Environmental Impact Assessment Report

Teindland Wind Farm

Volume 3

TA A7.1: Ornithology Baseline Report

Document prepared by Envams Ltd for: Teindland Wind Farm Ltd

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Teindland Wind Farm

Environmental Impact Assessment (EIA) Report

Technical Appendix A7.1: Ornithology Baseline Report

avianecology

CONTENTS

1 INTRODUCTION

1.1 Document Context

1.1.1 This Technical Appendix has been prepared to accompany **Chapter 7: Ornithology** of the Environmental Impact Assessment (EIA) Report for the proposed Teindland Wind Farm ('the Development').

1.1.2 The Technical Appendix presents details of ornithological data gathering methodologies and results, drawn from desk study and field surveys, in order to inform the design and assessment of the Development.

1.1.3 Three other Technical Appendices accompany **Chapter 7: Ornithology**:

- **Technical Appendix A7.2: Collision Risk Model Analysis** – provides details of the Collision Risk Modelling (CRM) undertaken to inform the impact assessment;
- **Technical Appendix A7.3: Confidential Ornithology** – provides information regarding the location of sensitive breeding species (**Volume 5**)
- **Technical Appendix A7.4**: Information to Inform a Habitats Regulations Appraisal.

1.1.4 **Chapter 7: Ornithology** and this Technical Appendix should be read with reference to the following figures:

- **Figure 7.1:** Vantage point locations and viewsheds;
- **Figure 7.2**: Baseline ornithology survey areas;
- **Figure 7.3**: Site regional context (Natural Heritage Zones);
- **Figure 7.4**: Statutory designated sites with ornithological features;
- **Figure 7.5a**: Flight activity survey results Year 1 – pink-footed goose;
- **Figure 7.5b**: Flight activity survey results Year 1 - target species (excluding pink-footed goose and osprey);
- **Figure 7.5c**: Flight activity survey results Year 2 – pink-footed goose;
- **Figure 7.5d**: Flight activity survey results Year 2 - target species (excluding pink-footed goose and osprey);

1.1.5 The following figures are considered sensitive and can be found in **Technical Appendix A7.3: Confidential Ornithology** (**Volume 5**):

- **Figure 7.6a**: Flight activity survey results Year 1 – osprey (confidential);
- **Figure 7.6b**: Flight activity survey results Year 2 – osprey (confidential);
- **Figure 7.7**: Breeding Schedule 1 raptor survey results (confidential)
- **Figure 7.8**: Proposed osprey platform locations (confidential).

1.1.6 The information contained in **Technical Appendix A7.3: Confidential Ornithology** will not be made publicly available, but will be provided to the Scottish Government, NatureScot, Moray Council and the Royal Society for the Protection of Birds (RSPB).

1.1.7 Only common bird species names are referred to within the main body of this Technical Appendix. Annex 1 provides a summary of all species referred to herein and within **Chapter 7: Ornithology** of the EIA Report and all other associated appendices and figures. Both common and scientific (Latin) names together with a summary of their conservation status, as relevant, is provided.

1.2 Site Overview

1.2.1 The land identified for the Development ('the Site') is located on land west of the village of Inchberry, and north of Rothes, in Moray (approximate Site centre at NJ 293 542).

1.2.2 The Site comprises commercial forestry plantation of mixed ages. The plantation onsite is interspersed with a series of tracks and watercourses. Open moorland lies to the west (Brown Muir) and the valley of the River Spey lies to the east and south of the Site. The coast of the Moray Firth is located approximately 10 km to the north of the Site.

1.2.3 The Site is located within two Natural Heritage Zones (NHZ). The majority of the Site is located within NHZ 21: Moray Firth, whilst the western part of the Site is within NHZ 10: Central Highlands. A third NHZ, NHZ 12: North East Glens, is located to the east and south of the Site (**Figure 7.3**).

1.3 Key Guidance

1.3.1 Ornithological survey methodologies and subsequent interpretation of results has referred to the following key industry standard guidance, including that produced by NatureScot (formerly Scottish Natural Heritage (SNH)):

- SNH (2018). Assessing significance of impacts from onshore wind farm outwith designated areas. Guidance. Version 2 – February 2018;
- SNH (2017). Recommended bird survey methods to inform impact assessment of onshore wind farms. Version 2. March 2017;
- SNH (2016). Assessing connectivity with Special Protection Areas (SPAs). Guidance. Version 3 – June 2016;
- Goodship, N.M. and Furness, R.W. (MacArthur Green) (2022). Disturbance Distances Review: An updated literature review of disturbance distances of selected bird species. NatureScot Research Report 1283;
- 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 Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain. British Birds 114: 723-747;
- 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; and
- Gilbert, G., Gibbons, D.W. & Evans, J. (1998). Bird monitoring methods. A manual of techniques for key UK species. RSPB, Sandy, Bedfordshire.

1.4 Target Species

1.4.1 In accordance with NatureScot guidance (SNH, 2017), the surveys focussed on 'target' species. These were identified as being those species which are afforded a higher level of legislative protection and are potentially most sensitive to wind farm developments, and were based on the following lists:

- Annex 1 of the EC Birds Directive;
- Schedule 1 of the Wildlife and Countryside Act 1981;
- Species listed on the Scottish Biodiversity List;
- Red-listed Birds of Conservation Concern (Stanbury, et al. (2021)); and
- Annex 1 '*Priority bird species for assessment when considering the development of onshore wind farms in Scotland*' (SNH, 2018).

1.4.2 Appropriate target species for the Development were identified through desk study and an initial reconnaissance visit, on the basis of known species distributions or likely presence in the vicinity of the Site, and the likely sensitivity of such species to wind farm developments. This determined that the key species for the Development were likely to be scarce raptors, non-breeding waterfowl and woodland grouse species.

1.4.3 Based on the above, target species during vantage point (VP) surveys comprised all Schedule 1 and Annex 1 listed raptors and owls, waterfowl (comprising swans, geese (excluding feral Canada goose) and ducks (excluding mallard)), all wader species, divers, grebes, black grouse and capercaillie, as observed during the survey.

1.4.4 During the VP surveys, 'secondary' species were also recorded. Secondary species were defined as commoner raptors (common buzzard, kestrel, and sparrowhawk), all gulls, feral waterfowl (e.g. Canada goose), mallard, red grouse and raven, along with any large congregations of Schedule 1 or red-listed passerines (Stanbury *et al*., 2021), as recorded during the survey.

1.4.5 The species recorded during the other baseline surveys (including species-specific surveys) are discussed under the methods described in **Section 3**.

1.4.6 The target species for survey and data gathering were agreed with NatureScot through informal consultation.

2 DESK STUDY

2.1 Methodology

2.1.1 In accordance with guidance (SNH, 2017), a desk study was undertaken with the aim of obtaining relevant supplementary information regarding ornithological features (species and designated sites), to provide context to the field survey data and to inform the EIA Report.

Designated Sites

2.1.2 A search for designated statutory sites with ornithological qualifying features was made using NatureScot *Sitelink*[1]. The search area used was the Site and an additional 10 km buffer. This was

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

extended to 20 km for statutory sites with migratory geese as a qualifying interest, due to the large foraging ranges of non-breeding grey goose species (15-20 km (SNH, 2016)).

2.1.3 An online search[2] was also undertaken to identify any non-statutory designated sites with ornithological interests within 2 km of the Site.

Species Records

2.1.4 Data requests were made to third party organisations for relevant ornithological data from the vicinity of the Site. These requests are summarised in **Table 2.1**, alongside the other sources of information consulted to inform the scope of baseline surveys and provide data for inclusion in the EIA.

Table 2.1: Desk study sources

Key Source	Date of Request	Information Sought	Search Area
Forestry and Land Scotland (FLS)	January 2025	Records held of protected species, e.g. Schedule 1 nesting locations.	FLS owned land in the Site and adjacent forest.
	February 2022	Records held for capercaillie.	FLS owned land in the Site.
Royal Society for the Protection of Birds (RSPB) Scotland	March 2022	Records held for birds of conservation interest (from last 10 years, extended to records since 2000 for capercaillie).	Within 10 km of central grid reference for all records, extended to 20 km for goose records.
Highland Raptor Study Group (RSG)	May 2024	Records held of scarce breeding and roosting raptors and owls (2015 onwards).	Within Site and 3 km buffer (west of the River Spey).
Northeast Scotland RSG	January 2025	Records held of scarce breeding and roosting raptors and owls (2020 onwards).	Within 5 km of the Site (east of the River Spey).
Mitchell, 2012[3]	-	Identification of regularly utilised foraging areas by wintering geese.	Scottish SPAs with pink-footed goose and greylag goose as listed features.
Moray & Nairn Bird Reports[4]	-	Information regarding target species in relation to the Development, included within the local annual bird reports.	Identifiable place names within 10 km of the Site.

[2] Available at: http://www.moray.gov.uk/moray_standard/page_137992.html (Accessed February 2025).
[3] Mitchell, C. (2012) *Mapping the distribution of feeding Pink-footed and Iceland Greylag Geese in Scotland.* Wildfowl & Wetlands Trust / Scottish Natural Heritage Report, Slimbridge.
[4] Available from: https://birdsinmorayandnairn.org/2011-onwards/ (Accessed February 2025).

2.2 Results

Designated Sites

2.2.1 **Table 2.2** provides information about the statutory designated sites with ornithological features of interest located within the search area: 10 km of the Site for all species, extended to 20 km for statutory sites with migratory geese as a qualifying feature. The designated sites are illustrated on **Figure 7.4**.

2.2.2 The identified sites are Moray and Nairn Coast Special Protection Area (SPA) and Ramsar Site, Moray Firth SPA, and Loch Spynie SPA, Ramsar Site and Site of Special Scientific Interest (SSSI).

2.2.3 There are no non-statutory sites (local wildlife sites, nature reserves or similar) present within 2 km of the Site.

Table 2.2: Designated sites with ornithological interests

Designated Site	Distance / Direction from Site	Qualifying Ornithological Interest
Sites of International Importance		
Moray and Nairn Coast SPA	5.0 km, northeast	<u>Breeding</u> • Osprey. <u>Non-breeding</u> • Bar-tailed godwit; • Pink-footed goose; • Greylag goose; • Redshank; and • Non-breeding bird assemblage (comprising the above species plus red-breasted merganser, dunlin, oystercatcher and wigeon).
Moray and Nairn Coast Ramsar Site	5.0 km, northeast	<u>Breeding</u> • Osprey. <u>Non-breeding</u> • Bar-tailed godwit; • Red-breasted merganser; • Dunlin; • Oystercatcher; • Wigeon; • Pink-footed goose; • Greylag goose; and • Redshank.
Moray Firth SPA	8.8 km, north	<u>Breeding</u> • Shag. <u>Non-breeding</u> • Great northern diver; • Red-throated diver; • Slavonian grebe; • Scaup; • Eider; • Long-tailed duck; • Common scoter; • Velvet scoter;

		• Goldeneye; • Red-breasted merganser; and • Shag.
Loch Spynie SPA	10.5 km, northwest	Non-breeding • Greylag goose.
Loch Spynie Ramsar Site	10.5 km, northwest	Non-breeding • Greylag goose.
Sites of National Importance		
Loch Spynie SSSI	10.5 km, north-west	Breeding • Breeding bird assemblage (including shoveler, great-crested grebe, water rail and grasshopper warbler). Non-breeding • Greylag goose.

2.2.4 The Site does not form part of any designated area with ornithological interests. However, any ospreys breeding within the Site would be considered as belonging to the designated population of the Moray and Nairn Coast SPA and Ramsar Site. This is because these designated sites protect foraging as well as breeding ospreys, and so any birds breeding within foraging range of the designated sites would have potential connectivity and would be considered as being 'SPA birds'. Core foraging range of osprey is cited as being 10 km (SNH, 2016) and the distance between the Site and the SPA/ Ramsar Site is 5 km, at its nearest point.

2.2.5 The Site also has potential connectivity with protected areas designated for wintering geese, as it lies within daily commuting distance of Moray and Nairn Coast SPA and Ramsar Site (which have pink-footed goose and greylag goose as qualifying features) and Loch Spynie SPA, Ramsar Site and SSSI (which have greylag goose as a qualifying feature), in reference to the core foraging range from night roosts of 15-20 km for both goose species, as cited in guidance (SNH, 2016).

2.2.6 The qualifying features of Moray Firth SPA are coastal and marine species that would generally not commute inland, and for which the Site holds no suitable habitat. Thus, there is considered to be no connectivity with this SPA.

Species Records

2.2.7 This section provides a summary of relevant ornithological records and information returned through desk study sources, as set out in **Table 2.1**.

FLS

2.2.8 FLS returned three historic capercaillie records from the Site, including a female recorded in flight in 2012 and a lekking male seen in 2014. The most recent record referred to capercaillie signs (droppings) recorded in 2016. There are understood to have been no recent records from FLS owned land in Teindland Forest.

2.2.9 The Schedule 1 species records returned by FLS are summarised below. Relevant locations are shown on confidential **Figure 7.7** in **Technical Appendix A7.3: Confidential Ornithology**.

- Osprey – the nest located on Site during baseline surveys (see **Section 3**) was confirmed as still being active (as of 2024). In addition, in 2024 a new pair of ospreys was thought to have attempted to breed at a location in the east of the Site, more than 1 km from the Development. The identified nest was incomplete and breeding is considered unlikely to have taken place. However, this may indicate the establishment of a new pair and nesting area.

- Goshawk – confirmed and suspected nesting sites for goshawk were provided, although some records were not dated. Within the Site, the nest locations suggest a minimum of two breeding territories, in the central and eastern parts of the Site.

- Common crossbill - recorded within the Site in 2023.

RSPB

2.2.10 In the data returned for capercaillie, RSPB confirmed that the last record they hold for the Site comes from 2006 (an unsexed individual). For the wider search area (10 km of central grid reference), RSPB provided 41 records from 2015 onwards, based on RSPB and FLS gathered data, these being mostly records of droppings/ latrines. Most records came from the same 1 km x 1 km square, located more than 4 km from the Site. The last lekking male in this area was recorded in 2017. The data included for the period 2018-2021 (the last full year for which data were obtained) only includes zero counts.

2.2.11 Further details of the capercaillie data returned for lekking males is provided in **Technical Appendix A7.3: Confidential Ornithology**.

2.2.12 Records held by the RSPB of non-breeding geese (excluding Canada goose) within the 20km search area are summarised in **Table 2.3** (2015 onwards only). In all cases the peak count came from Loch Spynie.

Table 2.3: Non-breeding goose records returned by RSPB

Species	Number of Records	Peak Count	Nearest Record to Site
Barnacle goose	2	15	10 km
Greenland white-fronted goose	1	13	10 km
Greylag goose	6	1500	10 km
Pink-footed goose	5	1800	10 km

2.2.13 Relevant records held by the RSPB of other target species (2015 onwards only) comprised records of two species: crane, one record of one bird seen 5 km from the Site in 2018, and Slavonian grebe, recorded annually in the non-breeding season and all more than 2 km from the Site.

Highland RSG

2.2.14 Highland RSG confirmed that they do not hold raptor monitoring data for the search area. It was stated that another raptor volunteer separate to the RSG monitors osprey in West Moray. This volunteer was contacted and a data request made for relevant osprey breeding data. The data request was acknowledged but no data was provided.

Northeast Scotland RSG

2.2.15 Northeast Scotland RSG did not respond to the data request.

Mitchell (2012)

2.2.16 Although the Site has no suitable habitat for geese, the proximity of the Site to designated areas with geese as a qualifying feature (**Table 2.2**) means that geese could regularly overfly the Site during daily commutes between roosting and foraging areas. This was investigated by examining the distribution maps of foraging pink-footed and greylag geese associated with the SPA network in Scotland, produced by Mitchell (2012). Geese associated with the Moray and Nairn Coast SPA mostly roost in

Findhorn Bay (more than 20 km from the Site) and forage along the coastal plain. Greylag geese associated with Loch Spynie SPA were shown to generally feed within 6-7 km of the loch. The nearest key foraging areas to the Site are the area of low-lying farmland east of Elgin and the area of low-lying farmland west of Spey Bay (both more than 5 km from the Site). There are no important feeding areas within foraging distance of the designated areas and for which the Development would lie on the daily flight path, with all regularly used foraging areas located to the north of the Site.

Moray & Nairn Bird Reports

2.2.17 The most recent bird reports available online[4] (at the time of writing) for the Moray and Nairn bird recording area were consulted: 2020 (Cook (2024[5])) and 2021 (Proctor, 2024[6])), and records considered of relevance are summarised in **Table 2.4**. This information provides some context as to the status of certain target species in the region.

Table 2.4: Records of interest from Moray and Nairn Bird Report 2021 and 2020

Species	Notes
Greylag goose	Recorded along coastal plain in the non-breeding season, with greatest numbers around Findhorn Bay. The highest count at Loch Spynie in 2020 was of 3,610 roosting there on 26/11/20. The highest count in 2021 was of *c.*100 on 27/08/2021. Breeding birds in the hills of Moray and Nairn move to the Moray coast in winter and this August count represents a post-breeding flock rather than Icelandic migrants.
Pink-footed goose	Largest numbers recorded in Findhorn Bay and surrounding coastal plain. Highest counts recorded in autumn (September and October) and spring (April). No high counts from vicinity of Site.
Capercaillie	Dedicated counts recorded five lekking males in Moray and Nairn in 2021, each in separate locations. The bird report notes an 'accelerated' decline in recent years, e.g., in 2011 there were 10 leks (20 males) and in 2016 there were 9 leks (14 males).
Black grouse	No records from vicinity of Site.
Osprey	In 2021, monitoring recorded 17 nests with eggs, of which 15 fledged a total of 31 juveniles.
Goshawk	In 2021, 11 pairs were recorded in lowland Moray.
Barn owl	Six territories recorded along Spey valley between Rothes and Orton (may include territories less than 500 m from the Site).
Crested tit	In 2020, four territories were recorded in Teindland Forest, including two with young.
Crossbill	In August 2020, a flock of 44 crossbills was recorded at Teindland. (Records of Scottish crossbill and common crossbill are provided together in the bird report given the two species/forms cannot be separated.)

[5] Cook. M. (ed.) (2024) *Birds in Moray and Nairn in 2020. Moray and Nairn Bird Report No. 35 – 2020*. Published at www.birdsinmorayandnairn.org

[6] Proctor, B. (ed.) (2024) *Birds in Moray and Nairn in 2021. Moray and Nairn Bird Report No. 36 – 2021*. Published at www.birdsinmorayandnairn.org

3 FIELD SURVEYS

3.1.1 In order to assess the potential effects of the Development upon ornithological features, detailed knowledge of bird populations, distributions and flight activity in the vicinity of the Site have been derived from a programme of field surveys.

3.1.2 The suite of baseline ornithology surveys undertaken was informed by expert knowledge and experience of bird habitat associations at comparable sites and locations in Scotland. Field survey effort and methodologies were agreed with NatureScot through informal consultation. Details of consultation undertaken are provided in **Chapter 7: Ornithology**.

3.1.3 The study areas for each survey type were based on the developable area that was proposed at the time of survey commencement (the Core Ornithology Survey Area) plus an appropriate surrounding buffer. Study areas are illustrated on **Figure 7.2**.

3.2 Methodologies

3.2.1 The following baseline ornithological surveys were undertaken:

- Vantage Point (VP) Flight Activity Surveys;
- Adapted Moorland Breeding Bird Survey (MBBS);
- Breeding Schedule 1 Raptor Searches;
- Black Grouse Searches; and
- Capercaillie Habitat Suitability Assessment.

3.2.2 Note that surveys for woodland passerines were not included in the baseline survey programme. NatureScot guidance (SNH, 2017) states that such surveys in commercial conifer forest are generally not required. Two Schedule 1 passerines associated with conifer woodland habitats were identified through desk study as being present in the vicinity of the Site: crested tit and crossbill (**Table 2.4**). However, these species would be protected through species protection plans, with pre-felling surveys undertaken (where required), and a census of these species is not needed to inform an impact assessment (SNH, 2017).

VP Flight Activity Surveys

3.2.3 VP flight activity surveys were undertaken between April 2021 and March 2023, in reference to NatureScot guidance (SNH, 2017). The surveys covered two breeding seasons (taken to be the period April to August, in 2021 and 2022) and two non-breeding seasons (taken to be the period September to March 2021/2022 and 2022/2023), thus giving two complete years of baseline surveys.

3.2.4 Appropriate VP locations were set up to provide the best possible visual coverage of the indicative turbine layout (at the time of survey completion) and a 500 m surrounding buffer, where possible, whilst adopting the minimum number of VPs in order to obtain this coverage; in accordance with NatureScot guidance (SNH, 2017).

3.2.5 A total of three VP locations were used to provide maximum visual coverage of the required VP study area, as summarised within **Table 3.1** and illustrated in **Figure 7.1.** The viewsheds (visible areas) were determined using a Digital Elevation Model (DEM), based on an observer height of 1 m and a 20 m above ground offset, before being ground-truthed during a reconnaissance visit. All VPs used a 2 km radius viewshed and a 180^{o} viewing angle.

3.2.6 The VP viewsheds that were used did not provide full coverage of a 500 m buffer around all turbines, as the forested nature of the Site and sloping topography made the locating of the VPs difficult. However, the coverage achieved is considered to have been adequate for determining baseline flight activity. Limitations in coverage are discussed below.

Table 3.1: Vantage point locations

VP	Grid Reference	Viewing Orientation
1	NJ 28224 52033	Northeast
2	NJ 28085 53091	West
3	NJ 29238 54092	Northwest

3.2.7 NatureScot guidance (SNH, 2017) recommends a minimum of 36 hours of survey effort be completed per VP per season (breeding and non-breeding season). The total survey effort (hours completed) during the two years of baseline surveys is presented in **Table 3.2**.

3.2.8 Each VP survey session was no more than three hours in duration, with a 30-minute break taken between consecutive surveys to maintain visual acuity.

Table 3.2: VP survey effort Year 1 and Year 2

VP	2021					Total Hrs	2021/2022							Total Hrs
	Breeding Season						Non-breeding Season							
	Apr	May	Jun	Jul	Aug		Sep	Oct	Nov	Dec	Jan	Feb	Mar	
VP1	6	6	12	6	9	**39**	6	6	6	6	6	6	6	**42**
VP2	6	6	12	6	9	**39**	6	6	6	6	6	6	6	**42**
VP3	6	6	9	15	6	**42**	6	6	6	6	6	3	6	**39**
VP	**2022**					**Total Hrs**	**2022/2023**							**Total Hrs**
	Breeding Season						**Non-breeding Season**							
	Apr	**May**	**Jun**	**Jul**	**Aug**		**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	
VP1	6	6	12	9	6	**39**	6	6	6	6	6	6	6	**39**
VP2	6	6	12	9	6	**39**	6	6	6	6	6	6	6	**39**
VP3	6	0	18	9	6	**39**	6	6	6	6	6	6	6	**39**

3.2.9 **Table 3.2** shows that in each season the minimum of 36 hours per VP was exceeded.

3.2.10 Additional survey effort was weighted towards June to August, with consideration to potential increased flight activity during the chick rearing and fledging period of raptor breeding seasons.

3.2.11 Flight lines were mapped for all target species passing through the VP study area. Details of species, number of birds, flight height bands (see below), duration and direction were noted on standardised recording forms and field plans.

3.2.12 The height bands used during the flight activity surveys are listed below. The use of height bands aimed to determine flight activity as being at, below, or above collision risk height, whilst acknowledging that final turbine specifications had not been decided at the time of survey completion.

- Height Band 1 = <25 m;
- Height Band 2 = 25-40 m;
- Height Band 3 = 40-150 m;

- Height Band 4 = 150-180 m; and
- Height Band 5 = >180 m.

3.2.13 Secondary species were noted in five-minute summary intervals, with the number of birds present and general behaviour recorded, in order to build an overall picture of relative activity. Secondary species were not mapped, in line with NatureScot guidance (SNH, 2017).

Adapted Moorland Breeding Bird Survey (MBBS)

3.2.14 A MBBS survey is often undertaken for wind farm developments, the aim of this survey being to record species in moorland and open country habitats, primarily breeding wader species. In the case of the Development, the Site comprises only plantation habitats of mixed ages (including clearfelled areas), with no moorland habitats present within the Site boundary. Therefore, in accordance with guidance (SNH, 2017), a MBBS was not undertaken.

3.2.15 Instead, an Adapted MBBS method was incorporated into the other surveys. Checks were made of adjacent open moorland habitats (where present) whilst undertaking the Breeding Schedule 1 Raptor Searches and Black Grouse Searches, for species that would typically be the focus of the MBBS: these being waders, waterfowl, gulls and grouse. Any target species noted were recorded on a base map, along with any evidence of breeding activity (e.g. displaying, alarming, juvenile birds).

3.2.16 The study area included for the Adapted MBBS was a 500 m buffer of the Core Ornithology Survey Area as identified at the time of survey commencement (see **Figure 7.2**); and comprised a small area of open ground along the western edge of the forest. As there was no surveyor access into this moorland area, it was scanned from within the Site.

Breeding Schedule 1 Raptor Searches

3.2.17 Dedicated searches for breeding Schedule 1 and Annex 1 listed raptors and owls were conducted in both survey years (2021 and 2022). Surveys were undertaken between March and July, and were informed by species-specific survey advice in Hardey *et al.* (2013[7]), and in reference to NatureScot guidance (SNH, 2017).

3.2.18 The study area for the Breeding Schedule 1 Raptor Searches covered the Core Ornithology Survey Area as identified at the time of survey commencement, plus a surrounding 2 km buffer (where access allowed). The search area is illustrated on **Figure 7.2**.

3.2.19 Although based on a slightly different developable area to that now proposed for locating the turbines of the Development, the raptor search area encompasses the full Site and a surrounding buffer of at least 2 km for all but one of the proposed turbines (approximately 1,900 m for one proposed turbine). Survey coverage outside the Site was limited but surrounding ground was scanned from within the Site or from public highways, where available.

3.2.20 Searches consisted of a combination of walkover surveys and vantage point watches over suitable habitat features to determine occupancy and any breeding or territorial behaviour. Searches were informed by the results of the VP flight activity surveys, where appropriate.

3.2.21 Surveyors were in possession of a Schedule 1 licence, where required, but no nests were approached and any information about breeding outcomes was determined by watching from distance.

[7] 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.

3.2.22 Survey effort is summarised in **Table 3.3**. All survey visits were undertaken in weather conditions conducive to survey.

Table 3.3: Survey effort for the breeding Schedule 1 raptor searches

2021			2022		
Date	**Start time**	**Finish time**	**Date**	**Start time**	**Finish time**
27/04/2021	07:15	10:15	03/03/2022	09:00	15:00
29/04/2021	11:30	17:30	28/04/2022	05:50	11:50
14/05/2021	07:30	13:30	24/05/2022	14:25	17:25
31/05/2021	12:05	18:20	02/06/2022	13:30	19:30
24/06/2021	12:45	15:45	15/06/2022	11:15	17:15
01/07/2021	05:40	11:40	16/06/2022	04:40	10:40
26/07/2021	14:00	20:00	06/07/2022	10:30	16:30
28/07/2021*	05:20	07:20	07/07/2022	10:20	13:20
29/07/2021	15:25	21:25			

*Two observers out at same time covering different parts of search area.

Black Grouse Searches

3.2.23 Searches for black grouse lek sites were undertaken in 2021, with reference to species-specific guidance detailed in Gilbert *et al*. (1998) and NatureScot guidance (SNH, 2017).

3.2.24 The study area comprised the Core Ornithology Survey Area, as identified at the time of survey commencement, plus a surrounding 1.5 km buffer (where access allowed) (**Figure 7.2**). Within the search area suitable habitat was visited; taken to be open ground habitats including areas of clearfell and forest rides. The majority of the search area was considered not to have suitable black grouse lekking habitat.

3.2.25 Visits were made in April with the aim of locating and counting any displaying males. The survey was undertaken again in May to increase the likelihood of detecting presence. Surveyors visited at dawn and scanned and listened for lekking males from suitable vantage points that enabled coverage of suitable habitat features.

3.2.26 Survey effort for the black grouse searches is summarised in **Table 3.4**. Searches were not undertaken in 2022.

Table 3.4: Survey effort for the black grouse searches

Date	Start time	Finish time	Sunrise (Elgin)
28/04/2021	04:30	07:30	05:29
30/04/2021	04:25	07:35	05:24
14/05/2021	03:55	07:00	04:52

Capercaillie Habitat Suitability Assessment

3.2.27 Through consultation and desk study it was determined that the Site has historically held capercaillie, but the data suggested that local declines had resulted in them no longer being present on Site. The absence of capercaillie from the Site means that FLS and RSPB no longer undertake formal censuses of capercaillie within this forest.

3.2.28 In order to better understand the potential importance of the Site for capercaillie at the current time, a high-level survey of the full Site was undertaken in April 2022 to determine the suitability of the habitats present.

3.2.29 Surveyors covered the Site by following the extensive network of tracks that are present in the forest. Forestry coupes were assessed for suitability by recording features such as tree density, nature of understorey and perceived level of human disturbance.

3.2.30 Any areas of forest that looked to have some degree of suitability for capercaillie were checked for evidence of presence, such as feathers or droppings; but, given the apparent status of capercaillie on Site, a dedicated capercaillie survey was not undertaken. Surveyors were in possession of a Schedule 1 licence.

3.3 Survey Limitations

3.3.1 Due to the extensive plantation forestry, as well as the sloping topography with limited high points, conditions on Site made it difficult to locate VPs with extensive viewsheds. Additionally, the VP surveys were undertaken before the proposed turbine layout had been finalised. This has resulted in some proposed turbines being located on the edge of viewsheds without a 500 m surrounding buffer having been covered, as is recommended in guidance (SNH, 2017). However, actual turbine locations do lie within the areas covered by the VP surveys and coverage is considered sufficient for undertaking the impact assessment. The turbine buffers that were not covered are on the edge of the turbine development area, with good coverage achieved within the turbine envelope. That full coverage of a 500 m buffer 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 (turbine locations and specified buffer area), and so the model is not spatially explicit. The level of flight activity recorded from the viewsheds can reasonably be applied to any small gaps as the habitat within these areas has been well represented by the surveys and there are no features in these coverage gaps that would be expected to result in higher than average activity in these locations (e.g. presence of Schedule 1 raptor nests).

3.3.2 NatureScot guidance (SNH, 2017) recommends that, where possible, VPs are situated outside the development area, to prevent surveyors potentially affecting bird behaviour. Both VP1 and VP2 were located outside the turbine envelope, but it was not possible to achieve this for VP3, given the limited availability of open areas and access permissions only extending within the Site (**Figure 7.2**). The location of VPs is, however, not considered to be a limitation. In all cases, surveyors at VPs were positioned against forest edges and, coupled with sitting positions and subtle clothing, this made surveyors relatively inconspicuous. In the case of VP3, this vantage point was not conducted concurrently with VP1 to prevent potential disturbance when undertaking the latter VP. And as VP3 lies within the viewshed of VP1, this allowed the area around VP3 to be surveyed when no-one was present at VP3, providing certainty that no disturbance impacts were influencing the level of bird activity during survey.

3.3.3 During the Breeding Schedule 1 Raptor Searches and Black Grouse Searches, parts of the study areas were outside the Site (**Figure 7.2**) and, therefore, access to these areas was not possible. Suitable habitat features were scanned from appropriate vantage points within the Site and on public roads, where available, to detect activity and likely breeding locations for key species. It is acknowledged that a limited part of the study areas did not receive survey coverage as a result, but such areas were

at the outer edge of the Site buffers, and it is considered highly unlikely that features of note will have been missed that would change the impact assessment.

3.3.4 As stated above, an Adapted MBBS was undertaken in conjunction with the other survey types and a dedicated walkover survey of the (limited) moorland habitat in the 500 m buffer of the Development was not completed. It is possible that target species of the MBBS could have been overlooked as a result, however as moorland breeding waders generally avoid nesting close to forest edges it is considered highly unlikely that this was the case.

3.3.5 The Capercaillie Habitat Suitability Assessment undertaken in 2022 only aimed to provide an indication of the likely suitability of the Site for this species. Although the recording of any signs of capercaillie was part of the survey method, the survey did not aim to categorically prove presence or absence of capercaillie from the Site.

3.3.6 NatureScot pre-application guidance for onshore wind farms[8] states that baseline data for ornithological features should have been collected within the last five years (or within three years if the population of key species is believed to be changing rapidly or if there have been substantial habitat changes between the surveys and application submission). In the case of the Development, the five year 'shelf life' is considered appropriate. As the data for the Development has been gathered since April 2021 (within the last five years at time of writing) there is not considered to be a limitation in the data used to inform the ornithological impact assessment.

3.4 Results

Vantage Point Flight Activity Surveys

3.4.1 A summary of the target species recorded during the VP flight activity surveys us presented in **Table 3.5.** Note that for completeness all target species records are presented in this table, including flights which would not be at collision risk (i.e., flights above and below rotor swept height or that lie outside the rotor swept area of the proposed turbines). For a summary of 'at-risk' flights see **Table 3.6**. Note that the number of birds presented is simply a sum of the number of individuals recorded for each flight, but in some cases this may refer to the same bird seen more than once.

3.4.2 Full details of these records are presented in **Annex 3**.

3.4.3 Flight-lines for baseline Year 1 are illustrated on **Figure 7.6a (confidential)** (osprey), **Figure 7.5a** (pink-footed goose) and **Figure 7.5b** (other species), and for Year 2 on **Figure 7.6b (confidential)** (osprey), **Figure 7.5c** (pink-footed goose) and **Figure 7.5d** (other species).

Table 3.5: VP flight activity survey results Year 1 (2021) and Year 2 (2022)

Species	No. of flights	No. of individuals
Breeding season Year 1 (April 2021 to August 2021)		
Curlew	2	2
Goshawk	2	2
Osprey	41	45
Peregrine	1	1
Pink-footed goose	1	50

[8] Available at: https://www.nature.scot/doc/naturescot-pre-application-guidance-onshore-wind-farms (Accessed February 2025).

Species	No. of flights	No. of individuals
Snipe	1	1
Non-breeding season Year 1 (September 2021 to March 2022)		
Goshawk	10	10
Greylag goose	2	43
Lapwing	1	2
Pink-footed goose	29	3,275
Breeding season Year 2 (April 2022 to August 2022)		
Goshawk	3	3
Hobby	1	1
Mute swan	1	1
Osprey	54	66
Non-breeding season Year 2 (September 2022 to March 2023)		
Golden plover	1	65
Goshawk	7	8
Pink-footed goose	29	4,479

3.4.4 The purpose of the flight activity surveys is to determine potential collision risk of target species. Target species flights recorded outside the collision risk zone (CRZ) or not recorded at potential collision height (PCH) can be considered as not being at risk from collision and are excluded from the assessment. The identification of 'at-risk' flights, including how the CRZ and PCH have been defined in the assessment, is covered in **Technical Appendix A7.2: Collision Risk Model Analysis**.

3.4.5 Those target flights regarded as being at-risk are summarised in **Table 3.6** (all seasons combined). Those species recorded with sufficient flight activity to meet the threshold for undertaking CRM (see **Technical Appendix A7.2: Collision Risk Model Analysis**) are highlighted in bold in the table.

Table 3.6: Target species flight activity - 'at risk' flights

Species	Number of flights	Number of individuals	Total flight time (seconds)[9]
Curlew	1	1	60
Goshawk	14	15	2,221
Greylag goose	2	43	5,795
Hobby	1	1	95
Lapwing	1	2	468
Osprey	70	83	13,656
Pink-footed goose	45	4,872	849,516

[9] Duration of each flight is multiplied by the number of individual birds and summed for each species. Times presented are those of the full duration of flightlines recorded, **before** apportioning time to 'at-risk'.

Adapted Moorland Breeding Bird Surveys

3.4.6 No target species (breeding waders, waterfowl, gulls or grouse) were recorded within the Adapted MBBS study area in Year 1 (2021) or Year 2 (2022).

Breeding Schedule 1 Raptor Searches

3.4.7 The dedicated Schedule 1 raptor surveys, in conjunction with the other baseline surveys, produced the following results. Relevant records are illustrated on **Figure 7.7 (confidential)** in **Technical Appendix A7.3: Confidential Ornithology**.

Osprey

3.4.8 In Year 1 (2021) an active osprey nest was located within the Site. The nest is located over 600 m from the nearest proposed turbine. A second active osprey nest site was also discovered a few hundred meters outside the Site. The nest is located over 500 m from the nearest proposed turbine. In Year 2 (2022), both osprey nests located in Year 1 were used again. Both nests are believed to have been successful in 2021, but are thought to have failed in 2022. Confidential **Figure 7.7** in **Technical Appendix A7.3: Confidential Ornithology** shows the locations of the osprey nest sites.

Goshawk

3.4.9 A goshawk territory was suspected in the southwest of the Site in both survey years. Sightings in this area included a calling female and a nest that was noted in both survey years, but which was not occupied during the two years surveyed. An active nest was suspected for the territory but not located.

3.4.10 In the southeast of the Site a nest was located in 2022, with this going on to successfully fledge juveniles. This nest is over 600 m from the nearest turbine. Further sightings of goshawk further to the north may have referred to birds from the same territory as the active nest. However, the distance of one of these records from the known nest, more than 2 km away, suggests an additional territory may have been present within the north of the Site; although no evidence of breeding was recorded here. Relevant goshawk records are presented in **Technical Appendix A7.3: Confidential Ornithology** and illustrated on confidential **Figure 7.7.**

Black Grouse Searches

3.4.11 No black grouse were recorded during the dedicated surveys in 2021, nor incidentally during the other survey types. It is concluded that black grouse are not present in the vicinity of the Site.

Capercaillie Habitat Suitability Assessment

3.4.12 The assessment identified little favourable habitat for capercaillie within the Site. Two small areas were identified in the Site that were regarded as having better potential of holding capercaillie, with mature trees and more open areas containing heather and limited heathland ground flora: an area on the northern edge of the Site and an area in the far southwest of the Site. However, both are small in extent and isolated from other areas of favourable habitat. The identified areas overlap with coupes within the forest being managed for low impact silviculture and long-term retention within the forestry management plan.

3.4.13 The habitat assessment included a search for signs of capercaillie within areas of suitable habitat. No evidence of capercaillie presence was recorded. Nor were capercaillie recorded during the other baseline surveys. Therefore, the field surveys support the desk study data that capercaillie are absent from the Site and adjacent forest.

ANNEX 1 – BIRD SPECIES SUMMARY

Table A1-1 provides a list of bird species referred to within **Chapter 7: Ornithology** and/or the associated Technical Appendices. Both common and scientific names are presented along with a summary of each species' conservation status using the following abbreviations:

- Red (high concern), Amber (medium concern) or Green (least concern) as listed on the Birds of Conservation Concern (BoCC) (Stanbury et al., 2021);
- Schedule 1.1, 1.1A, A1, 1.2 (Sch1.1/Sch1A/SchA1/Sch1.2) - species listed on Schedule I, Schedule IA or Schedule AI, or Schedule I part 2, of the Wildlife and Countryside Act (1981, as amended);
- SBL - species listed on the Scottish Biodiversity List;
- Ann1 - species listed on Annex I of the Birds Directive (2009/147/EC); and
- RBBP – listed as a species which the UK Rare Breeding Bird Panel reports on.

Table A1.1: Summary of bird species

Common name	Scientific Name	Conservation Status
Barnacle goose	*Branta leucopsis*	Amber; SBL; Ann1
Greylag goose	*Anser anser*	Amber; Sch1.2 (Outer Hebrides, Caithness, Sutherland and Wester Ross only)
Pink-footed goose	*Anser brachyrhynchus*	Amber; RBBP
Greenland white-fronted goose	*Anser albifrons flavirostris*	Red; SBL; Ann1
Mute swan	*Cygnus olor*	Green
Wigeon	*Mareca penelope*	Amber; RBBP
Mallard	*Anas platyrhynchos*	Amber
Scaup	*Aythya marila*	Red; Sch1.1; SBL; RBBP
Eider	*Somateria mollissima*	Amber
Velvet scoter	*Melanitta fusca*	Red; Sch1.1; RBBP
Common scoter	*Melanitta nigra*	Red; Sch1.1; SBL; RBBP
Long-tailed duck	*Clangula hyemalis*	Red; Sch1.1; RBBP
Red-breasted merganser	*Mergus serrator*	Amber; RBBP
Capercaillie	*Tetrao urogallus*	Red; Sch1.1; SBL; Ann1; RBBP
Black grouse	*Lyrurus tetrix*	Red; SBL
Slavonian grebe	*Podiceps auritus*	Red; Sch1.1; SBL; Ann1; RBBP
Great-crested grebe	*Podiceps cristatus*	Green
Oystercatcher	*Haematopus ostralegus*	Amber
Lapwing	*Vanellus vanellus*	Red; SBL
Curlew	*Numenius arquata*	Red; SBL
Bar-tailed godwit	*Limosa lapponica*	Amber; SBL; Ann1; RBBP
Dunlin	*Calidris alpina*	Red; SBL
Snipe	*Gallinago gallinago*	Amber
Redshank	*Tringa totanus*	Amber
Water rail	*Rallus aquaticus*	Green
Red-throated diver	*Gavia stellata*	Green; Sch1.1; SBL; Ann1; RBBP

Great northern diver	*Gavia immer*	Amber; Sch1.1; SBL; Ann1; RBBP
Shag	*Gulosus aristotelis*	Red
Osprey	*Pandion haliaetus*	Amber; Sch1.1; SBL; Ann1; RBBP
Goshawk	*Accipiter gentilis*	Green; Sch1.1; RBBP
Barn owl	*Tyto alba*	Green; Sch1.1; SBL
Hobby	*Falco subbuteo*	Green; Sch1.1; SBL; RBBP
Peregrine	*Falco peregrinus*	Green; Sch1.1; SBL; Ann1; RBBP
Common crossbill	*Loxia curviostra*	Green; Sc1.1; SBL
Scottish crossbill	*Loxia scotica*	Red, Sch1.1, SBL, RBBP
Crested tit	*Lophophanes cristatus*	Red, Sch1.1, SBL, RBBP
Grasshopper warbler	*Locustella naevia*	Red

ANNEX 2 – ORNITHOLOGY FIELD SURVEY EFFORT

The following codes were used to record weather conditions during surveys and are used in **Tables A2.1** to **A2.9**:

Wind Speed		**Rain**		**Cloud Cover**	
Calm	0	None	0	Out of 8 (oktas)	
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		

Field surveys were undertaken by the following named surveyors: A. McNab (AJM), A. Russell (AR), C. Griffin (CG), D. Burt (DB), G. Dunbar (GD), J. Spinks (JS), J. Sykes (JS), L. Carroll (LC), M. Lawson (ML), M. Wood (MW), N. Voaden (NV), P. Carroll (PC), P. Higginson (PH), S. MacDonald (SM) and V. Hastie (VH).

Table A2.1: Flight activity survey effort (April 2021 to March 2023)

Date	VP	Surveyor	Start Time	Finish Time	VP Hours	Wind Direction	Rain	Visibility	Frost	Snow
28/04/2021	1	PH	08:15	11:15	3	NNE/NNE/NNE	0/0/2	2/2/2	0/0/0	2/0/0
28/04/2021	1	PH	11:45	14:45	3	NNE/NNE/NNE	2/0/0	2/2/2	0/0/0	0/0/0
29/04/2021	2	PH	08:00	11:00	3	NNE/NNE/NNE	0/0/2	2/2/2	0/0/0	0/0/0
26/04/2021	2	PH	15:55	18:55	3	NW/NW/NW	2/2/2	2/2/2	0/0/0	0/0/0
27/04/2021	3	PH	11:00	14:00	3	ENE/ENE/ENE	2/2/2	2/2/2	0/0/0	0/0/0
27/04/2021	3	PH	14:30	17:30	3	ENE/ENE/ENE	2/2/2	2/2/2	0/0/0	0/0/0
06/05/2021	1	PC	08:55	11:55	3	NNW/NNW/NNW	3/3/0	2/2/2	0/0/0	1/1/0
06/05/2021	1	PC	12:25	15:25	3	NNW/NNW/NNW	0/0/0	2/2/2	0/0/0	0/0/0
01/06/2021	1	AJM	09:00	12:00	3	S/S/S	0/0/0	2/2/2	0/0/0	0/0/0
06/05/2021	2	NV	08:40	11:40	3	NW/NNW/NNW	2/2/0	2/2/2	0/0/0	1/0/0
06/05/2021	2	NV	12:10	15:10	3	NW/NNW/NNW	0/0/0	2/2/2	0/0/0	1/0/0
13/05/2021	3	AJM	12:35	15:35	3	NE/NE/NNE	0/0/1	2/2/1	0/0/0	0/0/0
13/05/2021	3	AJM	16:05	19:05	3	NNE/NNE/NE	2/0/0	2/2/2	0/0/0	0/0/0
01/06/2021	3	AJM	12:30	15:30	3	S/S/S	0/0/0	2/2/2	0/0/0	0/0/0
24/06/2021	1	JS	09:40	12:40	3	WSW/SW/SW	0/1/2	2/2/2	0/0/0	0/0/0
30/06/2021	1	JS	17:00	20:00	3	NE/NE/NE	0/0/0	2/2/2	0/0/0	0/0/0
30/06/2021	1	JS	20:30	23:30	3	NE/NE/NE	0/0/0	2/2/2	0/0/0	0/0/0
24/06/2021	2	GD	09:45	12:45	3	SE/SE/SE	1/0/0	2/2/2	0/0/0	0/0/0
30/06/2021	2	GD	17:00	20:00	3	N/N/N	0/0/0	2/2/2	0/0/0	0/0/0
30/06/2021	2	GD	20:30	23:30	3	N/N/N	0/0/0	2/2/2	0/0/0	0/0/0
24/06/2021	3	JS	13:05	16:05	3	SW/SW/SW	2/0/1	2/2/2	0/0/0	0/0/0
01/07/2021	3	JS	05:45	08:45	3	SE/SE/SE	0/0/0	1/1/2	0/0/0	0/0/0
01/07/2021	3	JS	09:15	12:15	3	N/N/N	0/0/0	2/2/2	0/0/0	0/0/0
26/07/2021	1	JS	14:05	17:05	3	NNW/NNW/NW	0/0/0	2/2/2	0/0/0	0/0/0
26/07/2021	1	JS	17:35	20:35	3	NNW/N/N	0/0/0	2/2/2	0/0/0	0/0/0
26/07/2021	2	AR	13:50	16:50	3	WSW/SW/SW	0/0/0	2/2/2	0/0/0	0/0/0

Date	VP	Surveyor	Start Time	Finish Time	VP Hours	Wind Direction	Rain	Visibility	Frost	Snow
26/07/2021	2	AR	17:20	20:20	3	SW/SW/-	0/0/0	2/2/2	0/0/0	0/0/0
28/07/2021	3	JS	05:20	08:20	3	E/ENE/ENE	0/0/3	2/2/2	0/0/0	0/0/0
29/07/2021	3	GD	15:25	18:25	3	NW/NW/NW	1/0/0	2/2/2	0/0/0	0/0/0
29/07/2021	3	GD	18:55	21:55	3	NW/NW/NW	0/0/0	2/2/2	0/0/0	0/0/0
05/08/2021	1	GD	17:10	20:10	3	SE/SE/SE	0/0/0	2/2/2	0/0/0	0/0/0
12/08/2021	1	GD	10:20	13:20	3	S/S/S	0/0/0	2/2/2	0/0/0	0/0/0
12/08/2021	1	GD	13:50	16:50	3	S/S/S	0/1/0	2/2/2	0/0/0	0/0/0
05/08/2021	2	VH	17:00	20:00	3	SE/SE/SE	0/0/0	2/2/2	0/0/0	0/0/0
13/08/2021	2	GD	05:30	08:30	3	-/-/-	0/0/0	2/2/2	0/0/0	0/0/0
13/08/2021	2	GD	09:00	12:00	3	S/S/S	0/0/0	2/2/2	0/0/0	0/0/0
12/08/2021	3	GD	17:20	20:20	3	S/S/S	0/0/0	2/2/2	0/0/0	0/0/0
31/08/2021	3	GD	14:45	17:45	3	N/N/N	0/0/0	2/2/2	0/0/0	0/0/0
01/09/2021	1	GD	09:35	12:35	3	NW/NW/NW	0/0/0	2/2/2	0/0/0	0/0/0
01/09/2021	1	GD	13:20	16:20	3	NW/NW/NW	0/0/0	2/2/2	0/0/0	0/0/0
17/09/2021	2	SM	09:15	12:15	3	SSE/SSE/S	0/0/0	2/2/2	0/0/0	0/0/0
17/09/2021	2	SM	12:45	15:45	3	S/S/S	0/0/0	2/2/2	0/0/0	0/0/0
02/09/2021	3	GD	06:00	09:00	3	N/N/N	0/0/0	2/2/2	0/0/0	0/0/0
02/09/2021	3	GD	09:30	12:30	3	N/N/NE	0/0/0	2/2/2	0/0/0	0/0/0
07/10/2021	1	SM	11:15	14:15	3	SSW/SSW/SSW	0/0/0	2/2/2	0/0/0	0/0/0
07/10/2021	1	SM	14:45	17:45	3	SSW/SW/SW	0/2/0	2/2/2	0/0/0	0/0/0
08/10/2021	2	SM	08:15	11:15	3	S/S/S	0/2/3	2/2/2	0/0/0	0/0/0
08/10/2021	2	SM	11:45	14:45	3	S/S/S	2/0/0	2/2/2	0/0/0	0/0/0
25/10/2021	3	SM	10:10	13:10	3	SSW/SSW/SSW	0/0/0	2/2/2	0/0/0	0/0/0
25/10/2021	3	SM	13:40	16:40	3	SSW/SW/WSW	0/0/0	2/2/2	0/0/0	0/0/0
05/11/2021	1	GD	07:50	10:50	3	N/N/N	0/0/0	2/2/2	0/0/0	0/0/0
05/11/2021	1	GD	11:20	14:20	3	N/N/N	0/0/0	2/2/2	0/0/0	0/0/0
04/11/2021	2	GD	10:20	13:20	3	N/N/N	0/0/0	2/2/2	0/0/0	0/0/0

Date	VP	Surveyor	Start Time	Finish Time	VP Hours	Wind Direction	Rain	Visibility	Frost	Snow
04/11/2021	2	GD	13:50	16:50	3	N/N/N	0/0/0	2/2/2	0/0/0	0/0/0
08/11/2021	3	GD	07:45	10:45	3	N/N/N	0/0/0	2/2/2	0/0/0	0/0/0
08/11/2021	3	GD	11:15	14:15	3	N/N/N	0/0/0	2/2/2	0/0/0	0/0/0
15/12/2021	1	SM	08:50	11:50	3	SW/WSW/W	0/0/0	2/2/2	0/0/0	0/0/0
15/12/2021	1	SM	12:20	15:20	3	W/W/W	0/0/0	2/2/2	0/0/0	0/0/0
14/12/2021	2	SM	08:45	11:45	3	SW/SW/SW	0/0/0	2/2/2	0/0/0	0/0/0
14/12/2021	2	SM	12:15	15:15	3	SW/SW/SW	0/0/0	2/2/2	0/0/0	0/0/0
08/12/2021	3	GD	09:00	12:00	3	NE/NE/NE	0/2/0	2/2/2	0/0/0	0/0/0
08/12/2021	3	GD	12:30	15:30	3	N/N/NW	2/1/0	2/2/2	0/0/0	1/1/1
28/01/2022	1	GD	07:50	10:50	3	W/W/W	0/2/0	2/2/2	0/0/0	0/0/0
28/01/2022	1	GD	11:20	14:20	3	W/W/W	2/0/0	2/2/2	0/0/0	0/0/0
27/01/2022	2	GD	10:15	13:15	3	NW/NW/NW	0/3/0	2/2/2	0/0/0	0/0/0
27/01/2022	2	GD	13:45	16:45	3	W/W/W	0/0/0	2/2/2	0/0/0	0/0/0
10/01/2022	3	SM	09:30	12:30	3	SSE/SSE/SSE	0/0/0	2/2/2	0/0/0	0/0/0
10/01/2022	3	SM	13:00	16:00	3	SSE/S/S	0/0/0	2/2/2	0/0/0	0/0/0
17/02/2022	1	GD	10:30	13:30	3	W/W/W	2/0/1	2/2/2	0/0/0	1/1/1
17/02/2022	1	GD	14:00	17:00	3	W/W/W	2/0/0	2/2/2	0/1/1	1/1/1
25/02/2022	2	GD	09:10	12:10	3	W/W/W	0/0/0	2/2/2	0/0/0	1/1/1
25/02/2022	2	GD	12:40	15:40	3	W/W/W	0/0/0	2/2/2	0/0/0	1/1/1
24/02/2022	3	GD	11:15	14:15	3	W/W/W	0/0/3	2/2/2	0/0/0	1/1/1
11/03/2022	1	GD	06:50	09:50	3	SE/SE/SE	0/0/0	2/2/2	0/0/0	0/0/0
11/03/2022	1	GD	10:20	13:20	3	SE/SE/SE	0/0/0	2/2/2	0/0/0	0/0/0
04/03/2022	2	GD	06:45	09:45	3	NW/WNW/WNW	1/1/0	2/2/2	0/0/0	0/0/0
04/03/2022	2	GD	10:16	13:15	3	NW/NW/NW	0/0/0	2/2/2	0/0/0	0/0/0
24/03/2022	3	GD	05:40	08:40	3	S/S/SW	0/0/2	2/2/2	0/0/0	0/0/0
24/03/2022	3	VH	09:10	12:10	3	SW/S/S	0/0/0	2/2/2	0/0/0	0/0/0
27/05/2022	1	PC	17:30	20:30	3	NE/-/ENE	0/0/0	2/2/2	0/0/0	0/0/0

Date	VP	Surveyor	Start Time	Finish Time	VP Hours	Wind Direction	Rain	Visibility	Frost	Snow
27/04/2022	2	AJM	17:10	20:10	3	NE/NE/SW	0/0/0	2/2/2	0/0/0	0/0/0
28/04/2022	3	AJM	05:50	08:50	3	S/S/S	0/0/0	2/2/2	0/0/0	0/0/0
28/04/2022	3	AJM	09:20	12:20	3	S/S/S	0/0/0	2/2/2	0/0/0	0/0/0
24/05/2022	1	SM	07:55	10:55	3	NNW/NW/NW	0/0/0	2/2/2	0/0/0	0/0/0
24/05/2022	1	SM	11:25	14:25	3	NNW/NNW/NW	0/0/0	2/2/2	0/0/0	0/0/0
23/05/2022	2	SM	11:35	14:35	3	NNE/NE/NE	3/0/2	2/2/2	0/0/0	0/0/0
23/05/2022	2	SM	15:05	18:05	3	NNE/N/NNW	1/1/0	1/1/2	0/0/0	0/0/0
02/06/2022	3	DB	13:40	16:40	3	NE/NE/NE	0/0/0	2/2/2	0/0/0	0/0/0
02/06/2022	3	DB	17:10	20:10	3	NE/NE/NE	0/0/0	2/2/2	0/0/0	0/0/0
03/06/2022	1	DB	06:00	09:00	3	NE/NE/NE	0/0/0	2/2/2	0/0/0	0/0/0
03/06/2022	1	DB	09:30	12:30	3	NE/NE/NE	0/0/0	2/2/2	0/0/0	0/0/0
14/06/2022	1	PC	14:00	16:00	2	SW/SW	1/1	2/2	0/0	0/0
14/06/2022	1	PC	16:30	18:30	2	SW/SW	0/0	2/2	0/0	0/0
15/06/2022	1	PC	08:45	10:45	2	SW/S	0/0	2/2	0/0	0/0
03/06/2022	2	GD	06:00	09:00	3	NE/NE/NE	0/0/0	2/2/2	0/0/0	0/0/0
03/06/2022	2	GD	09:30	12:30	3	NE/NE/NE	0/0/0	2/2/2	0/0/0	0/0/0
14/06/2022	2	LC	13:45	15:45	2	SW/SW	1/2	2/2	0/0	0/0
14/06/2022	2	LC	16:15	18:15	2	SW/SW	0/0	2/2	0/0	0/0
15/06/2022	2	LC	08:30	10:30	2	SE/SE	0/0	2/2	0/0	0/0
15/06/2022	3	LC	11:15	14:15	3	SW/SW/SW	0/0/0	2/2/2	0/0/0	0/0/0
15/06/2022	3	LC	14:45	17:45	3	SW/SW/SW	0/0/0	2/2/2	0/0/0	0/0/0
16/06/2022	3	LC	04:50	07:50	3	SW/SW/SW	0/0/0	2/2/2	0/0/0	0/0/0
16/06/2022	3	LC	08:20	11:20	3	SW/SW/SW	0/0/0	2/2/2	0/0/0	0/0/0
05/07/2022	1	DB	15:15	18:15	3	W/W/W	0/0/0	2/2/2	0/0/0	0/0/0
05/07/2022	1	DB	18:45	21:45	3	W/W/W	0/0/0	2/2/2	0/0/0	0/0/0
07/07/2022	1	DB	07:00	10:00	3	SW/SW/SW	0/0/0	2/2/2	0/0/0	0/0/0
05/07/2022	2	GD	15:30	18:30	3	W/W/W	0/0/0	2/2/2	0/0/0	0/0/0

Date	VP	Surveyor	Start Time	Finish Time	VP Hours	Wind Direction	Rain	Visibility	Frost	Snow
05/07/2022	2	GD	19:00	22:00	3	W/W/W	0/0/0	2/2/2	0/0/0	0/0/0
07/07/2022	2	GD	06:50	09:50	3	NW/NW/NW	0/0/0	2/2/2	0/0/0	0/0/0
06/07/2022	3	DB	10:00	13:00	3	SW/W/W	1/0/1	2/2/2	0/0/0	0/0/0
06/07/2022	3	DB	13:30	16:30	3	W/W/W	2/0/0	2/2/2	0/0/0	0/0/0
07/07/2022	3	DB	10:30	13:30	3	SW/SW/SW	0/0/0	2/2/2	0/0/0	0/0/0
10/08/2022	1	DB	08:30	11:30	3	WSW/SW/WSW	0/0/0	2/2/2	0/0/0	0/0/0
10/08/2022	1	DB	12:00	15:00	3	WSW/SW/S	0/0/0	2/2/2	0/0/0	0/0/0
10/08/2022	2	GD	08:30	11:30	3	WSW/WSW/WSW	0/0/0	2/2/2	0/0/0	0/0/0
10/08/2022	2	GD	12:00	15:00	3	WSW/SW/S	0/0/0	2/2/2	0/0/0	0/0/0
31/08/2022	3	MW	14:10	17:10	3	SE/SE/SE	0/0/0	2/2/2	0/0/0	0/0/0
31/08/2022	3	MW	17:40	20:40	3	SE/SE/SE	0/0/0	2/2/2	0/0/0	0/0/0
01/09/2022	1	MW	09:20	12:20	3	SE/S/S	0/0/0	2/2/2	0/0/0	0/0/0
01/09/2022	1	MW	12:50	15:50	3	S/S/S	0/0/0	2/2/2	0/0/0	0/0/0
01/09/2022	2	MW	16:20	19:20	3	SE/SE/-	0/0/0	2/2/2	0/0/0	0/0/0
02/09/2022	2	MW	06:35	09:35	3	/-/-/-	0/0/0	2/2/2	0/0/0	0/0/0
28/09/2022	3	CG	11:00	14:00	3	N/N/N	0/0/1	2/2/2	0/0/0	0/0/0
28/09/2022	3	CG	14:30	17:30	3	N/N/N	2/1/0	1/2/2	0/0/0	0/0/0
21/10/2022	1	DB	07:15	10:15	3	N/N/N	2/0/1	2/2/2	0/0/0	0/0/0
21/10/2022	1	DB	10:45	13:45	3	N/N/N	0/0/0	2/1/2	0/0/0	0/0/0
21/10/2022	2	GD	07:15	10:15	3	N/N/N	2/0/1	2/2/2	0/0/0	0/0/0
21/10/2022	2	GD	10:45	13:45	3	N/N/N	0/0/0	2/1/2	0/0/0	0/0/0
24/10/2022	3	SM	09:25	12:25	3	SSW/SW/WSW	0/0/0	2/2/2	0/0/0	0/0/0
24/10/2022	3	SM	12:55	15:55	3	SW/SSW/S	0/0/2	2/2/2	0/0/0	0/0/0
10/11/2022	1	DB	08:45	11:45	3	SW/SW/SW	0/0/0	2/2/2	0/0/0	0/0/0
10/11/2022	1	DB	12:15	15:15	3	SW/SW/SW	0/0/0	2/2/2	0/0/0	0/0/0
10/11/2022	2	GD	08:45	11:45	3	SSW/SW/SW	0/0/0	2/2/2	0/0/0	0/0/0
10/11/2022	2	GD	12:15	15:15	3	SW/SW/SW	0/0/0	2/2/2	0/0/0	0/0/0

Date	VP	Surveyor	Start Time	Finish Time	VP Hours	Wind Direction	Rain	Visibility	Frost	Snow
22/11/2022	3	MW	07:55	10:55	3	/-/-/-	0/0/0	2/2/2	0/0/0	0/0/0
22/11/2022	3	MW	11:25	14:25	3	/-/-/-	0/0/0	2/2/2	0/0/0	0/0/0
14/12/2022	1	DB	10:15	13:15	3	NW/NW/NW	0/3/2	2/2/1	2/2/2	1/1/1
19/12/2022	1	MW	12:30	15:30	3	WNW/W/W	0/0/0	2/2/2	0/0/0	1/1/1
14/12/2022	2	GD	10:15	13:15	3	NW/NW/NW	0/2/2	2/1/2	2/2/2	1/1/1
19/12/2022	2	MW	09:00	12:00	3	NW/NW/NW	0/2/0	2/2/2	0/0/0	1/1/1
16/12/2022	3	MW	09:20	12:20	3	/-/-/-	0/0/0	2/2/2	2/2/2	1/1/1
16/12/2022	3	MW	12:50	15:50	3	/-/-/-	0/0/0	2/2/2	2/2/2	1/1/1
10/01/2023	1	DB	08:30	11:30	3	SSE/SE/SSE	0/0/0	2/2/2	0/0/0	0/0/0
10/01/2023	1	DB	12:00	15:00	3	SE/SE/SSE	3/3/4	2/2/1	0/0/0	0/0/0
10/01/2023	2	GD	08:30	11:30	3	SSE/SSE/SSE	0/0/0	2/2/2	0/0/0	0/0/0
10/01/2023	2	GD	12:00	15:00	3	SSE/SSE/SSE	3/2/4	2/2/1	0/0/0	0/0/0
19/01/2023	3	MW	08:30	11:30	3	W/W/W	2/2/0	2/2/2	0/0/0	1/1/1
19/01/2023	3	MW	12:00	15:00	3	W/W/W	0/0/0	2/2/2	0/0/0	1/1/1
02/02/2023	1	PC	10:05	13:05	3	WSW/WSW/WSW	1/2/0	2/2/2	0/0/0	0/0/0
02/02/2023	1	PC	13:35	16:35	3	WSW/WSW/WSW	0/0/0	2/2/2	0/0/0	0/0/0
02/02/2023	2	AJM	09:50	12:50	3	WSW/WSW/WSW	2/2/0	2/2/2	0/0/0	0/0/0
02/02/2023	2	AJM	13:20	16:20	3	WSW/WSW/WSW	0/0/0	2/2/2	0/0/0	0/0/0
15/02/2023	3	PC	08:00	11:00	3	WSW/WSW/WSW	0/0/0	2/2/2	0/0/0	0/0/0
15/02/2023	3	PC	11:30	14:30	3	WSW/WSW/WSW	0/0/0	2/2/2	0/0/0	0/0/0
08/03/2023	3	MW	07:50	10:50	3	/-/-/-	0/0/0	2/2/2	2/2/2	1/1/1
08/03/2023	3	MW	11:20	14:20	3	/-/-/-	0/0/0	2/2/2	2/2/2	1/1/1
14/03/2023	1	ML	11:35	14:35	3	NW/NW/WNW	0/0/0	2/2/2	0/0/0	1/1/1
14/03/2023	1	ML	15:05	18:05	3	WNW/WNW/WNW	0/2/0	2/2/2	0/0/0	1/1/1
14/03/2023	2	MW	11:30	14:30	3	NNE/NNE/NNE	0/0/0	2/2/2	0/0/0	1/1/1
14/03/2023	2	MW	15:00	18:00	3	NNE/NNE/NNE	0/2/0	2/2/2	0/0/0	1/1/1

Table A2.2: Annex 1 & Schedule 1 breeding raptor and owl survey effort Year 1 & Year 2

Date	Survey type	Surveyor	Start Time	Finish Time	Wind Speed	Rain	Visibility	Frost	Snow
27/04/2021	RAPTORS	PH	07:15	10:15	4/3/3	2/2/2	2/2/2	0/0/0	0/0/0
29/04/2021	RAPTORS	PH	11:30	17:30	3/3/3/3/4/4	2/0/2/0/0/2	2/2/2/2/2/2	0/0/0/0/0/0	0/0/0/0/0/0
14/05/2021	RAPTORS	AJM	07:30	13:30	2/2/2/3/3/3/	0/1/0/0/0/0	2/2/2/2/2/2	0/0/0/0/0/0	0/0/0/0/0/0
31/05/2021	RAPTORS	AJM	12:05	18:20	3/3/3/3/3/3	0/0/0/0/0/0	2/2/2/2/2/2	0/0/0/0/0/0	0/0/0/0/0/0
24/06/2021	RAPTORS	GD	12:45	15:45	2/2/3	1/0/0	2/2/2	0/0/0	0/0/0
01/07/2021	RAPTORS	GD	05:40	11:40	1/1/2/2/2/2	0/0/0/0/0/0	2/2/2/2/2/2	0/0/0/0/0/0	0/0/0/0/0/0
26/07/2021	RAPTORS	PC	14:00	20:00	3/3/3/2/2/2	0/0/0/0/0/0	2/2/2/2/2/2	0/0/0/0/0/0	0/0/0/0/0/0
28/07/2021	RAPTORS	PC & AR	05:20	07:20	2/2	8/8	0/0	0/0	0/0
29/07/2021	RAPTORS	SM	15:25	21:25	3/2/1/1/1/1	0/0/0/0/0/0	2/2/2/2/2/2	0/0/0/0/0/0	0/0/0/0/0/0
03/03/2022	RAPTORS	GD	09:00	15:00	3/4/4/4/4/4	2/0/0/0/0/0	2/2/2/2/2/2	0/0/0/0/0/0	0/0/0/0/0/0
28/04/2022	RAPTORS	PC	05:50	11:50	2/2/2/2/2/2	0/0/0/0/0/0	2/2/2/2/2/2	0/0/0/0/0/0	0/0/0/0/0/0
24/05/2022	RAPTORS	SM	14:25	17:25	3/2/2	0/0/0	2/2/2	0/0/0	0/0/0
02/06/2022	RAPTORS	GD	13:30	19:30	3/2/2/2/2/2	0/0/0/0/0/0	2/2/2/2/2/2	0/0/0/0/0/0	0/0/0/0/0/0
15/06/2022	RAPTORS	PC	11:15	17:15	3/3/3/3/3/3	2/0/0/0/0/0	2/2/2/2/2/2	0/0/0/0/0/0	0/0/0/0/0/0
16/06/2022	RAPTORS	PC	04:40	10:40	1/2/3/3/3/3	0/0/0/0/0/0	2/2/2/2/2/2	0/0/0/0/0/0	0/0/0/0/0/0
06/07/2022	RAPTORS	GD	10:30	16:30	5/5/5/5/5/5	0/0/0/0/2/0	2/2/2/2/2/2	0/0/0/0/0/0	0/0/0/0/0/0
07/07/2022	RAPTORS	GD	10:20	13:20	3/3/3	0/0/0	2/2/2	0/0/0	0/0/0

Table A2.3: Black grouse survey effort

Date	Survey type	Surveyor	Start Time	Finish Time	Wind Speed	Rain	Cloud Cover	Visibility	Frost	Snow
28/04/2021	BK	PH	04:30	07:30	2/2/2	2/0/0	6/5/5	2/2/2	0/0/0	2/2/2
30/04/2021	BK	PH	04:25	07:35	2/2/2/2	2/0/0/0	8/8/7/7	2/2/2/2	0/0/0/0	1/2/0/0
14/05/2021	BK	AJM	03:55	07:00	1/1/2	0/1/1	8/8/7	2/2/2	0/0/0	0/0/0

ANNEX 3 – VP FLIGHT ACTIVITY SURVEYS: TARGET SPECIES FLIGHTS

Tables A3.1 and **A3.2** presents details of target species flight lines recorded during VP surveys undertaken between September 2019 and August 2021.

The species, number of birds, total flight time (in seconds) and duration spent at each height band (HT) is presented. Note that the flights presented refer to all target species flights recorded, and not just those flights which are identified as being 'at collision risk' from the Development.

British Trust for Ornithology (BTO) codes[10] used are: ***GJ*** *– Greylag goose,* ***PG*** *– Pink-footed goose,* ***MS*** *– Mute swan* ***GP*** *– Golden plover,* ***L.*** *– Lapwing,* ***CU*** *– Curlew,* ***SN*** *– Snipe,* ***EA*** *– Golden eagle,* ***OP*** *– Osprey,* ***GI*** *– Goshawk,* ***HY*** *– Hobby, and* ***PE*** *– Peregrine.*

Table A3.1: Target species flight activity Year 1 & Year 2

Date	VP	Field Ref	F/P	Species	Min. no	Start Time	Duration	HT1	HT2	HT3	HT4	HT5
28/04/2021	1	1	F	OP	1	08:46	600	600	0	0	0	0
28/04/2021	1	1	F	OP	1	08:56	105	45	45	15	0	0
28/04/2021	1	1	F	OP	1	11:56	430	10	90	165	165	0
28/04/2021	1	2	F	OP	1	12:20	125	0	50	45	30	0
29/04/2021	2	2	F	OP	1	10:05	40	25	0	15	0	0
26/04/2021	2	1	F	OP	1	17:01	35	20	15	0	0	0
27/04/2021	3	2	F	CU	1	13:00	45	0	0	45	0	0
06/05/2021	1	1	F	OP	1	13:22	90	0	0	0	0	90
06/05/2021	1	2	F	OP	3	14:44	130	0	10	0	0	120
01/06/2021	2	1	F	OP	1	09:06	50	5	45	0	0	0
01/06/2021	1	2	F	OP	1	10:21	35	0	0	35	0	0
01/06/2021	1	3	F	OP	1	10:28	145	0	30	30	85	0
06/05/2021	2	1	F	OP	1	09:40	14	14	0	0	0	0
06/05/2021	2	2	F	PG	50	10:12	138	0	138	0	0	0
06/05/2021	2	3	F	OP	1	10:21	28	13	15	0	0	0

[10] 'BTO Species Codes' Available at: https://www.bto.org/sites/default/files/u16/downloads/forms_instructions/bto_bird_species_codes.pdf (Accessed 16/01/2025).

Date	VP	Field Ref	F/P	Species	Min. no	Start Time	Duration	HT1	HT2	HT3	HT4	HT5
06/05/2021	2	5	F	OP	1	11:20	14	14	0	0	0	0
06/05/2021	2	6	F	OP	1	11:31	70	30	40	0	0	0
06/05/2021	2	1	F	OP	1	12:14	525	0	270	255	0	0
06/05/2021	2	3	F	OP	1	12:51	114	0	114	0	0	0
06/05/2021	2	4	F	OP	1	12:57	13	13	0	0	0	0
06/05/2021	2	5	F	GI	1	13:17	226	30	196	0	0	0
06/05/2021	2	6	F	OP	1	13:28	8	8	0	0	0	0
06/05/2021	2	7	F	OP	1	13:34	234	0	144	90	0	0
06/05/2021	2	8	F	OP	1	13:39	46	16	30	0	0	0
01/06/2021	2	1	F	OP	1	07:26	155	0	90	65	0	0
24/06/2021	1	1	F	OP	1	10:31	75	15	45	15	0	0
24/06/2021	1	2	F	OP	2	10:59	420	0	300	60	15	45
30/06/2021	1	1	F	OP	1	17:32	60	0	30	30	0	0
24/06/2021	2	1	F	OP	1	10:53	209	134	75	0	0	0
24/06/2021	3	3	F	SN	1	14:17	60	0	0	60	0	0
01/07/2021	3	3	F	OP	1	09:50	90	0	0	90	0	0
01/07/2021	3	4	F	CU	1	10:07	60	0	0	60	0	0
26/07/2021	1	1	F	PE	1	15:43	10	10	0	0	0	0
26/07/2021	1	2	F	OP	1	16:59	60	0	0	15	15	30
26/07/2021	2	5	F	OP	1	15:55	74	14	30	30	0	0
26/07/2021	2	6	F	OP	1	16:13	27	27	0	0	0	0
26/07/2021	2	1	F	OP	1	17:23	289	19	15	165	90	0
26/07/2021	2	2	F	OP	1	17:27	38	8	30	0	0	0
26/07/2021	2	3	F	OP	1	17:40	48	33	15	0	0	0
26/07/2021	2	4	F	OP	1	18:10	120	75	45	0	0	0
26/07/2021	2	5	F	OP	1	18:12	58	43	15	0	0	0
26/07/2021	2	6	F	OP	1	19:01	135	45	30	60	0	0

Date	VP	Field Ref	F/P	Species	Min. no	Start Time	Duration	HT1	HT2	HT3	HT4	HT5
26/07/2021	2	7	F	OP	1	19:07	93	33	60	0	0	0
26/07/2021	2	8	F	OP	1	19:38	210	75	60	75	0	0
29/07/2021	3	1	F	GI	1	19:24	31	31	0	0	0	0
05/08/2021	1	1	F	OP	2	19:42	119	105	14	0	0	0
12/08/2021	1	1	F	OP	1	10:24	159	9	150	0	0	0
12/08/2021	1	1	F	OP	1	16:04	197	2	195	0	0	0
01/09/2021	1	1	F	GI	1	09:56	83	38	45	0	0	0
01/09/2021	1	1	F	GI	1	13:42	74	14	30	30	0	0
07/10/2021	1	1	F	GI	1	12:04	171	0	0	171	0	0
07/10/2021	1	2	F	PG	73	13:17	184	0	0	135	49	0
05/11/2021	1	1	F	PG	650	08:12	154	0	0	154	0	0
05/11/2021	1	2	F	GJ	29	08:57	139	0	0	139	0	0
05/11/2021	1	3	F	GJ	14	10:14	126	0	0	126	0	0
04/11/2021	2	1	F	PG	65	11:27	92	0	0	92	0	0
04/11/2021	2	2	F	PG	100	11:47	89	0	0	89	0	0
04/11/2021	2	3	F	PG	140	11:50	123	0	0	0	0	123
04/11/2021	2	4	F	PG	90	11:52	98	0	0	0	0	98
15/12/2021	1	1	F	GI	1	09:09	47	0	30	17	0	0
15/12/2021	1	5	F	GI	1	11:54	281	0	0	150	60	71
08/12/2021	3	1	F	PG	85	09:52	124	0	0	124	0	0
28/01/2022	1	1	F	PG	45	08:41	205	0	0	0	90	115
28/01/2022	1	1	F	GI	1	13:21	155	0	65	90	0	0
25/02/2022	2	1	F	GI	1	14:45	45	15	30	0	0	0
11/03/2022	1	1	F	GI	1	09:24	140	30	110	0	0	0
11/03/2022	1	1	F	GI	1	12:09	95	0	15	90	0	0
04/03/2022	2	1	F	PG	110	07:38	75	0	0	75	0	0
04/03/2022	2	2	F	PG	350	07:56	105	0	0	105	0	0

Date	VP	Field Ref	F/P	Species	Min. no	Start Time	Duration	HT1	HT2	HT3	HT4	HT5
04/03/2022	2	3	F	PG	60	07:58	70	0	0	70	0	0
04/03/2022	2	1	F	PG	125	10:34	0	0	125	0	0	0
24/03/2022	3	1	F	GI	1	05:40	18	18	0	0	0	0
24/03/2022	3	2	F	PG	74	06:14	87	0	0	45	30	12
24/03/2022	3	3	F	PG	76	06:20	88	0	0	45	15	28
24/03/2022	3	4	F	PG	67	06:24	92	0	0	90	0	2
24/03/2022	3	5	F	PG	3	06:30	75	0	0	45	30	0
24/03/2022	3	6	F	PG	120	06:32	105	0	0	0	30	75
24/03/2022	3	7	F	PG	62	06:34	153	0	0	0	30	123
24/03/2022	3	8	F	PG	58	06:37	79	0	0	30	15	34
24/03/2022	3	9	F	PG	4	07:43	24	0	0	0	0	24
24/03/2022	3	10	F	PG	12	08:15	70	0	0	0	15	55
24/03/2022	3	11	F	PG	27	08:18	82	0	15	45	22	0
24/03/2022	3	12	F	PG	20	08:34	80	0	0	15	45	20
24/03/2022	3	1	F	PG.	19	09:12	80	0	0	30	50	0
24/03/2022	3	2	F	PG.	115	09:16	147	0	0	105	12	30
24/03/2022	3	3	F	PG.	550	09:31	183	0	0	0	0	183
24/03/2022	3	4	F	PG.	75	09:31	215	0	0	50	15	150
24/03/2022	3	5	F	PG.	94	10:05	198	0	0	0	0	198
24/03/2022	3	6	F	PG.	6	10:28	113	0	0	0	0	113
24/03/2022	3	7	F	L.	2	11:14	134	0	15	89	30	0
27/04/2022	1	1	F	OP	1	16:50	50	5	45	0	0	0
27/04/2022	2	1	F	OP	1	14:13	40	0	30	10	0	0
27/04/2022	2	2	F	OP	1	14:14	40	0	40	0	0	0
27/04/2022	2	3	F	OP	2	14:23	85	10	15	60	0	0
27/04/2022	2	4	F	OP	1	14:26	70	0	0	70	0	0
27/04/2022	2	5	F	OP	2	15:01	205	40	60	105	0	0

Date	VP	Field Ref	F/P	Species	Min. no	Start Time	Duration	HT1	HT2	HT3	HT4	HT5
27/04/2022	2	6	F	GI	1	15:03	25	25	0	0	0	0
27/04/2022	2	7	F	OP	1	15:37	120	60	30	30	0	0
27/04/2022	2	8	F	OP	1	15:42	65	5	60	0	0	0
27/04/2022	2	9	F	OP	1	15:48	50	15	30	5	0	0
27/04/2022	2	10	F	OP	1	15:56	130	45	55	30	0	0
27/04/2022	2	1	F	OP	1	17:16	50	35	15	0	0	0
27/04/2022	2	2	F	OP	1	17:27	40	15	15	10	0	0
27/04/2022	2	3	F	OP	1	17:42	105	0	0	105	0	0
27/04/2022	2	4	F	OP	1	17:43	115	0	30	85	0	0
27/04/2022	2	5	F	OP	1	17:58	210	15	0	195	0	0
27/04/2022	2	6	F	OP	1	18:32	40	0	30	10	0	0
27/04/2022	2	7	F	OP	1	18:45	35	5	15	15	0	0
28/04/2022	3	1	F	OP	1	07:15	50	0	0	50	0	0
28/04/2022	3	2	F	OP	1	07:18	85	0	0	85	0	0
24/04/2022	1	1	F	OP	1	13:03	297	0	0	180	117	0
23/05/2022	2	3	F	MS	2	12:17	106	0	0	106	0	0
23/05/2022	2	4	F	OP	1	12:51	50	5	45	0	0	0
23/05/2022	2	5	F	OP	1	14:08	39	39	0	0	0	0
03/06/2022	1	1	F	OP	1	09:53	419	0	74	135	210	0
03/06/2022	1	2	F	GI	1	10:21	197	0	60	137	0	0
03/06/2022	1	3	F	OP	1	11:24	156	0	15	141	0	0
14/06/2022	1	1	F	OP	1	18:01	25	10	15	0	0	0
14/06/2022	1	2	F	OP	1	18:06	35	5	30	0	0	0
14/06/2022	1	3	F	OP	1	18:07	60	0	60	0	0	0
14/06/2022	1	4	F	OP	2	18:08	40	0	30	10	0	0
15/06/2022	1	1	F	GI	1	08:59	185	50	60	75	0	0
15/06/2022	1	1	F	OP	1	10:16	390	30	30	330	0	0

Date	VP	Field Ref	F/P	Species	Min. no	Start Time	Duration	HT1	HT2	HT3	HT4	HT5
03/06/2022	2	1	F	OP	1	07:28	462	15	60	345	42	0
15/06/2022	2	1	F	OP	4	09:00	180	0	90	30	60	0
16/06/2022	3	1	F	OP	1	08:35	30	0	0	0	15	15
05/07/2022	1	1	F	OP	1	16:54	58	0	43	15	0	0
05/07/2022	1	1	F	OP	1	18:55	253	0	0	28	180	45
05/07/2022	1	2	F	OP	1	19:00	41	0	15	26	0	0
05/07/2022	1	3	F	OP	2	19:01	21	0	6	15	0	0
05/07/2022	1	4	F	OP	1	19:04	9	9	0	0	0	0
05/07/2022	1	5	F	OP	1	19:16	109	0	15	90	4	0
05/07/2022	1	6	F	OP	1	19:17	64	4	30	30	0	0
05/07/2022	2	1	F	OP	1	15:43	230	5	15	210	0	0
05/07/2022	2	1	F	OP	1	19:45	146	26	45	75	0	0
05/07/2022	2	2	F	OP	1	20:04	110	5	75	30	0	0
05/07/2022	2	3	F	OP	1	20:04	110	20	60	30	0	0
05/07/2022	2	4	F	OP	2	20:07	230	0	45	185	0	0
05/07/2022	2	5	F	OP	2	20:22	115	10	105	0	0	0
05/07/2022	2	6	F	OP	2	20:24	285	15	30	240	0	0
05/07/2022	2	7	F	OP	2	20:57	140	35	105	0	0	0
05/07/2022	2	8	F	OP	2	21:09	155	15	45	95	0	0
10/08/2022	1	1	F	OP	1	11:15	358	30	120	75	133	0
10/08/2022	1	1	F	OP	1	12:07	53	0	53	0	0	0
10/08/2022	2	1	F	OP	1	10:22	665	0	0	270	240	155
10/08/2022	2	2	F	OP	1	10:22	430	30	130	270	0	0
10/08/2022	2	3	F	OP	1	10:22	690	0	0	120	240	330
10/08/2022	2	1	F	HY	1	13:09	95	0	75	20	0	0
10/08/2022	2	2	F	OP	1	13:27	105	0	0	60	45	0
01/09/2022	1	1	F	GI	1	13:24	643	0	88	210	165	180

Date	VP	Field Ref	F/P	Species	Min. no	Start Time	Duration	HT1	HT2	HT3	HT4	HT5
28/09/2022	3	1	F	PG	264	11:55	194	0	0	0	194	0
28/09/2022	3	2	F	PG	138	12:03	176	0	0	0	176	0
28/09/2022	3	3	F	PG	409	12:09	189	0	0	0	0	189
28/09/2022	3	4	F	PG	166	12:11	182	0	0	0	182	0
28/09/2022	3	5	F	PG	151	13:48	163	0	0	0	163	0
28/09/2022	3	6	F	PG	209	13:54	146	0	0	0	0	146
24/10/2022	3	1	F	PG	210	10:02	114	0	0	0	0	114
24/10/2022	3	2	F	PG	87	10:38	104	0	0	0	0	104
24/10/2022	3	3	F	GP	65	10:59	187	22	30	135	0	0
10/11/2022	1	1	F	PG	694	09:29	378	0	0	378	0	0
10/11/2022	1	2	F	PG	127	11:08	64	0	15	30	19	0
10/11/2022	2	2	F	PG	45	09:20	260	0	260	0	0	0
10/11/2022	2	3	F	PG	130	09:25	230	0	0	230	0	0
10/11/2022	2	4	F	PG	26	09:31	200	0	200	0	0	0
10/11/2022	2	5	F	PG	240	09:33	220	0	0	220	0	0
10/11/2022	2	6	F	PG	9	10:24	170	0	0	170	0	0
22/11/2022	3	1	F	PG	660	08:21	128	0	0	0	128	0
22/11/2022	3	2	F	PG	28	08:26	136	0	0	0	136	0
22/11/2022	3	3	F	PG	33	08:28	120	0	0	0	120	0
22/11/2022	3	4	F	PG	90	08:45	97	0	0	0	97	0
22/11/2022	3	5	F	PG	87	08:52	122	0	0	0	122	0
22/11/2022	3	6	F	PG	108	09:13	129	0	0	0	129	0
22/11/2022	3	7	F	PG	53	09:18	133	0	0	0	133	0
22/11/2022	3	8	F	PG	81	09:48	111	0	0	0	111	0
22/11/2022	3	9	F	PG	34	09:51	117	0	0	0	117	0
22/11/2022	3	10	F	PG	140	09:55	125	0	0	0	125	0
22/11/2022	3	11	F	PG	106	10:02	89	0	0	0	89	0

Date	VP	Field Ref	F/P	Species	Min. no	Start Time	Duration	HT1	HT2	HT3	HT4	HT5
22/11/2022	3	12	F	PG	96	10:20	121	0	0	0	121	0
19/12/2022	2	1	F	GI	1	10:16	23	23	0	0	0	0
16/12/2022	3	1	F	PG	32	11:02	69	0	0	0	69	0
08/03/2023	3	1	F	PG	26	09:21	55	0	0	55	0	0
08/03/2023	3	1	F	GI	1	12:53	41	0	41	0	0	0
14/03/2023	1	1	F	GI	1	13:38	245	0	0	35	180	30
14/03/2023	1	1	F	GI	1	16:03	70	25	45	0	0	0
14/03/2023	1	2	F	GI	1	16:04	40	10	30	0	0	0
14/03/2023	2	1	F	GI	2	13:17	52	7	30	15	0	0