Technical Appendix

Lairdmannoch Energy Park

Technical Appendix 7-1: Ornithology

Lairdmannoch Energy Park Limited

May 2025

Contents

Contents

Tables

Figures

Annexes

1 Introduction

In September 2019, Atmos Consulting were commissioned by Lairdmannoch Energy Park Limited to undertake ornithology surveys in relation to a proposed wind farm development (the Proposed Development) at Lairdmannoch, Dumfries and Galloway.

Surveys were carried out in a main tranche between September 2019 and August 2021 with further surveys carried out for the proposed solar development between May – July 2023.

This Technical Appendix, provides details of the ornithology surveys carried out, reports on their findings and describes the results of the desk study carried out in support of the Ornithological Impact assessment described in Chapter 7: Ornithology.

The following figures support the Technical Appendix:

- Figure 7-1-1: Vantage point viewsheds
- Figure 7-1-2: Ornithology survey areas 2019 - 2023;
- Figure 7-1-3: Designated ornithology sites within 20 km;
- Figure 7-1-4a: Vantage point results - Red Kite Sep 2019 - Aug 2020
- Figure 7-1-4b: Vantage point results - Red Kite Sep 2020 - Aug 2021
- Figure 7-1-4c: Vantage point results – Raptors and grouse 2019 - 2021
- Figure 7-1-4d: Vantage point results – Wetland birds 2019 – 2021
- Figure 7-1-5a: Breeding raptor results 2020 (Confidential)
- Figure 7-1-5b: Breeding raptor results 2021 (Confidential)
- Figure 7-1-6a: Breeding bird results 2020 Numerous species
- Figure 7-1-6b: Breeding bird results 2020 Less numerous species
- Figure 7-1-7a: Breeding bird results 2021 Numerous species
- Figure 7-1-7b: Breeding bird results 2021 Less numerous species
- Figure 7-1-8a: Breeding bird results 2023 Numerous species
- Figure 7-1-8b: Breeding bird results 2023 Less numerous species
- Figure 7-1-8c: Breeding bird results 2023 Red kite (Confidential)

1.1 Site Location and Description

The Proposed Development Site is located 8 km north of Twynholm and 4km south-west of Laurieston in Dumfries and Galloway (approximate grid reference NX655615). The wind farm section of the Proposed Development comprises nine wind turbines with a tip height of up to 180 m plus associated infrastructure including turbine foundations, crane hard-standings, onsite access tracks, working areas and substations. The Solar Development Area, which was surveyed in the period covered by this report, is to the east of the Wind Development Area and closer to the A762. Due to the temporal and spatial differences in surveys between the proposed Wind Development Area and the proposed Solar Development Area, the surveys associated with each will be described as 'wind farm surveys' or 'solar farm surveys' respectively. The areas are shown on Figure 7-1-2.

The Proposed Development is located within upland farmland with extensive areas of purple moor-grass *Molinia caerulea* grassland and wet heath with conifer plantations, primarily of Sitka spruce, present around the northern and western edges. The highest point of the surveyed area, at Millae at 240 m AOD, is within the Wind Development survey area at the north, and west of the area the lowest point within the surveyed area is in the south east of the Proposed Development Site at about 55 m AOD and within the Solar Development survey area. Although outside of the red-line boundary, Loch Mannoch, a mesotrophic or eutrophic water body of roughly 30 ha, is hydrologically connected to the Wind Development Area by Anstool Burn and its' tributaries, and drained by Kirkconnell Linn, a steep sided wooded ravine with waterfalls, into the Tarrf water.

2 Methodology

The Wind Development and Solar Development surveys for the Proposed Development followed guidance provided by Naturescot (NS), (NatureScot, 2017), and were conducted at different times. The survey program is outlined in Table 7-1-1.

Table 7-1-1: Overview of surveys carried out

Survey type	Survey Focus	Survey period
Vantage Points	Wind Development Area	September 2019 to August 2021
Black Grouse *Lyrurus tetralix*	Wind Development Area	May 2020 and May 2021
Nightjar *Caprimulgus europaeus*	Wind Development Area	July 2020 and June and July 2021
Raptors	Wind Development Area	May to July 2020, April to July 2021
Breeding Birds	Wind Development Area	May to July 2020, March 2021 to July 2021
Breeding birds	Solar Development Area	May to July 2023

2.1 Target Species

Target avian species were identified as those that are either afforded specific legislative protection (i.e. of high conservation interest) or represent qualifying interests in designated sites in the wider area. Reference was then made to guidance for the identification of potentially vulnerable species (SNH,2017; SNH, 2018a). The final list of target species was determined using these guidance documents along with the likelihood of each species being present at the site and in the environs (based upon available habitat, experience of working in this region and geographical location).

Target species are considered to be those:

- identified as potentially at risk from impacts of onshore wind farms (SNH, 2018a);
- species listed in Annex I of the Birds Directive (2009/147/EC); or
- non-passerines listed in Schedule 1 of the WCA

2.2 Desk Study

2.2.1 Designated Sites

A desktop search of designated sites in proximity to the Wind Development Area and the Solar Development Area was undertaken using the following criteria:

- Any nationally/internationally designated site with an avian designation (e.g. Natura sites, Sites of Special Scientific Interest (SSSIs)) within 10 km of the Proposed Development boundary; and
- Any internationally designated site with geese as a qualifying feature within 20 km of the Proposed Development.

The reason why the search was carried out in relation to the Wind Development Area and the Solar Development Area was because the Access Track is largely being created around an existing track; as a result impacts will be very limited and consequently there is much less opportunity for there to be any impacts on designated sites up to 20 km from the Access Track. Criteria were chosen based upon likely connectivity of selected receptors (NatureScot, 2016).

2.3 Vantage Point Surveys

The Proposed Development is covered by two vantage points (VPs) (Figure 7-1-1):

- VP1 - 264897, 561590 (000°)
- VP2 - 264568, 562312 (165°)

The figure in degrees shows the angle of observation of the VP; *i.e.* the direction the surveyor faced while carrying out VPs.

Standard VP methodology has been used as per NS guidance (SNH, 2017). Each VP survey was undertaken by a suitably experienced single observer in conditions of good visibility. Acceptable weather conditions included winds no stronger than Beaufort force six, and no persistent rain.

The surveyor positioned themselves as inconspicuously as possible to minimise their effect on the birds' natural behaviour. The surveyor surveyed a 180° arc centred on a predetermined view bearing. During each survey, the landscape was scanned continuously until a target species was detected. Once detected, the bird was observed until it landed or flew out of sight, with monitoring occurring so long as it remained within the viewshed field of view. The time of first detection was noted, and the exact time spent flying in a specified height band was recorded. The estimated average height for each flight sector was also recorded.

While the VP was selected to ensure that the viewshed covered the required study area out to 2 km, as per NatureScot guidance, observations from the VP have not been constrained to a 2 km radius, although any outwith the viewshed were recorded as 'incidental' records and were not included in calculation of collision risk.

The viewshed is based on visibility over bare ground at an imaginary layer 20m above the ground, corrected for the presence of forestry where applicable. A groundtruthing visit is carried out before surveys commenced to ensure that the desk based viewshed is not compromised on the ground by unexpected issues or structures which reduce visibility.

Vantage point surveys commenced in September 2019 and were completed in August 2021. Surveys have been carried out up to 9 hours per VP per month during the winter months, primarily in case of Hen harrier roosts or goose movements in the vicinity of the Proposed Development and 6 hours per month during the summer. Table 7-1-2 shows the hours of observations per vantage point. Table 7-1-3 shows the diurnal occurrence of vantage points. Appendix A gives the dates and times of all vantage points and Appendix B gives the summary weather conditions for each VP.

Height bands used during surveys were as shown below:

- A – 0-15 m
- B – 15 – 150 m
- C - > 150 m

Since the surveys were carried out, the maximum tip height of the turbines has been changed to be up to 180 m. As such, any data which has been recorded with an average height of up to 180 m would now be considered to be at risk of collision.

Table 7-1-2: Hours of observations between September 2019 and August 2021

VP	Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total Hours per Year
1	2019									6	9	9	9	33
	2020	9	6.75	14.25	6	6	6	6	6	6	6	6	6	84
	2021	6	6	6	6	6	6	6	6					48
2	2019									6	9	9	9	33
	2020	9	9	12	6	6	6	6	6	6	6	6	3	81
	2021	9	6	6	6	6	6	6	3					48

In total, 327 hours of observation have been carried out across both VPs. Because of the additional hours in the winter of year 1, this is in excess of the minimum requirement which would be 288 across both VPs. Table 3 shows the distribution of those hours by period of day. Variation in time of day of observations increases the likelihood of observing species which are more active at night or at dawn/dusk as well as detecting flights to and from roosts.

Table 7-1-3: Time of day VPs carried out between September 2019 and August 2021

VP No.	Year	VP Type	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total Hours per Year per VP Type
1	2019	Dawn											3	3	6
		Diurnal									6	6	3	3	18
		Dusk										3	3	3	9
	2020	Dawn	3	3											6
		Diurnal	6	3.75	11.25	6	6	6	6	6	6	6	3	3	69
		Dusk			3								3	3	9
	2021	Dawn		3											3
		Diurnal	6	3	6	6	6	6	6	6					33
2	2019	Dawn										3			3
		Diurnal									6	6	6	9	27
		Dusk											3		3
	2020	Dawn			3										3
		Diurnal	6	6	9	6	6	6	6	6	6	6	6		69
		Dusk	3	3										3	9
	2021	Diurnal	9	6	6	6	6	6	6	3					42

2.4 Black Grouse Surveys

An initial site assessment was carried out in May 2020 to enable areas of suitable habitat to be identified and prioritised both on the Site and within 1.5 km of the Site boundary where access was available. Two visits were then carried out in May 2020 as per Gilbert *et al (*1998). The survey area is shown in Figure 7-1-2.

A second year of surveys was carried out in 2021. Given the area had been surveyed the previous year for suitable habitat, and that there had been no changes across the area which would affect this, one visit was carried out in May 2021. Table 7-1-4 presents information about the dates and times of Black grouse surveys.

Table 7-1-4: Dates and times of Black grouse surveys

Visit	Date	Start time	Length (hrs)	Surveyor
2020				
Habitat Assessment	06/05/2020	10:30	08:00	AM
1	09/05/2020	04:15	04:00	AM
	11/05/2020	04:15	04:00	AM
	13/05/2020	04:00	03:45	AM
2	29/05/2020	03:45	03:45	AM
	30/05/2020	03:45	03:45	AM
2021				
1	14/05/2021	03:50	03:00	LS
	27/05/2021	03:50	02:58	LS
	28/05/2021	03:47	03:13	LS

Observations were recorded on 1:10,000 scale maps, using standard BTO codes and nomenclature.

Limitations

Access was not available to all areas of buffer out with the landowner boundary; Covid restrictions meant there was no access to woodland areas to the north and west of the Proposed Development. In these areas, access was limited to public access only, which was made use of. This means that some individuals/leks may have gone undetected. A second visit for lek counting in 2021 was not required in view of the absence of Black grouse activity within accessible land. Surveys in 2021 carried on later than would have been desirable, but spring 2021 was cold and as such, breeding activity was very much delayed. The Proposed Development Site was prioritised on the first visit.

2.5 Nightjar Surveys

Surveys were conducted within the Proposed Development area, with two visits carried out in July 2020 and a further two in June and July 2021 following methods described in Gilbert *et al* (1998). Table 7-1-5 summarises these visits. The survey area is shown in Figure 7-1-2.

Table 7-1-5: Dates and times of Nightjar surveys

Visit	Date	Start time	Length (hrs)	Surveyor
2020				
1	20/07/2020	22:00	01:30	AM
		22:00	01:30	MC
	21/07/2020	22:00	01:30	AM
		22:00	01:30	MC
2	27/07/2020	21:30	01:30	AM
		21:21	01:39	MC
	28/07/2020	21:25	01:35	AM
		21:30	01:30	MC
2021				
1	22/06/2021	21:56	01:00	LS
		22:10	01:05	AF
	23/06/2021	22:00	01:00	LS
		22:08	01:00	AF
2	20/07/2021	21:38	01:12	RM
		21:40	01:00	AF
	22/07/2021	21:35	00:55	RM
		21:37	01:03	AF

Observations were recorded on 1:10,000 scale maps, using standard BTO codes and nomenclature.

Limitations

No limitations were encountered for Nightjar surveys.

2.6 Breeding Raptor Surveys

Breeding raptor surveys were carried out on an approximately monthly basis between April – July in both 2020 and 2021. The first visit in March to early April is carried out to detect occupancy by the various species. A second visit is used to identify active nests in April and early May. The third visit is carried out in June to check for the presence of young birds, and the final visit in July to August is used to recorded fledged young (Hardey 2013). Surveys were carried out during daylight hours.

The surveys used a walkover methodology for areas with access, where all parts of the survey area were approached to a distance of approximately 250 m. A buffer of 2 km was applied to the Proposed Development Site (Figure 7-1-2) and, where access was permissible, land within this area was surveyed using the same methodology. Where areas did not have access permission, public access was used where possible and mini-VPs were used to look over these areas to attempt to detect breeding raptors.

Table 7-1-6 shows the dates and times of surveys.

Table 7-1-6: Dates and times of breeding raptor surveys

Visit number	Date	Start time	Duration (hrs)	Surveyor
2020				
1	06/05/2020	10:30	8	AM
2	29/05/2020	08:00	4	AM
	09/06/2020	11:00	6.75	AM
3	10/07/2020	08:30	9.5	AM
4	31/07/2020	07:30	6	AM
2021				
1	28/04/2021	09:15	7	MC
2	03/06/2021	09:10	6.5	LS
3	22/06/2021	16:03	3	LS
	22/06/2021	17:10	2	AF
	23/06/2021	12:56	4	AF
4	22/07/2021	09:25	4.25	RM
	22/07/2021	16:40	1.3	AF
	23/07/2021	10:15	3	RM
	23/07/2021	09:40	2	AF

Limitations

In 2020, Covid restrictions mean there was limited access to any area not within the landowner boundary and only public access was available. Even after Covid restrictions eased, it was still not possible to gain access to land outwith the landowner boundary and with no public access. This does mean that less obvious species in the buffer area may have gone undetected.

In 2020, the first survey commenced later than would be desirable. This was due to the Covid lockdown, which began in late March 2020, meaning there was uncertainty as to whether surveys were permitted. This mean there was knock on delay to other surveys this season, although all were finished within the required period. Some early activity may have been under-recorded as a result.

In 2021, the second visit was carried out in early June which is later than the optimum period. However given all other surveys were carried out at appropriate times, then the impact of this would be limited.

2.7 Breeding Bird Surveys

Table 7-1-7 shows the dates and times of breeding bird surveys, which were carried out using a modified Brown and Shepherd methodology, following the modifications suggested in NatureScot's wind farm guidance, (NatureScot, 2017). The method is based on a constant search effort, allowing 20 to 25 minutes per 500 x 500 m quadrat of open land. A predetermined route through each quadrat was followed so that all areas of each quadrat were approached to within at least 100m, with the surveys taking place between 08:30 and 18:00, in accordance with the guidelines.

Surveys were carried out at approximately monthly intervals throughout the breeding season. All areas of the site were approached to a distance of approximately 100 m.

The survey area was defined in 2020 as the area within 1 km of the then turbine locations. This allowed for the developable area to be concentrated on, plus a 500 m buffer (Figure 7-1-2). Where access was not available, public access was used where possible and watches were carried out from the nearest accessible land, although most of the area was fully surveyed. All birds seen or heard were recorded using BTO codes onto paper maps (in 2020 and 2021) or GPS enabled electronic tablets (in 2023).

Table 7-1-7: Dates and times of breeding bird surveys

Visit Number	Date	Start Time	End Time	Duration	Surveyor
2020 Wind Farm Site					
1	07/05/2020	10:30	16:30	06:00	AM
	09/05/2020	09:00	13:30	04:30	AM
2	06/06/2020	10:45	17:00	06:15	AM
	07/06/2020	11:00	17:00	06:00	AM
3	04/07/2020	10:30	16:30	06:00	AM
	07/07/2020	09:30	13:45	04:15	AM
4	21/07/2020	11:15	15:10	03:55	MC
	21/07/2020	11:30	15:10	03:40	AM
	26/07/2020	12:15	15:30	03:15	AM
2021 Wind Farm Site					
1	27/04/2021	09:30	15:30	06:00	MC
2	27/05/2021	06:45	11:30	04:45	LS
	28/05/2021	07:00	10:00	03:00	LS
3	24/06/2021	12:20	17:45	05:25	AF
	24/06/2021	15:50	17:45	01:55	LS
	25/06/2021	10:03	18:00	07:57	AF
	25/06/2021	09:52	12:30	02:38	LS
4	21/07/2021	10:50	16:54	06:04	RM
	21/07/2021	11:00	17:15	06:15	AF
2023 Solar Farm Site					
1	02/05/2023	13:00	16:00	03:00	BW
	03/05/2023	09:00	15:00	06:00	BW
2	05/06/2023	11:00	16:10	05:10	AF
	06/06/2023	10:05	15:10	05:05	AF
3	29/06/2023	09:30	15:00	05:30	MH
	30/06/2023	09:15	11:45	02:00	MH
4	11/07/2023	10:20	16:00	05:40	MH

Upon completion of surveys, analysis of territories was undertaken. This involved assessment of bird records across all surveys. Four categories were recognised:

- Confirmed territory – where a nest was found, adults were seen carrying food (unless raptors) or nesting materials or there was presence of juvenile birds on the site;
- Probable territory – where bird(s) were seen in the same location on more than one occasion, but where breeding behaviour was observed on at least one occasion (e.g. courtship, display or singing, pairs in suitable habitat, territorial disputes);

- Possible territory – where birds were observed only once in one location but evidence of breeding was observed; birds were recorded repeatedly (i.e. across several visits) in suitable habitat but showed no evidence of breeding; and
- Non-breeding – where a bird was observed with no breeding behaviour observed and on no other visit was a bird observed in the same location.

Limitations

Surveys in 2020 and 2023 commenced in May rather than in April and so may have missed some early breeding attempts. Two surveys in 2021 commenced before 0800; however this restriction is in place because early surveys are more likely to detect wader activity, and as such, potentially bias results for those areas of the Proposed Development Site surveyed before 0800. However, the Proposed Development Site had relatively few wader species recorded so this is not considered to cause a limitation.

2.8 Collision Risk Modelling

The general methodology used to predict collision risk for birds using the wind farm airspace is provided by NatureScot (NatureScot 2025). Collision Risk Modelling (CRM) was carried out for Red kite.

Flights included in the calculations were all those recorded within the viewsheds of the VP locations during survey times (i.e. not including incidental records). Species specific parameters are shown in Table 7-1-8. Biometrics were taken from BTO Biometrics. Flight speed was taken from (Alerstam, et al. 2007). If the actual species was not available then the closest comparison species was used.

Table 7-1-8: Parameters for Red kite.

Variable	Red kite
Bird Length	0.63 m
Wingspan	1.85 m
Speed	12 ms^{-1}
Avoidance rate	0.990
Nocturnal Activity	1

A model (Forsyth, et al. 1995) was used to calculate the daytime length as a function of latitude and date.

The Proposed Development consists of nine turbines with 180m tip height. The turbine parameters used for the model are presented in Table 7-1-9, which is considered to be a worst case scenario for the swept area for turbines at this tip height.

Table 7-1-9: Turbine parameters

Parameter	Dimensions	Unit
Number of turbines	9	Numeral
Blades per turbine	3	Numeral
Hub height	98.5	Metres
Rotor radius	81.5	Metres
Maximum chord	4.3	Metres
Pitch (average)	6	Degrees
Rotation period	8	Revolutions per minute (RPM)

Parameter	Dimensions	Unit
Proportion operational	0.85	Fraction
Turbine type	Nordex N163	Manufacturer; model

In summary the following steps were taken for this assessment:

- Digitise all flight lines and record relevant characteristics (including species, number of birds, start time of flight, time within each height band and average flight height) in a database;
- Calculate total bird activity for each species with sufficient flight activity to justify collision risk modelling;
- Calculate an 'areal bird density' which is the number of bird per unit area in flight at any height at a given point in time. The areal bird density is most usually expressed per square kilometre (km^2);
- Calculate an 'occupancy rate' for each vantage point, defined as the observed 'at risk' activity levels divided by total observation time and area observed, giving the occupancy per unit time and unit area for each VP;
- Average the occupancy rate across the VPs using an un-weighted mean approach;
- Apply the average occupancy rate to the wind development site, based on the Proposed Development area, risk volume and total turbine rotor volume, applying a factor to estimate the total time that the birds could theoretically be active during the year, based on an algorithm for calculating day length (Forsyth, et al. 1995); thus determining the total predicted time spent by the individual species within air space that could be swept by turbine blades;
- Run the collision model with relevant turbine and ornithological parameters to calculate the theoretical probability of transits resulting in a collision assuming no avoiding action;
- Multiply the number of transits by the collision rate, avoidance factor and operating parameters of the proposed wind farm to estimate the theoretical number of collisions per year; and
- Avoidance rates used were in accordance with NatureScot guidance (NatureScot 2018).

The predicted mortality through collision is dependent on a number of variables, including flight activity within the turbine envelope, the species' physiology, nocturnal flight behaviour, flight velocity, weather conditions, the predicted avoidance rate, the number, rotational speed and dimensions of the turbines, and the proportion of the time that the turbines are operational throughout the year.

3 Results

3.1 Designated Sites

Table 7-1-10 shows the results of the search for designated sites. These sites are shown in Figure 7-1-3.

Table 7-1-10: Designated sites with avian qualifying features within 20 km for geese and 10 km for other species.

Site	Distance and Direction from the Proposed Development	All Avian Qualifying features	Species within connectivity range
Laughenghie and Airie Hills SSSI; (NatureScot, 2010)	400 m west	**Non-breeding** Hen harrier *Circus cyaneus* **Breeding** Breeding bird assemblage; species listed are Osprey *Pandion haliateus*, Teal *Anas crecca*, Goosander *Mergus merganser*, Goldeneye *Bucephala clangula*, Greylag goose *Anser anser*, Golden plover *Pluvialis apricaria*, Curlew *Numenius arquata* and Raven *Corvus corax*.	No figures for non-breeding Hen harrier ranging but must be considered potentially within range.
Loch Ken and River Dee Marshes	5.31 km east	**Non-breeding** Greenland White-fronted goose *Anser albifrons flavirostris* and Greylag goose	Non-breeding Greenland White-fronted goose (core range of 5 to 8 km), Greylag goose (core range of 20 km).
River Dee (Parton to Crossmichael) SSSI; (NatureScot, 2010)	6.6 km north east	**Non-breeding** Greenland White-fronted goose s; Greylag goose, and Whooper swan *Cygnus cygnus.*	Non-breeding Greenland White-fronted goose (core range of 5 to 8 km), Greylag goose (core range of 20 km).
Cree Estuary SSSI; (NatureScot, 2010)	16.4 km west	**Non-breeding** Pink-footed goose *Anser brachyrhynchus*	Non-breeding: Pink-footed goose (Core ranges of 20 km).
Solway Firth SPA; (JNCC, 2020)	16.7 km south	**Non-breeding** Under Article 4.1: Whooper swan; Barnacle goose *Branta leucopsis*; Golden plover, Bar-tailed godwit *Limosa lapponica*. Under Article 4.2; Pink-footed goose *Anser brachyhnchus*; Pintail *Anas acuta*; Scaup *Aythya marila*; Oystercatcher *Haematopus ostralegus;* Knot *Calidris canutus*; Curlew; Redshank *Tringa totanus*; Ringed Plover *Charadrius hiaticula* (on passage); Shelduck *Tadorna tadorna;* Teal; Shoveler, *Anas clypeata;*	Pink-footed and Greylag goose (Core ranges of 20 km).

Site	Distance and Direction from the Proposed Development	All Avian Qualifying features	Species within connectivity range
		Goldeneye; Grey Plover, *Pluvialis squatarola*; Sanderling, *Calidris alba*; Dunlin, *Calidris alpina*; Turnstone, *Arenaria interpres*; Common Scoter, *Melanitta nigra*; Goosander; Lapwing, *Vanellus vanellus*; Cormorant, *Phalacrocorax carbo*; Black-headed gull, *Chroicocephalus ridibundus*; Common gull, *Larus canus*; Herring gull, *Larus argentatus*.	

Additionally, there are four other sites for which there are no avian qualifying features but which are offered statutory protection (National Nature Reserves (NNRs) and Local Nature Reserves (LNRs)) or are Scottish Wildlife Trust (SWT) reserves with avian interests that fall within the connectivity ranges for consideration but are not qualifying features for specific protection. These are summarised in Table 7-1-9. Cairnsmore of Fleet NNR overlaps Cairnsmore of Fleet SSSI although the SSSI is not included in Table 8 because there are no designated avian features for the SSSI.

Table 7-1-11: Nature reserves with avian interests.

NAME	Distance and Direction from the Proposed Development	Type	Description
Wigtown Bay	17 km west	LNR	An estuarine site known to attract wildfowl species including geese.
Cairnsmore of Fleet	7.7 km west	NNR	An upland site which is known to be used by Black grouse and the occasional Golden eagle.
Southwick Coast	20 km southeast	SWT reserve	A coastal site known to have significance for wildfowl including geese.
Knowetop Lochs	15 km north	SWT reserve	An area known to be attractive to geese species.

3.2 Vantage Point Surveys

Table 7-1-10 shows the summary results of the vantage point surveys between September 2019 and August 2021. Nine species were recorded during the VP surveys. Flightlines for all species are shown in Figure 3. Appendix C includes the flight line information for all target species observed. Figures 3a to 3c show these flights and they are detailed in full in Appendix B.

Table 7-1-12: Lairdmannoch VP results between September 2019 and August 2021

Species	Scientific Name	Conservation Designations [1]	Min. No. of Birds	Max. No. of Birds	Mean No. of Birds	No. of flights	Total Bird Seconds	At Risk Bird Seconds
Black grouse	*Lyrurus tetralix*	BOCC red, SBL	1	1	1	1	31	31
Golden plover	*Pluvialis apricaria*	Annex I, SBL	35	60	44.67	3	37,526	32,726

Species	Scientific Name	Conservation Designations [1]	Min. No. of Birds	Max. No. of Birds	Mean No. of Birds	No. of fligh ts	Total Bird Sec-onds	At Risk Bird Sec-onds
Goshawk	*Accipiter gentilis*	Schedule 1	1	1	1	1	330	0
Greylag goose	*Anser anser*	BOCC amber	2	41	15.5	6	18,541	14,220
Hen harrier	*Circus cyaneus*	Annex I, Schedule 1, BOCC red, SBL	1	1	1	1	20	0
Merlin	*Falco columbari us*	Annex I, Schedule 1, BOCC red, SBL	1	1	1	2	45	0
Mute swan	*Cygnus olor*	BOCC amber	1	1	1	1	15	15
Oysterca tcher	*Haematop us ostralegus*	BOCC amber	1	1	1	1	54	54
Pink-footed goose	*Anser brachyrhy nchus*	BOCC amber	1	130	43.6	5	20,999	106
Red kite	*Milvus milvus*	Annex I, Schedule 1, SBL	1	4	1.13	285	55,834	43,275
Snipe	*Gallinago gallinago*	BOCC amber	1	1	1	1	79	79

Red kite was the most commonly recorded target species with a total of 285 flights. Greylag goose and Pink-footed goose were the next most commonly recorded species with six and five flights, respectively. Of the two species, Pink-footed goose had the most activity in terms of total bird seconds, with 20,999 bird seconds. Golden plover was recorded on three occasions, all during the winter months and Merlin was recorded twice. The rest of the species (Black grouse. Goshawk, Hen harrier, Mute swan, Oystercatcher and Snipe) each had only one flight recorded.

3.3 Black Grouse Surveys

Although some of the survey area was identified as being potentially suitable habitat for Black grouse, none were observed during the 2020 dedicated surveys.

In 2021, two heard-only records of Black grouse were recorded outside of accessible areas in forestry to the south-west of the original site boundary and an incidental recording of grouse droppings found within the Proposed Development.

Grouse are considered to be in the area even though no leks were identified on or close to the Proposed Development. In addition to the heard record and the droppings, there were two sightings during VPs; one a standard record in November 2020 shown in Table 10 and the other was an incidental record of a Black grouse flushed from the Proposed Development as the surveyor was walking to the VP in December 2020.

3.4 Nightjar Surveys

Nightjars were not recorded during 2020 or 2021 surveys or as incidental records in other surveys. As such, Nightjar are not considered to be present on or in the vicinity of the Proposed Development.

3.5 Breeding Raptor Surveys

Table 7-1-11 reports the analysis of breeding raptor and breeding bird data for 2020 and 2021 with regards to birds of prey species. Figure 4a and 4b show these results.

Table 7-1-13: Breeding Raptor Survey results 2020 and 2021

Species	Scientific Name	2020			2021		
		Conf.	Prob.	Poss.	Conf.	Prob.	Poss.
Red Kite	*Milvus milvus*	1	2	4		2	8
Buzzard	*Buteo buteo*		2	4			3
Kestrel	*Falco tinnunculus*	1				1	

In 2020, one possible territory of Red kite was observed within the Proposed Development Site, while the other three were in the survey buffers. The confirmed territory was actually outwith the survey area in 2020, but was noted incidentally.

Of the species observed during in 2021, only one possible Buzzard territory was identified within the Proposed Development Site.

Outwith the Proposed Development Site but within the survey area, seven possible and two probable territories of Red kite, a Schedule 1 species, were observed. In both 2020 and 2021, considerable Red kite activity was observed across the survey area.

3.6 Breeding Bird Surveys

Breeding bird surveys were conducted for the Wind Development Area in 2020 and 2021 and for the Solar Development Area in 2023 (Figure 7-1-12). Species listed on Schedule 1 of the Wildlife and Countryside Act 1981, Annex I of the Birds Directive, the Scottish Biodiversity List or are on red or amber lists of Birds of Conservation Concern and with territorial occurrences are given in Table 7-1-12. Codes specified by the British Trust for Ornithology (BTO) are specified in these tables and used in Figures 7-1-6 through Figure 7-1-8 to refer to the locations of these species.

3.6.1 Wind Farm Breeding Bird Surveys, 2020 and 2021

Due to the ubiquitousness of Meadow pipit *Anthus pratensis* it has not been included in this analysis. There is a high density of Meadow pipit across the Proposed Development.

Total numbers of species recorded within the survey area during breeding bird surveys came to 40 species in 2020 and 47 species in 2021. Figures 7-1-6a and 7-1-6b show results for 2020, and Figures 7-1-7a and 7-1-7b show results for 2021.

Table 7-1-12 shows the results of the territory analysis on breeding bird surveys results for the 18 species with breeding territories in 2020 or 2021 and for those species conservation designations specified in section 3.6. Data concerning territories of Kestrel and Red kite are considered in Section 3.5. Figures in brackets are for additional

territories that were incidentally suggested by results of other surveys. Nightjar surveys indicated possible further territories of Grasshopper warbler which is more vocal at early dusk and dawn which is outside of the survey window for standard breeding bird surveys.

Table 7-1-14: Breeding Bird Survey results 2020 and 2021

Species	Scientific name	BTO Code	Conservation Designations	2020			2021		
				Confirmed	Probable	Possible	Confirmed	Probable	Possible
Cuckoo	*Cuculus canorus*	CK	BOCC red, SBL	0	0	5			
Grasshopper warbler	*Locustella naevia*	GH	BOCC red, SBL	0	0	1		(+2)	3(+2)
Lesser redpoll	*Acanthis cabaret*	LR	BOCC red, SBL	2	2	4			
Linnet	*Linaria cannabina*	LI	BOCC red, SBL	0	4	8			1
Mistle thrush	*Turdus viscivorus*	M.	BOCC red	1	1	1			
Redstart	*Phoenicurus phoenicurus*	RT	BOCC amber		1	2			
Reed bunting	*Emberiza schoeniclus*	RB	BOCC amber, SBL						3(4)
Skylark	*Alauda arvensis*	S.	BOCC red, SBL	1	45	50			
Snipe	*Gallinago gallinago*	SN	BOCC amber					1	2
Song thrush	*Turdus philomelos*	ST	BOCC amber	1	0	3			4
Spotted flycatcher	*Muscicapa striata*	SF	BOCC red, SBL		1				
Starling	*Sturnus vulgaris*	SG	BOCC red, SBL	1					
Wheatear	*Oenanthe oenanthe*	W.	BOCC amber	1	0	0			2
Whinchat	*Saxicola rubetra*	WC	BOCC red	2	2	2	1		
Whitethroat	*Curruca communis*	WH	BOCC amber						10(+1)
Willow warbler	*Phylloscopus trochilus*	WW	BOCC amber	5	17	22		8	29
Wood pigeon	*Columba palumbus*	WP	BOCC amber	0	1	1			1
Wren	*Troglodytes troglodytes*	WR	BOCC amber	1	6	0		5	16

Species which were recorded in 2020 or 2021 which met the criteria for inclusion in Table 7-1-12 but for which no evidence of breeding was recorded were Crossbill *Loxia curvirostra*, Greylag goose, Mallard *Anas platyrhynchus*, Swift, *Apus apus* and Tree pipit *Anthus*.

Species Without Conservation Designations

The following species without conservation designations showed at least possible evidence of breeding on site:

In 2020: Blue tit *Cyanistes caeruleus*; Chaffinch *Fringilla coelebs*; Chiffchaff *Phylloscopus collybita*; Coal tit *Periparus ater*; Great tit *Parus major*; Nuthatch *Sitta europaea*; Robin *Erithacus rubecula* and Stonechat *Saxicola rubicola*.

In 2021: Blackbird *Turdus merula*; Blue tit; Chaffinch; Chiffchaff; Coal tit; Goldfinch, *Carduelis carduelis*; Great tit; Pied Wagtail, *Motacilla alba*; Robin and Stonechat.

Furthermore, the following species were observed without evidence of breeding:

In 2020: Blackbird; Buzzard; Carrion crow *Corvus corone*; Goldfinch; Great spotted woodpecker *Dendrocopus major*; Grey heron *Ardea cinerea*; Jay, *Garrulus glandarius*; Magpie, *Pica pica*; Pheasant, *Phasianus colchicus*; Pied Wagtail; Raven; *Corvus corax*; Sand martin; Riparia riparia; Siskin; *Carduelis spinus*; Swallow, *Hirundo rustica* and Treecreeper, *Certhia familiaris*.

In 2021: Buzzard; Carrion crow; Nuthatch; Raven; Sand martin; Siskin; Swallow.

3.6.2 Solar Farm Breeding Bird Surveys, 2023

Seventy-one species were recorded within the survey area during breeding bird surveys in 2023.

A total of 57 species were identified as breeding on the within the area surveyed in 2023. Figures 7-1-8 a and 7-1-8 b show these results. Table 7-1-13 shows the results of the territory analysis on breeding bird surveys results for the 30 species with conservation designations specified in section 3.6. Although the survey covered off the Solar Development Area, species were still considered under the NatureScot category of 'at risk from wind farms' due to the proximity to the Wind Development Area.

Table 7-1-15: Breeding Bird Survey results 2023

Species	Scientific name	BTO Code	Conservation Designations	Confirmed	Probable	Possible
Cuckoo	*Cuculus canorus*	CK	SBL, BOCC red		1	4
Curlew	*Numenius arquata*	CU	At risk from wind farms: SBL, BOCC red		1	
Dunnock	*Prunella modularis*	D.	SBL, BOCC amber		1	2
Grey Wagtail	*Motacilla cinerea*	GL	BOCC amber			1
Greylag Goose	*Anser anser*	GJ	At risk from wind farms: BOCC amber			1
House Sparrow	*Passer domesticus*	HS	SBL, BOCC red			2
Kestrel	*Falco tinnunculus*	K.	SBL, BOCC amber			1
Lesser Black-backed Gull	*Larus fuscus*	LB	BOCC amber			

Species	Scientific name	BTO Code	Conservation Designations	Confirmed	Probable	Possible
Lesser Redpoll	*Acanthis cabaret*	LR	SBL, BOCC red			1
Linnet	*Linaria cannabina*	LI	SBL, BOCC red	3		4
Mallard	*Anas platyrhynchos*	MA	BOCC amber	1		1
Meadow Pipit	*Anthus pratensis*	MP	BOCC amber	3	4	18
Mistle Thrush	*Turdus viscivorus*	M.	BOCC red		1	4
Red Kite	*Milvus milvus*	KT	At risk from wind farms: Schedule 1, Annex I, SBL			5
Redstart	*Phoenicurus phoenicurus*	RT	BOCC amber	1		1
Reed Bunting	*Emberiza schoeniclus*	RB	SBL, BOCC amber		4	9
Rook	*Corvus frugilegus*	RO	BOCC amber			1
Sedge Warbler	*Acrocephalus schoenobaenus*	SW	BOCC amber		1	3
Skylark	*Alauda arvensis*	S.	SBL, BOCC red			9
Song Thrush	*Turdus philomelos*	ST	BOCC amber	1		4
Spotted Flycatcher	*Muscicapa striata*	SF	SBL, BOCC red	1		
Starling	*Sturnus vulgaris*	SG	SBL, BOCC red	1		1
Stock Dove	*Columba oenas*	SD	BOCC amber			1
Tree Pipit	*Anthus trivialis*	TP	SBL, BOCC red		1	2
Wheatear	*Oenanthe oenanthe*	W.	BOCC amber	1		1
Whinchat	*Saxicola rubetra*	WC	BOCC red	6	2	2
Whitethroat	*Curruca communis*	WH	BOCC amber	2	9	21
Willow Warbler	*Phylloscopus trochilus*	WW	BOCC amber	6	9	36
Woodpigeon	*Columba palumbus*	WP	BOCC amber		4	14
Wren	*Troglodytes troglodytes*	WR	BOCC amber		13	26

Of the species for which there is breeding evidence, those which are considered at risk from wind farms (NatureScot, 2018) and which are most significant in conservation terms, are Red kite and Curlew. Red kite appears to be abundant in the area with a number of territories identified (more detailed information is provided in Technical Appendix 7-2). However, the area is 3.6 km from the Red kite feeding station at Laurieston - and so the number of territories could be overestimated if elevated bird numbers in the area are due to birds associated with the feeding site. More discussion is provided in Technical Appendix 7-2. Additionally, a single pair of Curlew probably bred within the survey area. Greylag goose in this area are likely to be from the naturalised British population which is less sensitive from a conservation viewpoint.

Of the 14 species seen within the survey area but with no signs of breeding the following nine have conservation status as specified above: Crossbill; Dipper *Cinclus cinclus*; Herring Gull; House Martin *Delichon urbicum*; Kingfisher *Alcedo atthis*; Lesser Black-backed Gull; Mute swan; Snipe; and Swift.

Of these species, Kingfisher, which is listed on Schedule 1 of the WCA, is the species with the greatest conservation significance and could potentially breed on the shores of Loch Mannoch or associated watercourses.

Species Without Conservation Designations

The following species without conservation designations showed at least possible evidence of breeding on site:

Blackbird; Blackcap, *Sylvia atricapilla*; Blue Tit; Buzzard; Carrion Crow; Chaffinch; Chiffchaff; Coal Tit; Garden warbler *Sylvia borin*; Goldcrest *Regulus regulus*; Goldfinch; Great Spotted Woodpecker; Great Tit; Green Woodpecker *Picus viridis*; Jackdaw, *Corvus monedula*; Jay; Little Grebe; Long-tailed Tit *Aegithalos caudatus*; Magpie; Nuthatch; Pied Wagtail; Raven; Robin; Sand Martin; Siskin; Stonechat; and Swallow.

Furthermore, the following species were observed without evidence of breeding:

Cormorant; Goosander; Grey Heron; Pheasant and Treecreeper.

4 References

Alerstam, T., M. Rosen, J. Backman, P.G.P Ericson, and O. Hellgren. 2007. "Flight speeds among bird species: allometric and phylogenetic effets." *PLoS Biology* e197.

Forsyth, W C, E J Rykiel, R S Stahl, H Wu, and R M Schoolfield. 1995. "A model comparison for daylenght as a function of latitude and day of year." *Ecological modelling 80* 87-95.

Hardey, J, Crick, H, Wernham, C, Riley, H, Etheridge, B, Thompson, D. 2013. *Raptors A Field Guide for Surveys and Monitoring 3rd ed.* Edinburgh: TSO.

NatureScot. 2018. *Avoidance rates for the onshore SNH wind farm collision risk model.* Inverness: NatureScot.

NatureScot. 2024. *Guidance on using an updated collision risk model to assess bird collision risk at onshore wind farms.* Inverness: NatureScot.

Appendices

Appendix A. Dates and times of all VPs

Table 7-1-16: Dates and times of all VPs

Survey Date	Start Time	Finish Time	Duration	Surveyor	VP Type	VP Number
19/09/2019	11:50	14:50	03:00:00	JGI	Diurnal	1
19/09/2019	15:35	18:35	03:00:00	JGI	Diurnal	1
20/09/2019	07:30	10:30	03:00:00	JGI	Diurnal	2
20/09/2019	11:15	14:15	03:00:00	JGI	Diurnal	2
28/10/2019	14:30	17:30	03:00:00	MC	Dusk	1
29/10/2019	09:45	12:45	03:00:00	MC	Diurnal	1
29/10/2019	13:15	16:15	03:00:00	MC	Diurnal	2
30/10/2019	07:10	10:10	03:00:00	MC	Dawn	2
30/10/2019	11:10	14:10	03:00:00	MC	Diurnal	1
31/10/2019	10:40	13:40	03:00:00	MC	Diurnal	2
25/11/2019	13:30	16:30	03:00:00	MC	Dusk	1
26/11/2019	09:00	12:00	03:00:00	MC	Diurnal	1
27/11/2019	08:00	11:00	03:00:00	MC	Dawn	1
27/11/2019	11:45	14:45	03:00:00	MC	Diurnal	2
28/11/2019	09:30	12:30	03:00:00	MC	Diurnal	2
28/11/2019	13:00	16:00	03:00:00	MC	Dusk	2
16/12/2019	13:30	16:30	03:00:00	MC	Dusk	1
17/12/2019	09:15	12:15	03:00:00	MC	Diurnal	1
17/12/2019	12:35	15:35	03:00:00	MC	Diurnal	2
18/12/2019	08:30	11:30	03:00:00	MC	Dawn	1
18/12/2019	12:00	15:00	03:00:00	MC	Diurnal	2
19/12/2019	09:50	12:50	03:00:00	MC	Diurnal	2
14/01/2020	12:20	15:20	03:00:00	MC	Diurnal	1
15/01/2020	09:30	12:30	03:00:00	MC	Diurnal	1
15/01/2020	13:15	16:15	03:00:00	MC	Dusk	2
16/01/2020	08:30	11:30	03:00:00	MC	Dawn	1
16/01/2020	12:00	14:00	02:00:00	MC	Diurnal	2
17/01/2020	09:15	12:15	03:00:00	MC	Diurnal	2
17/01/2020	12:20	13:20	01:00:00	MC	Diurnal	2
18/02/2020	13:05	16:05	03:00:00	MC	Diurnal	1
19/02/2020	07:30	10:30	03:00:00	MC	Dawn	1
19/02/2020	11:00	14:00	03:00:00	MC	Diurnal	2
20/02/2020	11:15	14:15	03:00:00	MC	Diurnal	2
20/02/2020	14:30	17:30	03:00:00	MC	Dusk	2
21/02/2020	09:30	10:15	00:45:00	MC	Diurnal	1
10/03/2020	09:00	12:00	03:00:00	MC	Diurnal	1
10/03/2020	12:30	15:30	03:00:00	MC	Diurnal	2

Survey Date	Start Time	Finish Time	Duration	Surveyor	VP Type	VP Number
10/03/2020	16:00	17:00	01:00:00	MC	Diurnal	1
11/03/2020	06:40	09:40	03:00:00	MC	Dawn	2
11/03/2020	09:50	12:50	03:00:00	MC	Diurnal	2
11/03/2020	13:20	16:20	03:00:00	MC	Diurnal	1
12/03/2020	10:00	11:15	01:15:00	MC	Diurnal	1
12/03/2020	11:45	14:45	03:00:00	MC	Diurnal	2
12/03/2020	15:15	18:15	03:00:00	MC	Dusk	1
13/03/2020	09:20	12:20	03:00:00	MC	Diurnal	1
29/04/2020	10:30	13:30	03:00:00	AM	Diurnal	2
29/04/2020	14:00	17:00	03:00:00	AM	Diurnal	1
30/04/2020	11:10	14:10	03:00:00	AM	Diurnal	1
30/04/2020	14:40	17:40	03:00:00	AM	Diurnal	2
30/05/2020	08:10	11:10	03:00:00	AM	Diurnal	1
30/05/2020	11:40	14:40	03:00:00	AM	Diurnal	2
31/05/2020	11:30	14:30	03:00:00	AM	Diurnal	2
31/05/2020	15:00	18:00	03:00:00	AM	Diurnal	1
27/06/2020	10:30	13:30	03:00:00	AM	Diurnal	2
27/06/2020	14:00	17:00	03:00:00	AM	Diurnal	1
30/06/2020	08:15	11:15	03:00:00	AM	Diurnal	1
30/06/2020	11:50	14:50	03:00:00	AM	Diurnal	2
26/07/2020	08:45	11:45	03:00:00	AM	Diurnal	2
28/07/2020	11:15	14:15	03:00:00	MC	Diurnal	1
30/07/2020	11:00	14:00	03:00:00	AM	Diurnal	2
30/07/2020	14:40	17:40	03:00:00	AM	Diurnal	1
26/08/2020	12:50	15:50	03:00:00	MC	Diurnal	1
27/08/2020	10:15	13:15	03:00:00	MC	Diurnal	2
27/08/2020	13:30	16:00	02:30:00	MC	Diurnal	1
28/08/2020	10:30	13:30	03:00:00	MC	Diurnal	2
28/08/2020	13:50	14:20	00:30:00	MC	Diurnal	1
16/09/2020	13:20	16:20	03:00:00	MC	Diurnal	1
17/09/2020	10:10	13:10	03:00:00	MC	Diurnal	2
17/09/2020	13:30	16:30	03:00:00	MC	Diurnal	1
18/09/2020	10:00	13:00	03:00:00	MC	Diurnal	2
19/10/2020	15:30	17:30	02:00:00	MC	Diurnal	1
20/10/2020	10:00	13:00	03:00:00	MC	Diurnal	2
20/10/2020	13:30	16:30	03:00:00	MC	Diurnal	1
21/10/2020	10:30	13:30	03:00:00	MC	Diurnal	2
21/10/2020	13:50	14:50	01:00:00	MC	Diurnal	1
24/11/2020	13:00	16:00	03:00:00	MC	Dusk	1
25/11/2020	09:20	12:20	03:00:00	MC	Diurnal	1
25/11/2020	12:40	15:40	03:00:00	MC	Diurnal	2
27/11/2020	09:50	12:50	03:00:00	MC	Diurnal	2
14/12/2020	12:50	15:50	03:00:00	MC	Dusk	1

Survey Date	Start Time	Finish Time	Duration	Surveyor	VP Type	VP Number
17/12/2020	09:30	12:30	03:00:00	MC	Diurnal	1
17/12/2020	12:50	15:50	03:00:00	MC	Dusk	2
25/01/2021	12:40	15:40	03:00:00	MC	Diurnal	2
26/01/2021	09:30	12:30	03:00:00	MC	Diurnal	1
26/01/2021	12:40	13:40	01:00:00	MC	Diurnal	1
27/01/2021	09:40	12:40	03:00:00	MC	Diurnal	2
27/01/2021	12:50	15:50	03:00:00	MC	Diurnal	2
28/01/2021	09:30	11:30	02:00:00	MC	Diurnal	1
25/02/2021	09:30	12:30	03:00:00	MC	Diurnal	2
25/02/2021	12:40	15:40	03:00:00	MC	Diurnal	2
26/02/2021	07:10	10:10	03:00:00	MC	Dawn	1
26/02/2021	10:20	13:20	03:00:00	MC	Diurnal	1
16/03/2021	12:40	15:40	03:00:00	MC	Diurnal	1
17/03/2021	09:00	12:00	03:00:00	MC	Diurnal	1
17/03/2021	12:30	15:30	03:00:00	MC	Diurnal	2
18/03/2021	09:20	12:20	03:00:00	MC	Diurnal	2
22/04/2021	09:15	12:15	03:00:00	MC	Diurnal	1
22/04/2021	12:30	15:30	03:00:00	MC	Diurnal	1
23/04/2021	09:40	12:40	03:00:00	MC	Diurnal	2
26/04/2021	12:45	15:45	03:00:00	MC	Diurnal	2
25/05/2021	10:25	13:25	03:00:00	LS	Diurnal	2
25/05/2021	13:50	16:50	03:00:00	LS	Diurnal	1
26/05/2021	10:30	13:30	03:00:00	LS	Diurnal	1
26/05/2021	14:00	17:00	03:00:00	LS	Diurnal	2
15/06/2021	13:30	16:30	03:00:00	LS	Diurnal	2
16/06/2021	10:54	13:54	03:00:00	LS	Diurnal	1
16/06/2021	14:24	17:24	03:00:00	LS	Diurnal	2
17/06/2021	10:50	13:50	03:00:00	LS	Diurnal	1
19/07/2021	15:30	18:30	03:00:00	RM	Diurnal	1
20/07/2021	11:00	14:00	03:00:00	RM	Diurnal	1
28/07/2021	11:00	14:00	03:00:00	AF	Diurnal	2
28/07/2021	14:30	17:30	03:00:00	AF	Diurnal	2
25/08/2021	14:45	17:45	03:00:00	AF	Diurnal	2
26/08/2021	13:15	16:15	03:00:00	AF	Diurnal	1
27/08/2021	12:15	15:15	03:00:00	AF	Diurnal	1

Appendix B. Weather conditions during VP surveys

Table 7-1-17: Weather conditions during VPs

Survey Date	VP No.	Mean Cloud Cover (eights)	Modal Visibility	Modal Precipitation	Mean Temp (˚C)	Mean Wind Speed (Beaufort Scale)	Modal Wind Direction
19/09/19	1	0	> 2km	None	15	2	SSW
		0	> 2km	None	18	2	SW
20/09/19	2	3	> 2km	None	12	1	S
		0	> 2km	None	20	2	SE
28/10/19	1	1	> 2km	None	7	3	SE
29/10/19	1	1	> 2km	None	5	4	NE
	2	3	> 2km	None	9	3	NE
30/10/19	1	1	> 2km	None	8	3	NE
	2	0	> 2km	None	3	1	NE
31/10/19	2	4	> 2km	None	7	2	NE
25/11/19	1	8	200m - 1km	Light Persistent	7	3	E
26/11/19	1	8	200m - 1km	Light Intermittent	8	3	SE
27/11/19	1	4	> 2km	None	5	2	N
	2	4	> 2km	None	7	1	NE
28/11/19	2	5	> 2km	None	6	3	NE
		2	> 2km	None	6	3	NE
16/12/19	1	2	> 2km	None	5	5	SW
17/12/19	1	6	> 2km	None	5	3	SE
	2	4	> 2km	None	5	2	SW
18/12/19	1	4	> 2km	None	3	2	SW
	2	8	> 2km	None	4	1	SE
19/12/19	2	6	> 2km	None	8	2	SE
14/01/20	1	8	> 2km	Light Persistent	5	3	SW
15/01/20	1	4	> 2km	None	5	5	SW
	2	4	> 2km	None	5	4	SW
16/01/20	1	7	> 2km	None	7	4	S
	2	8	> 2km	Heavy Intermittent	6	5	S
17/01/20	2	4	> 2km	None	4	3	WSW
		6	> 2km	None	4	2	WSW
18/02/20	1	7	> 2km	Light Intermittent	4	5	SW
19/02/20	1	8	> 2km	None	3	3	SW
	2	8	> 2km	Light Persistent	4	3	SW
20/02/20	2	5	> 2km	None	4	2	W

		5	> 2km	None	3	2	W
21/02/20	1	8	1km - 2km	Light Persistent	4	6	W
10/03/20	1	7	> 2km	None	6	4	SW
		3	> 2km	None	7	5	W
		6	> 2km	None	7	3	W
11/03/20	1	7	> 2km	Light Intermittent	7	4	SW
	2	7	> 2km	Light Intermittent	7	3	SW
		6	> 2km	None	7	3	SW
12/03/20	1	7	> 2km	None	4	6	SW
		6	> 2km	Light Intermittent	4	6	W
	2	8	> 2km	Light Intermittent	5	5	SW
13/03/20	1	6	> 2km	None	3	2	NE
29/04/20	1	8	> 2km	Light Persistent	7	2	ESE
	2	8	> 2km	None	6	3	ESE
30/04/20	1	7	> 2km	Light Intermittent	7	3	SE
	2	6	> 2km	Light Intermittent	7	3	SE
30/05/20	1	3	> 2km	None	15	2	ESE
	2	3	> 2km	None	19	3	ESE
31/05/20	1	2	> 2km	None	20	3	SE
	2	3	> 2km	None	19	3	ENE
27/06/20	1	8	> 2km	Light Intermittent	15	2	SE
	2	7	> 2km	Light Intermittent	15	2	SE
30/06/20	1	7	> 2km	Light Intermittent	12	3	WSW
	2	6	> 2km	None	14	3	SW
26/07/20	2	7	> 2km	None	13	4	SW
28/07/20	1	5	> 2km	None	15	4	NW
30/07/20	1	7	> 2km	None	14	3	S
	2	8	> 2km	Heavy Intermittent	14	3	SSE
26/08/20	1	7	> 2km	None	15	1	SW
27/08/20	1	8	> 2km	Light Intermittent	15	1	SE
	2	7	> 2km	Light Intermittent	14	2	SE
28/08/20	1	5	> 2km	None	13	4	NE
	2	6	> 2km	None	12	3	NE
16/09/20	1	7	> 2km	None	16	3	E

17/09/20	1	2	> 2km	None	15	1	NE
	2	5	> 2km	None	14	1	NE
18/09/20	2	6	> 2km	None	10	2	NE
19/10/20	1	8	> 2km	Light Persistent	11	2	S
20/10/20	1	8	> 2km	None	14	3	SE
	2	8	> 2km	None	12	2	SE
21/10/20	1	8	> 2km	Light Intermittent	13	2	SW
	2	8	> 2km	Light Intermittent	12	2	SW
24/11/20	1	8	> 2km	None	11	4	SW
25/11/20	1	6	> 2km	None	6	1	W
	2	4	> 2km	None	6	1	W
27/11/20	2	7	> 2km	None	5	0	NE
14/12/20	1	6	> 2km	None	9	3	SW
17/12/20	1	6	> 2km	None	8	4	SW
	2	7	> 2km	None	9	3	SW
25/01/21	2	5	> 2km	None	3	1	NW
26/01/21	1	8	> 2km	Light Intermittent	4	2	SE
		8	> 2km	Light Intermittent	3	2	SE
27/01/21	2	5	> 2km	None	6	1	W
		6	> 2km	None	5	1	W
28/01/21	1	8	1km - 2km	Light Intermittent	3	1	NE
25/02/21	2	6	> 2km	None	6	2	W
		5	> 2km	None	7	2	W
26/02/21	1	7	> 2km	None	2	1	SW
		6	> 2km	None	5	1	SW
16/03/21	1	3	> 2km	None	12	3	NW
17/03/21	1	6	> 2km	None	8	1	N
	2	5	> 2km	None	10	1	N
18/03/21	2	5	> 2km	None	10	1	N
22/04/21	1	2	> 2km	None	9	2	SW
		2	> 2km	None	10	2	SW
23/04/21	2	2	> 2km	None	11	2	SE
26/04/21	2	7	> 2km	None	9	3	SW
25/05/21	1	6	> 2km	None	9	3	NW
	2	4	> 2km	Light Intermittent	8	3	NW
26/05/21	1	7	> 2km	None	10	2	NNE
	2	6	> 2km	Light Intermittent	12	0	N
		6	> 2km	Light Intermittent	12	0	NW

15/06/21	2	6	> 2km	None	16	5	SSW
16/06/21	1	8	> 2km	None	14	2	SW
	2	7	> 2km	None	12	2	W
		7	> 2km	None	12	2	WSW
17/06/21	1	3	> 2km	None	16	2	WSW
19/07/21	1	2	> 2km	None	22	2	W
20/07/21	1	0	> 2km	None	21	2	SSW
28/07/21	2	6	> 2km	None	21	1	SW
		8	> 2km	None	18	1	SW
25/08/21	2	0	> 2km	None	23	1	SW
26/08/21	1	4	> 2km	None	24	1	S
27/08/21	1	4	> 2km	None	19	1	S

Appendix C. Flight data information

Table 7-1-18: Flight records

Date	Species	VP No.	Time First Observed	Number of Birds	Height Band	Time in Height Band (s)	No. of Bird Seconds at Risk height
28/10/2019	Red kite	1	15:05	1	A	180	0
28/10/2019	Red kite	1	15:05	1	B	60	60
28/10/2019	Red kite	1	15:28	1	B	30	30
29/10/2019	Merlin	1	09:55	1	A	35	0
29/10/2019	Red kite	1	10:24	1	B	350	350
29/10/2019	Red kite	1	10:34	3	B	360	1080
29/10/2019	Red kite	1	10:41	1	B	120	120
29/10/2019	Red kite	1	10:47	3	B	180	540
29/10/2019	Red kite	1	10:50	1	B	320	320
29/10/2019	Red kite	1	10:52	3	C	45	0
29/10/2019	Red kite	1	11:00	2	A	130	0
29/10/2019	Red kite	1	11:00	2	B	60	120
29/10/2019	Red kite	1	11:12	1	C	90	0
29/10/2019	Red kite	1	11:20	1	B	40	40
29/10/2019	Red kite	1	11:30	4	A	60	0
29/10/2019	Red kite	1	11:30	4	B	60	240
29/10/2019	Red kite	1	12:35	1	A	20	0
29/10/2019	Red kite	1	12:35	1	B	30	30
29/10/2019	Red kite	1	12:35	1	B	10	10
29/10/2019	Red kite	2	13:40	1	B	217	217
29/10/2019	Red kite	2	13:50	1	B	180	180
29/10/2019	Red kite	2	14:13	1	B	240	240
29/10/2019	Red kite	2	15:12	1	A	25	0
29/10/2019	Red kite	2	15:12	1	B	40	40
29/10/2019	Red kite	2	15:34	1	B	60	60

Date	Species	VP No.	Time First Observed	Number of Birds	Height Band	Time in Height Band (s)	No. of Bird Seconds at Risk height
30/10/2019	Red kite	1	11:15	4	C	300	0
30/10/2019	Red kite	1	11:30	1	A	40	0
30/10/2019	Red kite	1	11:30	1	B	20	20
30/10/2019	Red kite	1	11:48	3	A	40	0
30/10/2019	Red kite	1	11:48	3	B	60	180
30/10/2019	Red kite	1	12:00	1	B	140	140
30/10/2019	Red kite	1	12:02	1	B	110	110
30/10/2019	Red kite	1	12:40	1	B	130	130
30/10/2019	Red kite	1	12:40	1	C	440	0
30/10/2019	Red kite	2	09:15	1	B	360	360
30/10/2019	Red kite	2	09:25	1	B	170	170
30/10/2019	Red kite	2	09:50	1	B	60	60
30/10/2019	Red kite	2	09:50	1	B	60	60
30/10/2019	Red kite	2	09:50	1	C	180	0
31/10/2019	Red kite	2	11:30	1	B	150	150
31/10/2019	Red kite	2	13:02	1	B	160	160
31/10/2019	Red kite	2	13:02	1	C	160	0
31/10/2019	Red kite	2	13:04	1	B	190	190
27/11/2019	Golden plover	1	10:05	60	A	20	0
27/11/2019	Golden plover	1	10:05	60	B	20	1200
27/11/2019	Golden plover	1	10:05	60	C	60	0
27/11/2019	Red kite	2	12:17	1	B	180	180
27/11/2019	Red kite	2	12:25	1	A	90	0
27/11/2019	Red kite	2	12:25	1	B	50	50
27/11/2019	Red kite	2	12:25	1	C	50	0
27/11/2019	Red kite	2	12:49	1	B	250	250
27/11/2019	Red kite	2	13:14	1	B	60	60
27/11/2019	Red kite	2	13:14	2	B	190	380
27/11/2019	Red kite	2	13:20	1	B	68	68
27/11/2019	Red kite	2	13:25	1	B	110	110
28/11/2019	Golden plover	2	15:30	35	B	250	8750
28/11/2019	Pink-footed goose	2	14:10	130	C	130	0
28/11/2019	Red kite	2	10:13	1	A	10	0
28/11/2019	Red kite	2	10:20	1	B	240	240
28/11/2019	Red kite	2	11:04	1	B	30	30
28/11/2019	Red kite	2	11:15	1	B	320	320
28/11/2019	Red kite	2	11:15	1	B	915	915
28/11/2019	Red kite	2	15:25	1	B	90	90

Date	Species	VP No.	Time First Observed	Number of Birds	Height Band	Time in Height Band (s)	No. of Bird Seconds at Risk height
17/12/2019	Red kite	1	10:14	1	B	70	70
17/12/2019	Red kite	1	10:14	1	B	70	70
17/12/2019	Red kite	1	10:50	1	A	10	0
17/12/2019	Red kite	1	11:42	1	A	189	0
17/12/2019	Red kite	2	13:05	1	B	210	210
17/12/2019	Red kite	2	13:18	1	B	35	35
18/12/2019	Red kite	1	11:05	1	B	50	50
18/12/2019	Red kite	2	13:55	1	A	60	0
18/12/2019	Red kite	2	13:55	1	B	100	100
18/12/2019	Red kite	2	13:55	1	B	200	200
19/12/2019	Red kite	2	10:05	1	B	381	381
19/12/2019	Red kite	2	10:15	1	B	252	252
19/12/2019	Red kite	2	10:15	1	B	230	230
19/12/2019	Red kite	2	11:28	1	B	191	191
19/12/2019	Red kite	2	12:09	1	B	131	131
15/01/2020	Red kite	1	10:15	1	A	10	0
15/01/2020	Red kite	1	10:15	1	B	80	80
15/01/2020	Red kite	1	10:15	1	B	50	50
15/01/2020	Red kite	1	10:50	1	A	130	0
15/01/2020	Red kite	1	10:50	1	B	10	10
15/01/2020	Red kite	1	10:50	1	B	40	40
15/01/2020	Red kite	1	11:50	1	B	80	80
15/01/2020	Red kite	1	11:51	2	B	490	980
15/01/2020	Red kite	1	11:51	1	B	20	20
15/01/2020	Red kite	1	12:03	1	B	31	31
15/01/2020	Red kite	1	12:26	1	B	45	45
15/01/2020	Red kite	2	13:37	2	B	55	110
15/01/2020	Red kite	2	13:40	1	B	40	40
15/01/2020	Red kite	2	13:59	1	B	209	209
16/01/2020	Red kite	1	10:38	1	A	155	0
16/01/2020	Red kite	1	10:38	1	B	42	42
16/01/2020	Red kite	2	13:15	1	A	30	0
17/01/2020	Red kite	2	09:55	1	B	182	182
17/01/2020	Red kite	2	09:55	1	B	55	55
17/01/2020	Red kite	2	10:32	1	B	107	107
17/01/2020	Red kite	2	10:39	1	B	250	250
17/01/2020	Red kite	2	10:39	1	B	129	129
17/01/2020	Red kite	2	10:39	1	B	244	244
17/01/2020	Red kite	2	10:50	1	B	302	302
17/01/2020	Red kite	2	13:01	1	B	97	97
19/02/2020	Red kite	1	07:54	1	B	47	47
19/02/2020	Red kite	1	09:20	1	B	247	247

Date	Species	VP No.	Time First Observed	Number of Birds	Height Band	Time in Height Band (s)	No. of Bird Seconds at Risk height
19/02/2020	Red kite	1	09:29	1	B	20	20
19/02/2020	Red kite	1	09:32	1	A	15	0
20/02/2020	Greylag goose	2	10:30	3	B	100	300
20/02/2020	Greylag goose	2	11:30	3	C	60	0
20/02/2020	Hen harrier	2	17:05	1	A	20	0
20/02/2020	Red kite	2	12:50	1	A	60	0
20/02/2020	Red kite	2	12:50	1	B	56	56
20/02/2020	Red kite	2	15:20	1	B	134	134
10/03/2020	Pink-footed goose	1	09:14	1	B	36	36
10/03/2020	Pink-footed goose	2	13:04	2	B	35	70
10/03/2020	Red kite	1	11:52	1	A	110	0
10/03/2020	Red kite	1	11:52	1	B	50	50
10/03/2020	Red kite	1	11:52	1	B	40	40
10/03/2020	Red kite	1	16:29	1	B	33	33
10/03/2020	Red kite	2	13:02	1	B	191	191
11/03/2020	Greylag goose	2	10:02	40	B	333	13320
11/03/2020	Mute swan	2	06:51	1	B	15	15
11/03/2020	Red kite	2	07:48	1	B	72	72
11/03/2020	Red kite	2	07:52	1	A	37	0
11/03/2020	Red kite	2	07:52	1	A	20	0
11/03/2020	Red kite	2	08:00	1	B	68	68
11/03/2020	Red kite	2	08:34	1	A	93	0
11/03/2020	Red kite	2	08:34	1	A	18	0
11/03/2020	Red kite	2	08:34	1	B	40	40
11/03/2020	Red kite	2	10:33	1	B	97	97
11/03/2020	Red kite	2	11:10	1	B	38	38
11/03/2020	Red kite	2	11:14	1	B	304	304
12/03/2020	Red kite	1	10:00	1	A	49	0
12/03/2020	Red kite	1	10:00	1	B	290	290
12/03/2020	Red kite	1	10:15	1	A	70	0
12/03/2020	Red kite	1	10:15	1	A	30	0
12/03/2020	Red kite	1	10:15	1	B	30	30
12/03/2020	Red kite	1	10:15	1	B	180	180
13/03/2020	Red kite	1	10:14	1	B	171	171
13/03/2020	Red kite	1	10:19	2	A	39	0
13/03/2020	Red kite	1	10:19	1	B	490	490
13/03/2020	Red kite	1	10:19	3	C	249	0
13/03/2020	Red kite	1	10:20	1	B	10	10

Date	Species	VP No.	Time First Observed	Number of Birds	Height Band	Time in Height Band (s)	No. of Bird Seconds at Risk height
13/03/2020	Red kite	1	10:32	1	B	74	74
13/03/2020	Red kite	1	10:33	3	A	15	0
13/03/2020	Red kite	1	10:33	3	B	107	321
13/03/2020	Red kite	1	10:41	1	B	15	15
13/03/2020	Red kite	1	10:41	2	B	134	268
13/03/2020	Red kite	1	10:41	2	C	236	0
13/03/2020	Red kite	1	10:49	2	B	70	140
13/03/2020	Red kite	1	10:49	1	B	46	46
13/03/2020	Red kite	1	10:55	1	A	50	0
13/03/2020	Red kite	1	10:55	1	A	5	0
13/03/2020	Red kite	1	10:55	1	B	120	120
13/03/2020	Red kite	1	10:55	1	B	130	130
13/03/2020	Red kite	1	10:55	1	B	118	118
13/03/2020	Red kite	1	11:11	1	A	41	0
13/03/2020	Red kite	1	11:11	1	B	120	120
13/03/2020	Red kite	1	11:15	1	A	16	0
13/03/2020	Red kite	1	11:15	2	B	191	382
13/03/2020	Red kite	1	11:15	1	B	190	190
13/03/2020	Red kite	1	11:15	1	B	336	336
13/03/2020	Red kite	1	11:15	2	B	306	612
13/03/2020	Red kite	1	11:37	1	A	10	0
13/03/2020	Red kite	1	11:37	1	B	25	25
13/03/2020	Red kite	1	11:37	1	B	136	136
13/03/2020	Red kite	1	11:42	1	A	205	0
13/03/2020	Red kite	1	11:42	1	B	61	61
29/04/2020	Greylag goose	1	15:18	2	B	64	128
29/04/2020	Oystercatcher	2	12:26	1	B	54	54
29/04/2020	Red kite	1	14:27	1	B	56	56
29/04/2020	Red kite	2	11:10	1	A	25	0
29/04/2020	Red kite	2	11:12	1	A	28	0
29/04/2020	Red kite	2	11:15	1	C	63	0
30/04/2020	Red kite	1	13:02	1	B	108	108
30/04/2020	Red kite	1	13:08	1	B	125	125
30/04/2020	Red kite	2	14:57	1	B	135	135
30/04/2020	Red kite	2	17:04	1	B	155	155
30/04/2020	Red kite	2	17:06	1	B	167	167
30/05/2020	Greylag goose	1	08:43	4	B	118	472
30/05/2020	Red kite	1	09:01	1	B	84	84
30/05/2020	Red kite	1	09:01	1	C	71	0
30/05/2020	Red kite	1	09:40	1	A	36	0

Date	Species	VP No.	Time First Observed	Number of Birds	Height Band	Time in Height Band (s)	No. of Bird Seconds at Risk height
30/05/2020	Red kite	1	10:17	1	B	68	68
30/05/2020	Red kite	1	10:46	1	B	28	28
30/05/2020	Red kite	2	11:59	1	B	168	168
30/05/2020	Red kite	2	12:00	1	B	15	15
30/05/2020	Red kite	2	12:19	1	B	88	88
30/05/2020	Red kite	2	12:42	1	A	42	0
30/05/2020	Red kite	2	12:48	1	C	98	0
30/05/2020	Red kite	2	12:52	1	B	52	52
30/05/2020	Red kite	2	13:15	2	B	48	96
30/05/2020	Red kite	2	13:16	1	B	32	32
30/05/2020	Red kite	2	13:17	1	B	325	325
30/05/2020	Red kite	2	13:20	2	C	15	0
30/05/2020	Red kite	2	13:33	1	B	24	24
31/05/2020	Red kite	1	17:47	1	B	375	375
31/05/2020	Red kite	2	13:22	1	B	34	34
31/05/2020	Red kite	2	14:20	1	B	116	116
30/06/2020	Red kite	1	08:57	1	B	84	84
30/06/2020	Red kite	2	12:41	1	B	133	133
30/06/2020	Red kite	2	14:32	1	B	30	30
26/07/2020	Red kite	2	11:32	1	B	36	36
27/08/2020	Red kite	2	10:38	1	B	34	34
28/08/2020	Red kite	2	10:48	1	B	100	100
28/08/2020	Red kite	2	12:04	1	B	79	79
28/08/2020	Red kite	2	12:13	1	B	187	187
28/08/2020	Red kite	2	12:39	1	B	65	65
16/09/2020	Merlin	1	14:15	1	A	10	0
16/09/2020	Pink-footed goose	1	15:47	43	C	45	0
16/09/2020	Red kite	1	13:28	1	B	224	224
16/09/2020	Red kite	1	13:48	1	B	284	284
16/09/2020	Red kite	1	14:45	1	B	300	300
17/09/2020	Red kite	2	11:31	1	B	191	191
17/09/2020	Red kite	2	12:18	1	B	179	179
17/09/2020	Red kite	2	12:28	2	C	303	0
18/09/2020	Pink-footed goose	2	10:20	42	C	49	0
18/09/2020	Red kite	2	10:50	1	B	508	508
18/09/2020	Red kite	2	11:01	1	B	40	40
18/09/2020	Red kite	2	11:01	1	B	45	45
20/10/2020	Hen harrier	2	12:02	1	A	51	0
20/10/2020	Red kite	2	11:00	1	B	60	60
20/10/2020	Red kite	2	11:00	1	B	111	111
20/10/2020	Red kite	2	11:31	1	B	61	61

Date	Species	VP No.	Time First Observed	Number of Birds	Height Band	Time in Height Band (s)	No. of Bird Seconds at Risk height
20/10/2020	Red kite	2	11:35	1	B	125	125
20/10/2020	Red kite	2	11:42	1	B	66	66
20/10/2020	Red kite	2	11:42	1	B	187	187
20/10/2020	Red kite	2	12:01	1	B	653	653
20/10/2020	Red kite	2	12:01	1	B	653	653
20/10/2020	Red kite	2	12:15	1	B	94	94
20/10/2020	Red kite	2	12:15	1	B	56	56
20/10/2020	Red kite	2	12:45	1	B	100	100
20/10/2020	Whooper swan	2	10:20	3	B	98	294
21/10/2020	Red kite	2	11:03	1	B	210	210
25/11/2020	Black grouse	2	14:25	1	B	31	31
25/11/2020	Red kite	2	13:34	1	B	117	117
25/11/2020	Red kite	2	13:39	2	B	96	192
27/11/2020	Red kite	2	10:07	1	B	66	66
27/11/2020	Red kite	2	10:37	1	B	134	134
14/12/2020	Red kite	1	15:45	1	B	170	170
17/12/2020	Red kite	1	10:15	1	B	131	131
25/01/2021	Greylag goose	2	14:34	41	C	101	0
25/01/2021	Red kite	2	12:54	1	B	46	46
27/01/2021	Red kite	2	10:05	1	B	17	17
27/01/2021	Red kite	2	10:25	1	B	360	360
27/01/2021	Red kite	2	13:50	1	C	343	0
27/01/2021	Red kite	2	15:24	1	B	148	148
25/02/2021	Red kite	2	09:46	1	B	264	264
25/02/2021	Red kite	2	10:45	1	B	91	91
25/02/2021	Red kite	2	10:56	1	B	90	90
25/02/2021	Red kite	2	11:20	1	B	326	326
25/02/2021	Red kite	2	11:41	1	B	155	155
25/02/2021	Red kite	2	11:41	1	C	73	0
25/02/2021	Red kite	2	11:58	1	A	140	0
25/02/2021	Red kite	2	11:58	1	B	267	267
25/02/2021	Red kite	2	12:13	2	B	305	610
25/02/2021	Red kite	2	13:01	1	B	127	127
25/02/2021	Red kite	2	13:29	1	B	191	191
26/02/2021	Red kite	1	10:55	1	B	81	81
26/02/2021	Red kite	1	12:06	1	B	16	16
26/02/2021	Red kite	1	12:06	1	B	210	210
26/02/2021	Red kite	1	12:06	1	C	171	0
26/02/2021	Red kite	1	13:00	1	B	126	126
26/02/2021	Red kite	1	13:00	1	C	129	0

Date	Species	VP No.	Time First Observed	Number of Birds	Height Band	Time in Height Band (s)	No. of Bird Seconds at Risk height
16/03/2021	Red kite	1	12:59	1	B	65	65
16/03/2021	Red kite	1	13:31	1	B	106	106
16/03/2021	Red kite	1	13:31	1	C	65	0
16/03/2021	Red kite	1	14:16	1	B	78	78
17/03/2021	Golden plover	1	11:19	39	B	584	22776
17/03/2021	Red kite	1	10:01	1	A	5	0
17/03/2021	Red kite	1	10:01	1	B	10	10
17/03/2021	Red kite	1	10:01	1	B	230	230
17/03/2021	Red kite	1	10:12	1	B	64	64
17/03/2021	Red kite	1	10:53	1	B	77	77
17/03/2021	Red kite	1	11:14	1	B	54	54
17/03/2021	Red kite	1	11:41	1	B	240	240
17/03/2021	Red kite	2	13:56	1	B	286	286
18/03/2021	Red kite	2	09:46	1	B	158	158
18/03/2021	Red kite	2	09:46	1	C	71	0
18/03/2021	Red kite	2	10:25	1	B	137	137
18/03/2021	Red kite	2	10:35	1	B	179	179
18/03/2021	Red kite	2	10:45	1	B	278	278
18/03/2021	Red kite	2	11:11	1	B	167	167
18/03/2021	Red kite	2	11:20	1	B	337	337
18/03/2021	Red kite	2	11:20	1	C	225	0
18/03/2021	Red kite	2	11:39	1	B	114	114
18/03/2021	Red kite	2	12:09	1	B	231	231
18/03/2021	Red kite	2	12:09	1	C	31	0
22/04/2021	Red kite	1	09:45	1	B	329	329
22/04/2021	Red kite	1	09:45	1	B	329	329
22/04/2021	Red kite	1	09:49	4	B	126	504
22/04/2021	Red kite	1	10:16	1	B	173	173
22/04/2021	Red kite	1	10:20	1	B	124	124
22/04/2021	Red kite	1	13:00	1	B	284	284
22/04/2021	Red kite	1	15:06	1	C	248	0
23/04/2021	Red kite	2	09:40	1	B	60	60
23/04/2021	Red kite	2	09:40	1	B	290	290
23/04/2021	Red kite	2	10:15	1	B	146	146
23/04/2021	Red kite	2	10:31	1	B	108	108
23/04/2021	Red kite	2	10:49	1	B	61	61
23/04/2021	Red kite	2	12:30	1	B	76	76
23/04/2021	Snipe	2	12:32	1	B	79	79
26/04/2021	Red kite	2	15:02	1	B	98	98
25/05/2021	Red kite	1	14:20	1	B	336	336
25/05/2021	Red kite	1	14:20	1	B	184	184

Date	Species	VP No.	Time First Observed	Number of Birds	Height Band	Time in Height Band (s)	No. of Bird Seconds at Risk height
25/05/2021	Red kite	1	14:20	1	B	148	148
25/05/2021	Red kite	1	14:20	1	C	205	0
25/05/2021	Red kite	1	14:22	1	C	69	0
25/05/2021	Red kite	1	15:04	1	B	94	94
25/05/2021	Red kite	1	15:04	1	C	105	0
25/05/2021	Red kite	1	15:12	1	C	14	0
25/05/2021	Red kite	1	15:17	1	B	72	72
25/05/2021	Red kite	1	15:30	1	C	177	0
25/05/2021	Red kite	1	15:34	1	A	52	0
25/05/2021	Red kite	1	15:34	1	A	66	0
25/05/2021	Red kite	1	15:34	1	B	55	55
25/05/2021	Red kite	1	15:34	1	B	183	183
25/05/2021	Red kite	1	15:34	1	B	124	124
25/05/2021	Red kite	2	10:53	1	B	31	31
25/05/2021	Red kite	2	10:59	1	B	260	260
25/05/2021	Red kite	2	10:59	1	B	240	240
25/05/2021	Red kite	2	10:59	1	B	255	255
25/05/2021	Red kite	2	11:01	1	B	11	11
25/05/2021	Red kite	2	11:01	1	C	28	0
25/05/2021	Red kite	2	11:02	1	B	131	131
25/05/2021	Red kite	2	11:14	1	A	122	0
25/05/2021	Red kite	2	11:15	1	A	40	0
25/05/2021	Red kite	2	11:15	1	A	53	0
25/05/2021	Red kite	2	11:15	1	A	105	0
25/05/2021	Red kite	2	11:15	1	B	55	55
25/05/2021	Red kite	2	11:52	1	B	10	10
25/05/2021	Red kite	2	12:30	1	A	86	0
25/05/2021	Red kite	2	12:30	1	A	45	0
25/05/2021	Red kite	2	12:30	1	A	106	0
25/05/2021	Red kite	2	12:30	1	B	14	14
25/05/2021	Red kite	2	12:30	1	B	85	85
25/05/2021	Red kite	2	12:30	1	B	15	15
25/05/2021	Red kite	2	12:30	1	B	5	5
25/05/2021	Red kite	2	12:30	1	C	38	0
25/05/2021	Red kite	2	12:54	1	B	12	12
25/05/2021	Red kite	2	13:03	1	B	178	178
26/05/2021	Red kite	1	11:15	1	B	1021	1021
26/05/2021	Red kite	1	12:14	1	A	87	0
26/05/2021	Red kite	1	12:14	1	B	65	65
26/05/2021	Red kite	1	12:14	1	B	59	59
26/05/2021	Red kite	1	12:14	1	B	10	10
26/05/2021	Red kite	1	12:21	1	A	3	0

Date	Species	VP No.	Time First Observed	Number of Birds	Height Band	Time in Height Band (s)	No. of Bird Seconds at Risk height
26/05/2021	Red kite	1	12:21	1	B	113	113
26/05/2021	Red kite	1	12:34	1	B	124	124
26/05/2021	Red kite	1	12:34	1	B	5	5
26/05/2021	Red kite	1	12:34	1	C	65	0
26/05/2021	Red kite	1	12:56	1	B	85	85
26/05/2021	Red kite	1	12:56	1	B	95	95
26/05/2021	Red kite	1	12:56	1	C	25	0
26/05/2021	Red kite	1	12:56	1	C	25	0
26/05/2021	Red kite	1	12:57	1	C	58	0
26/05/2021	Red kite	2	15:32	1	B	45	45
26/05/2021	Red kite	2	15:32	1	C	297	0
26/05/2021	Red kite	2	15:47	1	C	446	0
26/05/2021	Red kite	2	15:47	1	C	98	0
26/05/2021	Red kite	2	15:48	1	C	70	0
26/05/2021	Red kite	2	15:48	1	C	65	0
26/05/2021	Red kite	2	15:48	1	C	65	0
26/05/2021	Red kite	2	16:28	1	B	212	212
15/06/2021	Red kite	2	13:40	1	B	76	76
15/06/2021	Red kite	2	14:16	1	B	34	34
15/06/2021	Red kite	2	14:50	1	B	258	258
15/06/2021	Red kite	2	14:57	1	B	135	135
15/06/2021	Red kite	2	15:40	1	A	118	0
15/06/2021	Red kite	2	15:40	1	B	236	236
15/06/2021	Red kite	2	15:43	1	B	195	195
15/06/2021	Red kite	2	15:59	1	B	3	3
16/06/2021	Red kite	1	10:54	1	A	10	0
16/06/2021	Red kite	1	10:54	1	B	398	398
16/06/2021	Red kite	1	10:54	1	C	22	0
16/06/2021	Red kite	1	11:08	1	B	541	541
16/06/2021	Red kite	1	11:15	1	C	135	0
16/06/2021	Red kite	1	11:23	1	B	119	119
16/06/2021	Red kite	1	11:23	1	B	265	265
16/06/2021	Red kite	1	11:23	1	C	35	0
16/06/2021	Red kite	1	11:31	1	C	23	0
16/06/2021	Red kite	1	11:38	1	B	694	694
16/06/2021	Red kite	1	12:05	1	A	15	0
16/06/2021	Red kite	1	12:05	1	B	43	43
16/06/2021	Red kite	1	12:05	1	B	395	395
16/06/2021	Red kite	1	12:07	1	B	348	348
16/06/2021	Red kite	1	12:29	1	B	134	134
16/06/2021	Red kite	1	12:29	1	C	118	0
16/06/2021	Red kite	1	12:43	1	B	45	45

Date	Species	VP No.	Time First Observed	Number of Birds	Height Band	Time in Height Band (s)	No. of Bird Seconds at Risk height
16/06/2021	Red kite	1	12:45	1	B	49	49
16/06/2021	Red kite	2	15:07	1	B	174	174
16/06/2021	Red kite	2	15:07	1	C	55	0
16/06/2021	Red kite	2	15:57	1	B	158	158
16/06/2021	Red kite	2	16:22	1	C	147	0
16/06/2021	Red kite	2	16:23	1	C	122	0
16/06/2021	Red kite	2	16:35	1	B	193	193
16/06/2021	Red kite	2	16:55	1	B	51	51
16/06/2021	Red kite	2	16:55	1	C	189	0
17/06/2021	Red kite	1	12:03	2	B	48	96
28/07/2021	Goshawk	2	12:24	1	C	330	0
28/07/2021	Red kite	2	11:28	1	B	300	300
28/07/2021	Red kite	2	12:24	1	C	330	0
28/07/2021	Red kite	2	12:40	1	B	300	300
28/07/2021	Red kite	2	13:20	1	A	45	0
28/07/2021	Red kite	2	13:33	1	B	240	240
28/07/2021	Red kite	2	15:58	1	A	40	0
28/07/2021	Red kite	2	15:58	1	B	30	30
26/08/2021	Red kite	1	13:30	1	B	45	45
27/08/2021	Red kite	1	14:20	1	A	45	0
27/08/2021	Red kite	1	14:20	1	B	75	75
27/08/2021	Red kite	1	14:32	1	B	180	180