/2021	2	16:00	19:00	03:00	cloud 8/8, wind 4-5 SSW, vey good vis, very occasional light drizzle

Key Species Data

VP	Date	Time	Species	Count	Direction of flight	Flight height (m)	Activity	Time bird observed (sec)	Notes
3	02/11/2020	07:40	ML	1	SW	11	hunt	60	male, chasing passerines, lost behind farm
1	03/11/2020	12:23	HH	1		16		280	2cy male, low to ground until end of flight then short period higher before dropping
1	03/11/2020	14:18	HH	1	NNW	8	hunt	480	adult male (different bird to that seen earlier)
1	03/11/2020	14:55	HH	1	WSW	8		220	2cy male (seen earlier in day)
1	03/11/2020	15:43	HH	1	ENE	43		100	2cy male (same as above)
2	16/11/2020	08:24	PG	85	NNW	200		210	
2	16/11/2020	09:21	PG	390	NW	150		300	
2	16/11/2020	09:21	PG	11	NW	150		300	
2	16/11/2020	09:28	PG	9	SE	120		240	
1	01/12/2020	12:03	HH	1	N	5	hunt	200	male
1	01/12/2020	15:14	GI	1	SSE	12	hunt	55	male
2	02/12/2020	08:31	PG	26	NNW	150	migrate	60	
2	02/12/2020	16:10	HH	1	SSE	5	roost/hunt	370	male
3	15/12/2020	09:51	HH	1	SW	14		135	adult male (different bird to that seen earlier)
3	15/12/2020	10:09	PG	73	SSE	200		360	
3	15/12/2020	10:27	ML	1	NW	28		70	hunting MP
3	15/12/2020	14:50	HH	1	SW	16		140	adult male
3	21/01/2021	07:50	BO	1	N	8	hunt	190	
3	21/01/2021	08:07	PG	31	NNW	55		210	
3	21/01/2021	13:55	ML	1	NNW	20		35	
2	06/01/2021	11:30	HH	1	ENE	31	hunt	110	male, landed on fencepost
2	06/01/2021	11:57	HH	1	NNE	3	hunt	120	male, same as 12
2	01/02/2021	09:21	PG	33	SSE	200	migrate	150	
2	01/02/2021	12:13	PG	89	WSW	250	migrate	200	
2	01/02/2021	12:49	GI	1	SE	2	hunt	80	juv, landed on fencepost for 40 secs then flew SSE
2	01/02/2021	13:16	GI	1	NNW	22	hunt	90	ad female
1	01/02/2021	14:31	GI	1	NNE	13	hunt	55	
1	01/02/2021	16:52	BO	1	WNW	7	hunt	780	
1	03/02/2021	10:24	GI	1	WSW	38	hunt	140	
1	03/02/2021	11:06	GI	1	ENE	15	hunt	100	ad female, presumably same as 5, landed in emergent treetop, dropped down into forest at 11:29
3	03/02/2021	12:50	HH	1	NE	2	hunt	780	male
3	03/02/2021	14:29	HH	1	ENE	8	hunt	660	male, same as 3
3	03/02/2021	14:40	ML	1	SSE	1	flushed	15	male, flushed by HH, landed on fence
3	26/02/2021	13:47	KT	1	SSW	13		210	
1	10/03/2021	06:51	PG	278	NW	200	migrate	140	
1	10/03/2021	07:58	HH	1	W	8	hunt	230	male
1	10/03/2021	10:38	GI	1	NNE	24	soar/hunt	120	ad male
3	22/03/2021	18:28	HH	1	S	60		230	adult male
2	23/03/2021	13:49	GI	1	SE	6		140	2cy flew from wood
2	23/03/2021	14:45	GI	1	circle E	33		240	2cy
2	23/03/2021	14:55	GI	1	NE	11		70	2cy