
The Repowered and Extended Ben Aketil Wind Farm
on behalf of Renantis UK Limited
Technical Appendix 8.1: Technical Ornithology Appendix



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1 INTRODUCTION

- 1.1.1 This Technical Appendix has been prepared to accompany Chapter 8: ‘Ornithology’ of The Repowered and Extended Ben Aketil Wind Farm (the Proposed Development) Environmental Impact Assessment (EIA) Report (EIAR).
- 1.1.2 It presents detailed methodologies and results of ornithology desk studies and field surveys, which have been undertaken to inform the design and assessment of the Proposed Development.
- 1.1.3 It should be read with reference to the following figures included within **Volume 2** of the EIAR:
- **Figure 8.1:** Statutory Designated Sites for Ornithological Interests;
 - **Figure 8.3a:** Vantage Point (VP) Survey Plan (VP1, VP2, VP3 and VP7)
 - **Figure 8.3b:** Vantage Point (VP) Survey Plan (VPA and B)
 - **Figure 8.4:** Breeding Bird Survey Areas 2021 and 2022;
 - **Figure 8.5a:** Target Species Flight Activity March 2021 to April 2022 (golden eagle);
 - **Figure 8.5b:** Target Species Flight Activity March 2021 to April 2022 (white-tailed eagle);
 - **Figure 8.5c:** Target Species Flight Activity March 2021 to April 2022 (other raptors);
 - **Figure 8.5d:** Target Species Flight Activity March 2021 to April 2022 (all other target species);
 - **Figure 8.6:** Moorland Breeding Bird Survey Results (2021 and 2022);
- 1.1.4 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** of the EIAR and all other associated Technical Appendices and Figures. Both common and species names together with a summary of their conservation status as relevant is provided.
- 1.1.5 The estimation of collision mortality risks using the NatureScot Collision Risk Model (CRM) (SNH, 2000¹ and Band *et al.*, 2007²) analysis is provided separately in **Technical Appendix 8.2** in **Volume 3** of the EIAR.
- 1.1.6 Commercially restricted information and information pertaining to the locations of sensitive breeding bird species and which is considered confidential is provided in the following Figures and Technical Appendices presented in **Volume 4** of the EIAR:
- **Figure 8.2:** Existing Ornithological Records (HRSG) Sensitive and Restricted
 - **Figure 8.7:** Breeding Raptor Search Results (2021 and 2022) Sensitive and Restricted;
 - **Technical Appendix 8.3:** Confidential Ornithology Appendix;
 - **Technical Appendix 8.4:** Ben Aketil Wind Farm, Skye Post Construction Monitoring Report 2017;

¹ SNH (2000) Windfarms and Birds - Calculating a theoretical collision risk assuming no avoiding action. SNH Guidance Note.

² Band, W., Madders, M. & Whitfield, D.P. (2007) Developing field and analytical methods to assess avian collision risk at wind farms. In: de Lucas, M., Janss, G.F.E. & Ferrer, M. (Eds.) *Birds and Wind Farms: Risk Assessment and Mitigation*, pp. 259-275.

- **Technical Appendix 8.5:** Ben Aketil Wind Farm, Skye Post Construction Monitoring Data 2022; and,

1.1.7 Such information will not be made publicly available, but will be provided separately to The Highland Council (THC) NatureScot (formerly Scottish Natural Heritage (SNH)) and the Royal Society for the Protection of Birds (RSPB) Scotland.

1.1.8 An assessment of the potential for operational habitat losses (displacement) to golden eagles using the Golden Eagle Topographical (GET) Model (Fielding *et al.*, 2019³) is also presented as **Technical Appendix 8.6: Golden Eagle Topographical (GET) Model Assessment** in **Volume 4** of the EIAR.

1.1.9 The term 'Site' used within this Technical Appendix, is defined as the red line planning application boundary shown in **Figure 2.3** in Volume 2 of the EIAR, encompassing the access track route, proposed turbines and additional infrastructure of the Proposed Development.

1.2 Key Guidance

1.2.1 Ornithology survey methodologies and subsequent interpretation of results has made reference to the following key guidance, produced by NatureScot:

- Assessing connectivity with Special Protection Areas (SPAs) (SNH, 2016⁴);
- Recommended bird survey methods to inform impact assessment of onshore wind farms (SNH, 2017⁵); and,
- Assessing significance of impacts from onshore wind farm outwith designated areas (SNH, 2018⁶).

1.2.2 Additional guidance, including species specific survey guidance, has also been referred to and is referenced where relevant.

2 DESK STUDY

2.1.1 A desk study has been undertaken to identify the proximity of the Site to designated sites for nature conservation with ornithological interests and existing ornithological records within the Site and surrounding area.

2.1.2 The desk study has been used to inform the identification of target species and scope of ornithology field surveys, and subsequent assessment presented within **Chapter 8** of the EIAR.

2.2 Methodology

2.2.1 A summary of key desk study sources consulted and reviewed, together with the information sought and search area is provided in Table 2.1.

³ Fielding, A.H., Haworth, P.F., Anderson, D., Benn, S., Dennis, R., Weston, E. and Whitfield, D.P. (2019). A simple topographical model to predict Golden Eagle *Aquila chrysaetos* space use during dispersal. *International Journal of Avian Science*, **162** (2), pp. 400-415.

⁴ SNH (2016). Assessing connectivity with Special Protection Areas (SPAs). Scottish Natural Heritage (SNH), Guidance. Version 3 – June 2016.

⁵ SNH (2017). Recommended bird survey methods to inform impact assessment of onshore wind farms. Scottish Natural Heritage (SNH), Guidance.

⁶ SNH (2018). Assessing Significance of Impacts from Onshore Windfarms on Birds Outwith Designated Areas. Scottish Natural Heritage (SNH), Guidance.

Table 2.1: Desk study key sources and information sought.

Key Source	Information Sought	Search Area
NatureScot Sitelink ⁷	Statutory designated sites for nature conservation with qualifying ornithological interests.	Within 10km of the Site, extended to 20km for internationally designated sites with migratory geese qualifying interests.
Highland Biological Recording Group (HBRG)	Existing ornithological records.	Within 5 km of the Site.
Royal Society for Protection of Birds (RSPB)	Existing ornithological records.	Within 10 km of the Site.
Highland Raptor Study Group (HRSG)	Existing records of Annex 1 ⁸ /Schedule 1 ⁹ breeding and roosting raptors and owls.	Within 2 km of the Site, and extended to 10 km of the Site for eagle species.
Local Golden Eagle Recorders	Existing records of golden eagle.	Within 10 km of the Site.
Ben Aketil Wind Farm, Skye Post Construction Monitoring Report 2017 (presented in Technical Appendix 8.4).	Post-construction Vantage Point (VP) survey flight activity data for the 2017 monitoring period and subsequent years.	Four VP locations (VP1, 2, 3 and 7) adopted during VP surveys in 2017 onwards, with viewshed coverage of the required VP study area for the Proposed Development illustrated in Figure 8.2a .
Ben Aketil Wind Farm, Skye Post Construction Monitoring Data 2017 (presented in Technical Appendix 8.5).	VP flight activity data for the period January – December 2022.	Four VP locations (VP1, 2, 3 and 7) adopted during VP surveys, with viewshed coverage of the required VP study area for the Proposed Development illustrated in Figure 8.2a .
Gleann Eoghainn Wind Farm ¹⁰ Baseline Ecology and Ornithological Report 2014-16 (Caledonian Conservation Ltd., 2016 ¹¹ presented as Technical Appendix 7.7)	Existing ornithological records from baseline surveys from previous investigations into a wind development within the Site. The survey data is considered too old to inform the design and assessment of the Proposed Development, but provides useful context.	Study areas of ornithological surveys are illustrated in Technical Appendix 7.7 and which comprise near complete coverage of turbine locations for the Proposed Development (and a 500m buffer), wider Site and access track route.

⁷ <https://sitelink.nature.scot/home> (Accessed 4th October 2022).

⁸ Species listed on Annex 1 of the Directive 2009/147/EEC (the 'Birds Directive').

⁹ Species listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended).

¹⁰ Previously proposed wind farm within the Site.

¹¹ Caledonian Conservation Ltd. (2016) Gleann Eoghainn Wind Farm: Baseline Ecology and Ornithology Report 2014-16. An unpublished report prepared for RES Ltd.

2.2.2 Additional peer reviewed literature and industry guidance, has also been reviewed and is referred to where relevant herein and within **Chapter 8: ‘Ornithology’**.

2.2.3 Further details of consultations are presented within **Chapter 8: ‘Ornithology’**.

2.3 Results

Designated Sites for Nature Conservation.

2.3.1 In review of NatureScot’s Sitelink and reference to **Figure 8.1**, the Site does not form part of any statutory designated site for nature conservation with qualifying ornithological interests. There are no such sites located within 10 km of the Site, and no such sites with migratory waterfowl interests located within 20 km of the Site.

Existing Ornithological Records

2.3.2 This section provides a summary of existing ornithological records identified through desk study sources listed above. 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) are considered in detail.

2.3.3 The consideration of existing records are also limited to those reported since 2017. The only exception to this are older records of breeding Annex 1/Schedule 1 raptor nest sites which are regarded as they generally provide valuable historical context.

Royal Society for Protection of Birds (RSPB)

2.3.4 Consultation was undertaken with the RSPB to obtain existing ornithological records within 10 km of the operational Ben Aketil Wind Farm.

2.3.5 In their response the RSPB provided records of 31 species, of which 13 species summarised in **Table 2.2** are listed as ‘Priority Species for assessment when considering the development of onshore wind farms in Scotland’ and ‘Species with restricted ranges’ within Annex 1 of NatureScot guidance (SNH, 2018).

2.3.6 In addition the RSPB also returned records of barn owl (2) and common scoter (1) from the search area in 2012, none of which were specified as breeding records.

2.3.7 The only records returned from within the Site included those of white-tailed eagle, none of which were specified as breeding records.

2.3.8 Further details of records of those species considered sensitive and/or restricted (* in **Table 2.2**) are provided in **Technical Appendix 8.3**.

Table 2.2: Existing ornithological records – RSPB.

Species	No. of Records	Date Range	Summary of Records (Non-sensitive)
Whooper swan	13	2012	Records of 1 to 55 birds (non-breeding)
Barnacle goose	1	2012	Single record of 28 birds (non-breeding).
Pink-footed goose	1	2012	Single record of 4 birds (non-breeding).
*White-tailed eagle	654	2000-2013	Records included 116 satellite tag fixes. <i>Sensitive/Restricted. See Technical Appendix 8.3.</i>

Species	No. of Records	Date Range	Summary of Records (Non-sensitive)
*Short-eared owl	7	2012	<i>Sensitive/Restricted. See Technical Appendix 8.3.</i>
Lapwing	1	2012	Single record of 15 birds (non-breeding).
*Merlin	1	2012	<i>Sensitive/Restricted. See Technical Appendix 8.3.</i>
Great skua	1	2012	Single record of 3 birds (non-breeding).
*Whimbrel	4	2012	<i>Sensitive/Restricted. See Technical Appendix 8.3.</i>
*Hen harrier	1	2012	<i>Sensitive/Restricted. See Technical Appendix 8.3.</i>
*Greenshank	1	2012	<i>Sensitive/Restricted. See Technical Appendix 8.3.</i>
*Corncrake	63	2012-2020	<i>Sensitive/Restricted. See Technical Appendix 8.3.</i>
*Golden eagle	14	2002-2010	<i>Sensitive/Restricted. See Technical Appendix 8.3.</i>

The Highland Raptor Study Group (HRSRG)

- 2.3.9 Consultation was undertaken with the HRSRG to obtain information regarding the presence of breeding raptors and owls within 2km of the operational Ben Aketil Wind Farm, extended to 10 km for records of golden and white-tailed eagle.
- 2.3.10 In their response the HRSRG provided records relating peregrine and white-tailed eagle, although no records of breeding peregrine were returned from within the 2 km search area.
- 2.3.11 The HRSRG advised of five white-tailed eagle territories located within the 10km search area, but were unable to provide detailed information regarding the location of breeding sites.
- 2.3.12 As information regarding the locations or potential locations of Schedule 1 breeding raptor species are considered sensitive, further detailed information obtained from the HRSRG and local species recorders is presented within **Technical Appendix 8.3** and **Figure 8.2**.

Local Golden Eagle Recorders

- 2.3.13 Consultation was also undertaken with local golden eagle recorders, who provided a general statement regarding their knowledge of golden eagle ranges within the 10 km search area. In summary they advised the 10km search area supported the breeding sites of two long established golden eagle ranges, and just excludes the breeding sites of a further third long established range. They additionally advised that all three ranges include hunting grounds within the 10 km search area and provided further context on the Skye and Rassay Golden Eagle population.
- 2.3.14 As information regarding the locations or potential locations of Schedule 1 breeding raptor species are considered sensitive, further detailed information obtained from the HRSRG and local species recorders is presented within **Technical Appendix 8.3**.

Highland Biological Recording Group (HBRG)

- 2.3.15 An information request was submitted to the HBRG to obtain existing ornithological (and ecological) records within 5km of the operational Ben Aketil Wind Farm.

2.3.16 No ornithological records were returned from the search area as part of the information request.

Ben Aketil Wind Farm Operational Monitoring Report 2017

2.3.17 The Proposed Development includes for the repowering of the operational Ben Aketil and Ben Aketil (two turbine) Extension Wind Farms, which in accordance with Condition 17 and Condition 15 of respective planning consents require the completion of post-construction ornithological monitoring.

2.3.18 Post-construction monitoring (PCM) for both operational schemes was subsequently aligned into one monitoring scheme.

2.3.19 Monitoring reports are available for the periods 2008-10, 2012-13 and 2017, with monitoring most recently completed in 2017 and 2022 (below), and upon which the desk study focuses.

2.3.20 The agreed PCM programme includes for Vantage Point (VP) flight activity surveys from four VP locations, which cover a 500m buffer of all operational turbines (including the extension turbines). Each VP is surveyed for nine hours per month in each monitoring year.

2.3.21 Reporting focuses on flight activity of golden eagle, white-tailed eagle and hen harrier, with information on breeding activity of hen harrier also collated.

2.3.22 In 2017, PCM survey work was carried out from four VP locations between January and December 2017 (VP1, 2, 3 and 7) as shown in **Figure 8.3a**, and comprising the same VP locations used during PCM in 2019, 2010, 2012 and 2013.

2.3.23 Survey effort comprised nine hours of observation per VP per month, with a total of 108 hours of observation per VP completed between January and December. Surveys were not carried out simultaneously.

2.3.24 **Table 2.3** provides a summary of seasonal flight activity including number of flights and flight seconds per month recorded for golden eagle and white-tailed eagle in 2017. Note this includes some flight activity that was recorded before or after timed observational effort.

2.3.25 The distribution of golden eagle, hen harrier and white-tailed flight activity recorded in 2017 is presented in Figure 1 and 2 of the 'Ben Aketil Wind Farm, Skye: Post Construction Monitoring Report 2017' (Atmos Consulting, 2018) presented in **Technical Appendix 8.4**.

2.3.26 It should be noted that PCM protocols for VP flight activity surveys include for the recording of additional target species. Such data has not been made available for the purposes of the desk study.

Table 2.3: Seasonal flight activity 2017 (all VPs combined).

Reproduced from Table 6 of the Ben Aketil Wind Farm, Skye: Post Construction Monitoring Report 2017 (Atmos Consulting, 2018).

2017	Golden eagle		White-tailed eagle	
	Flights	Seconds	Flights	Seconds
Jan	0	0	2	115
Feb	34	5905	36	5642
Mar	11	2166	12	2399
Apr	11	2732	16	1767
May	30	5095	37	4691
Jun	33	3437	23	2111

2017	Golden eagle		White-tailed eagle	
	Flights	Seconds	Flights	Seconds
Jul	33	4024	28	4362
Aug	6	356	44	5292
Sep	26	3842	37	5952
Oct	28	3228	4	367
Nov	20	5322	10	991
Dec	29	3300	19	1427
Total	263	39407	268	35116

Golden eagle

- 2.3.27 During PCM in 2017, golden eagle flights were recorded in every month except January. PCM in 2017 also recorded the highest level of activity than in any other PCM year.
- 2.3.28 Peak golden eagle flight activity occurred in February and from May to July. In February adults from nearby breeding locations were observed displaying and chasing away immature birds. From May to July, the increased activity was suggested as being likely attributable to an increased foraging demand on the adult eagles, as chicks develop in the nest. There was also a high level of activity between September and December, which was suggested as being attributable to the dispersal of juvenile golden eagles and the presence of carrion locally associated with the shooting season.
- 2.3.29 Relatively lower levels of golden eagle flight activity were recorded in April and August, which was suggested as being likely due to adults remaining closer to their occupied breeding sites when incubating and when the young eagles fledge. No golden eagles were recorded in January – and was suggested as being a result of juveniles having dispersed further afield out of local breeding territory by this time or that the previous season may have been less successful, meaning fewer juveniles had fledged.
- 2.3.30 It should be noted that Haworth (2015¹²) reported peaks in activity of golden eagles at nearby Edinbane wind farm in spring and autumn with less activity in winter and summer; this pattern loosely coincides with PCM data for the Ben Aketil wind farm.
- 2.3.31 In 2017 observations of two different adult pairs were recorded at either end of the VP survey area, suggesting the survey area may lie at the edges of two territories; one to the north and one to the south-east, although the exact locations of breeding sites associated with any local territories are not known.
- 2.3.32 Flight activity recorded in 2017 was also attributable to immature birds, which was recorded regularly and throughout the year. In 2017, it was evident that there were likely to have been several immature birds present, identified on the basis of plumage. Defence of the survey area from adults towards immature birds in 2017 was sporadically observed and varied across the year. The flight activity of immature eagles recorded in 2017 may therefore, to some degree, have been influenced by the levels of defensive behaviour by the adults.
- 2.3.33 Observations in 2017 did suggest the survey area is likely located to the edge of two occupied ranges. Adults can often defend the very edges of their ranges less vigorously and may not always detect

¹² Haworth Conservation (2015). Edinbane Windfarm: Ornithological Monitoring 2007–2014. A review of the spatial use of the area by birds of prey. Haworth Conservation Ltd.

intruders. There can also be some degree of tolerance by adult birds towards non-breeding birds, several years away from maturity (Watson, 2010¹³).

- 2.3.34 Relative to other PCM years 2017 gave the clearest indication of turbine avoidance by golden eagles, particularly the central turbines. Comparable to previous PCM golden eagle flight activity was much lower within the 500m turbine buffer, than in areas outside of the 500m buffer. Golden eagle flight activity, similar to previous PCM years, was highest to the south of the operational wind turbines, with higher levels of activity also recorded to the northeast and west. It was suggested that fluctuations of levels of activity in previous PCM years may be attributable to actual breeding site locations and therefore foraging habitats of territorial adult birds.
- 2.3.35 Peak golden eagle activity, even before construction activities for the wind farm, has always been over high altitude areas, to the north and south of the 500m turbine buffer, but there has been an apparent continued decline of activity (but not complete absence) in the central 500m turbine buffer, following construction and which does not suggest any habituation to the development.
- 2.3.36 From observations in 2017, and from previous PCM years, golden eagle within the survey area, appear to be scavenging on sheep and deer carcasses. Sheep grazing and deer stalking at Ben Aketil has continued following the construction of the wind farm.

White-tailed eagle

- 2.3.37 White-tailed eagles were recorded every month during PCM in 2017. Peaks of activity were variable, but as also recorded during PCM in 2013, a decrease in activity during the autumn and winter months was noted, from October to January. In 2017 there were peaks in February and July to September. February, July and September also coincided with peak activities of golden eagle, therefore a combination of different phases in the breeding cycle and food availability, may explain these flight activity levels.
- 2.3.38 The pattern of white-tailed eagle flight activity in 2017, broadly mirrored previous PCM survey years at Ben Aketil, and is likely explained by the fact that white-tailed eagles tend to use more coastal areas during the winter, as they rely more on fish during this time (e.g. Pálsdóttir, 2012¹⁴).
- 2.3.39 Haworth (2012¹⁵) reported a similar trend for the Edinbane Wind Farm.
- 2.3.40 White-tailed eagle flight activity at Ben Aketil has varied significantly between PCM survey years. There has however been a significant increase in overall activity since 2002, with activity levels in 2017 three times higher than recorded during PCM in 2013. The population of white-tailed eagles in Scotland has continued to increase, with the estimated population twice the size in 2017, than it was when the wind farm was construction (increase from an estimate of 45 pairs, to 90 pairs). It was also known that a single pair bred close to the wind farm in 2017 and was likely to be attributable to the level of activity recorded.
- 2.3.41 Analysis of data in 2017 (and subsequent PCM years) suggests that white-tailed eagle flight activity is fairly evenly spread across the survey area, with some preference for higher altitude areas. On average flight activity within 500m of turbine locations, was similar to the wider area. Very little avoidance of the wind farm has been evident from PCM, and no significant impact upon the behaviours of white-tailed eagles using the survey area has been observed.

¹³ Watson, J. (2010) *The Golden Eagle*. 2nd edition. London, Poyser.

¹⁴ Pálsdóttir, E.S. (2012). Demographic patterns in winter carcass use by Golden Eagle and White-tailed Eagle in Finnmark, Norway. Unpublished Masters' Thesis, University of Tromsø, Norway.

¹⁵ Haworth Conservation (2012). Edinbane Windfarm: ornithological monitoring. A review of the spatial use of the area by birds of prey. Haworth Conservation: Bunessan, Isle of Mull.

2.3.42 In 2017 white-tailed eagles were observed in very close proximity to the operational turbines, but generally showed some level of response, usually by circling to gain height and passing over turbines or by changing trajectory to pass between them.

Hen harrier

2.3.43 Hen harriers in Skye have been monitored by Bob McMillan since 2000. Survey methods and results of 2017 monitoring accompany the Ben Aketil Wind Farm, Skye: Post Construction Monitoring Report 2017 presented in **Technical Appendix 8.4**.

2.3.44 Originally all known hen harrier breeding sites on Skye were located in the south of the island, but are understood to have since moved away from this area. Hen harriers were also known to nest in north central Skye. Annual monitoring now occurs in north central Skye, in a study area north of the B885 Portree – Struan Road.

2.3.45 In the absence of deep rank heather, breeding pairs within the study area favour nest sites in young forestry. The establishing Choisleadar Forest (to the north-west of the Proposed Development) has been a major factor in providing suitable breeding opportunities for hen harriers within the study area, with the number of breeding pairs increasing to around 11 occupied territories in 2007, prior to the construction of the Ben Aketil and Edinbane wind farms.

2.3.46 There was a decline in overall breeding numbers within the study area in 2012, in common with other parts of the country. A further decline was noted in 2013, and breeding numbers whilst relatively stable between 2014-2017 within the study and in proximity to the Ben Aketil Wind Farm remains low at five/six pairs.

2.3.47 Although stable, pair productivity within the study area is variable. Evidence from nest remains and camera trapping, suggesting that fox predation is a major cause of nest failure within the study area, although there was no evidence of nest predation in 2017.

2.3.48 In 2017 seven territories were understood to be occupied within the study area, including five by adult pairs which successfully fledged young (mean of 2.0 per nest), one prospectively by a pair only early in the season and a further territory occupied by a single male.

2.3.49 Three nesting attempts occurred within the area covered by PCM, all to the north of the operational Ben Aketil wind farm.

2.3.50 Due to the sensitivity of hen harrier nesting locations, further details are not presented here, but restricted to the 2017 annual report presented as part of **Technical Appendix 8.3** and **Technical Appendix 8.4**.

2.3.51 The 2017 annual report details that pairs have nested and bred at the Ben Aketil and Edinbane wind farms, within 500m of turbines and within 50m of access tracks. It details that birds hunt frequently through the turbine areas and that there is no evidence that turbine have resulted in mortalities, or construction works have impacts upon the breeding population.

2.3.52 Breeding habitat within the study area is considered to remain suitable, with most pairs continuing to nest in young forest plantations. Forest edges, where areas have been ploughed and remain unplanted, but where deep heather has become dominant also provide nesting opportunities. The study area also supports some suitable areas of moorland, unaffected by burning and grazing, which hold good heather habitat and have been used by pairs in previous monitoring years. Pairs have also nested in woodland grant scheme plantations (hardwoods) in recent years.

2.3.53 During PCM in 2017 a total of 70 hen harrier flights were recorded, with flight time totalling 16,631 seconds. This was higher than some previous PCM years, and was considered to reflect the more successful breeding season.

- 2.3.54 Peak flight activity, in all PCM years has occurred during the breeding season (between March and August), with very little activity during the autumn and winter months. Activity in 2017 peaked in March and May, with March associated with the hen harrier main display period and May associated with the beginning of the peak period for brood provisioning. In 2017 the majority of flight activity recorded, occurred to the north of the turbines and attributable to occupied breeding territories in this part. Several flights occurred through the line of turbines, mostly below risk height. The species was also recorded to fly through the array during previous PCM years.
- 2.3.55 The distribution of flight activity recorded in 2017 is presented in Figure 3 of the ‘Ben Aketil Wind Farm, Skye: Post Construction Monitoring Report 2017’ (Atmos Consulting, 2018) presented in **Technical Appendix 8.4**.
- 2.3.56 Habitat use maps prepared by Haworth (2013¹⁶) for the nearby Edinbane wind farm, also suggest a lack of avoidance of wind farms.

Ben Aketil Wind Farm Operational Monitoring Data (2022)

- 2.3.57 PCM for the Ben Aketil Wind Farm was completed in 2022, and which included for VP flight activity surveys between January and December 2022.
- 2.3.58 The 2022 PCM dataset has not yet been analysed for the purposes of PCM reporting, but flight activity data has been made available to inform collision mortality risks estimates for the Proposed Development.
- 2.3.59 In 2022, PCM survey work was carried out from four VP locations (VP1, 2, 3 and 7) as shown in **Figure 8.3a**, and comprising the same VP locations used during PCM in 2017.
- 2.3.60 Survey effort at each VP is summarised in **Table 2.4**, with survey conditions presented in **Technical Appendix 8.5**.

Table 2.4: PCM VP flight activity survey effort (2022).

VP	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1	-	18	6	9	12	6	12	12	6	9	9	9	108
2	3	15	9	9	9	3	9	15	6	9	12	9	108
3	6	9	9	12	9	3	12	12	6	9	9	12	108
7	3	15	9	9	12	3	12	12	6	9	9	12	111

- 2.3.61 Flight activity of target species recorded across all VP locations combined is summarised in **Table 2.5** and illustrated in **Technical Appendix 8.5**. The data set has been filtered to remove flight activity recorded outside timed observational effort, for subsequent use in collision mortality risk estimates.

Table 2.5: Target species flight activity summary (all flights) – January 2022 to December 2022.

Species	Total No. of Flights	Total No. of Birds	Total Flight Time (secs) ¹⁷
Greylag goose	4	58	1,317
Golden eagle	19	20	3,356
Golden plover	5	89	2,615

¹⁶ Haworth Conservation 2013. Edinbane Windfarm: Ornithological monitoring. A review of the spatial use of the area by birds of prey. Bunessan, Isle of Mull: Haworth Conservation Ltd.

¹⁷ Total time multiplied by the number of birds.

Species	Total No. of Flights	Total No. of Birds	Total Flight Time (secs) ¹⁷
Red-throated diver	1	1	10
Red-breasted merganser	1	2	16
Snipe	1	1	6
Hen harrier	6	6	606
White-tailed eagle	41	52	9,452
Dunlin	3	5	13

2.3.62 In review of the 2022 PCM dataset obtained (including incidental observations):

- golden eagle flights were recorded between February and June, with the peak level of flight activity (flight time) recorded in May, flight activity included that of adult and immature birds;
- white-tailed eagle flights were recorded between February and November, peaks of activity (flight time) were variable, but with a noted decrease in activity from the autumn (September) onwards into the wintering months and with peaks recorded in February – May and July-August;
- hen harrier flights were recorded between late-August and December, with a relatively low level of flight activity recorded, this is in contrast to previous PCM where flight activity has occurred through the breeding season, and likely reflects the absence of breeding territories recorded within proximity to the Site in 2022 (>2km); and,
- flight activity of additional target species included that of a narrow range of species, with very low levels of flight activity recorded.

Gleann Eoghainn Baseline Ornithological Studies (April 2014 - July 2016)

2.3.63 The following baseline ornithological studies were carried out within the Site and along the access track route between 2014-2016 to inform the design and assessment of a previous wind farm development known as the Gleann Eoghainn Wind Farm and which did not proceed to a formal planning application:

- Flight Activity Surveys:
 - April 2014 to March 2015, 114 hours from each of two VP locations and which provide visual coverage of the majority of turbine locations and a 500m buffer for the Proposed Development (see Figure 7 of **Technical Appendix 7.7** with reference to **Figure 8.3a** and **8.3b**);
 - Mid-March 2015 to mid-March 2016, 156 hours from each of two VP locations and which correspond with VPA and VPB used during additional ornithological surveys in March 2021 and April 2022 (see Section 3.0 below), and provide visual coverage of the majority of turbine locations and a 500m for the Proposed development (see Figure 8 of **Technical Appendix 7.7** with reference to **Figure 8.3b**); and,
 - Mid-March 2016 to mid-May 2016, 45 hours from each of two VP hours and which correspond with VPA and VPB used during additional ornithological surveys in March 2021 and April 2022 (see Section 3.0 below), and provide visual coverage of the majority of turbine locations and a 500m for the Proposed development (see Figure 8 of **Technical Appendix 7.7** with reference to **Figure 8.3b**);
- Breeding bird surveys, with four visits between April and July:

- In 2014 and 2015 for a survey area shown in Figure 9 of **Technical Appendix 7.7**, and which corresponds with the northern extent of the Moorland Breeding Bird Survey (MBBS) Area adopted during additional ornithological surveys in 2021 and 2022 (see **Figure 8.4** and Section 3.0 below);
- In 2016 of a survey area shown in Figure 9 of **Technical Appendix 7.7** and which corresponds with MBBS Area adopted during additional ornithological surveys in 2021 and 2022 (see **Figure 8.4** and Section 3.0 below);
- Breeding raptor and owl surveys:
 - In 2014, comprising staggered visits between April and July for a survey area shown in Figure 10a of **Technical Appendix 7.7** and which corresponds with the northern extent of the Breeding Annex 1/Schedule 1 Raptor and Owl Search Area adopted during additional ornithological surveys in 2021 and 2022 (see **Figure 8.4** and Section 3.0 below);
 - In 2015, comprising staggered visits between February and July for a survey area shown in Figure 10b of **Technical Appendix 7.7** and which corresponds with the northern extent of the Breeding Annex 1/Schedule 1 Raptor and Owl Search Area adopted during additional ornithological surveys in 2021 and 2022 (see **Figure 8.4** and Section 3.0 below);
 - In 2016, comprising staggered visits between January and July for a survey area corresponding with the southern extent of the Breeding Annex 1/Schedule 1 Raptor and Owl Search Area adopted during additional ornithological surveys in 2021 and 2022 (see **Figure 8.4** and Section 3.0 below);
- Black grouse lek surveys
 - In 2015 and 2016, comprising three survey visits between March and May, within a survey area shown in Figure 11 of **Technical Appendix 7.7** and which provides coverage of the turbine locations and access track route of the Proposed Development and habitats within a 1.5km buffer;
- Winter bird surveys;
 - Over the 2014-15 and 2015-16 wintering periods, comprising three or four visits between October and February, to a survey area shown in Figure 9 of **Technical Appendix 7.7** and which provides coverage of the turbine locations and access track route of the Proposed Development and habitats within a 1.5km buffer.

2.3.64 The Gleann Eoghainn Wind Farm: Baseline Ecology and Ornithology Report 2014-16 reports flights of 16 target species during flight activity surveys, with hen harrier (71 flights), golden eagle (53 flights), white-tailed eagle (46 flights) the most regularly observed species over the full duration of flight activity surveys. Other target species for which flight activity was recorded comprised whooper swan (3 flights), greylag goose (3 flights), barnacle goose (1 flight), black grouse (1 flight), grey heron (1 flight), osprey (1 flight), merlin (2 flights), barn owl (1 flight), short-eared owl (13 flights), golden plover (5 flights), curlew (3 flights), woodcock (1 flight) and snipe (16 flights).

2.3.65 Snipe was the only target species recorded during breeding bird surveys, together with a narrow range of moorland passerines. Incidental observations of a small number of breeding golden plover territories outside the breeding bird survey areas were also made. No black grouse were recorded during black grouse lek surveys.

2.3.66 Although golden eagle, white-tailed eagle, hen harrier, merlin and peregrine activity was recorded during breeding raptor and owl searches, only breeding evidence of white-tailed eagle was recorded within the survey area, with nest building by a pair of eagles observed in an area south east of the Site.

- 2.3.67 Hen harrier breeding activity was suspected in 2015, in the north of the survey area, and consultation with Bob McMillan as part of baseline studies, also identified the presence of breeding hen harrier (1-2 nests per year within 2km of the Site).
- 2.3.68 Surveys did not record the Site or surrounding area to be of importance for foraging or flighting migratory waterfowl, and no evidence of regularly used flight corridors for breeding divers were recorded.

3 FIELD SURVEYS

- 3.1.1 Existing ornithological information detailed in Section 2 (above) pertaining to the presence, distribution and flight activity of ornithological species within the Site, and surrounding area is considered extensive.
- 3.1.2 Ornithological features which have the potential to be significantly affected by the Proposed Development are well established, with the following features identified as 'Target Species' for site-specific survey and recording:
- Species listed on Annex 1 of NatureScot guidance (2018);
 - Additional breeding Annex 1/Schedule 1 Raptors and Owls; and,
 - Breeding waders.

3.2 Methodology

- 3.2.1 The following surveys have been undertaken between March 2021 and August 2022:
- Vantage Point (VP) Flight Activity Surveys;
 - Moorland Breeding Bird Survey (MBBS); and,
 - Breeding Annex 1/Schedule 1 Raptor and Owl Searches.
- 3.2.2 All surveys have been undertaken with reference to NatureScot guidance (2017) and species-specific methodologies referenced therein.
- 3.2.3 All surveys have been undertaken by suitably competent ornithologists; all of whom have extensive experience in the undertaking of ornithology surveys for proposed wind farm developments at comparable sites across Scotland.

VP Flight Activity Surveys

- 3.2.4 Bird species flight activity data to estimate collision risks for the Proposed Development has been obtained from VP flight activity surveys between March 2021 and April 2022 (14 months) using two VP locations VPA and VPB as summarised in **Table 3.1** and illustrated in **Figure 8.3b** to provide visual coverage of preliminary proposed turbine locations and a 500m buffer.
- 3.2.5 Visual coverage of the VP survey area for the Proposed Development, i.e. that defined as the proposed extension and repowered turbine locations, plus a 500m buffer, is illustrated in **Figure 8.3b**.
- 3.2.6 Visible areas for each viewshed shown in **Figure 8.3b** were determined using a Digital Elevation Model (DEM), based on an observer height of 1m and a 20m above ground offset, before being ground-truthed.

Table 3.1: VP locations.

VP	Grid reference	Viewshed Radius
A	NG 30209 47610	2km
B	NG 32502 46454	2km

- 3.2.7 The total survey effort (hours) at each VP location is summarised in **Table 3.2**, and which for the period March 2021 to February 2022 exceeds the minimum 72 hours required per VP per year in accordance with NatureScot guidance, divided between a single consecutive breeding and non-breeding season for relevant target species.
- 3.2.8 Additional survey effort was weighted towards early spring (February and March) and September/October, which considers the potential for increased flight activity during golden eagle display and dispersal periods, respectively.
- 3.2.9 Each VP survey session was no more than three hours in duration.
- 3.2.10 Following the completion of a single year of survey in February 2022, surveys were continued and then ceased on account of the undertaking and availability of PCM data from the Ben Aketil Wind Farm in 2022.

Table 3.2: VP flight activity survey effort.

VP	2021										2022		Total No. of hours
	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb ¹⁸	
A	9	6	6	6	6	6	9	9	6	6	6	9	84
B	9	6	6	6	6	6	9	9	6	6	6	9	84
VP	2022		Total No. of hours										
	Mar	Apr											
A	9	6	15										
B	9	6	15										

- 3.2.11 During surveys flight lines were mapped for all target species passing through the VP survey area. Details of species, number of birds, flight height in bands, duration and direction were noted on standardised recording forms and field plans.
- 3.2.12 The following height bands were used in the field, to assign target species flight activity at, below or above collision risk height, based on the preferred candidate turbine specification.
- 3.2.13 Target species comprised all Annex 1 and Schedule 1 listed raptors and owls, all waders, all geese (excluding feral species), swans and ducks (but not feral species, or mallard), as observed during survey.
- 3.2.14 Secondary species were also noted in approximately 15-minute summary intervals, with the number of birds present and general behaviour recorded in order to build an overall picture of activity.

¹⁸ Start of breeding (display) season for golden eagle, but non-breeding for most target species.

3.2.15 Secondary species were defined as commoner raptors (buzzard, kestrel and sparrowhawk), all gulls, feral species, mallard and raven, along with any large concentrations of Schedule 1 or Red-Listed passerines (from Stanbury *et al.*, 2021) as recorded during survey.

Moorland Breeding Bird Surveys (MBBS)

3.2.16 Moorland breeding bird surveys (MBBSs) were undertaken in 2021 and 2022 following an adapted Brown and Shepherd (1993) methodology¹⁹.

3.2.17 The methodology is suitable for moorland and open country species including, waders, skuas, gulls and some wildfowl species however, incidental observations of any raptors, owls or notable passerines (i.e. Schedule 1 and BoCC red-listed species) may also be recorded.

3.2.18 During survey in 2021, four staggered survey visits, were undertaken at least two weeks apart between April and July. The MBBS survey area comprised all suitable open moorland habitats within the Study Area and a 500m buffer (where accessible), which included the main turbine area, and the original proposed Access Track Route, as shown on **Figure 8.4**.

3.2.19 During survey in 2022, four staggered survey visits were undertaken at least two weeks apart between April and August. Survey visits in May could not be undertaken due to the limited availability of good weather days and the requirement to avoid post construction ornithological monitoring visits for the operational Ben Aketil Wind Farm. Subsequent survey visits were similarly constrained due to weather and ongoing ornithological monitoring, survey in August was therefore undertaken to allow for staggered survey in available good weather windows. In 2022. the MBBS survey area comprised all suitable open moorland habitats within the Study Area and a 500m buffer (where accessible), which included the main turbine area, and the original proposed Access Track Route, as shown on **Figure 8.4**.

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

3.2.21 All survey visits were undertaken during daylight hours and in fine weather conditions suitable for survey. Survey effort is summarised in **Table 3.3**. Full details of all survey times, field surveyors used and weather conditions are presented in **Annex 3**. Given the size of the MBBS survey area, survey visits were typically undertaken by a small team of surveyors.

Table 3.3: Moorland breeding bird survey effort 2021 and 2022.

Year	Visit	Date	Start time (24hrs)	Finish time (24hrs)
2021	1	27/04/2021	08:15	12:00
	2	13/05/2021	10:50	14:00
		15/05/2021	10:50	13:50
	3	29/06/2021	08:35	12:00
	4	13/07/2021	08:30	14:55
2022	1	22/04/2022	08:30	14:00
	2	21/06/2022	08:50	14:50
		21/06/2022	09:00	15:00
	3	22/07/2022	08:45	14:45
	4	05/08/2022	08:30	14:30

¹⁹ Brown, A.F. & Shepherd, K.B. (1993). A method for censusing upland breeding waders. *Bird Study* 40, 189-195.

Breeding Annex 1/Schedule 1 Raptor and Owl Searches

- 3.2.22 Searches for breeding Schedule 1 and Annex 1 listed raptors and owls were conducted in 2021 and 2022, adopting species-specific survey advice from Hardey *et al.* (2013²⁰), in accordance with NatureScot guidance (SNH, 2017).
- 3.2.23 Survey effort is summarised in **Tables 3.4**. Full details of all survey times, field surveyors used and weather conditions are presented in **Annex 3**.
- 3.2.24 During searches in 2021, the survey area comprised coverage of the Site and, where access allowed, areas out to 2km as shown on **Figure 8.4**.
- 3.2.25 During searches in 2022, the survey area comprised coverage of the Site and, where access allowed areas out to 2km and 6km (for eagle species) as shown on **Figure 8.4**.
- 3.2.26 Survey visits involved a combination of walkovers and stationary observations, with particular focus on suitable breeding habitat and/or features for target raptor and owl species. Given the extent of the survey area, survey visits were typically undertaken by a small team of surveyors and/or over consecutive days.

Table 3.4: Breeding raptor and owl search effort summary 2021 and 2022.

Year	Date	Start time (24hrs)	Finish time (24hrs)
2021	28/04/2021	09:00	15:00
	12/05/2021	08:50	14:50
	29/06/2021	11:30	15:00
	13/07/2021	08:45	14:45
2022	28/03/2022	09:00	12:00
	19/04/2022	14:20	20:30
	21/04/2022	06:00	12:00
	22/06/2022	09:00	15:00
	21/07/2022	12:30	18:30
	04/08/2022	13:45	19:45

Additional Surveys

- 3.2.27 Targeted surveys for breeding black grouse have not been undertaken and agreed as not required in consultation with NatureScot, due to the established and generally accepted absence of the species from the local area.
- 3.2.28 Targeted surveys for breeding diver species have also not been undertaken and agreed as not required in consultation with NatureScot, due to the absence of suitable breeding lochans within proximity (1km) to the Site.
- 3.2.29 Full details of consultations are provided in Table 8.1 of **Chapter 8: 'Ornithology'** of the EIAR.
- 3.2.30 The Site is not located within known greylag or pink-footed goose feeding areas (as per Mitchell, 2012), or within the core foraging distances of whooper swan, Greenland white-fronted geese, bean geese

²⁰ Hardey, J., Crick, H., Wernham, C., Riley, H., Etheridge, B. & Thompson, D. (2013) *Raptors: a field guide to survey and monitoring*. Third Edition. The Stationary Office, Edinburgh.

or barnacle wintering populations associated with any European site. Feeding distribution surveys for geese and swans have therefore not been undertaken and are not required in accordance with NatureScot guidance (SNH, 2017).

3.3 Results

VP Flight Activity Surveys

Target Species

- 3.3.1 Target species flight activity recorded during the VP survey period (March 2021 to April 2022) from both VPs combined is summarised in **Table 3.6**. Flight lines for each species over the entire survey period are illustrated in **Figures 8.5a-d**.
- 3.3.2 The total number of all flights, total number of birds recorded and the total flight time (in seconds), from both VP locations, over the entire survey duration combined is presented in **Table 3.6**. This includes some flights which were detected outside of the VP survey area and which are not ‘at collision risk’ to the Proposed Development.
- 3.3.3 Detailed flight records are presented in **Annex 4**, which also indicates the total flight time for each species below, at and above the turbine rotor swept area.

Table 3.6: Target species flight activity summary (all flights) – March 2021 to April 2022.

Species	Total No. of Flights	Total No. of Birds	Total Flight Time (secs) ²¹
Red-throated diver	4	7	492
Pink-footed goose	1	4	158
Whooper swan	1	41	5,494
Grey heron	2	2	178
Snipe	7	13	1,315
Golden plover	2	41	1,874
Golden eagle	19	21	5,231
Hen harrier	8	8	994
White-tailed eagle	29	31	5,709
Merlin	1	1	42

Secondary Species

- 3.3.4 Flight activity of the following secondary species were also recorded:
- Raven;
 - Great black-backed gull
 - Kestrel;
 - Sparrowhawk;

²¹ Total time multiplied by the number of birds.

- Buzzard;
- Herring gull;
- Mallard;
- Common gull;
- Lesser black-backed gull.

Collision Mortality Risk

- 3.3.5 Where sufficient “at collision risk” flight activity data has allowed, collision mortality risks as a result of birds colliding with rotor blades has been assessed using the NatureScot Collision Risk Model (CRM) as detailed in Band *et al.* (2007).
- 3.3.6 Full details are provided in **Technical Appendix 8.2**.

MBBS

- 3.3.7 During each survey year, the MBBS survey areas were found to support a moorland breeding bird assemblage characteristic of the habitats present and the locality, and primarily comprising a small numbers of ground nesting waders as summarises in **Table 3.7** and illustrated in **Figure 8.6**.
- 3.3.8 Oystercatcher, eider and ringed plover territories were exclusively associated with the Loch Caroy extent of the MBBS area.

Table 3.7: MBBS breeding territories – 2021 and 2022.

Species	Estimated No. of territories within the MBBS Area	
	2021	2022
Snipe	12	8
Golden plover	2	1
Common sandpiper	4	1
Oystercatcher	1	0
Eider	1	1
Ringed plover	1	0

Breeding Annex 1/Schedule 1 Raptor and Owl Searches

- 3.3.9 Breeding Annex 1/Schedule 1 raptor and owl searches in 2021 and 2022 recorded observations of the following species: hen harrier, golden eagle, merlin and white-tailed eagle.
- 3.3.10 No confirmed breeding sites for any species were recorded within the survey area i.e. within 2km of the Site boundary, but it was suspected that a single white-tailed eagle nest was likely to have been present.
- 3.3.11 An active hen harrier nest was also identified approximately 5.5km north-west of the Site, and observations suggesting the presence of active golden eagle, merlin and additional white-tailed eagle territories overlapping within or within proximity to the survey areas were also recorded.
- 3.3.12 Detailed observations and which are considered sensitive are detailed within confidential **Technical Appendix 8.3** and **Figure 8.7**.

3.4 Limitations

- 3.4.1 All habitats within the Site were directly accessible for survey. Areas outside the Site within survey areas adopted, were surveyed from suitable locations within the Site and/or public rights of way (PROWs), scanning the survey areas with the use of optics (telescope and binoculars).
- 3.4.2 Given the good visibility across adopted survey areas and extensive available information pertaining to the locations of sensitive breeding species within the wider area, this is not considered a limitation to the field survey results obtained or subsequent interpretation and assessment.
- 3.4.3 Areas of viewshed visibility from VP locations used between March 2021 and April 2022, as shown in **Figure 8.3b**, illustrate some gaps in visibility within the VP survey area required for the Proposed Development in accordance with NatureScot guidance (SNH, 2017). Visibility and observations of target species flight activity within similar immediately adjacent habitats has however been obtained, and flight activity of key species within the VP survey area and wider surrounding habitats has been extensively monitored as part of PCM for the operational Ben Aketil Wind Farm. Patterns of key species flight activity is therefore well established.
- 3.4.4 There is no evidence to suggest that key target species flight activity would be significantly higher within areas of the VP survey area required for the Proposed Development, with limited visibility from VPA or VPB. Highest levels of activity for species including hen harrier, golden eagle and white-tailed eagle are typically demonstrated to be associated with topographical features and breeding locations beyond the VP survey area. The VP survey area has also not been established as an important flyway for additional target species, and for which significant levels of flight activity may have been under recorded in areas of limited visibility.
- 3.4.5 No significant limitations in the use of the March 2021 to April 2022 for the purposes of collision mortality risk estimates is therefore considered.
- 3.4.6 Searches for golden eagle and white-tailed eagle breeding sites within 6km of the Site were not undertaken in 2021, to avoid the potential for unnecessary disturbance to breeding pairs understood to be monitored by local species recorders. Searches were however extended to 6km in accordance with advice provided by NatureScot, in the event existing species monitoring data could not be made available (see Table 8.1 of Chapter 8: Ornithology of the EIA Report).
- 3.4.7 Unfortunately, detailed information pertaining to the breeding sites of golden or white-tailed eagle have not been made available for the purposes of assessment. Sufficient information has however been provided, and which is considered adequate to inform the interpretation of species observations made, and the subsequent design and assessment of the Proposed Development.

ANNEX 1: BIRD SPECIES SUMMARY

Table A1.1 below provides a summary of bird species referred to within this Appendix and within **Chapter 8** of the EIAR and all other associated Technical Appendices and Figures.

The following abbreviations are used to detail species conservation status’:

- Red/Amber/Green: Red, Amber or Green listed on the Birds of Conservation Concern 5 List (Standbury *et al.*, 2021);
- Sch1.1/1.1A/A1/1.2: Schedule 1 part 1, 1 part 1A, A1 or 1 part 2 of the Wildlife and Countryside Act 1981 (as amended);
- SBL: Scottish Biodiversity List species; and,
- Ann1: Listed on Annex I of The Birds Directive.

Table A1.1: Bird species summary.

Common name	Scientific Name	Conservation Status
Barnacle Goose	<i>Branta leucopsis</i>	Amber; SBL; Ann1
Greylag Goose	<i>Anser anser</i>	Amber; Sch1.2 (Outer Hebrides, Caithness, Sutherland and Wester Ross only)
Pink-footed Goose	<i>Anser brachyrhynchus</i>	Amber
Tundra Bean Goose	<i>Anser serrirostris</i>	Amber; SBL
Greenland White-fronted Goose	<i>Anser albifrons flavirostris</i>	Red; SBL; Ann1
Whooper Swan	<i>Cygnus cygnus</i>	Amber; Sch1.1; SBL; Ann1
Mallard	<i>Anas platyrhynchos</i>	Amber
Eider	<i>Somateria mollissima</i>	NT; Amber
Black Grouse	<i>Lyrurus tetrix</i>	Red; SBL
Oystercatcher	<i>Haematopus ostralegus</i>	NT; Amber
Golden Plover	<i>Pluvialis apricaria</i>	Green; SBL; Ann1
Ringed Plover	<i>Charadrius hiaticula</i>	Red
Snipe	<i>Gallinago gallinago</i>	Amber
Common Sandpiper	<i>Actitis hypoleucos</i>	Amber
Common Gull	<i>Larus canus</i>	Amber
Great Black-backed Gull	<i>Larus marinus</i>	Amber
Herring Gull	<i>Larus argentatus</i>	Red; SBL
Lesser Black-backed Gull	<i>Larus fuscus</i>	Amber
Red-throated Diver	<i>Gavia stellata</i>	Green; Sch1.1; SBL; Ann1
Grey Heron	<i>Ardea cinerea</i>	Green
Golden Eagle	<i>Aquila chrysaetos</i>	Green; Sch1.1/1A/A1; SBL; Ann1
Sparrowhawk	<i>Accipiter nisus</i>	Amber

Common name	Scientific Name	Conservation Status
Hen Harrier	<i>Circus cyaneus</i>	Red; Sch1.1 & 1A; SBL; Ann1
White-tailed Eagle	<i>Haliaeetus albicilla</i>	Amber; Sch1.1, 1A & A1; SBL; Ann1
Buzzard	<i>Buteo buteo</i>	Green
Short-eared Owl	<i>Asio flammeus</i>	Amber; SBL; Ann1
Kestrel	<i>Falco tinnunculus</i>	Amber; SBL
Merlin	<i>Falco columbarius</i>	Red; Sch1.1; SBL; Ann1
Peregrine	<i>Falco peregrinus</i>	Green; Sch1.1; SBL; Ann1
Raven	<i>Corvus corax</i>	Green

ANNEX 2: EXISTING ORNITHOLOGICAL RECORDS (NON-SENSITIVE)

Table A2.1 provides a summary of existing non-sensitive 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)²² within 2km of the Site and obtained from within the most recent 10-year period.

Table A2.1: Summary of existing ornithological records (RSPB).

Species	No. of Records	Date Range	Summary
Golden plover	1	2010	1 pair, confirmed breeding

²² SNH (2018) *Assessing significance of impacts from onshore wind farms outwith designated sites. Guidance*. Version 2 – February 2018.

ANNEX 3: ORNITHOLOGY FIELD SURVEY EFFORT

The following codes are used to record weather conditions within **Tables A3.1 to A3.5**:

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	<1km	1	None	0
Strong gale	9	>1km	2	On site	1
Whole gale	10			High ground	2
Storm	11	Cloud Height			
		<150m	0		
Wind Direction		150-500m	1		
16 point compass		>500m	2		

Surveys were completed by the following field surveyors: A. Little (AL), P. Carroll (PC), K. Little (KL), M. Wood (MW), G. Dunbar (GD), J. Sykes (JS), D. Burt (DB), V. Hastie (VH), D. Grundy (DG) and S. MacDonald (SM).

Table A3.1: Vantage Point (VP) Flight Activity Survey Effort March 2021 – April 2022.

Date	VP	Surveyor	Start Time	Finish Time	Wind Speed	Wind Direction	Rain	Cloud Cover	Cloud Height	Visibility	Frost	Snow
24/03/2021	A	GD	07:00	10:00	2/2/3	SSW/SW/SW	3/0/2	8/7/7	2/2/2	2/2/2	0/0/0	0/0/0
24/03/2021	B	PC	07:00	10:00	4/4/5	SW/SW/SW	2/2/2	7/6/6	2/2/2	2/2/2	0/0/0	0/0/0
24/03/2021	A	GD	10:30	13:30	3/3/4	SW/SW/SW	3/2/3	8/8/8	2/2/2	2/2/2	0/0/0	0/0/0
24/03/2021	B	PC	10:30	13:30	5/5/5	SW/SW/SW	2/2/2	6/7/8	2/2/2	2/2/2	0/0/0	0/0/0
25/03/2021	A	GD	12:45	15:45	4/5/5	SW/SW/SW	3/3/2	8/8/8	2/1/2	2/2/2	0/0/0	0/0/0
25/03/2021	B	PC	12:45	15:45	5/5/5	SW/SW/SW	3/3/2	8/8/8	1/1/2	2/2/2	0/0/0	0/0/0
26/04/2021	B	MW	17:20	20:20	3/3/3	NNE/N/N	0/0/0	8/7/7	1/2/2	2/2/2	0/0/0	0/0/0
26/04/2021	A	GD	17:25	20:25	2/2/2	N/N/N	0/0/0	8/8/8	2/2/2	2/2/2	0/0/0	0/0/0
27/04/2021	A	GB	05:15	08:15	2/4/4	NE/NE/NE	0/0/2	8/8/8	2/2/2	2/2/2	0/0/0	0/0/0
27/04/2021	B	MW	05:15	08:15	3/3/2	NNE/NNE/NNE	0/0/0	8/7/8	2/2/2	2/2/2	0/0/0	0/0/0
11/05/2021	A	MW	16:10	19:10	3/2/2	SSW/SSW/SSW	0/0/0	6/4/3	2/2/2	2/2/2	0/0/0	0/0/0
11/05/2021	B	GD	16:10	19:10	3/3/2	NE/NE/NE	0/0/0	7/6/8	2/2/2	2/2/2	0/0/0	0/0/0
13/05/2021	A	MW	07:50	10:50	1/1/2	NE/NE/NE	0/0/0	2/2/4	2/2/2	2/2/2	0/0/0	0/0/0
13/05/2021	B	GD	07:50	10:50	2/2/2	NE/NE/NE	0/0/0	4/5/6	2/2/2	2/2/2	0/0/0	0/0/0
28/06/2021	A	JS	16:40	19:40	2/2/2	W/W/NW	0/0/0	1/1/1	2/2/2	2/2/2	0/0/0	0/0/0
28/06/2021	B	GD	16:40	19:40	1/2/2	W/W/NW	0/0/0	1/1/1	2/2/2	2/2/2	0/0/0	0/0/0
28/06/2021	A	JS	20:10	23:10	2/1/1	NW/NW/NW	0/0/0	0/0/0	2/2/2	2/2/2	0/0/0	0/0/0
28/06/2021	B	GD	20:10	23:10	2/2/2	NW/NW/NW	0/0/0	1/1/8	2/2/2	2/2/2	0/0/0	0/0/0
14/07/2021	B	MW	08:55	11:55	3/3/3	S/S/S	0/0/1	8/8/8	2/2/1	2/2/2	0/0/0	0/0/0
14/07/2021	A	GD	09:20	12:20	3/3/3	S/S/S	0/2/3	8/8/8	2/1/1	2/1/2	0/0/0	0/0/0
14/07/2021	B	MW	12:25	15:25	4/4/4	S/S/S	0/1/2	8/8/8	2/1/1	2/2/2	0/0/0	0/0/0
14/07/2021	A	GD	12:50	15:50	3/3/3	S/S/S	0/0/3	8/8/8	2/2/2	2/2/1	0/0/0	0/0/0
16/08/2021	A	GD	14:25	17:25	1/2/2	W/NW/NW	0/0/0	8/8/8	2/2/2	2/2/2	0/0/0	0/0/0
16/08/2021	B	SM	14:25	17:25	3/3/3	W/WNW/WNW	0/0/2	8/8/8	2/1/1	2/2/2	0/0/0	0/0/0
17/08/2021	A	GD	12:00	15:00	3/3/3	NW/NW/NW	2/0/2	8/8/8	2/2/1	2/2/2	0/0/0	0/0/0
17/08/2021	B	SM	12:00	15:00	3/3/3	WNW/NW/NW	2/0/2	8/8/8	2/2/1	2/2/2	0/0/0	0/0/0
13/09/2021	A	PH	17:20	20:20	2/3/3	SSE/SSE/SSE	2/2/0	8/8/8	1/1/2	2/2/2	0/0/0	0/0/0

Date	VP	Surveyor	Start Time	Finish Time	Wind Speed	Wind Direction	Rain	Cloud Cover	Cloud Height	Visibility	Frost	Snow
13/09/2021	B	MW	17:20	20:20	3/3/3	SW/SW/SW	1/1/0	8/8/8	1/1/2	2/2/2	0/0/0	0/0/0
16/09/2021	A	PH	06:30	09:30	2/3/3	S/S/S	2/0/0	7/7/7	2/2/2	2/2/2	0/0/0	0/0/0
16/09/2021	B	MW	06:40	09:40	4/4/4	SW/SW/SW	1/0/0	7/6/6	2/2/2	2/2/2	0/0/0	0/0/0
16/09/2021	A	PH	10:00	13:00	3/3/3	S/S/S	0/0/0	6/7/7	1/2/2	2/2/2	0/0/0	0/0/0
16/09/2021	B	MW	10:10	13:20	4/4/4	SW/SW/SW	0/0/0	5/5/4	2/2/2	2/2/2	0/0/0	0/0/0
27/10/2021	A	PH	14:45	17:45	4/3/3	SSW/SSW/SSW	0/0/0	7/7/2	2/2/2	2/2/2	0/0/0	0/0/0
27/10/2021	B	MW	14:45	17:45	3/3/3	SW/SW/SW	0/0/0	7/6/5	1/2/2	2/2/2	0/0/0	0/0/0
28/10/2021	A	PH	09:10	12:10	3/4/4	SSW/SSW/SSW	0/2/0	8/8/8	2/2/2	2/2/2	0/0/0	0/0/0
28/10/2021	B	MW	09:15	12:15	3/3/3	SSW/SSW/SSW	0/0/0	8/8/7	2/2/2	2/2/2	0/0/0	0/0/0
28/10/2021	A	PH	12:40	15:40	4/4/4	SSW/SSW/SSW	0/2/2	8/7/7	2/2/2	2/2/2	0/0/0	0/0/0
28/10/2021	B	MW	12:45	15:45	3/3/3	SSW/SSW/SSW	0/0/1	6/7/8	2/2/2	2/2/2	0/0/0	0/0/0
25/11/2021	A	GD	08:30	11:30	3/3/3	N/N/N	0/2/0	8/8/8	2/2/2	2/2/2	0/0/0	0/0/0
25/11/2021	B	MW	08:30	11:30	2/2/3	NNW/NNW/NW	0/1/0	8/8/8	2/2/2	2/2/2	0/0/0	0/0/0
25/11/2021	A	GD	12:00	15:00	3/3/3	N/N/N	0/2/1	8/8/8	2/2/2	2/2/2	0/0/0	0/0/0
25/11/2021	B	MW	12:00	15:00	3/2/2	NW/WNW/WNW	2/2/2	8/8/8	2/2/2	2/2/2	0/0/0	0/0/0
15/12/2021	A	GD	08:45	11:45	2/2/2	SW/SW/SW	0/0/0	2/2/7	2/2/2	2/2/2	0/0/0	0/0/0
15/12/2021	B	MW	08:45	11:45	2/2/2	SW/SW/SW	0/0/0	7/8/8	2/2/2	2/2/2	0/0/0	0/0/0
15/12/2021	A	GD	12:15	15:15	2/2/2	SW/SW/SW	0/0/0	8/8/8	2/2/2	2/2/2	0/0/0	0/0/0
15/12/2021	B	MW	12:15	15:15	2/2/2	SW/SW/SW	0/0/0	8/8/8	2/2/2	2/2/2	0/0/0	0/0/0
19/01/2022	A	GD	09:15	12:15	4/4/4	NW/NW/NW	0/0/0	6/7/6	2/2/2	2/2/2	0/0/0	0/0/0
19/01/2022	B	PC	09:15	12:15	4/4/4	NW/NW/NW	2/2/2	6/5/6	2/2/2	2/2/2	0/0/0	0/0/0
19/01/2022	A	GD	12:45	15:45	4/3/4	NW/NW/NW	0/0/2	6/8/8	2/2/2	2/2/2	0/0/0	0/0/0
19/01/2022	B	PC	12:45	15:45	4/3/4	NW/NW/NW	0/0/2	7/7/6	2/2/2	2/2/2	0/0/0	0/0/0
21/02/2022	A	JS	13:10	15:10	2/2	N/NNW	0/0	4/3	2/2	2/2	0/0	0/0
21/02/2022	B	PC	13:15	15:15	2/2	NW/W	0/0	5/6	2/2	2/2	0/0	0/0
21/02/2022	A	JS	15:40	17:40	1/1	W/W	0/0	7/3	2/2	2/2	0/0	0/0
21/02/2022	B	PC	15:45	17:45	3/2	WNW/W	0/0	7/6	2/2	2/2	0/0	0/0
22/02/2022	A	JS	08:45	11:45	4/4/4	W/W/W	2/3/3	8/8/7	2/2	2/2	0/0	0/0

Date	VP	Surveyor	Start Time	Finish Time	Wind Speed	Wind Direction	Rain	Cloud Cover	Cloud Height	Visibility	Frost	Snow
22/02/2022	B	PC	08:30	11:30	3/4/4	W/W/W	3/3/3	6/8/7	2/2/2	2/2/2	0/0/0	0/0/0
22/02/2022	B	PC	12:00	14:00	4/4	W/W	3/3	7/7	2/2	2/2	0/0	0/0
22/02/2022	A	JS	12:15	14:15	3/4	W/WSW	3/3	8/4	2/2	2/2	0/0	0/0
28/03/2022	B	SM	12:30	15:30	2/2/2	SSW/SSW/SSW	0/0/0	7/6/2	2/2/2	2/2/2	0/0/0	0/0/0
28/03/2022	B	SM	16:00	19:00	2/2/1	SSW/SW/NNW	0/0/0	3/3/2	2/2/2	2/2/2	0/0/0	0/0/0
29/03/2022	A	SM	07:10	10:10	2/3/3	NE/NE/NE	0/0/0	5/2/3	2/2/2	2/2/2	0/0/0	0/0/0
29/03/2022	A	SM	10:40	13:40	3/3/3	NE/NE/ENE	0/0/0	2/4/3	2/2/2	2/2/2	0/0/0	0/0/0
18/04/2022	B	GD	13:00	16:00	6/6/6	SSW/SSW/SSW	3/0/3	8/8/8	2/2/2	2/2/1	0/0/0	0/0/0
18/04/2022	A	DB	13:00	16:00	6/6/6	SSW/SSW/SSW	3/0/3	8/8/8	2/2/2	2/2/1	0/0/0	0/0/0
19/04/2022	A	DB	14:25	17:25	2/3/2	N/N/N	2/1/2	7/7/7	2/2/2	2/2/2	0/0/0	0/0/0
19/04/2022	A	DB	17:55	20:55	1/0/0	N/-/-	1/0/0	7/6/5	2/2/2	1/2/2	0/0/0	0/0/0
21/04/2022	B	DB	06:00	09:00	4/4/3	E/E/E	0/0/0	3/3/3	2/2/2	2/2/2	0/0/0	0/0/0
21/04/2022	B	DB	09:30	12:30	3/3/3	E/E/E	0/0/0	3/2/3	2/2/2	2/2/2	0/0/0	0/0/0

Table A3.2: Moorland Breeding Bird Survey Effort 2021.

Date	Surveyor	Start Time	Finish Time	Wind Speed	Wind Direction	Rain	Cloud Cover	Cloud Height	Visibility	Frost	Snow
27/04/2021	MW/GD	08:15	12:00	3/3/4/4	NE/NE/NE/NE	0/0/0/0	6/6/5/5	2/2/2/2	2/2/2/2	0/0/0/0	0/0/0/0
13/05/2021	MW	10:50	14:00	2/2/2/2	NE/NE/NE/NE	0/0/3/0	5/6/7/6	2/2/2/2	2/2/2/2	0/0/0/0	0/0/0/0
15/05/2021	GD	10:50	13:50	2/2/2	NE/NE/NE/NE	0/3/3	6/7/7	2/2/2	2/2/2	0/0/0	0/0/0
29/06/2021	GD/JS	08.35	12:00	1/2/2	N/N/N	0/0/0	8/8/8	2/2/2	2/2/2	0/0/0	0/0/0
13/07/2021	MW	08:30	14:55	1/1/1/1/1/2	S/S/S/S/S/S	0/0/0/0/0/0	8/8/8/8/8/8	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 A3.3: Moorland Breeding Bird Survey Effort 2022.

Date	Surveyor	Start Time	Finish Time	Wind Speed	Wind Direction	Rain	Cloud Cover	Cloud Height	Visibility	Frost	Snow
20/04/2022	DB/GD	08:30	14:00	3/3/3/3/3/3	SE/SE/SE/SE/SE/SE	0/0/0/0/0/0	1/1/1/1/1/1	2/2/2/2/2/2	2/2/2/2/2/2	0/0/0/0/0/0	0/0/0/0/0/0
21/06/2022	CG/MW	08:50	15:00	1/2/2/2/2/2	NNW/NNW/NNW/NNW/NNW/NNW	0/0/0/1/1/0	8/8/8/8/8/8	1/1/1/2/2/2	2/2/2/2/2/2	0/0/0/0/0/0	0/0/0/0/0/0
22/07/2022	DB/GD	08:45	14:45	1/2/2/1/1/2	N/NW/NW/NW/N/NW	0/0/0/0/0/0	7/7/7/7/6/7	2/2/2/2/2/2	2/2/2/2/2/2	0/0/0/0/0/0	0/0/0/0/0/0
05/08/2022	GD/DB	08:30	14:30	2/2/2/2/2/2	SW/SW/SW/SW/SW/SW	0/0/0/2/0/0	4/5/5/7/4/4	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 A3.4: Breeding raptor and owl search effort summary 2021.

Date	Surveyor	Start Time	Finish Time	Wind Speed	Wind Direction	Rain	Cloud Cover	Cloud Height	Visibility	Frost	Snow
28/04/2021	MW	09:00	15:00	3/3/3/3/3/3	NW/NW/NW/NW/NW/NW	0/0/0/0/0/0	1/2/3/2/3/2	2/2/2/2/2/2	2/2/2/2/2/2	0/0/0/0/0/0	0/0/0/0/0/0
12/05/2021	GD/MW	08:50	14:50	3/3/3/3/3/2	NE/NE/NE/NE/NE/NE	2/0/0/0/2/0	8/6/8/8/8/8	2/2/2/2/2/2	2/2/2/2/2/2	0/0/0/0/0/0	0/0/0/0/0/0
29/06/2021	JS/GD	11:30	15:00	2/3/4	N/N/N	0/0/0	8/8/8	1/1/1	2/2/2	0/0/0	0/0/0
13/07/2021	GD	08:45	14:45	0/1/0/0/1/1	-/S/-/-S/S	0/0/0/0/0/0	8/8/8/8/8/8	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 A3.5: Breeding raptor and owl search effort summary 2022.

Date	Surveyor	Start Time	Finish Time	Wind Speed	Wind Direction	Rain	Cloud Cover	Cloud Height	Visibility	Frost	Snow
28/03/2022	SM	09:00	12:00	1/1/1	SSE/ESE/SSE	0/0/0	8/8/8	2/2/2	2/2/2	0/0/0	0/0/0
19/04/2022	GD	14:20	20:30	2/3/2/1/0/0	N/N/N/N/-/-	2/1/1/0/0/0	7/7/7/7/5/3	2/2/2/2/2/2	2/2/2/2/2/2	0/0/0/0/0/0	0/0/0/0/0/0
21/04/2022	GD	06:00	12:00	4/4/3/3/3/3	E/E/E/E/E/E	0/0/0/0/0/0	5/5/4/4/2/1	2/2/2/2/2/2	2/2/2/2/2/2	0/0/0/0/0/0	0/0/0/0/0/0
22/06/2022	MW/CG	09:00	15:00	3/3/2/4/4/4	SW/SW/SW/SW/SW/SW	0/1/1/1/1/1/1	8/8/8/8/8/8	1/1/1/1/1/1/1	2/2/2/2/2/2	0/0/0/0/0/0	0/0/0/0/0/0
21/07/2022	GD/DB	12:30	18:30	3/2/2/2/2/2	NW/NW/NW/NW/NW/NW	1/0/0/0/0/0	8/8/8/8/8/8	2/2/2/2/2/2	2/2/2/2/2/2	0/0/0/0/0/0	0/0/0/0/0/0
04/08/2022	GD/DB	13:45	19:45	3/3/3/3/3/3	SW/SW/SW/SW/SW/SW	0/2/2/0/2/0	8/8/8/8/8/8	2/2/2/2/2/2	2/2/2/2/2/2	0/0/0/0/0/0	0/0/0/0/0/0

ANNEX 4: TARGET SPECIES FLIGHT ACTIVITY

Table A4.1 provides details of target species flight activity recorded during Vantage Point (VP) flight activity surveys between March 2021 and April 2022. The total flight duration²³ and a breakdown of duration within height bands (HT) used during field surveys is provided.

This includes flight activity which is not “at collision risk” to the Proposed Development.

Table A4.1: Target species flight activity March 2021 – April 2022.

Date	VP	Species	Min. no	Start Time	Duration	HT1	HT2	HT3	HT4	Notes
24/03/2021	B	Golden eagle	1	08:01	15	15	0	0	0	-
24/03/2021	B	Golden eagle	1	12:51	20	5	15	0	0	Juvenile
24/03/2021	A	White-tailed eagle	1	12:39	176	146	30	0	0	Immature bird
24/03/2021	A	Whooper swan	41	11:04	5,494	0	5,494	0	0	-
11/05/2021	A	Hen harrier	1	17:57	287	287	0	0	0	Adult male
11/05/2021	A	Hen harrier	1	18:22	183	0	93	90	0	Adult male
11/05/2021	A	Merlin	1	17:44	42	0	42	0	0	Male
11/05/2021	A	White-tailed eagle	1	17:45	16	0	16	0	0	Adult
11/05/2021	A	White-tailed eagle	1	18:14	12	12	0	0	0	Adult
11/05/2021	A	White-tailed eagle	1	18:16	364	0	120	244	0	-
13/05/2021	A	Snipe	2	07:55	762	0	762	0	0	-
13/05/2021	B	Golden plover	1	08:32	74	0	60	14	0	-
13/05/2021	B	Grey heron	1	08:20	13	13	0	0	0	-
13/05/2021	B	Red-throated diver	1	08:23	126	0	0	36	90	-
13/05/2021	B	Red-throated diver	2	08:26	36	0	0	36	0	-

²³ Multiplied by the number of birds.

Date	VP	Species	Min. no	Start Time	Duration	HT1	HT2	HT3	HT4	Notes
13/05/2021	B	Red-throated diver	2	10:37	46	0	0	0	46	-
13/05/2021	B	Red-throated diver	2	08:23	284	60	120	104	0	-
13/05/2021	B	Snipe	1	08:54	59	6	45	0	0	-
13/05/2021	B	White-tailed eagle	1	08:31	20	0	20	0	0	-
13/05/2021	B	White-tailed eagle	1	09:42	197	45	152	0	0	-
13/05/2021	B	White-tailed eagle	1	09:43	154	0	154	0	0	Adult - Talon grappling
13/05/2021	B	White-tailed eagle	1	09:55	298	103	105	90	0	Adult - Talon grappling
28/06/2021	A	Snipe	1	19:38	45	15	30	0	0	Drumming then landed
28/06/2021	A	Snipe	1	21:45	30	15	15	0	0	Drumming
28/06/2021	B	Snipe	1	20:32	79	19	60	0	0	Drumming
28/06/2021	A	White-tailed eagle	1	17:13	300	0	135	165	0	Adult male
28/06/2021	A	White-tailed eagle	1	17:31	180	0	180	0	0	Adult male came out of the woodland and flew SW, never above the bottom of the turbine blades
28/06/2021	A	White-tailed eagle	1	22:30	45	15	30	0	0	Sat in coniferous woodland behind turbine (c. 100m), then flew deep to roost at 22:30
14/07/2021	A	White-tailed eagle	1	14:42	98	0	98	0	0	Adult.
14/07/2021	A	White-tailed eagle	1	09:44	94	94	0	0	0	-
14/07/2021	A	White-tailed eagle	1	10:16	162	162	0	0	0	Adult carrying prey, circled around over forestry then disappeared into trees
14/07/2021	A	Golden eagle	1	14:24	141	96	45	0	0	Second year bird mobbed by hooded crows
16/08/2021	A	White-tailed eagle	1	15:27	256	0	256	0	0	Sub-adult
17/08/2021	A	White-tailed eagle	2	12:42	146	146	0	0	0	Adult and juvenile sat in edge of forestry then flew in and landed
13/09/2021	A	Hen harrier	1	18:44	125	125	0	0	0	1st year male hunting on the moorland.

Date	VP	Species	Min. no	Start Time	Duration	HT1	HT2	HT3	HT4	Notes
13/09/2021	A	Grey heron	1	19:02	165	0	165	0	0	-
16/09/2021	A	Hen harrier	1	12:55	65	65	0	0	0	Female, hunting.
27/10/2021	A	White-tailed eagle	1	16:19	245	90	165	0	0	Juv, 1st winter
27/10/2021	A	White-tailed eagle	1	16:37	15	15	0	0	0	-
28/10/2021	B	Hen harrier	1	11:07	72	72	0	0	0	-
28/10/2021	B	Hen harrier	1	12:03	103	103	0	0	0	-
15/12/2021	A	Golden eagle	1	14:12	150	30	120	0	0	-
15/12/2021	B	Golden eagle	1	11:17	252	60	132	60	0	Female 3rd winter
15/12/2021	B	Golden eagle	1	14:04	173	75	98	0	0	Female 2nd winter
15/12/2021	B	Golden eagle	1	14:43	156	90	66	0	0	Female 2nd winter
19/01/2022	A	White-tailed eagle	1	10:11	189	75	114	0	0	3rd winter
19/01/2022	A	Golden eagle	1	10:14	372	60	312	0	0	Adult hunting
19/01/2022	A	Golden eagle	1	12:48	934	0	934	0	0	Adult hunting, flushed red grouse
19/01/2022	A	Golden eagle	2	13:37	432	0	252	180	0	Bird arrived and grappled with other eagle
19/01/2022	B	White-tailed eagle	1	09:45	240	60	75	105	0	3rd year bird hunting
19/01/2022	B	White-tailed eagle	1	10:28	35	20	15	0	0	Immature bird
19/01/2022	B	Golden eagle	1	13:28	180	15	135	30	0	Subadult hunting
19/01/2022	B	Golden eagle	1	14:00	20	15	5	0	0	Took off from post
19/01/2022	B	Golden eagle	2	14:01	250	0	220	30	0	Adults
19/01/2022	B	Golden eagle	1	14:10	40	40	0	0	0	Sub-adult again
21/02/2022	A	White-tailed eagle	1	14:34	420	0	0	0	420	Circling high
21/02/2022	A	White-tailed eagle	1	14:35	540	0	0	0	540	Circling high
22/02/2022	A	White-tailed eagle	1	10:19	60	0	60	0	0	Adult

Date	VP	Species	Min. no	Start Time	Duration	HT1	HT2	HT3	HT4	Notes
22/02/2022	B	White-tailed eagle	1	09:42	250	0	55	30	165	3rd year, hunting
28/03/2022	B	Golden eagle	1	13:09	238	0	118	120	0	Immature
28/03/2022	B	Golden eagle	1	13:24	141	0	45	96	0	Immature
28/03/2022	B	Golden eagle	1	14:41	327	0	0	0	327	Unaged
28/03/2022	B	Golden eagle	1	15:05	622	0	0	0	622	Unaged
28/03/2022	B	Golden eagle	1	16:02	768	0	288	180	300	Adult hunting
28/03/2022	B	Hen harrier	1	16:08	94	0	49	45	0	Ringtail
28/03/2022	B	White-tailed eagle	1	16:11	311	0	0	0	311	Adult
29/03/2022	A	White-tailed eagle	1	11:21	402	12	195	105	90	Adult, hunting
18/04/2022	A	White-tailed eagle	1	13:25	210	0	90	105	15	Adult circling
18/04/2022	A	Golden plover	40	14:42	1,800	1,800	0	0	0	Summer plumage birds
18/04/2022	A	Hen harrier	1	14:51	65	50	0	0	0	Adult male
18/04/2022	A	White-tailed eagle	2	14:59	274	0	184	90	0	Pair of adults
19/04/2022	A	Snipe	1	14:55	34	4	30	0	0	Calling and landed in heather
19/04/2022	A	Snipe	6	20:02	306	0	306	0	0	Calling
19/04/2022	A	Pink-footed goose	4	20:19	632	0	300	332	0	-