

Chleansaid Wind Farm 132 kV OHL Connection Environmental Appraisal (EA) Report

Appendix 8.1: Ornithology Technical Appendix

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LIST OF ABBREVIATIONS

BoCC	Birds of Conservation Concern
BTO	British Trust for Ornithology
CIEEM	Chartered Institute of Ecology and Environmental Management
CRA	Collison Risk Area
EU	European Union
FLS	Forestry and Land Scotland
HRSG	Highland Raptor Study Group
LNCS	Local Nature Conservation Site
LNR	Local Nature Reserve
LoD	Limit of Deviation
MBBS	Moorland Breeding Bird Survey
OA	Ornithological Assessment
OHL	Overhead Line
РСН	Potential Collision Height
PRC	Potential Risk of Collision
RSPB	Royal Society for the Protection of Birds
SBBS	Scarce Breeding Bird Survey
SBL	Scottish Biodiversity List
SNH	Scottish Natural Heritage (now NatureScot)
SPA	Special Protection Area
SPI	Standardised Preference Index
SSEN	Scottish and Southern Electricity Networks Transmission
SSSI	Site of Special Scientific Interest
THC	The Highland Council
VP	Vantage Point



EXECUTIVE SUMMARY

An ornithology desk study and suite of ornithological surveys were undertaken to provide the baseline upon which to inform the Ornithological Assessment (OA) for the 132 kV overhead transmission line between Chleansaid Windfarm and the existing Dalchork Substation (hereafter referred to as the 'Proposed Development'). The site of the Proposed Development encompasses land required to accommodate the proposed OHL alignment and temporary access tracks and construction areas (the Site).

The desk study comprised a search for designated sites of nature conservation interest within a maximum distance of 20 km from the Site and ornithology data requests within a maximum distance of 6 km from the Site. A suite of ornithology surveys was undertaken from March 2023 to February 2024, comprising the following: flight activity surveys, moorland breeding bird surveys (MBBS), scarce breeding bird surveys (SBBS) and lekking black grouse surveys. Surveys were undertaken across an area encompassing a maximum of 2 km from the Proposed Route as identified during the route selection stage of the project (hereafter 'Survey Area'). All flights recorded during the flight activity surveys at between 0 m and 30 m height above ground level that crossed the proposed OHL alignment plus an additional 100 m buffer either side (termed the Collison Risk Area (CRA)), were determined to be at Potential Risk of Collision (PRC).

Target Species for the ornithology surveys were selected based on their conservation status, such as presence on Schedule 1 of the Wildlife and Countryside Act 1981, Annex I of the EU Birds Directive or due to their vulnerability to impacts from OHL developments.

The Site is situated across upland habitats comprising commercial forestry plantation, open moorland and degraded blanket bog and agricultural land. Two designated sites with ornithological interest features were identified within approximately 1.2 km of the Site, namely Lairg and Strath Brora Lochs Special Protection Area /Site of Special Scientific Interest. Five more designated sites were identified within 5 km of the Site.

A summary of the ornithology survey results is provided below:

- Flight activity surveys Eighty-five flights by 16 Target Species with 15 flights at PRC;
- Moorland breeding bird surveys 13 territories held by five Target Species;
- Scarce breeding bird surveys five breeding territories of three scarce breeding bird species were identified; and
- Lekking black grouse surveys no leks or observations of any kind.

1. INTRODUCTION

1.1 Background

- 1.1.1 WSP UK Ltd (WSP) was commissioned by Scottish Hydro Electric Transmission plc (the 'Applicant'), operating and known as Scottish and Southern Electricity Networks Transmission (hereafter referred to as 'SSEN Transmission') to compile baseline ornithology information for the proposed 132 kV overhead transmission line (hereafter referred to as the 'Proposed Development') between the proposed Chleansaid Wind Farm Substation and the existing Dalchork Substation. The site of the Proposed Development encompasses land required to accommodate the proposed OHL alignment and temporary access tracks and construction areas (the Site).
- 1.1.2 This Ornithology Baseline Report (this 'Report') details the breeding locations of specially protected birds (listed under Schedule 1 of the Wildlife and Countryside Act 1981) that are potentially vulnerable to persecution. As a result, detailed locational information on such species is included in a Confidential Annex (Annex C). This information should not be released into the public domain, with distribution restricted to the minimal number of persons/ bodies required to administer and assess the consent application.

1.2 Scope of Report

- 1.2.1 A desk study and ornithology surveys (the 'Ornithology Study') were undertaken across an area encompassing the Proposed Route for the Proposed Development plus appropriate survey/ search buffers, extending to a maximum of 6 km from the Proposed Route. See Chapter 2: Route Selection and Alternatives for full details on the optioneering process, The proposed OHL alignment in relation to the ornithology survey areas is shown in Annex B Figure 8.1.1.
- 1.2.2 This Report provides details of the methods and results of the Ornithology Study conducted to inform the Ornithological Assessment (OA) for the Proposed Development. The Report concentrates on Target Species recorded in and around the Site which fall into at least one of the following categories:
 - birds listed on Annex I of the EU Birds Directive (Annex I)¹;
 - birds listed on Schedule 1of the Wildlife and Countryside Act 1981 (as amended) (Sch1)²;
 - species that are qualifying features of international or European designated sites of nature conservation importance for birds (i.e. Special Protection Areas (SPAs) and Wetlands of International Importance (Ramsar Sites)) in proximity or potentially connected to the Site;
 - species listed on the Scottish Biodiversity List (SBL)³;
 - red-listed Birds of Conservation Concern (BoCC) (Stanbury et al., 2021)⁴; and
 - bird species selected for action under the Highland Nature Biodiversity Action Plan 2021-2026⁵.
- 1.2.3 Other species which are typically recognised as being potentially vulnerable to the effects of OHL developments, but which do not fall under any of the above categories, such as greylag and pink-footed geese, were also considered as Target Species. Passerines, regardless of conservation status, were not considered in detail as they are not considered to be vulnerable to impacts from OHL developments⁶.

¹ Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (Codified version). Available online at : https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32009L0147 (Accessed March 2024).

 ² Schedule 1-listed species of the Wildlife and Countryside Act 1981. Available online at: http://www.legislation.gov.uk/ukpga/1981/69/schedule/1 (Accessed March2024).
 ³ NatureScot (2022). Scottish Biodiversity List. Available online at: https://www.nature.scot/scotlands-biodiversity/scottish-biodiversity-strategy-and-cop15/scottish-biodiversity-list (Accessed March 2024).

⁴ 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

⁵ Highland Environment Forum (undated). The Highland Nature Biodiversity Action Plan 2021-2026. Available online: https://www.highlandenvironmentforum.info/wpcontent/uploads/2022/01/Highland-Nature-Biodiversity-Action-Plan-2021-2026- compressed-.pdf. (Accessed March 2024).

⁶ SNH (2016). Assessment and mitigation of impacts of power lines and guyed meteorological masts on birds – Guidance (version 1).

1.2.4 The conservation status of all species recorded to inform this Report is provided in **Annex A**, together with scientific names. As a result, scientific names are not provided in the text.

2. METHODS

2.1 Desk Study

2.1.1 A review of existing data was undertaken as a desk-based exercise to identify ornithological records and designated sites within the Site and surrounding area to inform survey requirements and the ornithology baseline.

Designated Sites

2.1.2 Freely downloadable datasets were searched for information on statutory and non-statutory designated sites within a minimum of 2 km of the Proposed Route, in accordance with the Chartered Institute of Ecology and Environmental Management (CIEEM) guidelines for Preliminary Ecological Appraisal (CIEEM, 2017)⁷. This search was extended to 10 km for European sites⁸ and to 20 km for European sites designated for wintering geese (based on a maximum foraging range of 20 km for pink-footed and greylag geese)⁹. The search results were restricted to those designated sites with qualifying ornithological interests. Designated sites of interest and the appropriate search radii are as follows:

٠	Local Nature Conservation Sites (LNCs)	
٠	Local Nature Reserves (LNR)	
•	National Nature Reserves (NNR)	2 km
•	Sites of Special Scientific Interest (SSSI)	
•	Important Bird Area IBAs	
•	Special Protection Areas (SPAs)	- 10 km
•	Ramsar Sites	
•	Sites designated for overwintering geese (SPAs and Ramsar Sites)	20 km

2.1.3 Qualifying features of each site identified within the respective search radii were obtained from the NatureScot Site Link Portal (NatureScot, 2024)¹⁰. Where measurements are presented in the findings, these represent the distance of the designated area from the closest point of the Site.

Data Requests

- 2.1.4 To help inform the ornithological survey programme and the OA, a consultation exercise was undertaken to request recent historical records of Target Species (i.e. records from the past 10 years (2014-2023 inclusive)) within 2 km of the Proposed Route. Data were requested in August 2023. The search was extended to within 6 km for golden eagle and white-tailed eagle to encompass the core range for these wider ranging species. The following ornithological interest groups were consulted for any relevant data they may hold:
 - The Royal Society for the Protection of Birds (RSPB); and
 - Highland Raptor Study Group (HRSG).

Review of Existing Reports

2.1.5 A review of projects known to WSP / The Applicant was undertaken to gather publicly available information of relevance to the Proposed Development. Relevant projects were those that undertook ornithology surveys across

⁸ European sites are a network of sites across the European Union designated for rare and threatened species, and rare natural habitat types, protected in their own right originally under the Birds Directive 2009/147/EC and the Habitats Directive 92/43/EEC and subsequently under the UK Withdrawal from the European Union (Continuity) (Scotland) Act 2021.

⁷ CIEEM (2017) Guidelines for Preliminary Ecological Appraisal, 2nd edition. Chartered Institute of Ecology and Environmental Management, Winchester.

⁹ SNH (2016). Assessing Connectivity with Special Protection Areas (SPAs) – Guidance, Version 3. SNH, Battleby.

 $^{^{10}\,\}text{NatureScot}\,\text{(2024)}\,\text{Sitelink.}\,\text{Available online at: https://sitelink.nature.scot/home}\,\text{(Accessed March 2024)}.$

an area that overlapped with the Survey Area for the Proposed Development. Survey data gathered to inform assessments for the following projects were reviewed:

- Creag Riabhach Wind Farm Grid Connection¹¹;
- Chleansaid Wind Farm¹²;
- Lairg to Loch Buidhe Reinforcement¹³; and
- Strath Tirry Wind Farm¹⁴.

2.2 Ornithology Surveys

2.2.1 A suite of ornithology surveys was undertaken from March 2023 to February 2024 (inclusive) following methodologies recommended by NatureScot (formally Scottish Natural Heritage (SNH)) (SNH, 2017)¹⁵. Surveys were undertaken across the Proposed Route plus a maximum survey buffer of 500 m for MBBS, 1.5 km for black grouse surveys, and 2 km for SBBS. Three vantage point (VP) locations were established and used to survey flight activity within the Site. The surveys were coordinated and managed by WSP and undertaken by WSP surveyors. Survey areas described below are shown on **Annex B - Figure 8.1.1**.

Flight Activity Surveys

- 2.2.2 In order to collect flight activity data, surveys are conducted from VPs which offer as wide and as unrestricted a view as possible of the Site. Three VPs were identified to cover focal sections of the Site to achieve adequate coverage of the emerging Preferred Alignment for the OHL, as confirmed in March 2023. VPs were selected to target areas of the Site most likely to be utilised by Target Species. Based on information gathered during the desk study, Target Species identified as likely to be present on the Site and potentially at risk of collision included black-throated diver, golden eagle, black grouse, and hen harrier. VPs were designed principally for black-throated diver activity, with VPs 2 and 3 set up between three bodies of water, with an aim to capture diver flights between waterbodies during the breeding season. As other species favour upland moorland habitats the VPs were selected to focus on these areas of the Site. The susceptibility of particular bird species or individuals to collision with OHL infrastructure is a combination of morphology, visual acuity, age/ condition, and behaviour. EirGrid (2016)¹⁶ provides a detailed account of the factors influencing potential bird collision with OHL infrastructure.
- 2.2.3 The breeding season flight activity surveys took place between March and August 2023, and non-breeding season surveys began in September (when non-breeding season surveys would typically commence in accordance with SNH guidance¹⁵). The location of selected VP locations and their associated 2 km, 180° viewing arcs and viewsheds from 10 m above ground level are illustrated on Annex B Figure 8.1.2.
- 2.2.4 Survey effort was spread throughout the daytime period where daylight hours best represent temporal flight activity patterns. Surveys during the diver breeding season (May to August) included a greater proportion of survey effort either early or late in the day. Each survey was undertaken by a single observer in good conditions (i.e. visibility of at least 2 km). Weather and visibility conditions were recorded on an hourly basis including information on wind strength and direction, precipitation, and cloud cover.
- 2.2.5 All VP watches were limited to a maximum of three hours' duration by any single observer, with a minimum of half an hour's break between any two consecutive VP surveys. During each VP watch surveyors continuously scanned the airspace within the 2 km, 180° viewshed arc of the respective VP location using the naked eye as well

¹¹ Scottish and Southern Electricity Network, Creag Riabhach Windfarm Grid Connection EIA (2020) available at::

https://www.energyconsents.scot/ApplicationDetails.aspx?cr=ECU00002023&T=5

¹² RSK, Chleansaid Windfarm EIA (2022) Available at: https://chleansaid.rskgroup.eu/documents/

¹³ Scottish and Southern Electricity Network Lairg to Loch Buidhe EIA (2019), available at: https://www.energyconsents.scot/ApplicationDetails.aspx?cr=ECU00001763

¹⁴ REG Power Management, Methodology and Results for Ornithological Impact Assessment (2020) available at : https://strathtirrywindfarm.com/project/

¹⁵ Scottish Natural Heritage (2017). Recommended bird survey methods to inform impact assessment of onshore windfarms. SNH Guidance. SNH, Battleby.

 $^{^{16}}$ EirGrid (2016). EirGrid evidence based environmental studies study 5: Birds.

as binoculars to record any and all Target Species. Although a viewshed radius of 2 km was used to record Target Species, observations of birds located outside of this radius (e.g. individuals or flocks of large, easily detectable birds) were also recorded where possible to provide additional context.

- 2.2.6 Once a bird or flock was detected, it was observed until it had landed or flown out of sight. The paths of all observed flights (flight lines) were drawn directly onto 1:10,000 OS maps while the following associated flight data was also recorded:
 - flight start time;
 - species (where identification was uncertain, observations were identified to species group level at a minimum);
 - number of birds/ flock size;
 - flight duration;
 - bird(s) occupancy at one of four height bands relative to the height of the proposed OHL wires (0-10 m, 10-30 m, 30-50 m and >50 m) and the duration (in seconds) within each height band, including noting any time of change between height bands;
 - behaviour (including territorial or nesting behaviour); and
 - interaction with existing OHL (Creag Riabhach Wind Farm 132 kV OHL and 11 kV distribution OHL).
- 2.2.7 In addition to flights by Target Species, the presence and behaviour of any other notable species which may be potentially vulnerable to the effects of OHLs (so-called secondary species) was also recorded.
- 2.2.8 All flight activity survey data were entered into ArcView Geographic Information System (GIS) and a corresponding excel spreadsheet. For each flight, the proportion of the total flight time spent within the proposed OHL alignment plus 100 m buffer hereafter the referred to as the 'Collison Risk Area' (CRA) in the three height bands was estimated. This was achieved by measuring the length of the digitised flight line within the CRA in comparison to the total length of the flight and then assigning a proportion of the total duration of the flight in seconds to the CRA. Flights were deemed to be at potential risk of collision with the OHL if they passed over the CRA at heights of between 0-30 m (hereafter referred to as flights at 'Potential Risk of Collison' (PRC)). The height bands selected were precautionary based on the initial estimate of tower heights¹⁷.
- 2.2.9 Forty-eight hours of survey effort were completed at each VP in the breeding season March to August, with a minimum of 36 hours undertaken in the diver breeding season May to August. A total of 36 hours of survey effort were completed at each of the three VPs in the non-breeding season September to February. Table 2-1 and Table 2-2 present a summary of the flight activity survey effort undertaken, further details of which are provided in Annex D Table D-2.

VP	March 2023	April 2023	May 2023	June 2023	July 2023	August 2023	Total Effort
1	6	6	6	6	12	12	48
2	6	6	6	6	15	9	48
3	6	6	6	7	12	11	48
Effort	18	18	18	19	39	32	144

Table 2-1: Summary of the Breeding Season Flight Activity Survey Effort

 $^{^{17}}$ Pole heights for the Proposed Development range from approximately 9 to 14m

VP	September 2023	October 2023	November 2023	December 2023	January 2024	February 2024	Total Effort
1	6	6	6	6	6	6	36
2	6	6	6	6	6	6	36
3	6	6	6	6	6	6	36
Effort	18	18	18	18	18	18	108

Table 2-2: Summary of the Non- Breeding Season Flight Activity Survey Effort

Moorland Breeding Bird Survey

- 2.2.10 The Site plus a surrounding 500 m buffer was surveyed for moorland breeding birds between April and July 2023. The surveys followed a modified version of the Brown and Shepherd methodology (Brown and Shepherd, 1993)¹⁸ as summarised in Gilbert et al. (1998)¹⁹ and involved four rounds of surveys undertaken between mid-April and early July as recommended by SNH (2017)¹⁵. Surveys were targeted on areas of open moorland and lowland grassland/ agriculture with the methodology developed to target waders and waterbirds.
- 2.2.11 During each visit the surveyors covered the survey area on foot to within at least approximately 100 m of all relevant parts of the survey area. The behaviour of all birds seen or heard during the surveys was recorded using digital data capture software in the field using British Trust for Ornithology (BTO) coding. Survey visits were undertaken in good, clear weather conditions (wind less than Beaufort force 5). Annex D Table D-3 presents summarised details of the moorland breeding bird surveys undertaken.
- 2.2.12 All breeding bird survey records were entered into ArcView GIS software. These were then analysed in order to identify the minimum number of probable or confirmed breeding territories for all waders and wildfowl recorded. For wading birds, this was done following the methods of Brown and Shepherd (1993)¹⁸ whereby breeding territories were assigned on the basis of at least one registration of birds engaging in territorial behaviour including displaying, singing or alarm calling, distraction displays, territorial disputes or the detection of eggs, nests or young. Where possible, simultaneous registrations of birds displaying such behaviour were used to identify different territories. Where this was not possible, such registrations which were from the same survey visit and were within 500 m of each other (200 m for dunlin) were assumed to be associated with the same territory, while registrations beyond this distance from one another were considered to be from separate, neighbouring territories. For registrations from different survey visits, birds within 1 km of each other (500 m for dunlin) were assumed to be from the same territory.
- 2.2.13 Based on the territory analysis procedure detailed above, the estimated number of breeding territories held by Target Species was identified within the survey area. The location of each territory marks the estimated centre point of the territory.

Scarce Breeding Bird Survey

2.2.14 The Site plus a surrounding buffer of 2 km was surveyed for scarce breeding birds between April and July 2023. Scarce breeding birds were principally defined as those listed on Annex I of the EU Birds Directive or Schedule 1 of the Wildlife and Countryside Act 1981 (as amended), such as barn owl, greenshank, wood sandpiper, blackthroated diver, and golden eagle. Breeding diver surveys were undertaken across all suitable waterbodies within 1 km of the Site.

¹⁸ Brown, A.F. and Shepherd, K, B. (1993). A method for censusing upland breeding waders. Bird Study, 40:3 189-195.

¹⁹ Gilbert, G., Gibbons D.W., and Evans, J. (1998). Bird Monitoring Methods. RSPB, Sandy.

- 2.2.15 Survey protocols broadly followed the standard methodologies for assessing raptor populations set out by Hardey et al. (2013)²⁰, combined with wader and waterbird surveying methodologies set out by Gilbert et al (1998)¹⁹. The surveys involved at least four survey visits undertaken to determine presence, territory occupation and breeding success. Annex D Table D-4 presents summarised details of the scarce breeding bird surveys undertaken.
- 2.2.16 The surveys primarily comprised targeted VP watches over potentially suitable habitats and walkovers focussing effort in areas previously identified with concentrations of bird activity as well as other areas of suitable nesting and foraging habitat such as heather moorland, waterbodies, craggy rock faces, cliffs, and steep sided burns. The locations of recent historical nest sites provided by consultees were also inspected during the walkover surveys. The locations of any nest sites or nesting/ territorial activity by scarce breeding birds was recorded, as were any sightings and signs of activity (e.g. prey remains, faecal splashing, plucking posts and pellets). Observations or field signs were mapped using standard BTO symbols and activity codes.

Lekking Black Grouse Survey

- 2.2.17 The Site plus a surrounding buffer of 1.5 km was surveyed to determine the presence or likely absence of lekking black grouse. The survey protocol followed the methodology detailed in Gilbert et al. (1998)¹⁹. Two rounds of surveys were conducted between late March and mid-May 2023 and involved walkovers covering all areas of suitable habitat (e.g. areas of short grassland such as in-bye pastures or moorland particularly near young or sparse forest edges). Annex D Table D-5 presents summarised details of the lekking black grouse surveys undertaken.
- 2.2.18 Surveys were undertaken around sunrise up to approximately two hours after dawn in dry and calm conditions with good visibility. Surveyors sought to cover all areas of the survey area on foot to within 500 m in search of lekking male black grouse and any attending females. Any identified leks were observed from suitable vantage points to avoid disturbance and the number of males (not just displaying birds) and females seen in the lekking area were recorded on each visit. Birds located 200 m or more apart were considered to represent separate lek sites.

²⁰ Hardey et al. (2013). Raptors. A Field Guide for Surveys and Monitoring – Third Edition. The Stationery Office

3. **RESULTS**

3.1 Site Overview

3.1.1 The Site is situated to the east of Loch Shin, 3 km to the north of Lairg, Sutherland within the Local Authority of the Highland Council (THC). The site is bordered by the A836 to the west, commercial forestry land to the south-east and open moorland to the east. Surrounding the Site are large areas of coniferous woodland and commercial plantations, with open habitats (predominantly degraded blanket bog, lowland heathland, and upland heathland) adjacent. Forestry operations dominate the land use in and around the Site and outside of these areas the land is predominantly classified as agricultural land.

Desk Study

Designated Sites

- 3.1.2 Designated sites of ornithological interest identified within the appropriate search radii identified in Paragraph 2.1.2 are presented in **Table 3-1** below, alongside their qualifying interests.
- 3.1.3 Nine designated sites with ornithological qualifying features were located within 20 km of the Site. No designated sites overlapped the Site with the closest statutory site, Lairg and Strath Brora Lochs SAP/ SSSI, located approximately 1.2 km south of the Site. Additionally, the non-statutory Loch Shin and Nearby Lochs IBA, was located approximately 750 m west of the Site. The location of the designated sites are shown on **Figure 7.2.2** and **Figure 7.2.3** as appended **to Appendix 7-1 Habitats Technical Appendix.**

Site Name & Designation	Qualifying Features	Distance & Direction From Site
Lairg and Strath Brora Lochs SSSI	Designated sight for supporting breeding black- throated diver (unknown population).	Loch Beannach lies 1.2 km south of the Site, within the SBBS area.
Lairg and Strath Brora Lochs SPA	Designated sight for supporting breeding black- throated diver (unknown population).	Loch Beannach lies 1.2 km south of the Site, within the SBBS area.
Strath Carnaig and Strath Fleet Moors SSSI	Designated for supporting breeding hen harrier (12 pairs).	2 km southeast of the Site.
Strath Carnaig and Strath Fleet Moors SPA	Designated for supporting breeding hen harrier.	2 km southeast of the Site.
Loch Shin and Nearby Lochs IBA	 Designated for supporting the following resident or breeding species: Greylag goose – 100 breeding pairs; Black-throated diver – seven breeding pairs; Merlin – nine breeding pairs; and Scottish crossbill – Unknown population. Populations provided were those provided at citation in the mid 1990's. 	750 m west of the Site.
Caithness and Sutherland Peatlands SPA	Qualifies under Article 4.1 and Article 4.2 by regularly supporting Annex I and migratory species of European importance during the breeding season. Population estimates provided are derived from the most recent population estimates available following the third network review into the status of UK SPA ²¹ .	3.5 km west of the Site.

Table 3-1: Designated Sites

²¹ Joint Nature Conservation Committee (2016). The Status of UK SPAs in the 2000s: The Third Network Review. JNCC, Peterborough.

Site Name & Designation	Qualifying Features	Distance & Direction From Site	
	ARTICLE 4.1 OF DIRECTIVE 79/409/EEC		
	 Red-throated diver – 46 pairs; 		
	 Black-throated diver – 29 pairs; 		
	Hen harrier – 19 pairs;		
	• Golden eagle – 4 pairs;		
	Merlin – 11 pairs;		
	• Golden plover – 1,992 pairs;		
	Wood sandpiper-1 pair;		
	• Dunlin – 1,366 pairs; and		
	• Short-eared owl – 30 pairs.		
	ARTICLE 4.2 OF DIRECTIVE 79/409/EEC		
	Common scoter- 21 pairs;		
	• Greenshank – 653 pairs; and		
	• Wigeon – 43 pairs.		
Caithness and Sutherland Peatlands Ramsar Site	Designated for supporting blanket bog habitat and a similar suite of upland breeding birds to the Caithness and Sutherland Peatlands SPA. Populations provided were those provided at citation in the mid 1990's.	3.5 km west of the Site.	
	Species occurring at levels of national importance		
	during the breeding season:		
	Red-throated diver – 89 pairs;		
	 Black-throated diver – 25 pairs; 		
	• Wigeon – 43 pairs;		
	• Teal – 106 pairs;		
	Common scoter – 27 pairs;		
	Hen harrier – 14 pairs;		
	Golden eagle – 5 pairs;		
	• Merlin – 54 pairs;		
	• Golden plover – 1,064 pairs;		
	Curlew – 517 pairs;		
	Greenshank – 256 pairs		
	 Wood sandpiper – <5 pairs; 		
	Arctic skua – 39 pairs; and		
	• Short-eared owl – 30 pairs.		
Dornoch Firth and Loch Fleet Ramsar site	Qualifies under Ramsar Criterion 1 for containing a variety of wetland types:	18.3 km Southeast of the Site.	
	Estuarine alder woodland		
	Estuaries		
	Sand dunes		
	Qualifies under Ramsar Criterion 2 by supporting:		
	 Osprey - 5 pairs nesting within site and 14 pairs within feeding range of site (2.5% and 7% of GB population respectively) 		

Site Name & Designation	Qualifying Features	Distance & Direction From Site
	Qualifies under Ramsar Criterion 5 by supporting in excess of 20,00 waterbirds during the non-breeding season.	
	Qualifies under Ramsar Criterion 6 by supporting greater than 1% of the falling species during the non- breeding season:	
	 Greylag goose – 2823 individuals (3.2% of GB population); 	
	 Bar-tailed godwit – 884 individuals (2.3% of GB population); and 	
	• Wigeon – 11451 (2.6% of GB population).	
Dornoch Firth and Loch Fleet SPA	Qualifies Under Article 4.1 by regularly supporting populations of European importance of the following Annex 1 species:	18.3 km Southeast of the Site.
	Breeding season:	
	 Osprey – 5 pairs nesting within site and 14 pairs within feeding range of site (2.5% and 7% of GB population respectively). 	
	Non-breeding season:	
	 Bar-tailed godwit – 884 individuals (2.3% of GB population). 	
	Qualifies Under Article 4.2 by regularly supporting populations of European importance of the following migratory species during the non-breeding season:	
 Greylag goose – 2823 individuals (3.2% of GB population). 		
	Also qualifies under Article 4.2 by regularly supporting in excess of 20,000 individual waterbirds.	

Data Requests

Royal Society for the Protection of Birds (RSPB)

3.1.4 Records of confirmed breeding black-throated diver, namely nests, eggs and juveniles were recorded 1.2 km south of the Site on Loch Beannach every year between 2011 and 2021 (excluding 2012). Within the Site, there were records of probable breeding for greenshank and wood sandpiper, though none confirmed. There was one record of a singular white-tailed eagle in the north of the Site, though not displaying any breeding behaviour.

Highland Raptor Study Group

3.1.5 No records were returned.

Review of Existing Reports

Creag Riabhach Wind Farm Grid Connection EIA Report

3.1.6 Creag Riabhach OHL approximately follows the western side of the Site. Walkover bird surveys (upland breeding bird, breeding raptor, black grouse, and breeding diver surveys) were carried out across a survey area encompassing the western end of the Site between April and August 2019. Flight Activity Surveys were undertaken from eight VPs, the viewsheds of four of which overlapped with the Site. Six hours of watches were completed at each VP per month between May and September 2018 (inclusive) and March and April 2019 (inclusive). Key findings

of the aforementioned surveys were as follows (described in relation to the Site or Survey Area (Site plus 2 km) of the Proposed Development):

- Breeding raptor survey two possible hen harrier breeding territories within the Survey Area;
- Black grouse survey two black grouse leks within the Survey Area;
- **Breeding diver survey** both red and black-throated diver breeding, with one record of confirmed black-throated diver breeding on Loch Beannach and four red-throated diver flights within the Survey Area; and
- Flight activity surveys honey buzzard, greenshank, and greylag goose flights within the Survey Area. No divers were recorded.

Chleansaid Windfarm EIA Report

3.1.7 Between 2019 and 2021 (inclusive), MBBS, SBBS, Black Grouse, Breeding Diver and Flight Activity Surveys were undertaken at the proposed Chleansaid Windfarm, to the northeast of the Site. Two VP locations were used, with both viewsheds overlapping the Site. Survey effort took place between September 2019 and August 2021 (resulting in surveys over a full breeding season and a further partial breeding season, due to COVID19 restrictions). In total, 81 hours of survey effort were completed at each VP in Year 1 and 90 hours each in Year 2 (minimum six hours a month at each VP excluding April and May 2020 when zero hours were undertaken). The key findings of the aforementioned surveys are as follows:

Year 1 (2019-2020)

- **MBBS** at the northeastern end of the Survey Area eight target species held breeding territories: six snipe, four golden plover and one common sandpiper, curlew, dunlin, greenshank, lapwing, and teal territories were recorded.
- SBBS a golden eagle pair was recorded displaying at the northeastern edge of the Survey Area which was considered as evidence for possible breeding. Merlin were recorded in the same area but not confirmed to be breeding.
- Black Grouse Surveys no black grouse leks were recorded.
- Breeding Diver Surveys no breeding divers were recorded.
- Flight Activity Surveys the following ten target species were recorded within the Site: dunlin, golden eagle, goosander, greylag goose, greenshank, golden plover, hen harrier, merlin, snipe, and whooper swan. No divers were recorded.

Year 2 (2020-2021)

- MBBS within and adjacent to the Survey Area (to the north): 15 snipe; 11 golden plover; six lapwing; three common sandpiper and dunlin; two teal and curlew, and one wood sandpiper and oystercatcher territories were recorded.
- SBSS within and adjacent to the Survey Area (to the north), a golden eagle pair were recorded mating (confirming the area as a breeding territory). Merlin were also confirmed to be breeding due to the presence of a nest. Hen harrier, red kite, peregrine, white-tailed eagle, and short-eared owl were recorded as individual flights, not enough to confirm any breeding territories.
- **Black grouse surveys** no black grouse leks recorded. One incidental record of a male (non-lekking individual) in November 2020 and a female (considered a roaming bird) in June 2021.
- Breeding diver surveys no breeding divers recorded.
- Flight activity surveys Fifteen target species were recorded within and adjacent to the Survey Area (to the north): black-throated diver, curlew, dunlin, golden eagle, golden plover, greylag goose, hen harrier, lapwing, pink-footed goose, red kite, short-toed eagle, snipe, white-tailed eagle, whooper swan and wood sandpiper.

Lairg to Loch Buidhe Reinforcement EIA Report and Pre-Construction Monitoring

3.1.8 The Lairg to Loch Buidhe OHL overlaps with the southern end of the Site. Flight Activity Surveys and data obtained from the HRSG were used to inform the EIA. Flight activity surveys commenced in November 2014 and covered a 12-month period, finishing at the end of October 2015. Two of the nine VPs' viewshed overlapped with the Site. Pre-construction monitoring was undertaken in 2021 and 2022 with surveys for scarce breeding birds and lekking black grouse undertaken.

EIA Surveys

- Flight Activity Surveys (2014-2015) within the Site six target species were recorded. At the southern end of the Site single flights of goshawk, red kite and osprey were recorded. Multiple curlew flights as numerous lapwing and snipe flights were recorded directly south of the Site. No black-throated divers were recorded.
- HRSG Data obtained from the HRSG showed hen harrier breeding sites across moorland habitat within 5 km of the Site to the southeast of Dalchork Substation. Nest sites were recorded across multiple years from 2002 to 2012.

Pre-Construction Monitoring

- SBBS In 2021 and 2022 ornithological monitoring was carried out from Dalchork to Loch Buidhe. The only species recorded of relevance to the Site were two hen harrier breeding territories within 2 km of the southern end of the Site. One territory was recorded within 750 m of the Site. No territories were recorded in this area in 2022.
- Black grouse survey black grouse lekking surveys were undertaken in 2021 and 2022. Of relevance to the Site one lek, comprised of three males, was recorded approximately 1.3 km south of the southern end of the Site.

Strath Tirry Wind Farm

- 3.1.9 The Strath Tirry Wind Farm Site lies within centre of the Site. In 2013 and 2014 a suite of ornithological surveys was undertaken, comprising of flight activity surveys (November 2013- October 2014); winter walkover (November 2013, December 2013, and February 2014); black grouse (April to July 2014); breeding raptor (April to July 2014) and breeding bird surveys (April to June 2014). A total of 108 hours of survey effort were completed at each of the two VP locations, with both viewsheds overlapping with the Site.
- 3.1.10 In 2020, breeding and non-breeding season flight activity surveys were conducted alongside targeted blackthroated diver surveys. The breeding season surveys saw six observation hours at each VP from April to August, with 12 hours in June to complete the 36 hours needed during the diver breeding season. During the non-breeding season six hours of survey effort were undertaken at each VP per month. The targeted black-throated diver surveys comprised of three-hour watches of Loch Beannach (950 m south of the site) undertaken twice a month from May to August. These surveys recorded the presence and flights of black-throated divers. Furthermore, nesting diver surveys were undertaken on Lower Loch Shin, Loch Shin, Loch Beannach, the unnamed lochan north of Loch Beannach, Loch na Fuaralachd and Loch na Fuaralachd Beag. The presence or absence of divers was recorded from April to August.
- 3.1.11 The key findings from the above surveys are as follows:

2013-2014

- Flight activity surveys four target species were recorded across and adjacent to the northwestern section of the Site. Flights comprised, eight of greylag goose, nine of curlew, one snipe and one woodcock.
- Black grouse surveys no black grouse sightings or leks were recorded within the Site.
- **Breeding bird surveys** one common sandpiper territory was recorded within the central area of the Site, just east of the A836.

2020

- Breeding season flight activity surveys seven target species were recorded within the site. Two pink-footed goose, four greylag goose, one greenshank, two lapwing. one curlew and five snipe. No black-throated divers were recorded during the VP surveys.
- Non-breeding season flight activity surveys three target species were recorded within the site. Six hen harrier, three greylag goose and two lapwing flights were recorded within the Site.
- **Targeted black-throated diver surveys** five records of black-throated diver were recorded on Loch Beannach during diver VPs, but no breeding was confirmed. The breeding diver surveys yielded no divers in April, May, or July 2020. In June, a pair and adult individual were recorded on Little Loch Shin and in August five black-throated divers were recorded on Little Loch Shin.

3.2 Ornithology Surveys

Flight Activity Surveys

3.2.1 Survey results are provided for the 2023/24 breeding and non-breeding seasons with a full list of each recorded flight provided in **Annex D – Table D-5**.

Breeding Season

3.2.2 A total of 76 flights by 14 Target Species (including unidentified geese species) were recorded during the breeding season flight activity surveys. **Table 3-2** presents a summary of the flight activity survey results with full details provided in **Annex D – Table D-6**. Flights are shown on **Annex B – Figures 8.1.3a-c**.

Species	Total No. of Flights	Total Number of Birds	Cumulative Flight Duration (Seconds)	No. of Flights at PRC	No. of Birds at PRC	Cumulative Flight Duration at PRC (Seconds)
Black throated diver	2	2	25	2	2	7
Barnacle goose	1	57	40	0	0	0
Curlew	17	22	1114	1	1	3
Golden eagle	2	2	142	0	0	0
Greylag goose	12	169	569	6	12	29
Unidentified goose sp.	2	140	40	0	0	0
Golden plover	4	10	92	0	0	0
Red kite	8	8	850	2	2	26
Lapwing	9	12	250	0	0	0
Merlin	1	1	60	1	1	20
Oystercatcher	4	5	43	0	0	0
Pink-footed goose	2	253	60	0	0	0
Red Grouse	1	2	12	0	0	0
Snipe	8	11	256	2	5	12

Table 3-2: Summary of breeding season flight activity survey results

3.2.3 The most frequently recorded species were as follows:

• **Curlew** – the most frequently recorded species with 17 flights and 22 individuals recorded from March to August, with only one flight and one individual flying at PRC for a total of three seconds. Curlew flights were clustered to the west of the A836 and at the eastern extent of the Site.

- Greylag goose flights were recorded from March to August, comprising 169 individuals. These were
 predominantly continuous flights, ranging in flock sizes from two to 90 individuals. Six flights, comprised of 12
 individuals, were at PRC for a total of 29 seconds. The majority of flights were recorded around the western half
 of the Site.
- Lapwing were the third most common with nine flights and 12 individuals recorded between March and April. All of these flights were recorded at VP1 with none being at PRC.
- **Red kite** eight flights were recorded between March and June, all comprising one individual. All but one of the eight flights showed hunting behaviour, with just one being of a continuous flight. Two flights were flying at PRC for 25 seconds in total. All flights were across the western half of the Site.
- **Snipe** eight flights were recorded in June and August only. Two flights were at PRC, comprised of five individuals and totalling 12 seconds. The majority of flight were recorded from VP1.
- **Golden plover** four flights were recorded; two in April, one in June and one in August, none of which were at PRC In total, ten individuals were recorded. Three of four flights were recorded from VP1.
- **Oystercatcher** four flights were recorded, comprising of five individuals that landed to forage in the field adjacent to VP 1. Records were in March, May, and June only, with no flights being recorded at PRC.
- 3.2.4 The remaining seven Target Species were recorded infrequently with no more than two flights recorded. These were (flights were not at PRC unless stated):
 - Black-throated diver two flights of single birds, (April and July), totalling 7 seconds by both birds at PRC.
 - Golden eagle two continuous flights of a single juvenile bird, both on the 8th of August.
 - Geese (unidentified) two flights comprised of two flocks totalling 140 birds in April.
 - **Pink-footed goose** two flights of large flocks totalling 253 birds in April.
 - **Barnacle goose** a single barnacle goose flight by a flock of 57 birds was recorded to the northeast of the Site in April.
 - Merlin one flight in May of a single male flying for 20 seconds at PRC.
 - **Red grouse** one flight comprising a single individual.

Non-Breeding Season

3.2.5 A total of nine flights by five Target Species were recorded during the non-breeding season. **Table 3-3** presents a summary of the flight activity survey results with full details provided in **Annex D – Table D-6** Flights are shown on **Annex B – Figure 8.1.3d**.

Species	Total No. of Flights	Total Number of Birds	Cumulative Flight Duration (Seconds)	No. of Flights at PRC	No. of Birds at PRC	Cumulative Flight Duration at PRC (Seconds)
Greylag goose	1	12	180	0	0	0
Hen harrier	1	1	17	0	0	0
Red Kite	4	4	337	0	0	0
Snipe	1	2	12	0	0	0
White tailed eagle	2	2	299	1	1	10

Table 3-3: Summary of Non-Breeding Season Flight Activity Survey Results

3.2.6 **Red Kite** was the most frequently recorded species with four flights and four individuals recorded from September to February. Three out of four flights were recorded at the western end of the Site to the west of the A836. No flights were recorded at PRC.

- 3.2.7 White tailed eagle was the second most common bird recorded with two flights by individual birds recorded in October and February. One flight, at the western end of the Site, was recorded at PRC for a total of ten seconds.
- 3.2.8 One **Greylag goose** flight, comprising 12 individuals was recorded in October at VP3; the flight was not at PRC.
- 3.2.9 One **Snipe** flight of two birds was recorded in September to the west of the Site (not at PRC).
- 3.2.10 One Hen harrier flight was recorded in September to the southwest of the Site (not at PRC).

Moorland Breeding Bird Survey

3.2.11 Fourteen breeding territories held by five species were recorded during the MBBS. Curlew, lapwing, oystercatcher, red grouse, and snipe all held territories within the MBBS survey area, as summarised in **Table 3-4**. Breeding territories are shown in **Annex B – Figure 8.1.4**. No territories overlapped the Site with territories clustered in approximately four locations; east/north of the Dalnessie estate buildings, along the Feith Osdail valley, west of the A836 and south of Dalchork substation.

Table 3-4: Estimated Number of Breeding Territories

Species	Estimated No. of Breeding Territories
Snipe	6
Lapwing	3
Curlew	2
Red grouse	2
Oystercatcher	1

Scarce Breeding Bird Survey

3.2.12 Five scarce breeding bird territories were recorded, held by three species; greenshank²², wood sandpiper and barn owl. These territories are summarised in **Table 3-5** and shown in confidential **Annex B - Figure 8.1.5**.

Species	Estimated No. Of Breeding Territories
Greenshank	3
Wood sandpiper	1
Barn owl	1

The following non-breeding species (i.e. not associated with breeding sites in the Survey Area) were also recorded during the SBBS and MBBS:

- Red kite a pair circling together at the north-western edge of the site in March and a foraging bird to the southwest in April.
- Black-throated diver a single adult bird recorded on Loch Beannach in June.
- Golden eagle a single adult bird being mobbed by a buzzard approximately 1.5 km north of the Site in April.
- White-tailed eagle a single adult bird flying over the southern end of the Site in April.
- **Osprey** a single adult bird flying in the vicinity of Loch na Fuaralachd in June, approximately 1 km north of the Site.

²² Two greenshank territories were recorded during the MBBS surveys but are captured here due to enhanced legal protection under the WCA (Schedule 1).

• Whooper swan – flock of 62 flying north-west at the north-western edge of the Site in March.

Lekking Black Grouse Survey

3.2.13 The survey identified no black grouse leks or observations of any birds.

Annex A Species List, Conservation Status and Legal Protection

		Conservation Status and Legal Protection*					
Species	Scientific Name	Annex I	Sch1	SBL	BoCC Red Listed	Highland Nature Priority Species	
Barn owl	Tyto alba		\checkmark	\checkmark			
Barnacle goose	Branta Leucopsis			\checkmark			
Black grouse	Lyrurus tetrix	\checkmark		\checkmark	\checkmark	\checkmark	
Black-throated diver	Gavia arctica	\checkmark	\checkmark	\checkmark		\checkmark	
Common sandpiper	Actitis hypoleucos						
Curlew	Numenius arquata			\checkmark	\checkmark	\checkmark	
Golden eagle	Aquila chrysaetos	\checkmark	\checkmark	\checkmark		\checkmark	
Golden plover	Pluvialis apricaria	\checkmark		\checkmark		\checkmark	
Greenshank	Tringa nebularia		\checkmark			\checkmark	
Greylag goose ⁺	Anser anser						
Kestrel	Falco tinnunculus			\checkmark			
Lapwing	Vanellus vanellus			\checkmark	\checkmark	\checkmark	
Merlin	Falco columbarius	1	\checkmark	\checkmark	\checkmark	\checkmark	
Osprey	Pandion haliaetus	\checkmark	\checkmark	\checkmark		\checkmark	
Oystercatcher	Haematopus ostralegus					\checkmark	
Pink-footed goose ⁺	Anser brachyrhynchus						
Red grouse	Lagopus lagopus scotica			\checkmark			
Red kite	Milvus milvus	\checkmark	\checkmark	√			
Redshank	Tringa totanus					\checkmark	
Snipe	Gallinago gallinago					\checkmark	
Whimbrel	Numenius phaeopus		\checkmark		√		
White-tailed eagle	Haliaeetus albicilla	\checkmark	\checkmark	\checkmark		\checkmark	
Whooper swan	Cygnus cygnus	\checkmark	\checkmark	\checkmark			
Wood sandpiper	Tringa glareola	\checkmark	\checkmark	\checkmark		\checkmark	
Honey buzzard	Pernis apivorus	\checkmark	\checkmark	\checkmark			
Red-throated diver	Gavia stellata	\checkmark	\checkmark	\checkmark		\checkmark	

Table A-1: Species list, Conservation Status and Legal Protection

* - See paragraph 1.2.4 for definitions of conservation and legislative categories.

⁺- Geese species are widely regarded as potentially vulnerable to impacts from OHLs.

Annex B Ornithology Survey Figures

Figure 8.1.1: Ornithology Survey Areas Figure 8.1.2: Breeding Season Vantage Point Viewsheds Figure 8.1.3a: Breeding Season Flight Activity Survey Wader Results Figure 8.1.3b: Breeding Season flight Activity Survey Raptor and Grouse Results Figure 8.1.3c: Breeding Season Flight Activity Survey Water Bird Results Figure 8.1.3d: Non-Breeding Season Flight Activity Survey Water Bird Results Figure 8.1.4: Moorland Breeding Bird Survey Territories















Annex C Confidential Ornithology

Annex

Figure 8.1.5: Confidential Scarce Breeding Territories

Annex D Ornithology Survey Details

Table D-2: Flight Activity Survey Effort

Month	Date	VP	Start time	End time	Duration (hrs)
March	21.03.2023	2	11:50	14:50	03:00
March	22.03.2023	2	07:00	10:00	03:00
March	22.03.2023	3	15:55	18:55	03:00
March	23.03.2023	1	09:05	12:05	03:00
March	23.03.2023	3	12:15	15:15	03:00
March	23.03.2023	1	12:35	15:35	03:00
April	11.04.2023	1	15:30	18:30	03:00
April	11.04.2023	2	15:20	18:20	03:00
April	12.04.2023	1	10:20	13:20	03:00
April	12.04.2023	2	09:55	12:55	03:00
April	13.04.2023	3	07:15	10:15	03:00
April	13.04.2023	3	11:05	14:05	03:00
May	17.05.2023	2	12:00	15:00	03:00
May	18.05.2023	1	08:00	11:00	03:00
May	23.05.2023	3	18:00	21:00	03:00
May	24.05.2023	3	06:00	09:00	03:00
May	24.05.2023	2	18:00	21:00	03:00
May	25.05.2023	1	06:00	09:00	03:00
June	08.06.2023	2	14:30	17:30	03:00
June	09.06.2023	2	06:00	09:00	03:00
June	20.06.2023	3	16:00	17:00	01:00
June	21.06.2023	3	19:00	22:00	03:00
June	22.06.2023	3	06:00	09:00	03:00
June	22.06.2023	1	16:00	19:00	03:00
June	22.06.2023	1	19:00	22:00	03:00
July	11.07.2023	1	19:00	22:00	03:00
July	11.07.2023	2	19:00	22:00	03:00
July	12.07.2023	2	06:00	09:00	03:00
July	12.07.2023	3	06:00	09:00	03:00
July	12.07.2023	3	19:00	22:00	03:00
July	12.07.2023	2	19:00	22:00	03:00
July	13.07.2023	1	06:00	12:00	03:00
July	13.07.2023	2	06:00	09:00	03:00
July	13.07.2023	3	09:10	12:10	03:00
July	20.07.2023	3	06:05	09:05	03:00
July	20.07.2023	1	06:15	09:15	03:00
July	20.07.2023	2	09:45	12:45	03:00
August	08.08.2023	2	06:00	09:00	03:00
August	08.08.2023	2	09:30	12:30	03:00
August	08.08.2023	1	06:00	09:00	03:00

Month	Date	VP	Start time	End time	Duration (hrs)
August	08.08.2023	1	18:00	21:00	03:00
August	09.08.2023	3	06:00	09:00	03:00
August	09.08.2023	3	09:30	12:30	03:00
August	09.08.2023	1	06:00	09:00	03:00
August	09.08.2023	1	09:30	12:30	03:00
August	09.08.2023	2	18:45	21:45	03:00
August	09.08.2023	3	16:45	18:45	03:00
August	09.08.2023	3	18:45	21:45	03:00
September	18.09.2023	1	12:35	15:35	03:00
September	18.09.2023	1	16:05	19:05	03:00
September	18.09.2023	2	09:05	12:05	03:00
September	18.09.2023	2	06:35	09:35	03:00
September	19.09.2023	3	10:25	13:25	03:00
September	19.09.2023	3	13:55	16:55	03:00
October	06.10.2023	1	10:20	13:20	03:00
October	06.10.2023	1	13:50	16:50	03:00
October	18.10.2023	2	09:01	12:01	03:00
October	19.10.2023	2	12:24	15:24	03:00
October	18.10.2023	3	12:31	15:31	03:00
October	19.10.2023	3	08:54	11:54	03:00
November	01.11.2023	1	11:51	14:51	03:00
November	01.11.2023	1	08:27	11:27	03:00
November	01.11.2023	2	08:21	11:21	03:00
November	14.11.2023	2	12:02	15:02	03:00
November	02.11.2023	3	12:19	15:19	03:00
November	14.11.2023	3	08:32	11:32	03:00
December	11.12.2023	1	08:45	11:45	03:00
December	12.12.2023	1	11:20	14:20	03:00
December	10.12.2023	2	12:05	15:05	03:00
December	12.12.2023	2	07:50	10:50	03:00
December	10.12.2023	3	08:35	11:35	03:00
December	11.12.2023	3	12:20	15:20	03:00
January	08.01.2024	2	09:20	12:20	03:00
January	08.08.2024	3	12:50	15:50	03:00
January	13.08.2024	2	11:40	14:40	03:00
January	13.08.2024	3	08:10	11:10	03:00
January	29.08.2024	1	11:45	14:45	03:00
January	29.08.2024	1	08:15	11:15	03:00
February	27.08.2024	2	12:02	15:02	03:00
February	27.08.2024	3	08:32	11:32	03:00
February	28.08.2024	1	08:36	11:36	03:00
February	28.08.2024	3	12:06	15:06	03:00
February	29.08.2024	2	08:35	11:35	03:00

Month	Date	VP	Start time	End time	Duration (hrs)
February	29.08.2024	1	12:05	15:05	03:00

Table D-3: Moorland Breeding Bird Survey Effort

Month	Date	Start time	End time	Duration (hrs)
April	19.04.2023	06:30	10:00	03:30
April	18.04.2023	07:45	11:00	03:15
May	16.05.2023	07:00	08:30	01:30
May	16.05.2023	11:00	13:00	02:00
May	17.05.2023	08:40	11:40	03:00
May	18.05.2023	11:30	14:30	03:00
June	06.06.2023	08:15	12:30	04:15
June	07.06.2023	09:00	12:00	03:00
July	11.07.2023	10:30	14:30	04:00
July	12.07.2023	09:30	13:30	04:00

Table D-4: Scarce Breeding Bird Survey Effort

Month	Date	Start time	End time	Duration (hrs)
March	25.03.2023	09:00*	11:00	02:00
March	25.03.2023	09:00	11:00	02:00
April	13.04.2023	07:15	10:15	03:00
April	13.04.2023	07:15	10:15	03:00
April	13.04.2023	11:25	14:25	03:00
April	14.04.2023	08:20	11:20	03:00
April	14.04.2023	08:20	11:20	03:00
Мау	11.05.2023	08:00	13:10	05:10
May	11.05.2023	10:00	13:10	03:10
May	16.05.2023	13:00	14:30	01:30
June	06.06.2023	14:00	16:30	02:30
June	08.06.2023	08:50	11:00	02:10
June	08.06.2023	08:50	11:00	02:10

*Duplicate times are due to two surveyors at different areas on site simultaneously

Table D-5: Lekking Black Grouse Survey Effort

Month	Date	Start time	End time	Duration (hrs)
April	18.04.2023	04:39	07:15	02:36
April	18.04.2023	04:40	07:15	02:35
April	19.04.2023	04:50	07:20	02:30
April	20.04.2023	04:40	07:10	02:30
May	16.05.2023	03:50	07:00	02:50

Table D-6: Details of Flight Activity Survey Records

Month	Date	VP	Species	Observation Time	No. of Birds	Flight Duration (Secs)	Potential Risk of Collision (PRC) (Y/N)	Flight Duration at PRC (Secs)
March	23.03.2023	1	L.	09:18	3	40	N	0
March	23.03.2023	1	L.	13:08	2	15	N	0
March	23.03.2023	1	CU	13:53	1	12	Y	3
March	23.03.2023	1	CU	14:45	1	80	N	0
March	23.03.2023	1	OC	14:52	2	10	N	0
March	22.03.2023	2	GJ	07:56	2	30	N	0
March	22.03.2023	3	KT	16:23	1	15	N	0
March	22.03.2023	3	RG	16:31	2	12	N	0
March	23.03.2023	3	KT	13:35	1	85	N	0
March	23.03.2023	3	KT	13:58	1	145	Y	20
April	11.04.2023	1	L.	17:58	1	20	N	0
April	11.04.2023	1	BY	18:16	57	40	N	0
April	12.04.2023	1	L.	10:36	1	18	N	0
April	12.04.2023	1	L.	11:20	1	24	N	0
April	12.04.2023	1	GP	12:00	3	26	N	0
April	12.04.2023	1	GP	12:15	4	14	N	0
April	11.04.2023	2	GJ	18:12	90	110	N	0
April	13.04.2023	3	PG	07:16	63	30	N	0
April	13.04.2023	3	PG	07:20	190	30	N	0
April	13.04.2023	3	CU	07:29	2	60	N	0
April	13.04.2023	3	Goose sp.	07:44	100	20	N	0
April	13.04.2023	3	CU	07:45	1	50	N	0
April	13.04.2023	3	GJ	07:53	2	44	Y	4
April	13.04.2023	3	GJ	08:18	2	68	Y	4
April	13.04.2023	3	GJ	08:23	56	26	N	0
April	13.04.2023	3	Goose sp.	08:44	40	20	N	0
April	13.04.2023	3	BV	09:01	1	15	Y	5
April	13.04.2023	3	CU	11:15	2	5	N	0
Мау	18.05.2023	1	GJ	08:07	2	30	N	0
Мау	18.05.2023	1	L.	08:13	1	65	N	0
Мау	18.05.2023	1	OC	08:36	1	5	N	0
Мау	18.05.2023	1	OC	09:03	1	13	N	0
Мау	18.05.2023	1	L.	09:49	1	17	N	0
Мау	18.05.2023	1	L.	09:58	1	36	N	0
Мау	18.05.2023	1	CU	10:47	1	20	N	0
Мау	25.05.2023	1	L.	06:15	1	15	N	0
Мау	25.05.2023	1	CU	08:13	1	30	Ν	0
Мау	24.05.2023	2	ML	20:07	1	60	Y	20
Мау	23.05.2023	3	CU	18:02	1	10	Ν	0
May	23.05.2023	3	CU	18:18	1	10	Ν	0

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Month	Date	VP	Species	Observation Time	No. of Birds	Flight Duration (Secs)	Potential Risk of Collision (PRC) (Y/N)	Flight Duration at PRC (Secs)
May	23.05.2023	3	CU	18:22	2	30	N	0
May	23.05.2023	3	КТ	18:36	1	270	Y	6
Мау	23.05.2023	3	KT	18:38	1	120	Ν	0
Мау	23.05.2023	3	CU	18:59	1	30	N	0
Мау	23.05.2023	3	КТ	19:14	1	150	N	0
Мау	23.05.2023	3	CU	19:57	1	600	Ν	0
Мау	24.05.2023	3	GJ	06:42	2	120	N	0
Мау	24.05.2023	3	CU	07:16	1	90	N	0
June	22.06.2023	1	SN	16:28	1	40	Ν	0
June	22.06.2023	1	SN	18:56	1	20	Ν	0
June	22.06.2023	1	SN	20:25	1	15	Ν	0
June	22.06.2023	1	SN	20:43	1	25	Ν	0
June	22.06.2023	1	OC	20:53	1	15	Ν	0
June	22.06.2023	1	GP	21:03	2	10	Ν	0
June	21.06.2023	3	КТ	19:08	1	50	Ν	0
June	21.06.2023	3	CU	19:10	1	20	Ν	0
June	21.06.2023	3	КТ	20:47	1	15	N	0
June	22.06.2023	3	CU	06:06	3	15	N	0
June	22.06.2023	3	GJ	06:14	2	20	Y	5
June	22.06.2023	3	GJ	06:32	2	40	Y	5
June	22.06.2023	3	GJ	07:16	2	30	Y	8
June	22.06.2023	3	CU	07:30	1	22	Ν	0
June	22.06.2023	3	GJ	08:40	2	16	Y	3
July	13.07.2023	1	SN	07:11	4	24	Y	2
July	13.07.2023	1	SN	07:17	1	80	Y	10
July	13.07.2023	1	SN	10:56	1	42	Ν	0
July	12.07.2023	2	SN	20:13	1	10	Ν	0
July	12.07.2023	3	BV	06:17	1	10	Y	2
July	12.07.2023	3	CU	06:44	1	30	Ν	0
August	08.08.2023	1	EA	08:44	1	82	Ν	0
August	08.08.2023	1	EA	18:11	1	60	Ν	0
August	09.08.2023	3	GJ	06:48	5	35	Ν	0
August	09.08.2023	3	GP	06:51	1	42	Ν	0
September	18.09.2023	1	НН	16:31	1	17	Ν	0
September	19.09.2023	1	SN	13:13	2	12	N	0
October	06.10.2023	1	WE	13:18	1	283	Y	10
November	14.11.2023	1	КТ	09:02	1	146	N	0
December	10.12.2023	1	GJ	10:37	12	180	N	0
December	10.12.2023	2	КТ	11:08	1	104	N	0
December	11.12.2023	1	КТ	13:27	1	49	N	0
February	27.02.2023	1	WE	12:14	1	16	N	0

Month	Date	VP	Species	Observation Time	No. of Birds	Flight Duration (Secs)	Potential Risk of Collision (PRC) (Y/N)	Flight Duration at PRC (Secs)
February	29.02.2024	1	КТ	14:10	1	38	N	0