Technical Appendix 8.1: Ornithology

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Contents

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Introduction

Overview

This Technical Appendix has been prepared to accompany **Chapter 8: Ornithology** of the Appin Wind Farm (hereafter referred to as 'the Proposed Development') Environmental Impact Assessment (EIA) Report.

It presents detailed methodologies and results of the ornithology desk study and field surveys to inform the design and assessment of the Proposed Development.

It should be read with reference to the following Figures, which are included within **Volume 2** of the EIA Report:

Figure 8.1: Ornithological Statutory Designated Sites;

Figures 8.2: Vantage Point and Viewshed Location Plans;

Figures 8.3: Breeding Bird Study Area Plans;

Figures 8.4a: Target Species Flights (Raptors);

Figures 8.4b: Target Species Flights (Other Species); and

Figures 8.5: Moorland Breeding Bird Survey Results.

Only common bird species names are referred to within the main text of this Technical Appendix. **Annex 1** provides a summary of all bird species referred to herein, within **Chapter 8: Ornithology** and all other associated Technical Appendices. Both common and species names together with a summary of their conservation status as relevant is provided.

Collision mortality risk analysis is provided separately in **Technical Appendix 8.2** in **Volume 4**.

Information pertaining to the locations of sensitive breeding bird species and which are considered confidential is provided in **Confidential Technical Appendix 8.3** and in the following confidential figures:

Confidential Figure 8.6a: Desk Study Results (Royal Society for the Protection of Birds (RSPB));

Confidential Figure 8.6b: Desk Study Results (Dumfries and Galloway Raptor Study Group (DGRSG));

Confidential Figure 8.6c: Desk Study Results (Restoring Upland Nature (RUN));

Confidential Figure 8.6d: Desk Study Results (South West Scotland Environmental Information Centre (SWSEIC)); and

Confidential Figure 8.7: Breeding Raptor and Owl Survey Results.

Such information will not be made publicly available but will be provided to the Scottish Government Energy Consents Unit, Dumfries and Galloway Council, NatureScot and RSPB.

Site Overview

The land on which the Proposed Development (excluding the Access Route (see below)) would be located, is located at Appin, approximately 6.2 km north of Moniaive, in Dumfries and Galloway ("the Site"). The Site is illustrated on EIA Report **Figure 4.1** and relevant Ornithology figures. The Site is predominantly commercial plantation forest with pockets of open habitat in the west and south-west. The interior of the Site is a steep-sided valley containing the watercourse, Appin Burn.

Access to the Site ("the Access Route") would be taken from the C35s north of Strahanna at an existing access junction, located approximately 5.4 km to the south-west of the Site. The access route would largely follow an existing forestry track.

The wider area around the Site is predominantly open moorland/grassland habitat to the east, with further areas of commercial plantation forest adjoining the Site to the west.

The Site is located entirely within Natural Heritage Zone (NHZ) 19: "Western Southern Uplands and Inner Solway".

Key Guidance

Ornithology survey methodologies and subsequent interpretation of results has made reference to the following key industry standard guidance:

- Brown, A.F. and Shepherd, K.B. (1993). A method for censusing upland breeding waders. Bird Study 40, 189-195.

- NatureScot (Scottish Natural Heritage, SNH, 2017). Recommended bird survey methods to inform impact assessment of onshore wind farms. Version 2. March 2017.
- Hardey, J., Crick, H., Wernham, C., Riley, H., Etheridge, B. and Thompson, D. (2013). Raptors: a field guide to survey and monitoring. Third Edition. The Stationary Office, Edinburgh.
- Gilbert, G., Gibbons, D.W. and Evans, J. (1998). Bird monitoring methods. A manual of techniques for key UK species. RSPB, Sandy, Bedfordshire.
- Stanbury, A., Eaton, M., Aebischer, N., Balmer, D., Brown, A., Douse, A., Lindley, P., McCulloch, N., Noble, D. and Win, I. (2021). The status of our bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and the Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain. British Birds 114: 723-747.
- NatureScot (SNH, 2000). Windfarms and Birds – Calculating a theoretical collision risk assuming no avoiding action. SNH Guidance Note.
- NatureScot (2025). Guidance Note: Assessing the significance of impacts on bird populations from onshore wind farm that do not affect protected areas. (March 2025).
- NatureScot (SNH, 2016). Assessing connectivity with Special Protection Areas (SPAs). Guidance. Version 3 – June 2016.
- NatureScot (2024). Pre-application guidance for onshore wind farms.

It is acknowledged that baseline survey guidance was updated in March 2025 (NatureScot, 2025). However, the guidance that informed the baseline surveys for the Proposed Development was that which was correct at the time of survey completion (SNH, 2017) and it is this version of the guidance that is referred to throughout this document. Only minor changes have been made in the new guidance and the approach to surveys would not be fundamentally different under the updated guidance. The main change has been to the methods for recording gull species, which are now considered to be 'target species'. However, the baseline surveys for the Proposed Development recorded very few gulls and a conclusion of no significant effect on these species can be concluded.

Target Species

Target species for survey and recording were identified through desk study and a reconnaissance survey and were agreed in consultation with NatureScot (see **Chapter 8: Ornithology**), on the basis of known or likely presence, likely sensitivity to the Proposed Development and those which are afforded a higher level of legislative protection, in accordance with NatureScot guidance from that time (SNH, 2017 and 2018).

Primarily, target species during surveys comprised:

- raptor and owl species listed on Annex 1 of the EC Birds Directive (2009/147/EC) and/or Schedule 1 of the Wildlife and Countryside Act 1981 (Amendment) (Scotland) Regulations 2001;
- waterfowl, including geese, ducks and swans (but excluding feral species and mallard);
- waders;
- black grouse; and
- nightjar.

This has ensured inclusion of qualifying interests of designated sites for nature conservation (**Table 8**) and target species that should be considered in the development of onshore wind farms in Scotland, as per NatureScot guidance (SNH, 2017).

Methodology

Desk Study

In accordance with NatureScot guidance (SNH, 2017), a desk study was undertaken to ascertain an overview of likely bird populations and designated sites in proximity to the Proposed Development, to inform survey design, provide context to the field survey data and to inform the impact assessment.

A search for statutory sites with ornithological qualifying features was made using NatureScot Sitelink[1]. The search area comprised the Site and a surrounding 20 km buffer.

Non-statutory sites were additionally investigated within a search area of 5 km from the Site, which included a search for Local Nature Conservation Sites as presented in the Dumfries and Galloway Local Development Plan 2[2].

In addition, third party data providers were contacted to request supplementary species records. The data providers contacted, and the nature of the data requests, are provided in **Table 1**.

Table 1 – Data Sources and Information Sought

Key Source	Information Sought	Search Area
Royal Society for Protection of Birds (RSPB) – *September 2020 and updated in March 2025*	Existing ornithological records.	Within 6 km of the Site boundary (excluding the Access Route) (see **Confidential Figure 8.6a**).
Dumfries and Galloway Raptor Study Group (DGRSG) - *September 2020 and updated in March 2025*	Existing records of scarce breeding and roosting raptors and owls.	Within 6 km of the approximate Site centre (NX 72997 97640), extended to 10 km for any eagle records (see **Confidential Figure 8.6b**).
Restoring Upland Nature (RUN) - *February 2025*	Golden eagle tagging data.	Within 10 km of the Site boundary (see **Confidential Figure 8.6c**).
South West Scotland Environmental Information Centre (SWSEIC) - *September 2021 and updated in March 2025*	Non-statutory designated sites for nature conservation with qualifying ornithological interests, and existing ornithological records.	Within 2 km of the Site boundary and 1 km of the initial Access Track search area (see **Confidential Figure 8.6d**).

Baseline surveys, and the subsequent impact assessment, have further been informed using the existing EIA documentation for other wind farm developments located close to the Site (including Sanquhar II Wind Farm, Wether Hill Wind Farm and those of the Windy Standard/ Brockloch Rig wind farm complex). Where information was available, these were consulted to obtain information regarding ornithological features to provide context for the Proposed Development and to inform the Cumulative Impact Assessment (CIA).

Further data regarding migratory waterfowl was obtained through consultation with relevant literature: Mitchell, 2012 (foraging areas of wintering pink-footed and greylag goose) and Griffin *et al.*, 2011 (migratory routes of wintering geese and whooper swans).

Field Surveys

A programme of baseline ornithological field surveys was completed to assess the potential impacts of the Proposed Development upon ornithological features. Survey effort and methodologies were agreed with NatureScot at the start of the baseline survey campaign. On completion of one year of ornithology surveys, further consultation confirmed that, based on the surveys completed and the results of these surveys, NatureScot agreed sufficient baseline survey data had been collected to inform the impact assessment, alongside the desk study information that had also been gathered.

The baseline ornithology surveys were undertaken between September 2020 and August 2021 (except where otherwise stated) and provide detailed knowledge of bird populations, distributions and flight activity in the vicinity of the Site.

Field Survey Personnel

All field surveys have been completed by experienced and professional ornithologists named in **Annex 2**; all of whom are fully conversant in recognised bird survey methodologies for proposed onshore wind farm projects.

Field Methodologies

The following ornithology field surveys were completed:

- Vantage Point (VP) flight activity surveys (September 2020 to August 2021);
- Moorland breeding bird survey (MBBS) (2021);
- Breeding Annex 1 and Schedule 1 raptor and owl searches (2021);
- Breeding black grouse searches (2021);

[1] Available at: https://sitelink.nature.scot/map (Accessed 12 April 2025).

[2] Available at: https://www.dumgal.gov.uk/media/19849/LDP2-Local-Nature-Conservation-Sites-technical-paper/pdf/Local_Nature_Conservation_Sites_Jan2018.pdf (Accessed 12 April 2025).

- Nightjar survey (2021); and
- Access Route breeding bird survey (2025).

VP Flight Activity Surveys

VP flight activity surveys were undertaken between September 2020 and August 2021, providing coverage of a full non-breeding season (taken here to be September 2020 to February 2021) and one full breeding season (taken here to be March to August 2021).

VP Locations and Viewsheds

Three VP locations were used to provide maximum coverage of the VP Study Area (defined as a 500 m buffer around the outermost turbines, as proposed at the time of survey completion), in accordance with NatureScot guidance (SNH, 2017).

The VP locations used during the survey period are shown on **Figure 8.2**, along with ground-truthed modelled viewsheds (the areas of visible coverage within a 2 km search radius). **Table 2** summarises the VP locations.

Table 2 – VP Locations

VP	Grid Reference	Viewing Orientation
1	NX 71451 98775	South south-west
2	NX 74391 97573	South south-west
3	NX 72453 97455	North north-west

VP Survey Effort

The total survey effort (hours) completed at each VP is summarised in **Table 3**. Full details of all survey times, field surveyors and weather conditions are presented in **Annex 2**.

The total VP survey effort completed at each VP was 87 hours across the 12-month survey period. This comprised, at each VP, 36 hours during the non-breeding bird season period (September 2020 to February 2021) and 51 hours during the breeding bird season period (March to August 2021). Survey effort during the breeding and non-breeding bird seasons, therefore, met, or exceeded, the 36 hours per VP recommended in NatureScot guidance (SNH, 2017).

Table 3 – VP Flight Activity Survey Effort Summary (Hours)

VP	2020				2021								Total
	Non-breeding Season						Breeding Season						
	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	
1	6	6	6	6	6	6	6	9	9	6	12	9	**87**
2	6	6	6	6	6	6	6	9	9	9	9	9	**87**
3	6	6	6	6	6	6	6	9	9	9	9	9	**87**

Across the baseline period, survey times were dispersed throughout the day and were also completed in a range of weather conditions, but always conducive to survey and safe access.

The VP flight activity surveys commenced after a short period of “settling in”, to ensure any potential disturbance to target species present had reasonably passed, and to ensure surveyors were alert to survey following a traverse to the VP location. Surveys then generally took the form of two three-hour watches with a 30-minute break in between to maintain visual acuity of the surveyor.

In accordance with NatureScot guidance (SNH, 2017), flight lines were mapped for all target species passing through the VP Study Area. Details of species, number of birds, flight height in bands (see below), duration and direction were noted on standardised recording forms and field plans.

During the occasional survey when two VPs were carried out simultaneously, observers remained in contact to ensure flight lines of target species were not duplicated (where recorded).

Height bands (HT) were used in the field to record target species activity at, below or above collision risk height for subsequent use in the collision risk model (CRM) analysis. The height bands used were:

- HT1 <10 m;
- HT2 10-25 m;
- HT3 25-150 m;
- HT4 150-180 m;

- HT5 180-225 m; and
- HT6 >225 m.

Based on proposed turbine height, HT3, HT4 and HT5 are considered to represent rotor swept height (see **Technical Appendix 8.2**).

Secondary Species

During the VP surveys, secondary species were noted in five-minute summary intervals, with the number of birds present and general behaviour recorded to build an overall picture of their activity. In accordance with survey guidance (SNH, 2017) secondary species were not mapped, with surveyors prioritising the recording of target species.

Secondary species are defined here as commoner raptors (e.g. buzzard, kestrel and sparrowhawk), all gulls, mallard and feral waterfowl, herons, raven, and any large concentrations of Schedule 1 or Birds of Conservation Concern (BoCC) Red-listed passerines, as recorded during survey.

Moorland Breeding Bird Surveys

Moorland breeding bird surveys (MBBS) were undertaken in 2021.

The MBBS Study Area comprised coverage of non-forested areas within the Site, extended to include areas of open habitat within 500 m of the Site, as shown in **Figure 8.3** and in accordance with guidance (SNH, 2017).

The methodology employed was based on the Brown and Shepherd (1993) method for censusing upland breeding waders, but adapted to a four-visit methodology as recommended in Calladine *et al*. (2009), and adopted in guidance (SNH, 2017). An MBBS primarily aims to record breeding wader species, with other target species including waterfowl, gulls and grouse. Incidental observations of any other species of note, such as raptors, were also recorded. Only open ground habitats were covered by the survey, with forested habitats excluded, in accordance with guidance (SNH, 2017).

A series of four staggered visits were completed between April and July 2021.

During each survey visit a pre-determined route was walked through suitable habitat within the Study Area, with all birds seen or heard, and their behaviours (e.g. displaying, carrying food etc.) mapped in the field.

All surveys were undertaken during daylight hours and in conditions conducive to survey. Survey effort is summarised in **Table 4**. Where two sets of times are given on a date this represents two surveyors covering different parts of the Study Area. Full details of all survey times, field surveyors used, and weather conditions are presented in **Annex 2.**

Following completion of the four survey visits, the data were combined, and the location of breeding territories were estimated using a cluster analysis method. Details of how territories were determined can be provided upon request.

Table 4 – MBBS Effort

Visit	Date	Start Time (24 hrs)	Finish Time (24 hrs)
1	27/04/2021 30/04/2021	08:30 09:20	14:30 15:20
2	25/05/2021	09:00 09:10	14:30 15:10
3	29/06/2021	09:30 09:40	15:00 15:40
4	27/07/2021 28/07/2021	10:00 11:00	16:00 17:00

Breeding Annex 1 and Schedule 1 Raptor and Owl Searches

Searches for Annex 1 and Schedule 1 breeding raptor and owls were undertaken between April and August 2021 and were informed by species-specific methodologies outlined in Hardey *et al.* (2013).

The Study Area for the breeding raptor searches comprised coverage of the Site and out to a surrounding 2 km buffer around the Site boundary, based on the likely species present and in reference to NatureScot guidance (SNH, 2017). The Study Area is shown on **Figure 8.3**. Within the Study Area, surveyors covered the ground by a combination of walkover and short targeted watches of suitable habitat features, to determine territory occupancy and any evidence of breeding.

To avoid disturbance of breeding birds, any nests identified were not approached but were instead watched from a distance. However, surveyors were in possession of a Schedule 1 licence, where required.

Survey effort is summarised in **Table 5**. Full details of all survey times, field surveyors and weather conditions are presented in **Annex 2**.

Table 5 – Breeding Raptor and Owl Search Effort

Date	Start Time (24 hrs)	Finish Time (24 hrs)
06/04/2021	08:40	14:40
16/04/2021	09:20	15:20
17/05/2021	09:25	15:25
16/06/2021	10:40	16:40
28/06/2021	10:00	16:00
07/07/2021	08:40	14:40
29/07/2021	12:45	15:45
02/08/2021	13:25	19:25
03/08/2021	09:45	15:45

Breeding Black Grouse Searches

In reference to NatureScot guidance (SNH, 2017), searches were carried out to determine the presence of lekking black grouse in the vicinity of the Site. The searches were undertaken at dawn in March and April 2021.

The Study Area comprised all suitable habitats (e.g. open moorland, woodland edges and tracks) within, and out to 1.5 km of, the Site and as shown on **Figure 8.3**. Identified areas were scanned from suitable vantage points, with observers looking and listening for the presence of displaying males.

Survey effort is summarised in **Table 6**. Where two sets of times are given on a date this represents two surveyors covering different parts of the Study Area. Survey visits were undertaken on two dates in March, and were repeated in April, with the latter surveys targeting the most suitable areas of habitat identified on the earlier visits.

As no black grouse were recorded during the March and April visits in 2021 a further survey in May was not undertaken.

Full details of all survey times, field surveyors and weather conditions are presented in **Annex 2**.

Table 6 – Breeding Black Grouse Search Effort

Date	Start Time (24 hrs)	Finish Time (24 hrs)	Sunrise (24 hrs)
17/03/2021	05:30 05:30	08:30 08:30	06:27
31/03/2021	05:50	08:50	06:51
07/04/2021	05:30	08:30	06:32
13/04/2021	05:17	08:17	06:17

Nightjar Survey

A nightjar survey was undertaken in mid-June 2021. The survey began at sunset on an evening of favourable weather conditions. During the survey, the surveyors undertook a walkover of suitable habitat with regular stopping and listening for churring (displaying) birds and was undertaken in reference to the methodology in Gilbert *et al.* (1998). Potentially suitable habitat targeted during the survey comprised forest edge, clearings and rides within the forest. The Study Area for the nightjar survey covered the Site and out to 500 m around the Site, with the Study Area shown on **Figure 8.3**.

Survey effort is summarised in **Table 7**. The survey was undertaken by two observers covering different parts of the Study Area. Full details are presented in **Annex 2**.

Table 7 – Nightjar Survey Effort

Date	Start Time (24 hrs)	Finish Time (24 hrs)	Sunset (24 hrs)
17/06/2021	22:20	01:20	21:59

Access Route Breeding Bird Survey

A breeding bird walkover of the Access Route Study Area (Access Route plus 750 m surrounding buffer (where accessible)) was undertaken in spring 2025. The Study Area is illustrated on **Figure 8.3**. The combined survey aimed to record selected target species, namely Schedule 1 raptors, waders and black grouse to record any evidence of breeding within the Study Area.

During the survey, observers began the walkover at dawn to target lekking black grouse, with the survey extended to cover suitable habitat for breeding raptors (e.g., mature plantation areas) and breeding waders (open ground and clearfelled areas).

The Study Area was covered monthly between March and May 2025, as set out in Table 8. Full details of survey times, field surveyors and weather conditions are presented in **Annex 2**.

Table 8 – Access Route Breeding Bird Survey Effort

Date	Start Time (24 hrs)	Finish Time (24 hrs)
27/03/2025 28/03/2025	05:00 05:00	08:00 11:00
16/04/2025	05:00	11:30
06/05/2025	05:25	12:45

Limitations

NatureScot guidance (SNH, 2017 and NatureScot, 2024) states that baseline ornithological survey data should have been collected within the last five years to remain valid; or within three years if the populations of key species are believed to be changing rapidly or there have been substantial changes to habitat. In the case of the Proposed Development a shelf life of five years is considered to be appropriate. Although areas of habitat within the vicinity of the Site will have experienced rotational felling and planting since the baseline surveys were completed, the Site remains a mosaic of mixed age plantation and clear-felled areas as was the case during the baseline survey period. A habitat validation survey undertaken in September 2024 (see **Chapter 7: Ecology**) confirmed that habitats on Site have not undergone substantive change. Changes in forest structure will have led to localised distribution changes in birds in the vicinity of the Site but the overall community of birds recorded by the baseline surveys remains suitably characterised. The regional population of some ornithological features will have undergone change in the intervening period, for example the continued expansion of golden eagle and red kite in south-west Scotland, but these will not have led to "rapid" changes in their populations at a local scale. The data requests have, in any case, been updated (early 2025) to allow for inclusion of more contemporary data in the assessment. As the baseline ornithology surveys were undertaken between September 2020 and August 2021 the baseline data remains valid at the time of writing this assessment (May 2025) for both the breeding and non-breeding season, according to guidance.

The three VPs used for the baseline flight activity surveys were set up to provide maximum coverage of the Site, with the proposed layout not known at the time of survey commencement. Coverage of the Proposed Development is considered to be good and suitable for informing the impact assessment. **Figure 8.2** shows that all proposed turbine locations are within the viewsheds of the VPs, as is the majority of a surrounding 300 m turbine buffer. Only a small part of the VP Study Area did not receive coverage (based on the 20 m above ground offset used in the figure). That full coverage of the Study Area was not achieved is not considered a substantive limitation. When flight activity is used in the CRM analysis, average flight activity rates within each viewshed are applied across the full collision risk area (300 m turbine envelope), and so the model is not spatially explicit. The levels of flight activity recorded during the VP surveys can reasonably be applied to the coverage gap, as the habitat here is the same as in the adjacent land that lies within the visible viewsheds. Furthermore, the other surveys showed that there were no wader territories or breeding raptors (for example) within the viewshed gap, which might have otherwise resulted in higher than average activity of target species within that area.

NatureScot guidance (SNH, 2017) recommends that, where possible, VPs are situated outside the development area, to prevent surveyors potentially affecting bird behaviour. VP2 was located distantly from the Proposed Development and VP3 was also located outside the 300 m turbine envelope. Although VP1 was located close to a proposed turbine, this turbine also lies in the viewshed of VP3. This meant that the area around this turbine was also surveyed in the absence of a surveyor at VP1, thus ensuring the recording of normal flight activity in this part of the Study Area.

Figure 8.3 shows that the Study Areas (Site plus appropriate surrounding buffer) are based on a site boundary that does not exactly match the current Site boundary; the baseline surveys having been undertaken at an early stage of project design. However, this applies only to a small area at the western edge of the Site and the Study Areas have not been compromised, for example the MBBS Study Area includes all open ground habitat of any consequence within the current Site and a 500 m buffer, in accordance with guidance (SNH, 2017).

Ground within the survey-specific Study Areas and which were located outside the Site boundary were surveyed from suitable vantage points within the edge of the Site or from publicly accessible roads and tracks. The sloping topography meant that these areas were generally visible (including scanning using binoculars and telescope,

where appropriate) and the detection of target species within the surrounding survey buffer was readily achievable. The exception was the 2 km search area used in the breeding raptor surveys, with it not being possible to achieve full coverage of distant parts of the 2 km site buffer. However, the raptor data received from DGRSG supplements the field survey data and provides records within the wider search area around the Site. Any target species breeding within, or close to, the Site (i.e., those most likely to be subjected to impact) are considered to have been adequately recorded during survey.

During the completion of the baseline surveys, parts of the forest adjacent to the Site and within the 2 km Study Area were subject forestry operations (felling). These small parts of the survey area were avoided by surveyors for health and safety reasons, whilst the forestry activity may have caused disturbance at a local scale and affected bird behaviour. However, this is not considered to be a limitation given such work represents baseline conditions for the Site and given the relatively small and isolated extent of such activities within the Study Areas.

Third party data has been sourced, as set out in **Table 1**. It is acknowledged that the returned data may not be comprehensive, as the Site is located in a remote area that is unlikely to be regularly visited by ornithologists. Even where dedicated monitoring occurs (e.g. by DGRSG), it is highlighted that not all breeding pairs and occupied territories are known. However, the results of the desk study records sourced, in combination with the field data, are unlikely to have overlooked any key ornithological features in close proximity to the Site and the data are considered suitable for informing the impact assessment.

Results

Desk Study

Statutory Designated Sites for Nature Conservation

This section should be read with reference to **Figure 8.1**.

The Site does not form part of any statutory designated site for nature conservation with qualifying ornithological interests.

Table 8 summarises statutory designated sites with ornithological features of interest located within 20 km of the Site. Two designated areas have been identified: Muirkirk and North Lowther Uplands (SPA and associated Sites of Special Scientific Interest (SSSI)) and Loch Ken and River Dee Marshes SPA and Ramsar site.

Distances specified within **Table 8** are taken from the Site (or Access Route if closer) to the designated area at its nearest point.

Table 8 – Designated Sites for Nature Conservation

Designated Site	Distance / Orientation	Ornithological Qualifying Interests
Muirkirk and North Lowther Uplands SPA	14.3 km to north of Site	Breeding: • Golden plover; • Hen harrier; • Merlin; • Peregrine; and • Short-eared owl. Non-breeding: • Hen harrier.
North Lowther Uplands SSSI	14.3 km to north of Site	Breeding: • Hen harrier; and • Bird assemblage (hen harrier, short-eared owl, merlin, peregrine, golden plover, red grouse, raven, dunlin, snipe, teal, curlew, redshank, whinchat and wheatear).
Muirkirk Uplands SSSI	16.6 km to north of Site	Breeding: • Hen harrier; • Short-eared owl; and • Bird assemblage (teal, hen harrier, buzzard, merlin, peregrine, short-eared owl, golden plover, red grouse, dunlin, snipe, curlew, redshank, whinchat, stonechat, wheatear and ring ouzel). Non-breeding: • Hen harrier.
Loch Ken and River Dee Marshes SPA and Ramsar site	19.9 km to south-west of Site. 16.3 km to south of Access Route.	Non-breeding: • Greylag goose; and • Greenland white-fronted goose.

Note that the citation for Loch Ken and River Dee Marshes SPA[3] states that the site also supports important assemblages of breeding and wintering birds (as listed in the citation). However, these additional ornithological features are not included on the Standard Data Form[4] for the SPA nor on the Sitelink overview[1] and were not highlighted during Scoping consultation. Therefore, these additional species are not considered to be qualifying features for the SPA. Their exclusion is further supported by the citation for Kenmure Holms SSSI; the underpinning SSSI that overlaps with the small part of Loch Ken and River Dee Marshes SPA and Ramsar site that lies partially within 20 km of the Site. No ornithological features are notified in the citation for this SSSI, with the site qualifying for habitat and invertebrate features only.

Non-statutory Designated Sites for Nature Conservation

The Site does not form part of any non-statutory designated site for nature conservation with ornithological interests and no such sites are located within 5 km of the Site.

Existing Ornithological Records

This section provides a summary of existing ornithological records identified through desk study sources. Only records of "Priority Species for assessment when considering the development of onshore wind farms in Scotland" and "Species with restricted ranges" as listed within Annex 1 of NatureScot guidance (SNH, 2018), as well as any additional Schedule 1 listed species (where recorded in the breeding season) are presented.

The consideration of existing records is also limited to those reported since (and including) 2010, to remove species for which there are only historic records.

Desk study species records from the sources listed in **Table 1** are presented in **Confidential Figures 8.6a-d**.

RSPB

All records refer to the original data request made in 2020, with no additional records returned for the period 2020-2024, as enquired in the updated (2025) request.

Records of two species were returned from the RSPB: black grouse and red kite. For black grouse, the records were supplied by Forestry and Land Scotland (FLS) and comprised 14 records of lekking males (peak record of six lekking males) and eight non-lekking records (males and/or females). No records were returned from within the Site, with most more than 5 km distant. However, one lekking area was located just over 1 km from the Access Route. There was one record of a non-lekking bird from within 1 km of the Site. The period 2010-2011 provides most of the records with no records returned from after 2019.

The records provided for red kite include four nest sites, although two nests are in the same location a short distance apart (same pair). Other records comprised two records of a red kite pair and two non-breeding red kite records. One nest location lies more than 1 km from the Site and two further nest sites are more than 4 km and more than 5 km from the Site. More detailed results are provided in **Confidential Ornithology Technical Appendix 8.3** and shown on **Confidential Figure 8.6a**. The RSPB data also returned negative records for nightjar for a location monitored for several years by Dumfries and Galloway Nightjar Study Group; this being located more than 5 km from the Site.

DGRSG

Records of four species were returned by the DGRSG. A goshawk breeding location close to the Site was highlighted, however the known nest site was in an area that has now been clear-felled. The territory is still occupied but the new nest site is not known. Another occupied territory is known to be present approximately 3 km from the Site but at least part of this area is due to be clear-felled in 2025. It was acknowledged that other goshawk territories may be present in the area.

A red kite nest site was highlighted within 2 km of the Site and, although a grid reference was not provided, this is thought to be the same location as that provided in the RSPB data. Note the other red kite nest locations supplied by RSPB would be outside the 6 km search area of the central grid reference used by DGRSG.

Four barn owl nest sites were provided, these all being within 3 km of the Site. Not all locations have been active in all monitored years.

Finally, a well monitored peregrine nest was identified just outside the search area (more than 6 km distant). More detailed results are provided in **Confidential Ornithology Technical Appendix 8.3** and breeding locations (indicative only) are shown on **Confidential Figure 8.6b**.

RUN

RUN provided satellite tagging data associated with the South of Scotland Golden Eagle Project, which has overseen the reintroduction of golden eagles to the south of Scotland. Information was also provided regarding a golden eagle pair that first established a territory within the 10 km search area in 2023 and now nests within the search area. The female of this pair has a GPS tag and data was received of this tagged bird as well as tag data from other dispersing birds in the search area. The tag data shows that the Site is very rarely used by golden

[3] Available at: https://www.nature.scot/sites/default/files/special-protection-area/8528/spa-citation.pdf (Accessed 13 April 2025).

[4] Available at: https://jncc.gov.uk/jncc-assets/SPA-N2K/UK9003111.pdf (Accessed 13 April 2025).

eagles, including by the tagged female. More detailed results are provided in **Confidential Ornithology Technical Appendix 8.3** and shown on **Confidential Figure 8.6c**.

SWSEIC

The SWSEIC data included records for five priority species. Most records returned were of black grouse, with all records coming from before 2020. Although locations were mostly returned at the tetrad scale (2 km x 2 km squares), lekking locations mostly match the data returned from RSPB, with the majority of records coming from an area more than 3 km from the Site boundary, but close to the Access Route.

Other records returned included two for goshawk from two neighbouring kilometre squares that overlap with the Access Route. Although the most recent record is from 2016, unless the forest here has since been clearfelled a territory would be expected to still exist in this area (and may just be unmonitored). A red kite record was returned from 2020 and likely relates to a bird from the breeding pair within 2 km of the Site, as highlighted by DGRSG and RSPB. A hen harrier record was provided from 2010 (non-breeding) at a location close to the Access Route. Finally, two common crossbill records were provided, one of these being in the vicinity of the Site and one in the vicinity of the Access Route. Common crossbill is a widespread species but is Schedule 1 listed. More detailed results are provided in **Confidential Ornithology Technical Appendix 8.3** and locations (indicative) are shown on **Confidential Figure 8.6d**.

Nearby Wind Farm Proposals

Key ornithological features recorded during baseline surveys for other wind farm projects within 10 km of the Site including raptor and owl species (goshawk, red kite, peregrine, hen harrier, barn owl and short-eared owl) and wader species (curlew, oystercatcher, snipe, common sandpiper and golden plover), as well as species such as whooper swan and common crossbill. Relevant data is presented, where appropriate, in the CIA for the Proposed Development (see **Chapter 8: Ornithology**).

Desk Study – Migratory Waterfowl

The Site itself does not provide any habitat suitable for foraging or roosting geese, however, the potential for regularly overflying geese requires consideration in the assessment. Mitchell (2012) looked at the foraging distribution of wintering pink-footed geese and greylag geese associated with SPAs designated for these species, with this including greylag geese in the vicinity of Loch Ken and River Dee Marshes SPA (see **Table 8**). This paper was therefore consulted to provide supplementary data regarding greylag geese. Mitchell (2012) states that the winter distribution of greylag goose has shifted north since SPA designation and that only small numbers of wintering greylag geese now occur at Loch Ken. The distribution maps provided show that even before numbers declined, the distribution of geese was primarily along the Loch Ken valley. An outlying cluster of (historic) records are also associated with the area around Auchenreoch and Milton Lochs, which are located more than 25 km to the south of the Site. The Site lies at the very edge of the stated foraging range for greylag goose (15-20 km) from the Loch Ken and River Dee Marshes SPA, and well beyond the core range of Greenland white-fronted goose (5-8 km). In combination with the data provided in Mitchell (2012), and as supported by the baseline field data, daily commuting flights over the Site by wintering geese can be ruled out.

To better understand the potential for migratory flights of waterfowl over the Site (those that happen in spring and autumn), Griffin *et al*. (2011) was consulted. This paper used satellite-tagging data to compare the migration routes of selected waterfowl, including whooper swan and Greenland white-fronted goose, in relation to onshore and offshore wind farms (as correct at that time). Whooper swans on migration passing through Dumfries and Galloway tended to follow the valleys, particularly the corridors of the River Nith and the River Cree, which are located to the east and the west of the Site, respectively. However, migration across operational wind farm sites does occur, with the paper highlighting a bird that had up to 12 operational onshore wind farms within 5 km of its mapped flightline. (Although the number of wind farms in Scotland has increased since this paper was written, it should be noted that the number of whooper swans wintering in the UK has also increased). The data provided for Greenland white-fronted geese tagged at Loch Ken is limited but shows that birds departing in the spring left in a north-westerly direction from Loch Ken; a direction which would not take them across the Site.

Field Surveys

VP Flight Activity Surveys

Target Species

Target species flight activity recorded during the VP survey period (September 2020 to August 2021) from all VPs combined is summarised in **Table 9**. The table shows the total number of flights, the total number of individuals and the total time recorded (duration of each flight, summed). Note that the "total number of birds" will include some records of the same individual bird recorded more than once. The data presented includes all flights for completeness; note that this includes some flights which will have been outside the rotor swept area and/or which would have been above or below rotor swept height. “At risk” flights are presented separately (**Table 10**).

Detailed flight records are presented in **Annex 3**, which also shows the total flight time for each species at the different height bands. Flight lines for each species over the survey period are illustrated in **Figure 8.4a** (raptors) and **Figure 8.4b** (other species).

Table 9 – Target Species Flight Activity Summary (All Flights)

Species	Total No. of Flights	Total No. of Birds	Total Flight Time (secs)
Red kite	30	40	5,145
Goshawk	19	20	2,662
Greylag goose	4	9	300
Pink-footed goose	3	91	173
Goosander	3	4	190
Hen harrier	3	3	308
Whooper swan	2	96	345

The purpose of the VP flight activity surveys is to determine potential collision risk of target species. Target species flights recorded outside the area of collision risk (turbines plus 300 m) or not recorded at potential collision height (25 m - 225 m; based on height bands that overlap with rotor swept height) can be considered as not being at risk from collision and are excluded from the collision mortality assessment. The identification of at-risk flights is fully covered in **Technical Appendix 8.2**.

Flights regarded as being at-risk are summarised in **Table 10**. Those species recorded with sufficient flight activity to meet the threshold for undertaking CRM (three or more at-risk flights (or 10 or more individuals, if less than three flights) within the 12-month survey period) are highlighted in bold in the table.

Table 10 – Summary of At-risk Target Species Flight Activity

Species	Total No. of Flights	Total No. of Birds	Total Flight Time (s)	Total Time At-risk Height (s)
Red kite	13	16	2,622	1,652
Goshawk	4	4	932	767
Greylag goose	2	5	235	30
Hen harrier	2	2	258	200
Whooper swan	1	42	151	151

The outputs of the CRM analysis are presented in **Technical Appendix 8.2**.

Secondary Species

The following secondary species were recorded during the VP flight activity surveys (in order of greatest to fewest number of records): buzzard, kestrel, sparrowhawk, great black-backed gull, lesser black-backed gull and grey heron.

Note that current survey guidance (NatureScot, 2025) states that all gulls should be recorded as target species. This is an update from the previous guidance that was followed during the baseline surveys (SNH, 2017). However, given the number of gull flights recorded (great black-backed gull: two flights (four individuals) and lesser black-backed gull: one flight (five individuals) (all flights)) these species would not have qualified for CRM and no significant effects would have been concluded.

MBBS

The MBBS recorded a modest breeding wader assemblage as summarised in **Table 11**, and illustrated in **Figure 8.5**. The small number of breeding waders in the Study Area was to be expected given the Site comprises mostly plantation forestry and breeding waders tend to avoid nesting near woodland edge. All breeding territories identified were off-Site, and overlapped with the 500 m survey buffer.

Table 11 – MBBS Results

Species	No. Territories Within Study Area
Snipe	3
Curlew	1

Breeding Annex 1 and Schedule 1 Raptor and Owl Searches

Across the dedicated raptor searches and other baseline surveys, one breeding location was identified for a Schedule 1 species. This was of a barn owl site, where the use of an old building by this species was confirmed by the presence of recent pellets. The roof space could not be examined but the use of the building during the breeding season was considered suggestive of a nesting location. This is a different location to the nest sites returned in the DGRSG data. The location is illustrated on **Confidential Figure 8.7**.

Red kite was recorded during the dedicated raptor surveys but the behaviour witnessed generally related to foraging activity. A nesting location was not found during the baseline surveys, but the recorded activity likely relates to the nearby pair (within 2 km) that has been confirmed through the data search (DGRSG and RSPB data).

No breeding behaviour was recorded for goshawk during the dedicated raptor searches, but a territorial flight was recorded during the VP flight activity surveys, with this occuring within the northern edge of the Site.

Breeding Black Grouse Searches

No black grouse were recorded during the dedicated survey visits within the Study Area in 2021, nor during the course of undertaking the other baseline surveys.

Nightjar Surveys

Nightjar was not recorded during the dedicated survey visits within the Study Area in 2021, nor during the course of undertaking the other baseline surveys.

Access Route Breeding Bird Survey

No species of note (Schedule 1 raptors, black grouse, breeding waders) were recorded during the 2025 surveys along the Access Route Study Area.

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Annex 1 – Bird Species Summary

Table A1-1 provides a list of bird species referred to within **Chapter 8: Ornithology**. Both common and species names are presented along with a summary of each species conservation status using the following abbreviations:

- 'Annex 1' - species listed on Annex 1 of the Birds Directive (2009/147/EC);
- 'Sch 1.1', 'Sch 1A', 'Sch A1' - species listed on Schedule 1 part 1, Schedule 1 part 1A or Schedule 1 part A1 of the Wildlife and Countryside Act (1981, as amended);
- 'SBL' - species listed on the Scottish Biodiversity List;
- BoCC 'Red' and 'Amber' - BoCCs as listed by leading bird conservation organisations in the UK, including the RSPB and the British Trust for Ornithology (BTO). Conservation status (Red and Amber categories) is provided, given these are the species which have suffered the greatest declines, in accordance with Stanbury *et al*. (2021); and
- 'LBAP' - species listed as a local priority species in the Dumfries and Galloway Local Biodiversity Plan.

Table A1-1 – Species Common and Scientific Names and Conservation Status

Common name	Scientific Name	Conservation Status
Greylag goose	*Anser anser*	Amber
Pink-footed goose	*Anser brachyrhynchus*	Amber
Greenland white-fronted goose	*Anser albifrons*	Red; SBL, LBAP
Whooper swan	*Cygnus cygnus*	Amber; Sch1.1; SBL; Annex 1; LBAP
Mallard	*Anas platyrhynchos*	Amber
Teal	*Anas crecca*	Amber
Goosander	*Mergus merganser*	-
Red grouse	*Lagopus scotica*	Amber; SBL
Black grouse	*Lyrurus tetrix*	Red; SBL; LBAP
Nightjar	*Caprimulgus europaeus*	Amber; SBL; Annex 1; LBAP
Oystercatcher	*Haematopus ostralegus*	Amber
Golden plover	*Pluvialis apricaria*	SBL; Annex 1; LBAP
Curlew	*Numenius arquata*	Red; SBL; LBAP
Dunlin	*Calidris alpina*	Red; SBL
Snipe	*Gallinago gallinago*	Amber
Common sandpiper	*Actitis hypoleucos*	Amber
Redshank	*Tringa totanus*	Amber
Great black-backed gull	*Larus marinus*	Red
Lesser black-backed gull	*Larus fuscus*	Amber
Grey heron	*Ardea cinerea*	-
Golden eagle	*Aquila chrysaetos*	Sch1.1/1A/A1; SBL; Annex 1; LBAP
Sparrowhawk	*Accipiter nisus*	Amber
Goshawk	*Astur gentilis*	Sch1.1
Hen harrier	*Circus cyaneus*	Red; Sch1.1 & 1A; SBL; Annex 1; LBAP
Red kite	*Milvus milvus*	Sch1.1 & 1A; SBL; Annex 1; LBAP
Buzzard	*Buteo buteo*	-
Barn owl	*Tyto alba*	Sch1.1; SBL; LBAP
Short-eared owl	*Asio flammeus*	Amber; SBL; Annex 1; LBAP

Common name	Scientific Name	Conservation Status
Kestrel	*Falco tinnunculus*	Amber; SBL; LBAP
Merlin	*Falco columbarius*	Red; Sch1.1; SBL; Annex 1; LBAP
Peregrine	*Falco peregrinus*	Sch1.1; SBL; Annex 1; LBAP
Raven	*Corvus corax*	-
Ring ouzel	*Turdus torquatus*	Red; SBL
Whinchat	*Saxicola rubetra*	Red
Stonechat	*Saxicola rubicola*	-
Wheatear	*Oenanthe oenanthe*	Amber
Common crossbill	*Loxia curvirostra*	Sch1.1

Annex 2 – Ornithology Field Survey Effort

The following codes are used to record weather conditions within **Tables A2-1** to **A2-5**:

Wind Speed		**Rain**		**Cloud Cover**	
Calm	0	None	0	Out of 8	
Light air	1	Drizzle/mist	1		
Light breeze	2	Light showers	2	**Frost**	
Gentle breeze	3	Heavy showers	3	None	0
Moderate breeze	4	Heavy rain	4	Ground	1
Fresh breeze	5			All day	2
Strong breeze	6	**Visibility**			
Moderate gale	7	Poor	0	**Snow**	
Fresh gale	8	<1 km	1	None	0
Strong gale	9	>1 km	2	On site	1
Whole gale	10			High ground	2
Storm	11	**Cloud Height**			
		<150 m	0		
Wind Direction		150-500 m	1		
16 point compass		>500 m	2		

The following field surveyors carried out the suite of ornithology surveys: A. McNab (AJM), P. Carroll (PC), M. Wood (MW), A. Russell (AR), G. Palmer (GP), V. Hastie (VH), T. Bowman (TB), P. Higginson (PH) and A. Stainthorpe (AS).

Table A2-1 – VP Flight Activity Survey Effort (September 2020 to August 2021)

Date	VP	Surveyor	Start Time	Finish Time	VP Hours	Wind Speed	Wind Direction	Rain	Cloud Cover	Cloud Height	Visibility	Frost	Snow
09/09/2020	1	AR	10:15	13:15	3	4/4/4	WNW/WNW/WNW	1/0/1	7/5/6	2/2/2	2/2/2	0/0/0	0/0/0
09/09/2020	1	AR	13:45	16:45	3	4/4/4	WNW/WNW/WNW	1/2/0	4/6/6	2/2/2	2/2/2	0/0/0	0/0/0
09/09/2020	2	GP	10:30	13:30	3	4/4/4	W/W/WNW	0/0/0	8/3/6	2/2/2	2/2/2	0/0/0	0/0/0
09/09/2020	2	GP	14:00	17:00	3	4/4/4	WNW/NW/NW	0/2/0	6/7/6	2/2/2	2/2/2	0/0/0	0/0/0
14/09/2020	3	PC	11:55	14:55	3	2/2/2	SSW/SSW/SSW	0/0/0	7/7/6	2/2/2	2/2/2	0/0/0	0/0/0
21/09/2020	3	PC	14:05	17:05	3	3/3/3	W/W/W	0/0/0	4/4/5	2/2/2	2/2/2	0/0/0	0/0/0
18/10/2020	3	AJM	10:45	13:45	3	1/1/1	SE/S/S	0/0/0	6/5/7	2/2/2	2/2/2	0/0/0	0/0/0
18/10/2020	3	AJM	14:15	17:15	3	1/1/1	S/SSE/S	0/0/1	7/8/8	2/2/2	2/2/2	0/0/0	0/0/0
21/10/2020	1	GP	09:45	12:45	3	5/5/4	S/S/S	1/1/1	8/8/8	1/1/1	1/2/1	0/0/0	0/0/0
21/10/2020	1	GP	13:15	16:15	3	4/3/3	S/S/S	0/1/0	8/8/8	1/1/1	1/1/1	0/0/0	0/0/0
26/10/2020	2	PC	07:05	10:50	3	3/3/4	W/W/W	2/2/3	8/7/8	2/2/2	2/2/2	0/0/0	0/0/0
28/10/2020	2	TB	11:20	14:20	3	3/3/3	SW/SW/SW	0/0/1	7/7/5	2/2/2	2/2/2	0/0/0	0/0/0
12/11/2020	1	PC	10:00	13:00	3	3/3/4	SSW/SSW/SSW	0/2/0	8/8/8	1/1/2	1/2/2	0/0/0	0/0/0
12/11/2020	1	PC	13:30	16:30	3	5/5/5	SSW/SSW/SSW	2/2/2	7/8/8	2/2/1	2/2/2	0/0/0	0/0/0
12/11/2020	2	VH	10:00	13:00	3	4/3/4	SSW/SSW/SSW	0/0/0	7/7/5	1/1/2	1/1/2	0/0/0	0/0/0
12/11/2020	2	VH	13:30	16:30	3	4/4/4	SSW/SSW/SSW	2/2/0	6/6/7	2/1/1	2/2/1	0/0/0	0/0/0
19/11/2020	3	TB	07:40	10:40	3	1/2/1	NW/WNW/W	0/0/0	3/7/2	2/2/2	2/2/2	1/1/1	2/0/0
19/11/2020	3	TB	11:10	14:10	3	2/1/2	W/NW/NW	0/0/0	1/0/2	2/-/2	2/2/2	1/1/1	0/0/0
03/12/2020	1	VH	08:45	11:45	3	2/2/1	S/W/NW	0/0/0	3/6/6	0/1/1	1/1/1	1/1/1	2/2/2
03/12/2020	1	VH	12:15	15:15	3	0/2/2	/-/N/N	0/0/0	8/6/6	0/1/2	0/2/2	0/0/0	2/2/2
09/12/2020	3	VH	08:30	11:30	3	3/3/2	SW/SW/SW	0/0/0	4/6/6	2/2/1	2/2/2	0/0/0	0/0/0
09/12/2020	3	VH	12:00	15:00	3	3/3/2	SW/SW/SW	0/0/0	7/6/8	1/1/1	2/1/2	2/2/2	2/2/2
14/12/2020	2	VH	09:20	12:20	3	4/5/4	SW/SW/SW	3/2/2	7/6/6	1/1/2	2/2/2	0/0/0	0/0/0
14/12/2020	2	VH	12:50	15:50	3	4/4/5	SW/SW/SW	1/0/2	7/6/6	2/2/1	2/2/2	0/0/0	0/0/0
06/01/2021	2	VH	09:00	12:00	3	3/2/2	NW/NW/NW	0/0/0	1/1/0	2/2/2	2/2/2	2/2/2	1/1/1
06/01/2021	2	VH	12:30	15:30	3	2/2/2	NW/N/NW	0/0/0	0/0/1	2/2/2	2/2/2	2/2/2	1/1/1

Date	VP	Surveyor	Start Time	Finish Time	VP Hours	Wind Speed	Wind Direction	Rain	Cloud Cover	Cloud Height	Visibility	Frost	Snow
21/01/2021	3	VH	09:20	12:20	3	5/5/4	W/W/W	0/0/0	6/5/4	2/2/2	2/2/2	0/0/0	1/1/1
21/01/2021	3	VH	12:50	15:50	3	4/5/5	W/W/W	0/0/0	5/3/2	2/2/2	2/2/2	0/0/0	1/2/2
31/01/2021	1	TB	08:40	11:40	3	3/4/4	SE/SE/SE	0/0/0	8/8/8	2/2/2	2/2/2	2/2/2	1/1/1
31/01/2021	1	TB	12:10	15:10	3	4/4/3	SE/SE/SE	0/0/0	8/7/7	2/2/2	2/2/2	2/1/2	1/1/1
06/02/2021	2	VH	08:30	11:30	3	5/4/4	NE/NE/NE	0/0/0	6/7/7	2/2/2	2/2/2	0/0/0	1/1/1
06/02/2021	2	VH	12:00	15:00	3	4/5/5	NE/NE/NE	0/2/2	5/6/5	2/2/2	2/2/2	0/0/0	1/1/1
11/02/2021	3	VH	09:30	12:30	3	2/3/2	E/SE/E	0/0/0	1/1/1	2/2/2	2/2/2	1/1/1	1/1/1
11/02/2021	3	VH	13:00	16:00	3	2/3/3	ESE/SE/E	0/0/0	1/2/1	2/2/2	2/2/2	1/0/0	1/1/1
22/02/2021	1	VH	09:00	12:00	3	3/4/4	SW/SW/SW	0/0/0	3/2/2	2/2/2	2/2/2	0/0/0	2/2/2
22/02/2021	1	VH	12:30	15:30	3	3/4/4	SW/SW/SW	0/0/0	3/2/3	2/2/2	2/2/2	0/0/0	2/2/2
04/03/2021	2	VH	07:00	10:00	3	3/2/3	NE/NE/ENE	2/2/0	3/6/7	2/1/2	2/2/2	0/0/0	1/2/0
04/03/2021	2	VH	10:30	13:30	3	3/4/4	NE/NE/ENE	2/3/2	7/6/7	2/2/2	2/2/2	0/0/0	0/0/0
09/03/2021	3	VH	10:20	13:20	3	3/3/3	S/SSW/S	2/0/1	7/7/8	2/2/1	2/2/2	0/0/0	0/0/0
09/03/2021	3	VH	13:50	16:50	3	3/4/5	SW/S/S	2/1/0	7/8/8	2/1/1	2/2/1	0/0/0	0/0/0
16/03/2021	1	VH	09:00	12:00	3	5/4/4	NW/NW/NW	0/0/0	7/3/2	1/2/2	1/2/2	0/0/0	0/0/0
16/03/2021	1	VH	12:30	15:30	3	5/4/5	NW/NW/NW	0/0/0	2/3/5	2/2/2	2/2/2	0/0/0	0/0/0
01/04/2021	2	VH	09:45	12:45	3	3/3/3	E/E/E	0/0/0	7/8/7	2/2/2	2/2/2	0/0/0	0/0/0
01/04/2021	3	VH	13:15	16:15	3	3/3/3	E/E/E	0/0/0	8/7/3	2/2/2	2/2/2	0/0/0	0/0/0
05/04/2021	1	VH	10:15	13:15	3	5/4/4	NW/NW/NW	0/0/0	3/4/4	2/2/2	2/2/2	0/0/0	0/0/0
05/04/2021	1	VH	13:45	16:45	3	4/5/4	NW/NW/NW	0/0/1	4/3/3	2/2/2	2/2/2	0/0/0	0/0/0
07/04/2021	2	VH	09:00	12:00	3	3/3/3	NW/NW/NW	0/0/0	3/5/6	2/2/2	2/2/2	0/0/0	0/0/0
07/04/2021	2	VH	12:30	15:30	3	3/3/2	NW/NW/NW	0/0/0	7/7/7	2/2/2	2/2/2	0/0/0	0/0/0
09/04/2021	3	VH	08:20	11:20	3	4/3/3	NW/NW/WNW	0/0/0	1/1/3	2/2/2	2/2/2	0/0/0	0/0/0
09/04/2021	3	VH	11:50	14:50	3	3/3/3	NW/WNW/NW	0/0/0	3/4/3	2/2/2	2/2/2	0/0/0	0/0/0
13/04/2021	1	VH	08:30	11:30	3	2/2/1	SW/SSW/W	0/0/2	7/7/7	2/2/2	2/2/2	1/0/0	0/0/0
05/05/2021	3	VH	08:40	11:40	3	3/4/3	NW/NW/NW	0/0/0	1/3/5	2/2/2	2/2/2	1/0/0	1/1/1
05/05/2021	2	VH	12:00	15:00	3	4/4/3	NW/NW/NW	2/2/0	5/3/4	2/2/2	2/2/2	0/0/0	1/2/2
12/05/2021	1	VH	06:10	09:10	3	2/2/3	ENE/E/ESE	2/0/0	7/7/7	2/2/2	2/2/2	0/0/0	0/0/0

12/05/2021	1	VH	09:40	12:40	3	2/3/4	ESE/SE/SE	0/0/0	6/5/6	2/2/2	2/2/2	0/0/0	0/0/0
Date	**VP**	**Surveyor**	**Start Time**	**Finish Time**	**VP Hours**	**Wind Speed**	**Wind Direction**	**Rain**	**Cloud Cover**	**Cloud Height**	**Visibility**	**Frost**	**Snow**
17/05/2021	1	PC	18:20	21:20	3	3/3/2	WNW/WNW/WNW	0/0/0	4/4/2	2/2/2	2/2/2	0/0/0	0/0/0
19/05/2021	3	VH	13:00	16:00	3	4/3/3	WNW/W/W	0/0/0	6/7/6	2/2/2	2/2/2	0/0/0	0/0/0
21/05/2021	3	VH	06:40	09:40	3	4/5/5	ENE/NNE/NE	2/0/1	8/8/8	2/2/1	2/2/2	0/0/0	0/0/0
21/05/2021	2	VH	10:15	13:15	3	5/5/4	NW/NW/NW	2/1/1	8/8/8	2/2/2	2/2/1	0/0/0	0/0/0
21/05/2021	2	VH	13:45	16:45	3	5/4/5	NW/NW/NW	1/1/1	8/8/8	2/2/2	1/2/2	0/0/0	0/0/0
14/06/2021	2	VH	15:00	18:00	3	4/3/4	SW/SW/SSW	2/0/0	6/7/7	2/2/2	2/2/2	0/0/0	0/0/0
14/06/2021	2	VH	18:30	21:30	3	3/3/2	W/W/W	0/0/0	7/5/3	2/2/2	2/2/2	0/0/0	0/0/0
15/06/2021	3	VH	10:30	13:30	3	2/2/2	S/SSW/SSW	0/0/2	8/8/8	2/2/2	2/2/2	0/0/0	0/0/0
15/06/2021	3	VH	14:00	17:00	3	2/3/3	SSW/SSW/SSW	0/0/0	8/7/7	2/2/2	2/2/2	0/0/0	0/0/0
18/06/2021	1	VH	09:40	12:40	3	2/2/2	N/N/N	0/0/0	3/3/4	2/2/2	2/2/2	0/0/0	0/0/0
18/06/2021	1	VH	13:10	16:10	3	2/2/2	E/E/ESE	0/0/0	4/5/4	2/2/2	2/2/2	0/0/0	0/0/0
21/06/2021	3	VH	13:25	16:25	3	2/2/3	ENE/E/ENE	0/0/0	7/7/6	2/2/2	2/2/2	0/0/0	0/0/0
22/06/2021	2	VH	09:25	12:25	3	2/2/3	SW/SW/SW	0/0/0	5/4/6	2/2/2	2/2/2	0/0/0	0/0/0
06/07/2021	2	VH	09:20	12:20	3	3/3/2	NW/N/N	0/0/0	5/7/7	2/2/2	2/2/2	0/0/0	0/0/0
06/07/2021	2	VH	12:50	15:50	3	2/2/2	NW/N/N	2/0/2	7/8/8	2/2/2	2/2/2	0/0/0	0/0/0
08/07/2021	3	VH	05:30	08:30	3	2/2/2	NW/W/W	0/0/0	6/7/8	2/2/2	2/2/2	0/0/0	0/0/0
08/07/2021	3	VH	09:00	12:00	3	2/2/3	W/W/W	0/0/0	8/8/8	2/2/2	2/2/2	0/0/0	0/0/0
13/07/2021	3	VH	15:30	18:30	3	2/3/3	NW/NW/NW	0/0/0	4/3/2	2/2/2	2/2/2	0/0/0	0/0/0
13/07/2021	2	VH	19:00	22:00	3	3/3/3	NW/W/W	0/0/0	2/3/5	2/2/2	2/2/2	0/0/0	0/0/0
21/07/2021	1	PH	08:55	11:55	3	2/2/2	E/SSE/SSE	0/0/0	1/1/1	2/2/2	2/2/2	0/0/0	0/0/0
21/07/2021	1	PH	12:30	15:30	3	2/1/2	SSW/SSW/SSW	0/0/0	1/1/3	2/2/2	2/2/2	0/0/0	0/0/0
23/07/2021	1	VH	05:40	08:40	3	2/1/1	NW/N/N	0/0/0	2/3/3	2/2/2	2/2/2	0/0/0	0/0/0
23/07/2002	1	VH	09:10	12:10	3	2/2/2	NE/E/E	0/0/0	3/2/2	2/2/2	2/2/2	0/0/0	0/0/0
04/08/2021	1	MW	10:15	13:15	3	2/2/30	SW/SW/SW	0/0/0	6/5/5	2/2/2	2/2/2	0/0/0	0/0/0
04/08/2021	1	MW	13:45	16:45	3	3/3/4	SW/SW/SW	0/0/0	4/3/3	2/2/2	2/2/2	0/0/0	0/0/0
04/08/2021	2	AR	10:35	13:35	3	3/3/4	SW/SW/SW	0/0/0	8/8/7	2/2/2	2/2/2	0/0/0	0/0/0
04/08/2021	2	AR	14:05	17:05	3	4/4/5	SW/SW/SW	0/0/0	6/4/3	2/2/2	2/2/2	0/0/0	0/0/0

30/08/2021	3	VH	10:30	13:30	3	3/2/3	NE/NE/NE	0/0/0	8/8/8	2/2/2	2/2/2	0/0/0	0/0/0
30/08/2021	3	VH	14:00	17:00	3	3/3/2	NE/NNE/NE	2/0/0	8/8/8	2/2/2	2/2/2	0/0/0	0/0/0
Date	**VP**	**Surveyor**	**Start Time**	**Finish Time**	**VP Hours**	**Wind Speed**	**Wind Direction**	**Rain**	**Cloud Cover**	**Cloud Height**	**Visibility**	**Frost**	**Snow**
30/08/2021	2	VH	17:30	20:30	3	3/2/2	NE/NE/NE	0/0/0	8/8/8	2/2/2	2/2/2	0/0/0	0/0/0
31/08/2021	1	VH	10:40	13:40	3	2/3/2	NE/NNE/NE	1/0/0	8/7/8	2/2/2	2/2/2	0/0/0	0/0/0
31/08/2021	3	VH	14:15	17:15	3	2/3/3	NE/NNE/NE	0/0/0	8/8/8	2/2/2	2/2/2	0/0/0	0/0/0

Table A2-2 – MBBS Effort (2021)

Date	Surveyor	Start Time	Finish Time	Wind Speed	Wind Direction	Rain	Cloud Cover	Cloud Height	Visibility	Frost	Snow
27/04/2021	VH	08:30	14:30	3/3/4/3/3/3	NW/N/NW/NW/NW/NW	1/2/2/0/0/0	7/7/7/7/7/6	2/2/2/2/2/2	2/2/2/2/2/2	0/0/0/0/0/0	0/0/0/0/0/0
30/04/2021	VH	09:20	15:20	2/3/3/2/2/2	NE/NE/NNE/NNE/NE/NE	1/0/2/0/0/0	5/5/6/6/6/7	2/2/2/2/2/2	2/2/2/2/2/2	0/0/0/0/0/0	0/0/0/0/0/0
25/05/2021	PC	09:10	15:10	3/3/3/3/3/3	NW/NW/NW/NW/NW/NW	0/2/2/2/2/2	7/7/7/7/7/7	2/2/2/2/2/2	2/2/2/2/2/2	0/0/0/0/0/0	0/0/0/0/0/0
25/05/2021	PH	09:00	14:30	3/4/3/3/3	NW/NW/NW/NW/NW	0/0/2/2/2	5/6/7/7/7	2/2/2/2/2	2/2/2/2/2	0/0/0/0/0	0/0/0/0/0
29/06/2021	VH	09:40	15:40	2/2/2/2/2/2	NE/NE/N/N/N/N	0/0/0/0/0/0	3/3/4/4/3/3	2/2/2/2/2	2/2/2/2/2	0/0/0/0/0	0/0/0/0/0
29/06/2021	PH	09:30	15:00	2/2/3/2/2/2	W/W/W/W/W/W	0/0/0/0/0/0	5/5/3/4/4/4	2/2/2/2/2	2/2/2/2/2	0/0/0/0/0	0/0/0/0/0
27/07/2021	VH	10:00	16:00	2/3/3/3/2/2	SW/W/W/SW/SW/W	0/0/0/0/1/0	8/8/8/8/7/7	1/2/2/2/1/2	2/2/2/2/1/2	0/0/0/0/0/0	0/0/0/0/0/0
28/07/2021	VH	11:00	17:00	2/3/3/3/3/4	W/SW/W/SW/WSW/SW	0/0/0/2/0/2	6/7/7/8/6/7	2/2/2/2/2/2	2/2/2/2/2/2	0/0/0/0/0/0	0/0/0/0/0/0

Table A2-3 – Breeding Annex 1 and Schedule 1 Raptor and Owl Search Effort (2021)

Date	Surveyor	Start Time	Finish Time	Wind Speed	Wind Direction	Rain	Cloud Cover	Cloud Height	Visibility	Frost	Snow
06/04/2021	VH	08:40	14:40	2/4/4/4/5/4	NW/NW/WNW/WNW/NW/NW	0/0/0/2/2/2	2/4/4/5/6/6	2/2/2/2/2/2	2/2/2/2/2/2	1/0/0/0/0/0	0/0/0/0/0/0
16/04/2021	VH	09:20	15:20	2/3/2/2/2/2	ESE/SE/S/SW/SW/SW	0/0/0/0/0/0	2/3/3/4/5/5	2/2/2/2/2/2	2/2/2/2/2/2	1/0/0/0/0/0	0/0/0/0/0/0
17/05/2021	PC	09:25	15:25	1/2/3/3/3/3	WNW/NW/NW/NW/NW/NW	0/0/0/0/0/0	8/7/7/6/7/7	2/2/2/2/2/2	2/2/2/2/2/2	0/0/0/0/0/0	0/0/0/0/0/0
16/06/2021	VH	10:40	16:40	2/2/2/2/2/3	SW/S/SW/SSW/SSW	0/0/0/2/2/0	8/7/7/6/4/5	2/2/2/2/2/2	2/2/2/2/2/2	0/0/0/0/0/0	0/0/0/0/0/0
28/06/2021	VH	10:00	16:00	2/2/3/3/2/2	N/N/ENE/ENE/N/ENE	0/0/0/0/0/0	6/7/6/7/7/6	2/2/2/2/2/2	2/2/2/2/2/2	0/0/0/0/0/0	0/0/0/0/0/0
07/07/2021	VH	08:40	14:40	3/2/4/3/3/3	NW/W/W/W/W/W	0/0/0/0/0/0	5/4/5/6/5/5	2/2/2/2/2/2	2/2/2/2/2/2	0/0/0/0/0/0	0/0/0/0/0/0
29/07/2021	VH	12:45	15:45	3/3/3	SW/W/W	0/0/0	7/7/8	2/2/2	2/2/2	0/0/0	0/0/0
02/08/2021	AR	13:25	19:25	3/3/2/3/3/2	SE/SE/SE/SE/SE/SE	0/0/0/0/0/0	3/2/4/4/4/3	2/2/2/2/2/2	2/2/2/2/2/2	0/0/0/0/0/0	0/0/0/0/0/0

03/08/2021	AR	09:45	15:45	2/3/3/3/2/2	SSW/SSW/SW/SW/SW/SW	0/1/0/2/0/2	8/8/8/7/7/8	2/1/2/1/2/1	2/2/2/1/2/2	0/0/0/0/0/0	0/0/0/0/0/0

Table A2-4 – Breeding Black Grouse Search Effort (2021)

Date	Surveyor	Start Time	Finish Time	Wind Speed	Wind Direction	Rain	Cloud Cover	Cloud Height	Visibility	Frost	Snow
17/03/2021	PC & VH	05:30	08:30	3/3/4	NW/NW/NW	0/0/0	8/8/8	2/2/2	2/2/2	0/0/0	0/0/0
31/03/2021	PH	05:50	08:50	1/1/2	SE/SE/SE	0/0/0	6/5/4	2/2/2	2/2/2	0/0/0	0/0/0
07/04/2021	VH	05:30	08:30	2/3/3	NW/NW/NW	0/0/0	5/4/3	2/2/2	2/2/2	1/1/1	0/0/0
13/04/2021	VH	05:17	08:17	2/2/2	NW/WSW/SSW	0/0/0	3/5/6	2/2/2	2/2/2	1/1/0	0/0/0

Table A2-5 – Nightjar Survey Effort (2021)

Date	Surveyor	Start Time	Finish Time	Wind Speed	Wind Direction	Rain	Cloud Cover	Cloud Height	Visibility	Frost	Snow
17/06/2021	PC & VH	22:20	01:20	3/2/2	NW/NW/NW	0/0/0	2/2/2	2/2/2	2/2/2	0/0/0	0/0/0

Table A2-6 – Access Route Breeding Bird Survey Effort (2025)

Date	Surveyor	Start Time	Finish Time	Wind Speed	Wind Direction	Rain	Cloud Cover	Cloud Height	Visibility	Frost	Snow
27/03/2025	AS	05:00	08:00	2/2/2	SW/SW/SW	0/0/1	8/8/8	1/1/1	1/1/1	0/0/0	0/0/0
28/03/2025	AS	05:00	11:00	2/3/3/3/3/4	WSW/WSW/WSW/WSW/W/W	0/0/2/0/2/0	8/7/7/7/7/5	2/2/2/2/2/2	1/2/2/2/2/2	0/0/0/0/0/0	0/0/0/0/0/0
16/04/2025	AS	05:00	11:30	2/2/3/3/2/2	NE/NE/NE/NE/NE/NE	2/2/2/2/0/0	8/8/8/8/8/8	2/2/2/2/2/2	1/2/2/2/2/2	0/0/0/0/0/0	0/0/0/0/0/0
06/05/2025[5]	TB	05:25	12:45	0/1/0/1/1/1	-/SW/-/NW/NW/NW	0/0/0/0/0/0	0/0/0/1/1/1	-/-/-/2/2/2	2/2/2/2/2/2	1/0/0/0/0/0	0/0/0/0/0/0

[5] Note, this survey was split into 05:25 hrs to 08:15 hrs, and then 09:45 hrs to 12:45 hrs (and thus weather information is provided for a six-hour survey period in total).

Annex 3 – VP Flight Activity Surveys: Target Species Flights

Table A3-1 presents details of target species flight lines recorded during VP flight activity surveys between September 2020 and August 2021. The species, number of birds, flight duration and duration spent at each height band (HT) is presented. Note that the flights in **Table A3-1** refer to all target species flights recorded, and not just those flights included in the collision risk modelling. HT3 to HT5 are considered as at-risk, with HT1 and HT6 respectively under, and over, at-risk height.

Table A3-1 – Target Species Flights (September 2020 to August 2021)

Date	VP	Species	No. of Birds	Start Time (24 hr)	Duration (s)	HT1 (s)	HT2 (s)	HT3 (s)	HT4 (s)	HT5 (s)	HT6 (s)	Notes
14/09/2020	3	Goshawk	1	12:21	148	0	58	90	0	0	0	Sub-adult male hunting, brief interaction with buzzard.
14/09/2020	3	Red kite	1	12:40	314	15	30	179	90	0	0	Adult hunting.
14/09/2020	3	Red kite	1	14:05	35	5	15	15	0	0	0	Juvenile hunting.
18/10/2020	3	Pink-footed goose	63	13:24	110	0	0	0	0	110	0	-
18/10/2020	3	Goshawk	1	14:27	235	0	15	220	0	0	0	Adult male, territorial flight, interaction with raven.
18/10/2020	3	Red kite	1	14:30	20	0	0	20	0	0	0	-
12/11/2020	2	Red kite	1	11:14	125	0	30	95	0	0	0	Hunting.
19/11/2020	3	Goshawk	2	13:54	75	0	0	75	0	0	0	Interacting, both males.
14/12/2020	2	Goosander	1	09:42	34	4	30	0	0	0	0	Female.
14/12/2020	2	Red kite	2	11:06	69	69	0	0	0	0	0	-
06/01/2021	2	Red kite	1	12:45	184	0	79	105	0	0	0	Hunting, adult.
06/01/2021	2	Goshawk	1	12:51	21	0	21	0	0	0	0	-
22/02/2021	1	Goshawk	1	10:42	92	0	17	45	30	0	0	Adult female, hunting.
22/02/2021	1	Goshawk	1	14:57	258	0	0	15	48	195	0	Female, hunting.
22/02/2021	1	Goshawk	1	15:16	209	0	0	29	45	60	75	Female, briefly chased by raven.
06/02/2021	2	Goshawk	1	09:48	201	0	6	195	0	0	0	Hunting/stooping.
06/02/2021	2	Goshawk	1	10:05	156	0	15	141	0	0	0	Adult hunting, likely the same bird as flight above.
06/02/2021	2	Goshawk	1	10:17	105	0	30	75	0	0	0	Hunting.
06/02/2021	2	Goshawk	1	10:23	483	0	15	318	150	0	0	Hunting.
11/02/2021	3	Goshawk	1	13:25	18	0	18	0	0	0	0	Female.
11/02/2021	3	Goshawk	1	15:15	335	0	45	290	0	0	0	Adult female, chasing and being chased by raven.
04/03/2021	2	Pink-footed goose	12	09:22	30	0	0	0	0	30	0	Calling.

Date	VP	Species	No. of Birds	Start Time (24 hr)	Duration (s)	HT1 (s)	HT2 (s)	HT3 (s)	HT4 (s)	HT5 (s)	HT6 (s)	Notes
04/03/2021	2	Pink-footed goose	16	12:06	33	0	0	0	0	0	33	-
04/03/2021	2	Goosander	1	12:25	83	0	0	53	30	0	0	Adult male.
16/03/2021	1	Goshawk	1	11:26	23	23	0	0	0	0	0	-
01/04/2021	2	Goshawk	1	10:18	71	26	15	30	0	0	0	Adult calling.
01/04/2021	2	Red kite	1	10:49	26	0	15	11	0	0	0	Immature. Hunting.
01/04/2021	2	Red kite	1	11:18	261	0	21	240	0	0	0	Likely the same immature bird as flight above.
01/04/2021	2	Whooper swan	54	11:57	194	0	0	149	45	0	0	Calling.
01/04/2021	2	Goshawk	1	12:20	39	9	30	0	0	0	0	
01/04/2021	3	Whooper swan	42	13:16	151	0	0	136	15	0	0	-
01/04/2021	3	Red kite	2	14:18	375	0	0	90	45	240	0	-
07/04/2021	2	Goosander	2	09:55	73	13	30	30	0	0	0	Adult pair. Landed in stream.
07/04/2021	2	Red kite	1	13:17	68	0	30	38	0	0	0	Adult.
09/04/2021	3	Greylag goose	2	11:09	30	15	15	0	0	0	0	-
12/05/2021	1	Greylag goose	2	06:25	32	17	15	0	0	0	0	Calling.
12/05/2021	1	Greylag goose	2	10:48	74	14	45	15	0	0	0	Calling.
12/05/2021	1	Red kite	1	12:27	106	0	0	15	60	31	0	Immature bird. Hunting.
21/05/2021	2	Goshawk	1	13:08	11	11	0	0	0	0	0	Adult female. Perched briefly then dropped into trees.
21/05/2021	2	Goshawk	1	14:45	148	0	13	15	30	90	0	-
21/05/2021	2	Red kite	1	16:27	155	0	65	90	0	0	0	Adult feeding on the wing.
21/05/2021	3	Greylag goose	3	08:08	161	11	135	15	0	0	0	Calling.
18/06/2021	1	Red kite	1	10:06	191	56	105	30	0	0	0	Adult hunting. Landed briefly.
18/06/2021	1	Red kite	1	11:40	578	38	300	240	0	0	0	Adult hunting.
18/06/2021	1	Red kite	2	12:11	184	124	60	0	0	0	0	Hunting, flew and landed to perch.
18/06/2021	1	Red kite	3	12:24	505	115	300	90	0	0	0	Together hunting and chasing each other.
18/06/2021	1	Red kite	1	13:18	157	0	0	0	0	15	142	-
18/06/2021	1	Red kite	2	14:12	133	0	0	118	15	0	0	-
21/06/2021	3	Red kite	1	13:37	57	57	0	0	0	0	0	Adult hunting.

Date	VP	Species	No. of Birds	Start Time (24 hr)	Duration (s)	HT1 (s)	HT2 (s)	HT3 (s)	HT4 (s)	HT5 (s)	HT6 (s)	Notes
21/06/2021	3	Red kite	1	13:40	54	24	30	0	0	0	0	Adult hunting (likely the same bird as flight above).
21/06/2021	3	Red kite	2	13:46	208	13	15	90	30	30	30	Same bird as flights above, joined by a second bird.
22/06/2021	2	Red kite	1	09:35	186	30	30	75	51	0	0	Hunting.
22/06/2021	2	Red kite	1	10:11	77	0	32	45	0	0	0	Hunting.
22/06/2021	2	Red kite	2	10:44	281	0	15	60	30	60	116	Hunting.
22/06/2021	2	Goshawk	1	10:52	34	4	15	15	0	0	0	Male.
22/06/2021	2	Red kite	2	11:29	130	0	0	0	0	15	115	Hunting.
08/07/2021	3	Red kite	1	10:25	188	0	0	90	98	0	0	Immature, hunting.
04/08/2021	1	Red kite	1	10:21	300	0	75	225	0	0	0	-
04/08/2021	1	Red kite	1	12:15	111	0	0	60	51	0	0	-
04/08/2021	1	Hen harrier	1	15:01	103	13	45	45	0	0	0	Male.
04/08/2021	2	Red kite	2	13:09	49	19	15	15	0	0	0	Pair chasing each other.
04/08/2021	2	Hen harrier	1	15:05	50	15	15	20	0	0	0	Male hunting over clear-fell, gained height to fly over trees.
30/08/2021	3	Red kite	1	14:31	18	18	0	0	0	0	0	Hunting.
31/08/2021	3	Hen harrier	1	16:26	155	0	0	50	105	0	0	Male hunting.