ScottishPower Renewables Ltd

HARESTANES WEST WINDFARM

Technical Appendix 9.1: Ornithological Technical Report

.

OCTOBER 2024

PUBLIC

ScottishPower Renewables Ltd

HARESTANES WEST WINDFARM

Technical Appendix 9.1: Ornithological Technical Report

TYPE OF DOCUMENT (VERSION) PUBLIC

PROJECT NO. 70115869

OUR REF. NO. .

DATE: OCTOBER 2024

WSP

7 Lochside View
Edinburgh Park
Edinburgh, Midlothian
EH12 9DH

Phone: +44 131 344 2300

WSP.com

QUALITY CONTROL

Issue/ revision	First issue	Revision 1	Revision 2
Remarks	N/A	N/A	N/A
Date	03/10/2024	23/10/2024	04/11/2024
Prepared by	Robbie Watt	Martin Rann	Martin Rann
Signature			
Checked by	Thomas Goater	Pete Clark	Pete Clark
Signature			
Authorised by	Pete Clark	Ian Ellis	Ian Ellis
Signature			
Project number	70115869	70115869	70115869
Report number	v.01	v.02	v.03
File reference	\\uk.wspgroup.com\central data\Projects\70115xxx\70115869 - Harestanes West Ornithology\03 WIP\Reporting\Chapter 9 Ornithology\Draft 1\Technical appendices	\\uk.wspgroup.com\central data\Projects\70115xxx\70115869 - Harestanes West Ornithology\03 WIP\Reporting\Chapter 9 Ornithology\Draft 2	\\uk.wspgroup.com\central data\Projects\70115xxx\70115869 - Harestanes West Ornithology\03 WIP\Reporting\Chapter 9 Ornithology\Draft 2

CONTENTS

TABLES

APPENDICES

1 INTRODUCTION

1.1 BACKGROUND

1.1.1. This Technical Appendix was commissioned by ScottishPower Renewables Ltd. (SPR) and has been prepared to accompany **Chapter 9: Ornithology** of the Harestanes West Windfarm (hereafter, the 'proposed Development') Environmental Impact Assessment (EIA) Report.

1.1.2. The proposed Development is located northwest of the village of Ae, approximately 1.3 kilometres (km) to the Application Boundary and 2.2 km to the nearest proposed turbine, and approximately 13 km north of Dumfries (Central Ordnance Survey Grid Reference: NX 95654 92305). The final design layout comprises a layout of 12 turbines, six with a maximum height of 220 m and six with a maximum height of 200 m (to vertical turbine blade tip), hard standings, 31.5 km of access track (10.5 km of which is new), and associated infrastructure.

1.1.3. A programme of flight activity surveys was undertaken by WSP over a 24-month period between September 2019 and August 2021. Year 1 covered the 2019/20 non-breeding season and 2020 breeding season; and Year 2 covered the 2020/21 non-breeding season and the 2021 breeding season. A broader suite of targeted breeding bird surveys was also undertaken during the two breeding seasons. All surveys were carried out in line with NatureScot (2017[1]) guidance. Additionally, a breeding bird walkover survey was carried out in May 2024 and focused on the access track only.

1.1.4. This Ornithological Technical Report provides details of the methods and results of the ornithological field surveys conducted to inform the EcIA for the proposed Development. The report concentrates on target species recorded in and around the Site (the area within the Application Boundary) which fall into at least one of the following categories:

- Birds listed on Annex I of the EU Birds Directive[2];
- Birds listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended3);
- Birds that are qualifying features of 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; and
- Red-listed Birds of Conservation Concern (BoCC) (Stanbury *et al*. 2021[4]).

1 NatureScot (2017). Recommended bird survey methods to inform impact assessment of onshore windfarms. v2.
2 EU Birds Directive: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32009L0147.
3 Schedule 1-listed species of the Wildlife and Countryside Act 1981: http://www.legislation.gov.uk/ukpga/1981/69/schedule/1.
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.

1.1.5. Other species which are typically recognised as being potentially vulnerable to the effects of windfarm developments, but which do not fall under any of the above categories, such as certain wader and waterfowl species were also recorded as target species (e.g. snipe (*Gallinago gallinago*), oystercatcher (*Haematopus ostralegus*) and mute swan (*Cygnus olor*). Passerines (songbirds) are not typically considered as target species as it is generally accepted that they are not significantly impacted by wind farm developments.

1.1.6. Sensitive information pertaining to the nest site locations of rare and vulnerable species, particularly those which may be at risk of persecution, has been omitted from this report and is instead presented in the **Technical Appendix 9.2: Confidential Ornithological Information.**

1.1.7. This Technical Appendix should be read with reference to the following figures, presented in **Volume 3a** of the EIA Report:

- Figure 9.1 – Vantage Point Locations and Viewsheds;
- Figure 9.2 – Targeted Bird Survey Areas;
- Figure 9.3 – Ornithological Designated Sites within 20 km;
- Figure 9.4a – Flight Activity Survey Results: Raptors (Year 1: 2019/20);
- Figure 9.4b – Flight Activity Survey Results: Raptors (Year 1: 2020/21);
- Figure 9.5a – Flight Activity Survey Results: Waterfowl and Wading Birds (Year 1: 2019/20);
- Figure 9.5b – Flight Activity Survey Results: Waterfowl and Wading Birds (Year 1: 2020/21);
- Figure 9.6a – Scarce Breeding Raptor Survey Results (Year 1: 2020);
- Figure 9.6b – Scarce Breeding Raptor Survey Results (Year 2: 2021);
- Figure 9.7a – Breeding Bird Survey Results: Wader Territories (Year 1: 2020);
- Figure 9.7b – Breeding Bird Survey Results: Wader Territories (Year 2: 2021);
- Figure CA9.1 – Desk Study Records of Scarce Raptor Nest Sites;
- Figure CA9.2 – Desk Study Records of Scarce Black Grouse Lek Sites;
- Figure CA9.3 – Black Grouse Lek sites (Year 1: 2020 and Year 2: 2021);
- Figure CA9.4 – Scarce Breeding Bird Survey Results (Year 1: 2020);
- Figure CA9.5 – Scarce Breeding Bird Survey Results (Year 2: 2021);
- Figure CA9.6 – Overall Distribution of Tracked Golden Eagle Movement Within 10 km of Site;
- Figure CA9.7 – Golden Eagle Roost Distribution;
- Figure CA9.8 – Golden Eagle Occurrence Hotspots;
- Figure CA9.9 – Golden Eagle Roost Hotspots; and
- Figure CA9.10 – Golden Eagle Flight Distribution.

2 DESK STUDY AND BIRD SURVEY METHODS

2.1 DESK STUDY AND CONSULTATION

DESIGNATED SITES

2.1.1. A desk study was undertaken at the outset of the survey programme to identify statutory ornithological designated sites of nature conservation interest located within, in close proximity, or potentially connected to the Site.

2.1.2. The extent of searches conducted for statutory European/International designated sites (i.e. Special Protection Areas (SPAs) and Wetlands of International Importance (Ramsar Sites)) was dependent on their proximity and/or potential connectivity to the Site. This included direct connectivity, such as via watercourses, or indirect connectivity, such as through the potential use of habitats within the Site by qualifying species of designated sites in the wider surrounding area based on those species recognised foraging/commuting ranges (e.g. as detailed in NatureScot (2016)[5]). Consequently, searches extended up to 20 km from the Site boundary based on the longest recognised commuting distance which is for pink-footed geese (*Anser brachyrhynchus*) and greylag geese (*Anser anser*) (core range of 15-20 km from night roost during the winter season); species which are associated with a number of designated sites in Scotland. Searches for all other designated sites with ornithological features of interest (including Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNRs) and Local Nature Reserves (LNRs)) extended to 2 km from the Site (see EIA Report **Figure 9.3**). Searches were conducted using the following sources:

- NatureScot's Sitelink database website[6];
- Natural England's MAGIC Map application[7]; and
- Joint Nature Conservation Committee (JNCC) website[8].

Protected and Notable Species of Conservation Concern

2.1.3. To help inform the EcIA, a consultation exercise was also undertaken to request recent historical records of protected and notable species of conservation concern (i.e. records of target species from the past 10 years (2014-2023 inclusive)) within 2 km of the Site[9]. The following land management organisations and ornithological interest groups were consulted for any relevant data they may hold:

- Forestry and Land Scotland (FLS: landowners of the majority of the Site);
- Dumfries and Galloway Raptor Study Group (D&GRSG);
- Royal Society for the Protection of Birds (RSPB) Conservation Data Management Unit; and
- South West Scotland Environmental Information Centre (SWSEIC).

5 NatureScot (2016). Assessing Connectivity with Special Protection Areas (SPAs). Version 3 – June 2016.
6 NatureScot Sitelink database website (https://sitelink.nature.scot/home).
7 Natural England MAGIC Map application website (https://magic.defra.gov.uk/).
8 JNCC website (http://jncc.defra.gov.uk/).
9 At the time of writing, data for 2024 is not yet available from any of the third-party data providers.

2.1.4. Additionally, the South of Scotland Golden Eagle Project (SSGEP) were also contacted in September 2024 to request golden eagle (*Aquila chrysaetos*) distribution data from satellite-tagged golden eagles monitored under their project (2018-present). Data was requested for the Application Boundary and a 10 km buffer, in order to ascertain key activity areas as well as any nest and roost sites within the search area.

2.1.5. Data obtained from the above sources has been used to supplement and support the field survey data.

2.2 ORNITHOLOGICAL FIELD SURVEYS

2.2.1. The ornithology survey programme was developed based on the particular ornithological sensitives which were anticipated to occur in and around the Site and was devised following NatureScot (2017) survey guidance for assessing onshore wind farms.

2.2.2. It is important to note that Vantage Point (VP) locations for the flight activity surveys were identified at the outset of the ornithological survey programme when the proposed Development was represented by an Initial Site Feasibility Study Area which, as shown in EIA Report **Figures 9.1** and **9.2**, was larger than the final Application Boundary,

LIMITATIONS TO THE FIELD SURVEYS

2.2.3. Like most outdoor activities in 2020, the breeding season survey programme for the proposed Development was affected to some extent by the global Coronavirus (Covid-19) pandemic, but only partially and predominantly during the initial weeks of public lockdown (i.e. late March to the end of April 2020). During this time, surveys were postponed while potentially acceptable, alternative ways of continuing some reduced-scope field surveys safely and responsibly were investigated.

2.2.4. Due to the rural setting of the Site and the isolated nature of the ornithological surveys it was possible to continue with the majority of surveying and achieve a large proportion of the scheduled ornithological surveys during the critical early stages of the breeding season. Ultimately, the minimum survey effort requirements have been achieved across the season, as presented herein. Therefore, it is considered that Covid-19 restrictions have not resulted in significant limitations to assessing the ornithological baseline within the Study Area.

2.2.5. The survey areas are dominated by forestry and also complex topography, particularly with respect to the Flight Activity Survey Area, which focused on the potential turbine layout. It is understood that complete coverage of the lower sweep height of any proposed turbine layout in such landscapes is difficult, but will be accounted for in the impact assessments.

2.2.6. Additionally, the access track between the A701 and the proposed Development was only subjected to a single breeding bird survey visit in May 2024, as it initially fell outside of the ornithological survey areas (e.g. the Initial Site Feasibility Study Area). It is understood that a single survey visit only gives a high-level appraisal of the bird assemblage along the access track route and therefore more detailed surveys of the access track route will be updated pre-construction (i.e. focussing on sensitive species such as Schedule 1 listed raptors for example).

FLIGHT ACTIVITY SURVEYS

2.2.7. These surveys were designed to record the flight activity of birds utilising the airspace over the Site. The data collected allow the total flight activity and bird numbers involved to be estimated over a given timeframe (e.g. breeding season, non-breeding season or year), as well as showing spatial and temporal flight activity patterns. In turn, this information is used to undertake collision risk modelling (CRM) for key species using the standard Band *et al*. (2007)[10] method, to predict potential mortality rates from collisions.

2.2.8. In order to collect flight activity data, surveys are conducted from elevated VPs which offer as wide and as unrestricted a view as possible of the Site and a surrounding buffer of 500 m (the Flight Activity Survey Area). For the Site, eight VPs were identified to adequately cover the Flight Activity Survey Area. Combined, these VPs overlook the majority of the Initial Site Feasibility Study Area and the Proposed Development Site at rotor height in accordance with NatureScot guidelines, which for the turbine models under consideration are 38 m to 200 m/220 m above ground level. Details of each of these VP locations are provided in **Table 2-1** while their locations, distribution around the Site and 2 km and 180° viewsheds from 38 m above ground level are illustrated in EIA Report **Figure 9.1**.

2.2.9. NatureScot (2017) guidance requires that a minimum of 36 hours of survey effort is carried out at each VP in each relevant survey season (i.e. breeding and non-breeding). Importantly though, it also requires that the minimum required 36 hours of survey effort is captured within the specific breeding and non-breeding seasons of each of the key species/groups of conservation concern which are most likely to occur over or in the vicinity of the Site. Based on local knowledge of habitats and ornithological interests associated with the Site and surrounding area, two key species that were identified as likely to be present were red kite (*Milvus milvus*) and goshawk (*Accipiter gentilis*), the breeding seasons for which are March to July and mid-March to mid-August respectively (NatureScot, 2014)[11]. Consequently, the flight activity survey programme for proposed Development was devised to cover the non-breeding season between September 2019 and February 2020 and the breeding season between March and August 2020 for year one. Additionally, for year two, between September 2020 and February 2021 and the breeding season between March and August 2021.

Table 2-1 – Flight Activity Survey VP locations covering the Site

VP Number*	Eastings	Northings	View Angle	Location in Relation to the Site
1	293905	595651	135°	Outwith (~3 km to nearest proposed turbine)
2	294641	592726	90°	Outwith (~1 km to nearest proposed turbine)
3	296605	595089	145°	Outwith (~1.5 km to nearest proposed turbine)
4	296608	588768	0°	Outwith (~0.75 km to nearest proposed turbine)
5	297556	592449	255°	Outwith (~2 km to nearest proposed turbine)

[10] Band, W, Madders, M, & Whitfield, D.P. (2007) Developing field and analytical methods to assess avian collision risk at wind farms. In: Janss, G, de Lucas, M & Ferrer, M (eds.) Birds and Wind Farms. Quercus, Madrid.

[11] NatureScot(2014).Breeding season dates for key breeding species in Scotland (https://www.nature.scot/sites/default/files/2017-07/A303080%20-%20Bird%20Breeding%20Season%20Dates%20in%20Scotland.pdf).

VP Number*	Eastings	Northings	View Angle	Location in Relation to the Site
6	297968	590302	0°	Outwith (~2 km to nearest proposed turbine)
8	298711	594102	135°	Outwith (~2.5 km to nearest proposed turbine)
15	297968	590302	180°	Outwith (~2 km to nearest proposed turbine)

* VP numbering reflects that surveys initially covered a much larger area and/or that some original VP locations had to be dropped and replaced following denial of land access.

2.2.10. Additional flight activity survey effort for migratory waterfowl during the autumn and spring passage periods was not considered to be necessary as the Site is not known to be located in an area which is expected to be regularly used, or overflown, during these specific migration periods. This was supported by the findings of Mitchell (2012)[12] who demonstrated that the core foraging areas of geese associated with the nearest SPAs (identified in **Table 3-1**) are located well away from the Site with only a small proportion of birds heading in the direction of the Site to forage around the lower Water of Ae valley. The non-requirement of survey effort for migratory waterfowl was accepted by NatureScot and RSPB in their responses to an interim bird survey report for the neighbouring Harestanes South Windfarm Extension, for which surveys were being undertaken concurrently (WSP, 2020)[13] and submitted following the completion of surveys over 2019/20 non-breeding season including the autumn and spring migratory periods[14,15].

2.2.11. Survey effort was spread throughout the daytime period where daylight hours best represent temporal flight activity patterns. 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.

2.2.12. Non-breeding season effort was carried out by RPS between 2019/20 and WSP between 2020/21, while the 2020 and 2021 breeding season surveys were both conducted by WSP. All VP watches were limited to a maximum of three hours duration by any single observer, with a minimum of half an hour break between any two consecutive VP surveys. Simultaneous VPs were not carried out where one observer's VP position was located within another surveyor's viewshed. That said, levels of human-related disturbance at the Site is high, with regular forestry and recreational activity occurring, including walking and mountain biking. Therefore, birds associated with the Site and their behaviour is expected to be relatively habituated to human activities.

2.2.13. 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 as binoculars to record all target bird species. Although a viewshed radius of 2 km was used to record all species, observations of birds located outside of this radius (e.g. flocks of large, easily detectable birds) were also recorded to provide additional context.

[12] Mitchell, C. 2012. Mapping the distribution of feeding Pink-footed and Iceland Greylag Geese in Scotland. Wildfowl & Wetlands Trust /SNH Report, Slimbridge. 108pp.
[13] WSP (2020). Harestanes Extension (South) Wind Farm Interim Ornithological Technical Report. July 2020.
[14] Letter from Crispin Hill, SNH Operations Officer (Forth & Southern Scotland) in response to Harestanes Extension (South) Wind Farm Interim Ornithological Technical Report, dated 04 August 2020.
[15] Letter from Ed Tooth, Conservation Officer (Scottish Lowlands and Southern Uplands) in response to Harestanes Extension (South) Wind Farm Interim Ornithological Technical Report, dated 13 August 2020.

2.2.14. 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 up to six height bands above ground level[16] for each 15 second flight time interval; and
- behaviour (including territorial or nesting behaviour).

2.2.15. 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 wind turbines (so-called secondary species) was also recorded.

2.2.16. A total of 385 flight activity surveys were undertaken over and around the Site between September 2019 and August 2021 totalling of 1,152 hours of survey effort. A total of 36 hours of survey effort was undertaken at each VP during both the 2019/20 and 2020/21 non-breeding seasons and 2020 and 2021 breeding seasons in accordance with NatureScot's minimum requirements with effort being evenly distributed throughout the seasons as much as possible.

2.2.17. **Table 2-2 and Table 2-3** present a summary of the flight activity survey effort undertaken in Year 1 (between September 2019 and August 2020) and in Year 2 (between September 2020 and August 2021), respectively, further details of which are provided in **Annex A, Table A-1**.

Table 2-2 – Summary of Flight Activity Survey Effort in Year 1 (September 2019-August 2020)

	Monthly Survey Effort per VP												
	2019				2020								
VP Location	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr*	May	Jun	Jul	Aug	Total Effort
VP 1	0+	12	6	6	6	6	6	6	6	6	6	6	72
VP 2	0+	12	6	6	6	6	6	6	6	6	6	6	72
VP 3	3	9	6	6	6	6	6	0	9	9	6	6	72
VP 4	3	9	6	6	6	6	6	6	6	5	7	6	72
VP 5	3	9	6	6	6	6	6	0	9	9	6	6	72
VP 6	3	9	6	6	6	6	6	3	9	6	6	6	72

[16] Height bands applied varied between RPS during the non-breeding season (Height Bands 1 = <20m, 2 = 20-40m, 3 = 40-100m, 4 = 100-150m, 5 = 150-200m, 6= 200m+) and WSP during the breeding season (Height Bands 1 = <50m, 2 = 50-250m, 3 = 250m+) due to indicative turbine specifications being made available for the breeding season. For collision risk modelling, non-breeding season flight activity data will be adapted to identify proportionate flight time in the relevant overlapping height bands.

VP Location	Monthly Survey Effort per VP												Total Effort
	2019				2020								
	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr*	May	Jun	Jul	Aug	
VP 8	3	9	6	6	6	6	6	0	9	6	9	6	72
VP 15	0+	6	9	9	6	6	6	6	6	0^	12	6	72
Total Effort	15	75	51	51	48	48	48	27	60	47	58	48	576

* Reduced survey effort in April 2020 reflects Covid-19 related access restrictions. Deficiencies incurred in April were made up between May and July where total survey effort for those months is proportionately higher.

+ No survey effort was completed at VPs 1, 2 or 15 in September as they were only identified and ground-truthed in October.

^ Survey effort at VP15 in June was missed due to a survey scheduling error, so an additional six hours was covered in July.

Table 2-3 – Summary of Flight Activity Survey Effort in Year 1 (September 2019-August 2020)

VP Location	Monthly Survey Effort per VP												Total Effort
	2020				2021								
	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	
VP 1	6	6	6	6	6	6	6	6	6	6	6	6	72
VP 2	6	6	6	6	6	6	6	6	6	6	6	6	72
VP 3	6	6	6	6	6	6	6	6	6	6	6	6	72
VP 4	6	6	6	6	6	6	6	6	6	6	6	6	72
VP 5	6	6	6	6	6	6	6	6	6	6	6	6	72
VP 6	6	6	6	6	6	6	6	6	6	6	6	6	72
VP 8	6	6	6	6	6	6	6	6	6	6	6	6	72
VP 15	6	6	6	6	6	6	6	6	6	6	6	6	72
Total Effort	48	48	48	48	48	48	48	48	48	48	48	48	576

SCARCE BREEDING RAPTOR SURVEYS

2.2.18. The Initial Site Feasibility Study Area plus a surrounding buffer of 2 km was surveyed for scarce breeding raptors between March and July in both 2020 and 2021. The scarce breeding raptor survey area is shown in EIA Report **Figure 9.2**.

2.2.19. Survey protocols broadly followed the standard methodologies for assessing raptor populations set out by Hardey *et al*. (2013)[17] and Gilbert *et al*. (1998)[18]. The surveys involved an initial scoping visit in March followed by four rounds of survey visits undertaken thereafter to determine presence, territory occupation and breeding success. Covering this period encompassed the time of year when activity can be highest and species presence is most likely to be detected.

2.2.20. The scoping visit for both year one and year two in March and the initial surveys in April and May predominantly involved VP watches overlooking the extensive forestry of the Initial Site Feasibility Study Area as well as other areas of suitable breeding raptor habitat in the surrounding area such open moorland and small stands of woodland. The purpose of these surveys was to detect early breeding season display activity, particularly by species such as goshawk and hen harrier. Thereafter, surveys primarily involved walkovers focussing effort in areas previously identified with concentrations of raptor activity (including through other surveys such as VPs) as well as other areas of suitable nesting habitat such as mature forestry, heather moorland, 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 by suitably licenced ornithologists. The locations of any nest sites or nesting/territorial activity by raptors was recorded, as were any sightings and signs of activity (e.g. prey remains, faecal splashing, plucking posts and pellets).

2.2.21. All observations of raptor species and sightings of any associated field signs and the locations of flight lines were mapped using standard British Trust for Ornithology (BTO) symbols and activity codes. The grid references of any target raptor nest sites (regardless of activity status) were also recorded. In doing so, care was taken not to disturb occupied nest sites and all surveyors held a Schedule 1 survey licence issued by NatureScot.

2.2.22. **Annex A, Table A-2** presents the scarce breeding raptor survey effort during the 2020 breeding season.

LEKKING BLACK GROUSE SURVEYS

2.2.23. The Initial Site Feasibility Study Area plus a surrounding buffer of 1.5 km was surveyed to determine the presence or likely absence of lekking black grouse (*Lyrurus tetrix*). The survey protocol followed the methodology detailed in Gilbert *et al*. (1998). The lekking black grouse survey area is shown **EIA Report Figure 9.2**.

2.2.24. A habitat suitability assessment was undertaken in March from flight activity surveys and through drive-arounds. Thereafter, two rounds of surveys were conducted between late March and mid-May in both 2020 and 2021 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). 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 to within 500 m in search of lekking male black grouse and attending females. Any identified leks were observed from suitable observation 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. The grid reference and details of any observations or signs of black grouse were also recorded. Leks located 200 m or more apart were considered to be separate.

[17] Hardey *et al*. (2013). Raptors. A Field Guide for Surveys and Monitoring. SNH, Inverness.
[18] Gilbert, G., Gibbons D.W., and Evans, J. (1998). Bird Monitoring Methods. RSPB, Sandy.

2.2.25. **Annex A, Table A-3** presents the lekking black grouse survey effort between late March and mid-May in both 2020 and 2021.

BREEDING NIGHTJAR SURVEYS

2.2.26. The Initial Site Feasibility Study Area plus a surrounding buffer of 500 m was surveyed to determine the presence or likely absence of breeding nightjar (*Caprimulgus europaeus*). The survey protocol followed the methodology detailed in Gilbert *et al*. (1998). The breeding nightjar survey area is shown in EIA Report **Figure 9.2**.

2.2.27. Assessments of potentially suitable breeding nightjar habitat were undertaken in April and May 2020 during other surveys and when travelling in and around the Site to other survey destinations. Thereafter, two rounds of surveys were undertaken between June until mid-July in both 2020 and 2021 involving walkovers covering all areas of suitable habitat (e.g. areas of heathland, clear-fell and/or young forestry plantations). Surveys were undertaken in dry and calm conditions from around dusk and extended to approximately two and a half hours after sunset.

2.2.28. During each survey, surveyors tried to get to within 100 m of all points, subject to safe access (clear-felled areas were not traversed in the dark for health and safety reasons), listening out for churring (singing) male nightjar.

2.2.29. **Annex A, Table A-4** presents the breeding nightjar survey effort undertaken between June and mid-July in both 2020 and 2021.

MOORLAND BREEDING BIRD SURVEYS

2.2.30. These surveys sought to determine the assemblage of breeding birds and the locations of breeding territories for all non-passerine species of conservation concern and covered all areas of open moorland within the Initial Site Feasibility Study Area and a surrounding buffer of 500 m, as shown in **EIA Report Figure 9.2**. As recommended by NatureScot (2017), surveys followed the adapted Calladine *et al*. (2009)[19] version of the Brown and Shepherd (1993)[20] methodology as detailed in Gilbert *et al*. (1998). This involved four visits undertaken between April and July in both 2020 and 2021.

2.2.31. During each visit the surveyors followed transect routes covering the survey area to within at least 100m of all parts of open moorland. This distance is considered sufficient to detect most species expected to occur on the open moorland habitats of the survey area, particularly breeding waders of conservation concern such as golden plover (*Pluvialis apricaria*), curlew (*Numenius arquata*) or lapwing (*Vanellus vanellus)*.

2.2.32. The behaviour of all birds seen or heard during the surveys was recorded on large-scale maps using standard BTO coding and notation. Survey visits were undertaken in good, clear weather conditions (wind less than Beaufort force 5). **Annex A, Table A-5** presents summarised details of the moorland breeding bird surveys undertaken in 2020 and 2021[21].

---

[19] Calladine, J., Garner, G., Wernham, C. & Thiel, A. (2009). The influence of survey frequency on population estimates of moorland breeding birds. Bird Study, Volume 56, Issue 3.

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

[21] These surveys covered small areas of habitat around the edges of Ae Forest and therefore survey times and dates were incorporated into the Scarce Breeding Bird Surveys, hence dates and times of the survey types are identical in **Annex A, Table A-2** and **Table A-5**.

2.2.33. All breeding bird survey records were entered into ArcView Geographic Information System (GIS) software. These were then analysed in order to identify the minimum number of probable or confirmed breeding territories for all target species, principally wading birds (territory analysis was not carried out for non-target species). The territory analysis for wading birds was done following the methods of Brown and Shepherd (1993) 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 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 were assumed to be from with the same territory.

2.2.34. Based on the territory analysis procedure detailed above, the estimated number of breeding territories held by target species was identified within the entire survey area and within the Site itself.

BREEDING BIRD SURVEY WALKOVER

2.2.35. Direct Ecology Ltd undertook a single breeding bird survey walkover of the proposed access track route in May 2024 in order to ascertain the breeding bird assemblage along the route. The survey recorded all species and focused on birds exhibiting breeding bird behaviour and/or nests, although the latter were not searched for directly.

3 DESK STUDY AND BIRD SURVEY RESULTS

3.1 DESK STUDY RESULTS

DESIGNATED SITES

3.1.1. The Application Boundary does not physically overlap with any internationally or nationally designated sites. Two internationally designated sites of ornithological interest were identified within 20 km of the Application Boundary. Details of each of these sites are presented in **Table 3-1** while their locations and distribution in relation to the Site are shown in EIA Report **Figure 9.3**.

Table 3-1 – International Designated Sites within 20 km of the proposed Development

Site	Distance from Site	Qualifying Interest
Castle Loch, Lochmaben SPA and Ramsar Site	13.0 km	Non-breeding: pink-footed goose
Upper Solway Flats and Marshes SPA and Ramsar Site	17.2 km	Non-breeding: bar-tailed godwit (*Limosa lapponica*), cormorant (*Phalocrocorax carbo*), curlew, dunlin (*Calidris alpina schiinzi*), golden plover, goldeneye (*Bucephala clangula*), grey plover (*Pluvialis squaterola*), knot (*Calidris canutus*), lapwing, oystercatcher, pink-footed goose, pintail (*Anas acuta*), redshank (*Tringa totanus*), ringed plover (*Charadrius hiaticula*), scaup (*Aythya marila*), shelduck (*Tadorna tadorna*), barnacle goose (*Branta leucopsis*), waterfowl assemblage, whooper swan (*Cygnus cygnus*) Passage: ringed plover

3.1.2. There are no non-statutory designated sites with ornithological interests within 2 km of the Site.

PROTECTED AND NOTABLE SPECIES OF CONSERVATION CONCERN

3.1.3. The following provides an overview of the data obtained through the consultation exercise. Nest site locations for rare and vulnerable species of conservation concern have been withheld and are provided in **Technical Appendix 9.2: Confidential Ornithological Information**.

South West Scotland Environmental Information Centre

3.1.4. SWSEIC provided recent historical records (i.e. 2013-present) for various target species within 2 km of the Site, all of which were observational sighting records (i.e. no nest, roost or lek site records). These are summarised as follows:

- Goshawk: seven records from within the Site and wider surrounding 2 km search area (i.e. the wider Forest of Ae);
- Red kite: eleven records over the forestry and open ground within the 2 km search area to the north and west of the Site;
- Short-eared owl (*Asio flammeus*): four records over the open moorland and forest edge habitats within the 2 km search area to the north west of the Site;

- Long-eared owl (*Asio otus*): a single record along the forest edge within the 2 km search area to the north west of the Site;
- Hen harrier (*Circus cyaneus*): four records including a single record over the forestry within the Site and three records over the open ground within the wider 2 km search area to the north west and south of the Site; and
- Merlin (*Falco columbarius*): a single record over the open moorland within the 2 km search area to the north west of the Site.

3.1.5. SWSEIC also provided records from over ten years ago (prior to 2014) for white-tailed eagle (*Haliaetus albicilla*), osprey (*Pandion haliaetus*), peregrine (*Falco peregrinus*) and barn owl (*Tyto alba*).

Dumfries and Galloway Raptor Study Group

3.1.6. D&GRSG provided the following records from the most recent five-year period (2019-23):

- Goshawk: five territories (comprising ten nest sites) are located within 2 km of the Site, including one associated with the wind farm part of the Site. Additionally, three territories have nesting areas within 500 m of the proposed access track, and a fifth territory located at the edge of the 2 km search area to the south of the Site;
- Red kite: one territory comprising two nest sites located within the 2 km search area to the south of the Site; and
- Barn owl: five territories (comprising six nesting sites) all of which are located within the 2 km search area to the north, east and south of the Site.

Forestry and Land Scotland

3.1.7. FLS provided records of target raptor nest sites in and around the Site (2017-present). These included:

- Goshawk: a single nest site located within the northern part of the Site, likely corresponding to one of the territories provided by D&GRSG; and
- Barn owl: one nest site within the 2 km search area to the north of the Site, corresponding to one of the nest sites provided by D&GRSG.

RSPB

3.1.8. RSPB provided 29 black grouse records from 2014-present relating to 47 lekking/displaying males (plus one record of five 'resting' males) and five records for individual females which were recorded on the same date and location as lekking males (see **Technical Appendix 9.2: Confidential Ornithological Information**). The records were all located within the 2 km search area to the north west of the Site.

SSGEP

3.1.9. SSGEP provided golden eagle satellite-tag records from 2018-present relating to 25 different individuals using an area of 10 km around the proposed Development (see **Technical Appendix 9.2: Confidential Ornithological Information**). The records were largely located within the open ground to the north of the Site, with only two of 3,301 satellite tag fixes within 581 m of the turbine locations (0.06%).

3.1.10. Only one eagle is considered to be settled into a territory (tag 1271), with only 0.18% of their time spent within 10 km of the Site since settling (70 of 38,651 fixes). Prior to settling, 33 of 8,381 fixes fell within 10 km of the Site.

3.1.11. Another female eagle (tag 181544) is now settled into a territory (with a male that is not tagged by SSGEP), although she lost her tag in the dispersal period (in 2023), before settling in 2024. Therefore the only data available for this bird is during the dispersal period. While the tag was operational, she spent 8.4% of her time within 10 km of the Site.

3.1.12. There are no known nest sites within 10 km of the Site.

3.1.13. Recurrent roost activity (e.g. more than ten nights) within the 2 km buffer of the Application Boundary was restricted to a single area, registering a total of 12 visits between May 2019 and October 2024. Other roosts within the buffer were used infrequently with an average of two nights across the sample period.

3.2 ORNITHOLOGICAL FIELD SURVEY RESULTS

FLIGHT ACTIVITY SURVEYS

3.2.1. A total of 265 flights by 15 target species were recorded over and around the Site between September 2019 and August 2020. **Table 3-2** presents a summary of the flight activity survey results, full details of which are provided in **Annex B, Table B-1**, while a summary of the results of the flight activity recorded for each target species is provided below. Additionally, EIA Report **Figures 9.4a** and **9.4b** show the distribution of target raptor flight activity in Year 1 (2019/20 and Year 2 (2020/21) respectively. EIA Report **Figures 9.5a** and **9.5b** show the distribution of target waterbird species flight activity in Year 1 (2019/20 and Year 2 (2020/21), respectively.

Table 3-2 – Summary of Flight Activity Survey Results

Species	Year	Total No. of Flights	Total Constituent No. of Birds	Cumulative Flight Duration (sec)
Goshawk	2019/20	54	60	5,565
	2020/21	34	35	4,960
Red kite	2019/20	27	31	2,895
	2020/21	48	52	9,890
Short-eared owl	2019/20	13	13	1,530
	2020/21	-	-	-
Peregrine	2019/20	2	2	90
	2020/21	5	5	1,035
Osprey	2019/20	-	-	-
	2020/21	5	5	1,185

Species	Year	Total No. of Flights	Total Constituent No. of Birds	Cumulative Flight Duration (sec)
Hen harrier	2019/20	-	-	-
	2020/21	3	3	1,440
Merlin	2019/20	2	2	30
	2020/21	-	-	-
Pink-footed goose	2019/20	8	549	N/A
	2020/21	22	2,332	N/A
Greylag goose	2019/20	2	4	N/A
	2020/21	4	27	N/A
Whooper swan	2019/20	-	-	-
	2020/21	2	46	N/A
Golden plover	2019/20	-	-	-
	2020/21	1	4	165
Curlew	2019/20	2	2	45
	2020/21	1	1	45
Lapwing	2019/20	13	18	330
	2020/21	2	4	315
Snipe	2019/20	7	7	570
	2020/21	4	5	180
Oystercatcher	2019/20	4	4	75
	2020/21	-	-	-

Goshawk

3.2.2. Year 1: There were 54 observations comprising 60 individual flights with activity generally being widely distributed over forestry throughout the flight activity survey area. There were however concentrations of activity in the western and central parts of the Site. The frequency of flight activity was comparable between the breeding and non-breeding seasons.

3.2.3. Year 2: There were 34 observations comprising 35 individual flights, with activity generally broadly distributed across the Site, particularly the western and southern parts. Flights were recorded in all months.

Red kite

3.2.4. Year 1: There were 27 observations involving 31 individual flights, with flight activity being concentrated over the open ground and forest edge habitats to the south east of the Site and occasional flight activity also being detected in the northern and western parts of the Site. All but one of the flights were recorded during the breeding season with the majority of sightings being over the open moorland and forest edge habitats surrounding the Site.

3.2.5. Year 2: There were 48 observations involving 52 individual flights in Year 2, with activity predominantly associated with the open ground and forest edge habitats to the south of the Site around Ae Village but with a reasonable proportion of flights also to the north and north-west of the Site. Flights were recorded throughout the year.

Hen harrier

3.2.6. Year 1: No observations of hen harrier were made in Year 1.

3.2.7. Year 2: There were three hen harrier flights in Year 2. Sightings were distributed around the Site and were typically associated with the open ground and forest edge habitats.

Short-eared owl

3.2.8. Year 1: There were 13 short-eared owl flights recorded during the breeding season of 2020. Flight activity was concentrated in two areas in the north of the survey area which corresponded with suspected breeding territories.

3.2.9. Year 2: There were no sightings of this species during any of the flight activity surveys in Year 2.

Peregrine

3.2.10. Year 1: Two flights were recorded in Year 1. These were located over and around the central part of the Site.

3.2.11. Year 2: There were five flights in Year 2, with flights being distributed over the forestry and forest edge habitats to the south and east of the Site. Flights were recorded during both the breeding and non-breeding season.

Merlin

3.2.12. Year 1: The only merlin sightings made during the Year 1 surveys involved individual birds observed flying along the moorland and forest edge to the south of the Site.

3.2.13. Year 2: No merlin flights were observed in Year 2.

Osprey

3.2.14. Year 1: No osprey flights were observed in Year 1.

3.2.15. Year 2: Five osprey flights were recorded during the breeding season of Year 2 with those flights being observed over the central and eastern parts of the Site.

Pink-footed goose

3.2.16. Year 1: Eight flights involving 549 individuals were recorded during the Year 1 surveys, the majority of which were observed passing over and around the Site in a predominantly southerly direction. Flights activity reflected longer distance migratory flights to and from core overwintering sites as opposed to daily commuting movements between traditional roosting and foraging sites.

3.2.17. Year 2: There were 22 flights involving a total of 2,332 individuals observed over and around the Site throughout Year 2. Flights observed during the autumn and early winter months were typically southward-bound while those observed in the late winter and early spring were typically northward-bound, again reflecting migratory movements as opposed to localised commuting flights.

Greylag goose

3.2.18. Year 1: There were two flights involving four birds, over the central and southern parts of the Site in Year 1.

3.2.19. Year 2: Four flights involving a total of 27 individuals were recorded throughout Year 2 most of which were orientated along the open ground of the lower valley north of Ae Village.

Whooper swan

3.2.20. Year 1: No flights by whooper swan were observed during Year 1.

3.2.21. Year 2: Two flights involving 46 individuals were observed over the central and southern parts of the Site in Year 2. These flights were observed autumn migration and were orientated southwards indicating that these were migratory flights.

Golden plover

3.2.22. Year 1: No golden plover flights were observed in Year 1.

3.2.23. Year 2: A single flock of four golden plover was observed in Year 2 flying over the central forested part of the Site during the autumn passage period.

Curlew

3.2.24. Year 1: Two flights were recorded in Year 1. These were located over the open moorland and fields to the north and east of the Site.

3.2.25. Year 2: A single curlew flight was observed over the moorland to the south of the Site in year 2.

Lapwing

3.2.26. Year 1: There were 13 lapwing observations comprising 18 individual flights recorded in Year 1, all but one of which were located over the open moorland to the south of the Site during the breeding season.

3.2.27. Year 2: Only two flights by four individuals were recorded in Year 2. These were located to the north and east of the Site.

Snipe

3.2.28. Year 1: Seven flights were observed. These were located over open moorland to the north of the Site and fields either side of the minor road to the north of Ae Village, east of the Site.

3.2.29. Year 2: There were four flights involving five birds in Year 2. These involved birds observed displaying over the open moorland to the south of the Site and birds located over the open ground along the road valley north of Ae Village.

Oystercatcher

3.2.30. Year 1: Four flights were recorded in Year 1. These were located over fields either side of the minor road to the north of Ae Village.

3.2.31. Year 2: There were no observations of oystercatcher in Year 2.

SCARCE BREEDING RAPTOR SURVEYS

3.2.32. **EIA Report Figures 9.6a** and **9.6b** show the distribution of scarce breeding raptor survey observations during the 2020 and 2021 breeding seasons respectively. The following provides summarised accounts of the scarce breeding raptor survey results, however, sensitive information such as details of nest sites and their locations are provided in **Technical Appendix 9.2: Confidential Ornithological Information.**

Goshawk

3.2.33. Observations of goshawk were frequently made throughout the breeding season over the forestry associated with the Site and surrounding moorland edge habitats. At least three active goshawk nest sites were identified within the 2 km survey area during the surveys in 2020. Two of these was located within 500 m of the Site to the west while the other active nest site was located over 1.5 km to the east of the Site. A fourth goshawk breeding territory was located to the south east of the Site. However, dense windblown trees precluded detailed searches and no active nest site was located, and there were no sightings of goshawk indicative of an active breeding attempt (e.g. sightings of or begging calls by young).

3.2.34. During the 2021 surveys the nest site to the west of the Site was again found to be active, while the nest site 1.5 km to the east of the Site was found to be occupied. Goshawk were suspected to potentially be breeding at (at least) two other locations to the north and south of the Site but no other active nest sites were located.

Red kite

3.2.35. Frequent red kite flights were observed over the open moorland and along the forest edge habitats surrounding the Site. A pair of red kites were frequently observed to the south of the Site where an active nest was located in 2020. Although no chicks were seen during a nest check later in the season, third-party data from the D&GRSG confirmed that the nest fledged two chicks.

3.2.36. The nest site to the south of the site was again found to be active during the 2021 breeding season and fledged two chicks. Multiple sightings of red kites were again made over the open ground and forest edge to the north of the Site and an active nest was located but this was beyond the 2 km survey buffer to the north-west.

Short-eared owl

3.2.37. Three active short-eared owl breeding territories were identified in 2020, all of which were located to the north of the Site. Two of these were located in the open moorland, while the third was located in an area of clear-felled forestry. Breeding was suspected at these locations based on the birds' observed behaviour (territorial behaviour including caching prey); however, the nest sites were not located, and no young were observed.

3.2.38. By comparison, no short-eared owls were recorded during the 2021 breeding season, despite comparable survey effort in the same areas of suitable habitat.

Peregrine

3.2.39. Peregrine were recorded twice during scarce breeding raptor surveys in 2020 and just once in 2021 all of which were over the open moorland to the north west of the Site. However, there was no evidence of breeding by this species within the survey area.

Merlin

3.2.40. There was only a single observation of merlin during the scarce breeding raptor surveys, that being recorded in 2020 over the northern part of the Site. There was no evidence of breeding by this species within the survey area.

Barn owl

3.2.41. The scarce breeding raptor surveys included checks of old derelict buildings. However, no barn owl nest sites were located. Fresh barn owl pellets were identified north-west of the Site in 2020 and a barn owl was observed incidentally during a black grouse survey in May 2021 to the north of the Site, thereby confirming the species presence locally. However, there was no evidence of breeding activity by this species within the survey area.

Other raptor and owl species

3.2.42. Other raptor species which were frequently recorded throughout the survey and considered likely to be breeding within the Site were buzzard (*Buteo buteo*), sparrowhawk (*Accipiter nisus*) and kestrel (*Falco tinnunculus*). A tawny owl (*Strix aluco*) was also observed during the surveys and was also considered likely to be breeding within the woodland habitats on the Site.

LEKKING BLACK GROUSE SURVEYS

3.2.43. The results of the Lekking Black Grouse Surveys can be found in the **Technical Appendix 9.2: Confidential Ornithological Information.**

BREEDING NIGHTJAR SURVEYS

3.2.44. No nightjar were recorded (seen or heard) during any of the surveys undertaken and the species is considered to have been absent from the surveyed areas.

MOORLAND BREEDING BIRD SURVEYS

3.2.45. Moorland Breeding Bird Surveys (MBBS) were undertaken in both 2020 and 2021.

3.2.46. A total of 42 species were recorded during the 2020 and 2021 MBBS. The full list of species recorded during the moorland breeding bird surveys is presented in **Annex B, Table B-2**. The surveys identified that the pastoral agricultural land, open moorland and associated forest edge habitats supported an assemblage of breeding birds which is typical of these habitats.

3.2.47. Of the 42 species recorded, only seven were target species, namely goshawk, red kite, merlin, curlew, lapwing, oystercatcher and snipe. Pink-footed geese were also observed but only flying overhead.

3.2.48. Breeding activity by goshawk, red kite and merlin is discussed above under the scarce breeding raptor surveys.

3.2.49. Two curlew breeding territories were identified in 2020, one located in the open moorland to the north of the Site and the other in the open moorland to the south. In 2021, only a single territory was identified, this being located in the same area of open moorland to the south of the Site.

3.2.50. There were two lapwing territories during the 2020 breeding season. One of these was located in the open moorland to the south of the Site while the other was in pastoral farmland to the south-east. No lapwing breeding territories were identified from the 2021 survey data.

3.2.51. Snipe was the most abundant species of breeding wader with eight territories being identified in 2020. Five of these were located in the open moorland to the north of the Site while the other three were located in the open moorland and pastoral farmland to the south and south-east. In 2021 only four breeding territories were identified, all of which were located in the open moorland to the north of the Site.

3.2.52. Two oystercatcher territories were identified from the 2020 survey data, both of which were located in the open moorland and pastoral farmland to the south and south-east. In 2021, only a single oystercatcher territory was identified, this also being located in the moorland habitat to the south of the Site.

3.2.53. The locations of these breeding territories are shown in **EIA Report Figures 9.7a** and **9.7b** for 2020 and 2021 respectively and show that none of the breeding territories were located within the Site itself.

BREEDING BIRD WALKOVER SURVEYS

3.2.54. A total of 37 species were recorded during the breeding bird walkover survey of the access track in May 2024.

3.2.55. Almost all records were of birds exhibiting some sort of breeding behaviour, usually territoriality. These included common species typical of the local habitats and geographical location of the Site and also a number of notable species including red-listed species cuckoo (*Cuculus canorus*), skylark (*Alauda arvensis*), mistle thrush (*Turdus viscivorus*), tree pipit (*Anthus trivialis*) and redpoll (*Acanthis flammea*); as well as barn owl and crossbill (*Loxia curivostra*), which both receive additional legal protection under Schedule 1.

3.2.56. A full species list is presented in **Annex B, Table B-3**.

Annex A

ORNITHOLOGICAL SURVEY DETAILS

Table A-1 – Flight Activity Survey Effort (September 2019 - August 2021)

Date	VP	Surveyor*	Start time	End time	Duration (hrs)
26/09/19	4	TBo	13:00	16:00	03:00
26/09/19	6	TBo	16:35	19:35	03:00
27/09/19	5	PCa	12:15	15:15	03:00
29/09/19	3	PCa	10:25	13:25	03:00
29/09/19	8	AR	10:30	13:30	03:00
01/10/19	2	TBo	11:15	14:15	03:00
01/10/19	1	TBo	14:55	17:55	03:00
08/10/19	2	AR	12:30	15:30	03:00
08/10/19	1	PCa	12:45	15:45	03:00
08/10/19	2	AR	16:00	19:00	03:00
08/10/19	1	PCa	16:15	19:15	03:00
09/10/19	3	TBo	07:00	10:00	03:00
09/10/19	3	TBo	10:30	13:30	03:00
10/10/19	5	TBo	12:30	15:30	03:00
10/10/19	5	TBo	16:00	19:00	03:00
11/10/19	4	TBo	09:30	12:30	03:00
11/10/19	4	TBo	13:00	16:00	03:00
15/10/19	8	TBo	10:20	13:20	03:00
15/10/19	8	TBo	13:50	16:50	03:00
17/10/19	6	TBo	07:20	10:20	03:00
17/10/19	6	TBo	10:50	13:50	03:00
24/10/19	1	PHi	11:50	14:50	03:00
24/10/19	2	TBo	12:40	15:40	03:00
24/10/19	3	PHi	15:25	18:25	03:00
25/10/19	8	TBo	07:35	10:35	03:00
25/10/19	5	TBo	11:15	14:15	03:00

Date	VP	Surveyor*	Start time	End time	Duration (hrs)
25/10/19	6	PHi	11:55	14:55	03:00
28/10/19	4	GM	10:40	13:40	03:00
30/10/19	15	PCa	10:30	13:30	03:00
30/10/19	15	PCa	14:00	17:00	03:00
07/11/19	15	TBo	12:45	15:45	03:00
11/11/19	3	PCa	10:05	13:05	03:00
11/11/19	1	GM	10:20	13:20	03:00
11/11/19	3	PCa	13:35	16:35	03:00
11/11/19	1	GM	13:50	16:50	03:00
12/11/19	5	PC	08:00	11:00	03:00
12/11/19	5	PCa	11:30	14:30	03:00
14/11/19	2	TBo	10:15	13:15	03:00
14/11/19	2	TBo	13:45	16:45	03:00
21/11/19	8	TBo	09:25	12:25	03:00
21/11/19	8	TBo	12:55	15:55	03:00
22/11/19	6	TBo	09:45	12:45	03:00
22/11/19	6	TBo	13:15	16:15	03:00
27/11/19	15	TBo	07:40	10:40	03:00
27/11/19	15	TBo	11:10	14:10	03:00
28/11/19	4	TBo	08:45	11:45	03:00
28/11/19	4	TBo	12:15	15:15	03:00
06/12/19	6	AR	09:00	12:00	03:00
06/12/19	3	TBo	09:45	12:45	03:00
06/12/19	6	AR	12:30	15:30	03:00
06/12/19	3	TBo	13:15	16:15	03:00
09/12/19	2	PCa	08:35	11:35	03:00
09/12/19	1	GM	08:40	11:40	03:00

Date	VP	Surveyor*	Start time	End time	Duration (hrs)
09/12/19	2	PCa	12:05	15:05	03:00
09/12/19	1	GM	12:10	15:10	03:00
10/12/19	15	TBo	13:15	16:15	03:00
11/12/19	5	PCa	08:30	11:30	03:00
11/12/19	5	PCa	12:00	15:00	03:00
13/12/19	15	GM	09:15	12:15	03:00
13/12/19	15	GM	12:45	15:45	03:00
23/12/19	4	TBo	08:40	11:40	03:00
23/12/19	8	PCa	09:35	12:35	03:00
23/12/19	4	TBo	12:10	15:10	03:00
23/12/19	8	PCa	13:05	16:05	03:00
03/01/20	5	AR	08:30	11:30	03:00
03/01/20	5	AR	12:00	15:00	03:00
15/01/20	3	GM	08:25	11:25	03:00
15/01/20	1	PCa	08:35	11:35	03:00
15/01/20	3	GM	11:55	14:55	03:00
15/01/20	1	PCa	12:05	15:05	03:00
17/01/20	2	GM	08:45	11:45	03:00
17/01/20	8	PCa	08:50	11:50	03:00
17/01/20	2	GM	12:15	15:15	03:00
17/01/20	8	PCa	12:20	15:20	03:00
22/01/20	15	GM	10:10	13:10	03:00
22/01/20	15	GM	13:40	16:40	03:00
26/01/20	6	TBo	10:40	13:40	03:00
26/01/20	6	TBo	14:10	17:10	03:00
29/01/20	4	TBo	07:45	10:45	03:00
29/01/20	4	TBo	11:15	14:15	03:00

Date	VP	Surveyor*	Start time	End time	Duration (hrs)
03/02/20	3	TBo	07:35	10:35	03:00
03/02/20	3	TBo	11:05	14:05	03:00
04/02/20	8	TBo	10:55	13:55	03:00
04/02/20	8	TBo	14:25	17:25	03:00
07/02/20	5	AR	08:30	11:30	03:00
07/02/20	5	AR	12:00	15:00	03:00
11/02/20	15	TBo	08:55	11:55	03:00
11/02/20	15	TBo	12:25	15:25	03:00
19/02/20	1	TBo	07:00	10:00	03:00
19/02/20	1	TBo	10:30	13:30	03:00
21/02/20	6	TBo	11:30	14:30	03:00
21/02/20	6	TBo	15:00	18:00	03:00
25/02/20	2	GM	08:15	11:15	03:00
25/02/20	4	TBo	09:35	12:35	03:00
25/02/20	2	GM	11:45	14:45	03:00
25/02/20	4	TBo	13:05	16:05	03:00
10/03/20	2	RW	11:30	14:30	03:00
10/03/20	2	RW	15:00	18:00	03:00
12/03/20	6	IG	07:35	10:35	03:00
12/03/20	15	RW	07:35	10:35	03:00
12/03/20	6	RW	11:15	14:15	03:00
12/03/20	15	IG	11:15	14:15	03:00
16/03/20	5	RW	11:00	14:00	03:00
16/03/20	5	RW	14:30	17:30	03:00
17/03/20	3	IG	06:50	09:50	03:00
17/03/20	3	IG	10:20	13:20	03:00
18/03/20	1	RW	08:30	11:30	03:00

Date	VP	Surveyor*	Start time	End time	Duration (hrs)
18/03/20	1	RW	12:00	15:00	03:00
19/03/20	4	RW	11:40	14:40	03:00
19/03/20	4	RW	15:10	18:10	03:00
20/03/20	8	RW	09:15	12:15	03:00
20/03/20	8	RW	12:45	15:45	03:00
14/04/20	4	RW	10:00	13:00	03:00
15/04/20	1	RW	09:25	12:25	03:00
20/04/20	4	RW	10:45	13:45	03:00
22/04/20	6	RW	07:50	10:50	03:00
22/04/20	15	TBo	09:00	12:00	03:00
23/04/20	2	GM	14:05	17:05	03:00
23/04/20	2	GM	17:35	20:35	03:00
24/04/20	1	RW	08:00	11:00	03:00
27/04/20	15	TBo	07:40	10:40	03:00
04/05/20	3	RW	09:00	12:00	03:00
04/05/20	3	RW	12:45	15:45	03:00
07/05/20	8	GM	07:35	10:35	03:00
07/05/20	8	GM	11:05	14:05	03:00
13/05/20	8	GM	15:10	18:10	03:00
18/05/20	4	RW	10:15	13:15	03:00
18/05/20	1	GM	11:30	14:30	03:00
18/05/20	4	RW	13:45	16:45	03:00
19/05/20	5	GM	11:35	14:35	03:00
19/05/20	3	GM	15:05	18:05	03:00
20/05/20	6	Tbo	05:25	08:25	03:00
21/05/20	6	RW	11:25	14:25	03:00
21/05/20	6	RW	14:55	17:55	03:00

Date	VP	Surveyor*	Start time	End time	Duration (hrs)
25/05/20	5	GM	18:05	21:05	03:00
26/05/20	1	GM	16:10	19:10	03:00
28/05/20	2	RW	10:30	13:30	03:00
28/05/20	2	RW	14:00	17:00	03:00
28/05/20	5	GM	15:10	18:10	03:00
29/05/20	15	RW	07:20	10:20	03:00
29/05/20	15	RW	10:50	13:50	03:00
01/06/20	1	RW	07:20	10:20	03:00
01/06/20	8	GM	11:25	14:25	03:00
01/06/20	1	RW	12:15	15:15	03:00
01/06/20	8	GM	14:55	17:55	03:00
05/06/20	2	RW	09:25	12:25	03:00
05/06/20	2	RW	12:55	15:55	03:00
09/06/20	5	GM	12:50	15:50	03:00
09/06/20	3	GM	16:20	19:20	03:00
16/06/20	4	RW	10:30	13:30	03:00
16/06/20	4	RW	14:00	16:00	02:00
18/06/20	5	RW	09:30	12:30	03:00
18/06/20	5	RW	13:00	16:00	03:00
19/06/20	6	RW	06:30	09:30	03:00
19/06/20	6	RW	11:55	14:55	03:00
30/06/20	3	RW	15:00	18:00	03:00
30/06/20	3	RW	18:30	21:30	03:00
09/07/20	8	GM	17:30	20:30	03:00
13/07/20	3	PCa	13:30	16:30	03:00
13/07/20	3	PCa	17:00	20:00	03:00
15/07/20	2	PCa	11:15	14:15	03:00

Date	VP	Surveyor*	Start time	End time	Duration (hrs)
15/07/20	2	PCa	14:45	17:45	03:00
16/07/20	8	GM	14:35	17:35	03:00
16/07/20	15	PCa	15:15	18:15	03:00
16/07/20	8	GM	18:05	21:05	03:00
16/07/20	15	PCa	18:45	21:45	03:00
20/07/20	1	GM	09:50	12:50	03:00
20/07/20	1	GM	13:20	16:20	03:00
21/07/20	6	GM	12:05	15:05	03:00
21/07/20	6	GM	15:35	18:35	03:00
23/07/20	5	PCa	15:00	18:00	03:00
23/07/20	5	PCa	18:30	21:30	03:00
28/07/20	15	GM	13:00	16:00	03:00
28/07/20	15	GM	16:30	19:30	03:00
29/07/20	4	RW	09:35	11:35	02:00
29/07/20	4	RW	13:25	16:25	03:00
31/07/20	4	RW	12:05	14:05	02:00
07/08/20	6	RW	08:35	11:35	03:00
07/08/20	6	RW	12:10	15:10	03:00
09/08/20	8	GM	11:55	14:55	03:00
09/08/20	8	GM	15:25	18:25	03:00
15/08/20	15	RW	10:10	13:10	03:00
15/08/20	15	RW	13:20	16:20	03:00
19/08/20	5	GM	09:50	12:50	03:00
19/08/20	1	TBo	10:00	13:00	03:00
19/08/20	5	GM	13:20	16:20	03:00
19/08/20	1	TBo	13:30	16:30	03:00
20/08/20	4	RW	13:15	16:15	03:00

Date	VP	Surveyor*	Start time	End time	Duration (hrs)
24/08/20	2	RW	09:55	12:55	03:00
24/08/20	2	RW	13:25	16:25	03:00
27/08/20	4	RW	16:45	19:45	03:00
28/08/20	3	RW	10:30	13:30	03:00
28/08/20	3	RW	14:00	17:00	03:00
04/09/20	15	RW	08:05	11:05	03:00
04/09/20	15	RW	11:35	14:35	03:00
08/09/20	6	RW	09:30	12:30	03:00
08/09/20	6	RW	13:00	16:00	03:00
09/09/20	3	RW	09:45	12:45	03:00
09/09/20	3	RW	13:25	16:25	03:00
10/09/20	5	GP	10:00	13:00	03:00
10/09/20	8	AR	10:30	13:30	03:00
10/09/20	8	AR	13:30	16:30	03:00
10/09/20	5	GP	14:30	17:30	03:00
16/09/20	2	PCa	08:15	11:15	03:00
16/09/20	1	GM	08:20	11:20	03:00
16/09/20	2	PCa	11:45	14:45	03:00
16/09/20	1	GM	11:50	14:50	03:00
17/09/20	4	GM	08:10	11:10	03:00
17/09/20	4	GM	11:40	14:40	03:00
05/10/20	2	TBo	09:10	12:10	03:00
05/10/20	2	TBo	12:40	15:40	03:00
08/10/20	1	GM	06:45	09:45	03:00
08/10/20	1	GM	10:15	13:15	03:00
15/10/20	4	GM	11:10	14:10	03:00
15/10/20	4	GM	14:40	17:40	03:00

Date	VP	Surveyor*	Start time	End time	Duration (hrs)
20/10/20	6	TBo	08:30	11:30	03:00
20/10/20	6	TBo	12:00	15:00	03:00
22/10/20	3	TBo	11:30	14:30	03:00
22/10/20	15	PCa	12:00	15:00	03:00
22/10/20	3	TBo	15:00	18:00	03:00
22/10/20	15	PCa	15:30	18:30	03:00
26/10/20	8	GM	11:00	14:00	03:00
26/10/20	8	GM	14:30	17:30	03:00
27/10/20	5	GM	08:15	11:15	03:00
27/10/20	5	GM	11:45	14:45	03:00
17/11/20	6	RW	09:30	12:30	03:00
17/11/20	6	RW	13:00	16:00	03:00
19/11/20	2	PCa	09:00	12:00	03:00
19/11/20	15	VH	09:15	12:15	03:00
19/11/20	2	Pca	12:30	15:30	03:00
19/11/20	15	VH	12:45	15:45	03:00
21/11/20	1	TBo	09:50	12:50	03:00
21/11/20	1	TBo	13:20	16:20	03:00
22/11/20	4	TBo	08:30	11:30	03:00
22/11/20	4	TBo	12:00	15:00	03:00
25/11/20	8	GM	09:55	12:55	03:00
25/11/20	8	GM	13:25	16:25	03:00
26/11/20	3	TBo	09:30	12:30	03:00
26/11/20	3	TBo	13:00	16:00	03:00
28/11/20	5	TBo	08:15	11:15	03:00
28/11/20	5	TBo	11:45	14:45	03:00
01/12/20	5	RW	09:30	12:30	03:00

Date	VP	Surveyor*	Start time	End time	Duration (hrs)
01/12/20	5	RW	13:00	16:00	03:00
02/12/20	8	PCa	09:30	12:30	03:00
02/12/20	8	PCa	13:00	16:00	03:00
05/12/20	4	TBo	09:15	12:15	03:00
05/12/20	4	TBo	12:45	15:45	03:00
07/12/20	15	RW	09:25	12:25	03:00
07/12/20	15	RW	12:55	15:55	03:00
14/12/20	6	TBo	09:45	12:45	03:00
14/12/20	6	TBo	13:15	16:15	03:00
20/12/20	2	TBo	08:50	11:50	03:00
20/12/20	2	TBo	12:10	15:10	03:00
22/12/20	1	TBo	09:40	12:40	03:00
22/12/20	1	TBo	13:10	16:10	03:00
24/12/20	3	TBo	08:05	11:05	03:00
24/12/20	3	TBo	11:35	14:35	03:00
18/01/21	1	TBo	08:30	11:30	03:00
18/01/21	15	VH	09:15	12:15	03:00
18/01/21	1	TBo	12:00	15:00	03:00
18/01/21	15	VH	12:45	15:45	03:00
21/01/21	3	TBo	10:30	13:30	03:00
21/01/21	3	TBo	14:00	17:00	03:00
22/01/21	6	VH	08:40	11:40	03:00
22/01/21	6	VH	12:10	15:10	03:00
23/01/21	4	TBo	08:30	11:30	03:00
23/01/21	4	TBo	12:00	15:00	03:00
24/01/21	8	TBo	08:30	11:30	03:00
24/01/21	8	TBo	12:00	15:00	03:00

Date	VP	Surveyor*	Start time	End time	Duration (hrs)
25/01/21	2	TBo	08:20	11:20	03:00
25/01/21	2	TBo	11:50	14:50	03:00
27/01/21	5	TBo	10:35	13:35	03:00
27/01/21	5	TBo	14:05	17:05	03:00
06/02/21	1	TBo	11:00	14:00	03:00
06/02/21	1	TBo	14:30	17:30	03:00
07/02/21	5	RW	09:30	12:30	03:00
07/02/21	5	RW	13:00	16:00	03:00
08/02/21	15	VH	08:15	11:15	03:00
08/02/21	15	VH	11:45	14:45	03:00
09/02/21	6	VH	08:45	11:45	03:00
09/02/21	6	VH	12:15	15:15	03:00
11/02/21	2	TBo	09:30	12:30	03:00
11/02/21	2	TBo	13:00	16:00	03:00
21/02/21	4	TBo	11:15	14:15	03:00
21/02/21	4	TBo	14:45	17:45	03:00
22/02/21	8	TBo	11:35	14:35	03:00
22/02/21	8	TBo	15:05	18:05	03:00
25/02/21	3	TBo	06:45	09:45	03:00
25/02/21	3	TBo	10:15	13:15	03:00
08/03/21	6	VH	09:40	12:40	03:00
08/03/21	6	VH	13:10	16:10	03:00
12/03/21	15	VH	09:10	12:10	03:00
12/03/21	15	VH	12:40	15:40	03:00
17/03/21	4	TBo	06:30	09:30	03:00
17/03/21	4	TBo	10:00	13:00	03:00
18/03/21	8	VH	10:00	13:00	03:00

Date	VP	Surveyor*	Start time	End time	Duration (hrs)
18/03/21	8	VH	13:30	16:30	03:00
19/03/21	3	VH	08:00	11:00	03:00
19/03/21	3	VH	11:30	14:30	03:00
23/03/21	5	VH	08:30	11:30	03:00
23/03/21	5	VH	12:00	15:00	03:00
24/03/21	2	VH	09:10	12:10	03:00
24/03/21	2	VH	12:40	15:40	03:00
25/03/21	1	TBo	05:35	08:35	03:00
25/03/21	1	TBo	09:05	12:05	03:00
09/04/21	2	AR	09:45	12:45	03:00
09/04/21	1	GP	10:15	13:15	03:00
09/04/21	2	AR	13:15	16:15	03:00
09/04/21	1	GP	13:45	16:45	03:00
12/04/21	15	VH	10:10	13:10	03:00
12/04/21	15	VH	13:40	16:40	03:00
14/04/21	8	VH	10:30	13:30	03:00
14/04/21	8	VH	14:00	17:00	03:00
15/04/21	6	VH	14:30	17:30	03:00
16/04/21	3	GM	12:05	15:05	03:00
16/04/21	3	GM	15:35	18:35	03:00
22/04/21	6	VH	08:35	11:35	03:00
22/04/21	6	VH	12:05	15:05	03:00
26/04/21	5	VH	12:30	15:30	03:00
26/04/21	5	VH	16:00	19:00	03:00
29/04/21	4	VH	10:10	13:10	03:00
29/04/21	4	VH	13:40	16:40	03:00
04/05/21	3	VH	07:30	10:30	03:00

Date	VP	Surveyor*	Start time	End time	Duration (hrs)
04/05/21	3	VH	11:00	14:00	03:00
14/05/21	1	VH	07:15	10:15	03:00
14/05/21	1	VH	10:45	13:45	03:00
17/05/21	6	VH	14:50	17:50	03:00
17/05/21	6	VH	18:20	21:20	03:00
21/05/21	15	DG	09:50	12:50	03:00
21/05/21	15	DG	13:20	16:20	03:00
24/05/21	2	VH	12:15	15:15	03:00
24/05/21	2	VH	15:45	18:45	03:00
27/05/21	4	PH	07:15	10:15	03:00
27/05/21	4	PH	10:45	13:45	03:00
28/05/21	5	PH	08:00	11:00	03:00
28/05/21	5	PH	11:30	14:30	03:00
30/05/21	8	GP	12:00	15:00	03:00
30/05/21	8	GP	15:30	18:30	03:00
02/06/21	15	GD	15:45	18:45	03:00
02/06/21	15	GD	19:15	22:15	03:00
07/06/21	5	PCa	05:15	08:15	03:00
07/06/21	5	PCa	08:45	11:45	03:00
11/06/21	2	AR	10:00	13:00	03:00
11/06/21	1	GP	10:15	13:15	03:00
11/06/21	2	AR	13:30	16:30	03:00
11/06/21	1	GP	13:45	16:45	03:00
23/06/21	3	AR	09:40	12:40	03:00
23/06/21	6	GP	09:45	12:45	03:00
23/06/21	3	AR	13:10	16:10	03:00
23/06/21	6	GP	13:15	16:15	03:00

Date	VP	Surveyor*	Start time	End time	Duration (hrs)
25/06/21	8	VH	11:00	14:00	03:00
25/06/21	8	VH	14:30	17:30	03:00
28/06/21	4	PH	12:25	15:25	03:00
28/06/21	4	PH	15:55	18:55	03:00
01/07/21	5	VH	13:20	16:20	03:00
01/07/21	5	VH	16:50	19:50	03:00
02/07/21	15	VH	04:30	07:30	03:00
02/07/21	15	VH	08:00	11:00	03:00
05/07/21	2	AR	10:40	13:40	03:00
05/07/21	1	GP	10:50	13:50	03:00
05/07/21	2	AR	14:10	17:10	03:00
05/07/21	1	GP	14:20	17:20	03:00
12/07/21	3	AR	11:40	14:40	03:00
12/07/21	6	GP	11:45	14:45	03:00
12/07/21	3	AR	15:10	18:10	03:00
12/07/21	6	GP	15:15	18:15	03:00
14/07/21	8	VH	11:00	14:00	03:00
14/07/21	8	VH	14:30	17:30	03:00
22/07/21	4	PH	07:45	10:45	03:00
22/07/21	4	PH	11:15	14:15	03:00
05/08/21	2	AR	05:10	08:10	03:00
05/08/21	1	MW	05:20	08:20	03:00
05/08/21	2	AR	08:40	11:40	03:00
05/08/21	1	MW	08:50	11:50	03:00
10/08/21	15	VH	06:50	09:50	03:00
10/08/21	15	VH	10:20	13:20	03:00
18/08/21	3	VH	06:45	09:45	03:00

Date	VP	Surveyor*	Start time	End time	Duration (hrs)
18/08/21	3	VH	10:15	13:15	03:00
23/08/21	5	PCa	11:25	14:25	03:00
23/08/21	8	VH	11:45	14:45	03:00
23/08/21	5	PCa	14:55	17:55	03:00
23/08/21	8	VH	15:15	18:15	03:00
26/08/21	4	VH	09:10	12:10	03:00
26/08/21	4	VH	12:40	15:40	03:00
26/08/21	6	VH	16:30	19:30	03:00

* Surveyors: AR: Andrew Russell; DG: Dave Grundy; GD: George Dunbar; GM: Gus McNab; GP: Gerry Palmer; GS, Graham Sparshott: IG: Iain Gilmore; MW: Mike Wood; PH: Phil Higginson; PCa: Pete Carroll; RW: Robbie Watt; TBo: Tony Bowman; VH: Viv Hastie.

Table A-2 – Scarce Breeding Raptor Survey Effort (April-July 2020 and 2021)

Year	Month	Date	Surveyor#	Start Time	End Time	Duration (hh:mm)*
2020	March	11/03/20	RW	08:30	16:00	07:30
		17/03/20	RW	07:00	14:00	07:00
	April	15/04/20	RW	12:30	16:30	04:00
		20/04/20	RW	07:30	16:30	09:00
		22/04/20	GM	11:05 14:10	14:05 17:10	06:00
			RW	11:30	16:30	05:00
		24/04/20	GM	09:30	12:30	03:00
		28/04/20	TBo	10:30 13:45	13:30 16:45	06:00
	May	07/05/20	RW	08:00	12:00	04:00
		11/05/20	TBo	08:30 11:55	11:30 14:55	06:00
		13/05/20	RW	07:30	12:30	05:00
		14/05/20	RW	06:30	14:00	07:30

Year	Month	Date	Surveyor#	Start Time	End Time	Duration (hh:mm)*
			Tbo	07:00	10:00	03:00
		18/05/20	Tbo	09:15 12:40	12:15 15:40	06:00
		20/05/20	RW	14:00	22:00	08:00
		27/05/20	RW	08:00	15:00	07:00
		28/05/20	TBo	08:45	14:45	06:00
	June	03/06/20	RW	11:00	21:30	10:30
		09/06/20	GM	10:40	12:20	01:40
		11/06/20	GM	08:30	14.20	05:50
		12/06/20	RW	08:00	15:00	09:00
		17/06/20	PC	18:10	21:10	03:00
	July	14/07/20	GM	12:00 15:10	15:00 18:10	06:00
		29/07/20	GM	12:00	18:00	06:00
2021	April	16/04/21	VH	08:30	11:30	03:00
		21/04/21	VH	09:00	15:00	06:00
	May	18/05/21	VH	09:10	15:10	06:00
		27/05/21	PH	14:30	18:20	03:50
	June	24/06/21	VH	09:40	15:40	06:00
		26/06/21	VH	10:00	13:00	03:00
	July	09/07/21	VH	08:00	14:00	06:00
		16/07/21	VH	10:30	13:30	03:00

* Surveyors: GM: Gus McNab; PC: Pete Carroll; PH: Phil Higginson; RW: Robbie Watt; TB: Tony Bowman; VH: Viv Hastie.

Table A-3 – Lekking Black Grouse Survey Effort (late March-mid May 2020 and 2021)

Year	Date	Surveyor*	Sunrise Time	Start Time	End Time	Duration (hh:mm)
2020	09/04/20	RW	06:24	05:30	08:30	03:00
	14/04/20	RW	06:12	05:30	07:30	02:00
	17/04/20	RW	06:04	05:00	08:00	03:00
	24/04/20	RW	05.47	05:15	07:15	02:00
	24/04/20	GM	05.47	04:45	06:45	02:00
	27/04/20	Tbo	05:40	05:10	06:40	01:30
	07/05/20	RW	05:18	05:00	08:00	03:00
	07/05/20	GM	05:18	04:20	07:20	03:00
	13/05/20	RW	05:06	04:30	07:30	03:00
	14/05/20	Tbo	05:04	04:45	06:45	02:00
	21/05/20	GM	04:52	05:55	07:55	02:00
	21/05/20	GM	04:52	03:55	05:55	02:00
2021	22/04/21	VH	05:50	04:55	07:55	03:00
	21/04/21	VH	05:22	04:55	07:55	03:00
	14/05/21	Pca	05:04	04:10	07:10	03:00
	14/05/21	VH	05:04	04:10	07:10	03:00

* Surveyors: GM: Gus McNab; RW: Robbie Watt; Tbo: Tony Bowman; Pca: Pete Carroll; VH: Viv Hastie.

Table A-4 – Breeding Nightjar Survey Effort (June–mid July 2020 and 2021)

Year	Date	Surveyor*	Start Time	End Time	Duration (hh:mm)
2020	17/06/20	GM	22:10	01:05	02:55
	17/06/20	GM	22:20	00:50	02:30
	25/06/20	GM	22:20	00:55	02:35
	02/07/20	GM	22:15	00:55	02:30
	16/07/20	GM	22:00	00:40	02:40

Year	Date	Surveyor*	Start Time	End Time	Duration (hh:mm)
	16/07/20	Pca	22:05	00:35	02:30
	23/07/20	Pca	21:55	00:25	02:30
	23/07/20	GM	21:50	00:25	02:35
2021	21/06/21	Pca/VH	22:15	01:20	03:05
	30/06/21	PH/VH	22:20	01:20	03:00
	15/07/21	Pca/VH	22:00	01:00	03:00
	29/07/21	VH	21:40	00:40	03:00
* Surveyors: GM: Gus McNab; Pca: Pete Carroll; VH: Viv Hastie.					

Table A-5 – Moorland Breeding Bird Survey Effort (April – July 2020 and 2021)

Year	Month	Date	Surveyor*	Start Time	End Time	Duration (hh:mm)*
2020	April	14/04/20	RW	08:30	09:30	01:00
		22/04/20	TBo	07:15	08:55	01:40
		24/04/20	AM	11:30	12:30	01:00
			RW	11:00	13:00	02:00
		27/04/20	TBo	06:40	07:30	00:50
	May	07/05/20	RW	08:00	12:00	04:00
		13/05/20	RW	07:30	19:30	02:00
	June	01/06/20	RW	10:30	12:00	01:30
		16/06/20	RW	08:30	10:30	02:00
		19/06/20	RW	09:45	11:45	02:00
		30/06/20	RW	13:00	15:00	02:00
	July	14/07/20	GM	08:30	11:30	03:00
		20/07/20	GM	08:30	09:45	01:15
		29/07/20	GM	08:35	11:30	02:55
			RW	11:10	13:10	02:00

Year	Month	Date	Surveyor*	Start Time	End Time	Duration (hh:mm)*
2021	April	16/04/21	GM	08:30	11:35	03:05
		21/04/21	VH	09:00	15:00	06:00
	May	18/05/21	VH	09:10	15:10	06:00
		27/05/21	PH	14:30	18:20	03:50
	June	24/06/21	VH	09:40	15:40	06:00
		26/06/21	VH	10:00	13:00	03:00
	July	09/07/21	VH	08:00	14:00	06:00
		16/07/21	VH	10:30	13:30	03:00

* Surveyors: GM: Gus McNab; PH: Phil Higginson; RW: Robbie Watt; TB: Tony Bowman; VH: Viv Hastie.

Annex B

ORNITHOLOGICAL SURVEY RESULT DETAILS

Table B-1 – Details of Flight Activity Survey Records

Date	Time	VP	Surveyor*	Species	No. of Birds	Flight Duration (secs)
29/09/19	13:00	8	AR	Goshawk	1	195
01/10/19	11:40	2	TBo	Pink-footed goose	70	105
01/10/19	12:18	2	TBo	Pink-footed goose	34	105
01/10/19	13:51	2	TBo	Pink-footed goose	70	60
08/10/19	16:02	2	AR	Goshawk	1	135
30/10/19	11:10	15	PCa	Goshawk	1	195
30/10/19	12:08	15	PCa	Red kite	1	165
09/12/19	12:05	2	PCa	Peregrine	1	60
09/12/19	14:03	1	GM	Goshawk	1	45
23/12/19	10:21	4	TBo	Goshawk	2	240
23/12/19	14:10	4	TBo	Greylag goose	2	30
03/01/20	13:27	5	AR	Goshawk	2	165
03/01/20	13:41	5	AR	Goshawk	1	285
03/01/20	13:43	5	AR	Goshawk	1	210
17/01/20	09:43	2	GM	Goshawk	1	90
17/01/20	09:44	2	GM	Pink-footed goose	122	225
17/01/20	10:04	8	PCa	Pink-footed goose	110	120
17/01/20	10:16	2	GM	Goshawk	1	75
17/01/20	14:36	8	PCa	Goshawk	1	120
26/01/20	14:17	6	TBo	Goshawk	1	90
03/02/20	09:16	3	TBo	Goshawk	2	225
03/02/20	10:33	3	TBo	Goshawk	2	300
03/02/20	11:40	3	TBo	Goshawk	1	315
07/02/20	10:43	5	AR	Goshawk	1	195
07/02/20	12:07	5	AR	Goshawk	1	150
07/02/20	14:52	5	AR	Goshawk	1	285

Date	Time	VP	Surveyor*	Species	No. of Birds	Flight Duration (secs)
07/02/20	14:57	5	AR	Goshawk	1	150
25/02/20	08:41	2	GM	Goshawk	1	30
25/02/20	11:49	2	GM	Goshawk	1	60
25/02/20	11:49	2	GM	Goshawk	1	285
25/02/20	11:54	2	GM	Goshawk	1	30
25/02/20	12:09	4	TBo	Goshawk	2	30
25/02/20	13:15	4	TBo	Goshawk	1	30
10/03/20	15:18	2	RW	Goshawk	1	30
10/03/20	15:18	2	RW	Goshawk	1	15
12/03/20	10:04	15	RW	Pink-footed goose	45	300
12/03/20	11:22	15	IG	Pink-footed goose	10	90
12/03/20	12:22	6	RW	Pink-footed goose	88	75
16/03/20	11:16	5	RW	Goshawk	1	60
16/03/20	11:32	5	RW	Goshawk	2	30
16/03/20	12:20	5	RW	Goshawk	1	15
16/03/20	12:42	5	RW	Goshawk	1	15
16/03/20	12:52	5	RW	Goshawk	1	15
16/03/20	12:53	5	RW	Goshawk	1	15
16/03/20	13:58	5	RW	Goshawk	1	15
16/03/20	15:28	5	RW	Goshawk	1	15
16/03/20	15:42	5	RW	Peregrine	1	30
18/03/20	09:48	1	RW	Red kite	1	60
18/03/20	10:53	1	RW	Snipe	1	210
18/03/20	10:55	1	RW	Snipe	1	255
19/03/20	11:42	4	RW	Lapwing	2	15
19/03/20	11:48	4	RW	Lapwing	1	30
19/03/20	11:50	4	RW	Lapwing	1	30

Date	Time	VP	Surveyor*	Species	No. of Birds	Flight Duration (secs)
19/03/20	12:03	4	RW	Lapwing	1	15
19/03/20	12:14	4	RW	Merlin	1	15
19/03/20	13:09	4	RW	Goshawk	1	15
19/03/20	17:04	4	RW	Lapwing	1	45
19/03/20	17:15	4	RW	Lapwing	1	30
14/04/20	10:31	4	RW	Goshawk	1	45
14/04/20	10:57	4	RW	Lapwing	1	30
14/04/20	12:51	4	RW	Red kite	1	240
15/04/20	11:08	1	RW	Goshawk	1	15
15/04/20	11:08	1	RW	Goshawk	1	15
20/04/20	11:20	4	RW	Goshawk	1	75
20/04/20	11:35	4	RW	Lapwing	1	15
20/04/20	11:54	4	RW	Red kite	1	225
20/04/20	12:51	4	RW	Lapwing	1	15
22/04/20	10:12	15	TBo	Red kite	1	60
22/04/20	10:24	6	RW	Snipe	1	15
23/04/20	16:13	2	GM	Goshawk	1	30
23/04/20	19:55	2	GM	Goshawk	1	75
24/04/20	08:30	1	RW	Goshawk	1	15
24/04/20	09:28	1	RW	Goshawk	1	240
24/04/20	09:42	1	RW	Curlew	1	15
04/05/20	11:23	3	RW	Red kite	2	75
07/05/20	11:53	8	GM	Goshawk	1	45
13/05/20	15:24	8	GM	Goshawk	1	165
13/05/20	16:03	8	GM	Goshawk	1	225
18/05/20	10:25	4	RW	Lapwing	1	15
18/05/20	10:44	4	RW	Lapwing	1	15

Date	Time	VP	Surveyor*	Species	No. of Birds	Flight Duration (secs)
18/05/20	15:18	4	RW	Lapwing	3	30
19/05/20	12:11	5	GM	Curlew	1	30
19/05/20	13:16	5	GM	Goshawk	1	150
19/05/20	14:08	5	GM	Greylag goose	2	135
19/05/20	15:40	3	GM	Short-eared owl	1	225
19/05/20	15:57	3	GM	Short-eared owl	1	255
19/05/20	16:14	3	GM	Short-eared owl	1	105
19/05/20	16:31	3	GM	Short-eared owl	1	210
19/05/20	16:56	3	GM	Short-eared owl	1	165
19/05/20	17:03	3	GM	Red kite	1	120
19/05/20	17:43	3	GM	Short-eared owl	1	105
19/05/20	17:46	3	GM	Red kite	1	30
20/05/20	08:14	6	TBo	Red kite	1	60
21/05/20	11:34	6	RW	Lapwing	3	45
21/05/20	17:52	6	RW	Oystercatcher	1	15
28/05/20	12:22	2	RW	Red kite	1	75
28/05/20	12:27	2	RW	Red kite	1	45
28/05/20	14:28	1	GM	Red kite	1	45
28/05/20	16:49	5	GM	Goshawk	1	105
29/05/20	08:30	15	RW	Red kite	1	30
29/05/20	11:08	15	RW	Oystercatcher	1	15
29/05/20	11:24	15	RW	Red kite	1	30
29/05/20	12:10	15	RW	Red kite	1	15
01/06/20	07:37	1	RW	Snipe	1	45
01/06/20	09:23	1	RW	Short-eared owl	1	30
01/06/20	09:51	1	RW	Short-eared owl	1	105
01/06/20	10:08	1	RW	Short-eared owl	1	60

Date	Time	VP	Surveyor*	Species	No. of Birds	Flight Duration (secs)
01/06/20	10:17	1	RW	Short-eared owl	1	15
01/06/20	13:05	8	GM	Goshawk	1	60
01/06/20	?	1	RW	Short-eared owl	1	120
05/06/20	10:11	2	RW	Red kite	1	15
05/06/20	11:42	2	RW	Red kite	1	30
05/06/20	12:16	2	RW	Red kite	1	15
05/06/20	12:24	2	RW	Red kite	1	30
05/06/20	14:42	2	RW	Goshawk	1	15
09/06/20	16:42	3	GM	Short-eared owl	1	60
09/06/20	16:56	3	GM	Short-eared owl	1	75
19/06/20	07:11	6	RW	Snipe	1	15
19/06/20	14:01	6	RW	Snipe	1	15
19/06/20	14:05	6	RW	Snipe	1	15
15/07/20	12:06	2	PCa	Goshawk	1	15
16/07/20	15:39	15	PCa	Red kite	1	150
16/07/20	16:12	15	PCa	Red kite	2	105
16/07/20	16:21	15	PCa	Red kite	1	600
16/07/20	16:42	8	GM	Red kite	1	270
16/07/20	17:50	15	PCa	Oystercatcher	1	30
16/07/20	18:12	15	PCa	Oystercatcher	1	15
20/07/20	10:17	1	GM	Red kite	1	195
20/07/20	10:42	1	GM	Goshawk	1	90
20/07/20	15:48	1	GM	Red kite	1	60
07/08/20	12:40	6	RW	Goshawk	1	15
17/08/20	14:04	15	RW	Red kite	1	45
20/08/20	14:22	4	RW	Merlin	1	15
24/08/20	10:34	2	RW	Red kite	3	105

Date	Time	VP	Surveyor*	Species	No. of Birds	Flight Duration (secs)
08/09/20	12:07	6	RW	Goshawk	1	105
10/09/20	10:30	5	GP	Hen harrier	1	60
16/09/20	08:22	1	GM	Hen harrier	1	375
16/09/20	09:51	1	GM	Red kite	1	180
16/09/20	13:16	1	GM	Pink-footed goose	51	210
16/09/20	13:32	2	PCa	Goshawk	1	465
16/09/20	14:04	2	PCa	Golden plover	4	165
16/09/20	14:17	2	PCa	Pink-footed goose	43	135
17/09/20	09:36	4	GM	Greylag goose	19	195
17/09/20	09:38	4	GM	Pink-footed goose	112	165
17/09/20	12:11	4	GM	Pink-footed goose	13	150
17/09/20	12:45	4	GM	Pink-footed goose	76	195
05/10/20	14:20	2	TBo	Goshawk	1	130
15/10/20	11:31	4	GM	Red kite	1	60
15/10/20	15:27	4	GM	Red kite	1	135
15/10/20	15:41	4	GM	Pink-footed goose	23	120
22/10/20	12:41	15	PCa	Whooper swan	38	105
22/10/20	13:50	15	PCa	Goshawk	1	30
22/10/20	15:25	3	TBo	Whooper swan	8	90
26/10/20	13:02	8	GM	Peregrine	1	105
17/11/20	15:53	6	RW	Goshawk	1	15
19/11/20	11:57	15	VH	Goshawk	1	285
21/11/20	11:17	1	TBo	Pink-footed goose	53	105
21/11/20	14:48	1	TBo	Goshawk	1	120
22/11/20	09:41	4	TBo	Peregrine	1	90
22/11/20	11:23	4	TBo	Goshawk	1	30
26/11/20	14:16	3	TBo	Pink-footed goose	400	150

Date	Time	VP	Surveyor*	Species	No. of Birds	Flight Duration (secs)
26/11/20	15:50	3	TBo	Pink-footed goose	300	135
22/12/20	15:47	1	TBo	Pink-footed goose	200	30
18/01/21	09:33	15	VH	Goshawk	1	105
18/01/21	10:58	15	VH	Pink-footed goose	160	345
18/01/21	12:12	15	VH	Red kite	2	270
20/01/21	09:03	6	VH	Pink-footed goose	49	300
20/01/21	11:19	6	VH	Snipe	2	30
20/01/21	13:55	6	VH	Snipe	1	15
23/01/21	11:26	4	TBo	Red kite	1	45
23/01/21	12:02	4	TBo	Red kite	1	90
27/01/21	12:04	5	TBo	Red kite	1	180
08/02/21	13:06	15	VH	Goshawk	1	180
08/02/21	15:18	5	RW	Goshawk	1	30
09/02/21	13:36	6	VH	Pink-footed goose	94	150
11/02/21	14:11	2	TBo	Goshawk	1	75
25/02/21	07:09	3	TBo	Pink-footed goose	150	165
25/02/21	07:36	3	TBo	Pink-footed goose	37	30
25/02/21	07:42	3	TBo	Pink-footed goose	36	105
25/02/21	09:18	3	TBo	Pink-footed goose	120	75
25/02/21	09:45	3	TBo	Pink-footed goose	65	60
25/02/21	12:39	3	TBo	Goshawk	1	75
08/03/21	10:09	6	VH	Lapwing	1	225
08/03/21	11:03	6	VH	Red kite	1	150
12/03/21	09:28	15	VH	Red kite	1	555
12/03/21	09:51	15	VH	Red kite	1	330
12/03/21	10:06	15	VH	Red kite	1	260
12/03/21	10:45	15	VH	Red kite	1	300

Date	Time	VP	Surveyor*	Species	No. of Birds	Flight Duration (secs)
12/03/21	11:40	15	VH	Red kite	1	645
12/03/21	13:46	15	VH	Red kite	1	105
17/03/21	12:30	4	TBo	Goshawk	1	195
18/03/21	10:40	8	VH	Goshawk	1	210
19/03/21	08:56	3	VH	Lapwing	3	90
19/03/21	11:37	3	VH	Pink-footed goose	85	210
19/03/21	12:17	3	VH	Goshawk	1	30
23/03/21	08:41	5	VH	Goshawk	1	420
23/03/21	10:26	5	VH	Goshawk	1	270
09/04/21	10:48	2	AR	Goshawk	1	135
09/04/21	10:54	2	AR	Goshawk	1	75
09/04/21	10:54	2	AR	Goshawk	2	105
09/04/21	11:13	2	AR	Red kite	1	285
09/04/21	11:39	2	AR	Goshawk	1	195
09/04/21	11:41	2	AR	Goshawk	1	30
09/04/21	14:48	2	AR	Red kite	1	105
09/04/21	15:21	1	GP	Red kite	1	60
09/04/21	15:21	1	GP	Red kite	1	195
09/04/21	16:00	2	AR	Goshawk	1	105
12/04/21	10:59	15	VH	Goshawk	1	135
12/04/21	14:21	15	VH	Red kite	1	180
12/04/21	15:52	15	VH	Peregrine	1	675
16/04/21	12:29	3	VH	Pink-footed goose	160	255
22/04/21	09:24	6	VH	Pink-footed goose	42	255
22/04/21	11:14	6	VH	Pink-footed goose	63	330
22/04/21	14:33	6	VH	Red kite	1	300
26/04/21	13:11	5	VH	Greylag goose	2	60

Date	Time	VP	Surveyor*	Species	No. of Birds	Flight Duration (secs)
26/04/21	14:02	5	VH	Greylag goose	2	75
29/04/21	11:23	4	VH	Red kite	1	75
29/04/21	11:27	4	VH	Red kite	1	255
29/04/21	11:34	4	VH	Red kite	1	285
29/04/21	11:50	4	VH	Goshawk	1	15
29/04/21	16:21	4	VH	Red kite	2	15
04/05/21	09:56	3	VH	Goshawk	1	255
14/05/21	07:26	1	VH	Red kite	2	150
14/05/21	07:29	1	VH	Red kite	1	75
14/05/21	11:45	1	VH	Red kite	1	225
17/05/21	16:37	6	VH	Red kite	1	270
17/05/21	18:47	6	VH	Red kite	1	165
17/05/21	19:28	6	VH	Goshawk	1	90
17/05/21	20:10	6	VH	Osprey	1	165
21/05/21	10:02	15	DG	Red kite	1	240
24/05/21	15:01	2	VH	Red kite	1	45
25/05/21	16:39	2	VH	Red kite	1	165
27/05/21	10:46	4	PH	Goshawk	1	300
27/05/21	10:50	4	PH	Curlew	1	45
27/05/21	11:01	4	PH	Snipe	1	45
27/05/21	11:45	4	PH	Goshawk	1	345
28/05/21	11:56	5	PH	Greylag goose	4	180
02/06/21	16:02	15	GD	Red kite	2	675
02/06/21	17:09	15	GD	Red kite	1	270
02/06/21	17:41	15	GD	Red kite	1	75
11/06/21	10:41	1	GP	Red kite	1	45
11/06/21	10:46	1	GP	Red kite	1	210

Date	Time	VP	Surveyor*	Species	No. of Birds	Flight Duration (secs)
11/06/21	11:51	1	GP	Goshawk	1	90
11/06/21	11:57	1	GP	Red kite	1	255
11/06/21	12:31	1	GP	Red kite	1	105
11/06/21	12:53	1	GP	Red kite	1	15
11/06/21	15:05	1	GP	Red kite	1	120
23/06/21	10:42	3	AR	Red kite	1	105
25/06/21	13:13	8	VH	Peregrine	1	120
28/06/21	14:28	4	PH	Red kite	1	285
01/07/21	19:04	5	VH	Osprey	1	330
02/07/21	08:49	15	VH	Red kite	1	690
02/07/21	10:05	15	VH	Snipe	1	90
05/07/21	12:40	1	GP	Red kite	1	150
05/07/21	13:07	2	AR	Goshawk	1	75
05/07/21	16:05	1	GP	Red kite	1	270
12/07/21	12:42	3	VH	Goshawk	1	165
05/08/21	07:50	2	AR	Osprey	1	225
10/08/21	07:35	15	VH	Osprey	1	360
10/08/21	08:35	15	VH	Peregrine	1	45
10/08/21	10:22	15	VH	Red kite	1	90
10/08/21	10:57	15	VH	Red kite	1	135
18/08/21	08:15	3	VH	Osprey	1	105
18/08/21	13:04	3	VH	Goshawk	1	75
26/08/21	09:58	4	VH	Hen harrier	1	1005

* Surveyors: AR: Andrew Russell; DG: Dave Grundy; GD: George Dunbar; GM: Gus McNab; GP: Gerry Palmer; GS, Graham Sparshott: IG: Iain Gilmore; MW: Mike Wood; PH: Phil Higginson; PCa: Pete Carroll; RW: Robbie Watt; TBo: Tony Bowman; VH Viv Hastie.

Table B-2 – Moorland Breeding Bird Survey Species List and associated Conservation Status

Species	EU Annex I	WCA Sch. 1	BoCC Red-listed	BoCC Amber-listed
Blackbird (*Turdus merula*)				
Blue tit (*Cyanistes caeruleus*)				
Buzzard				
Carrion crow (*Corvus corone*)				
Collared dove (*Columba decaocto*)				
Chaffinch (*Fringilla coelebs*)				
Crossbill		✓		
Curlew			✓	
Dunnock (*Prunella modularis*)				✓
Goshawk		✓		
Goldfinch (*Carduelis carduelis*)				
House sparrow (*Passer domesticus*)			✓	
Jackdaw (*Corvus monedula*)				
Kestrel				✓
Lapwing			✓	
Lesser black-backed gull (*Larus fuscus*)				
Linnet (*Carduelis cannabina*)			✓	
Merlin	✓	✓	✓	
Meadow pipit (*Anthus pratensis*)				✓
Oystercatcher			✓	
Pink-footed goose				✓
Pheasant (*Phasianus colchichus*)				
Pied wagtail (*Motacilla alba yarelli*)				
Raven (*Corvus corax*)				
Reed bunting (*Emberiza schoeniclus*)				✓
Redpoll			✓	

Species	EU Annex I	WCA Sch. 1	BoCC Red-listed	BoCC Amber-listed
Red-legged partridge (*Alectoris rufa*)				
Red kite	✓	✓		
Common redstart (*Phoenicurus phoenicurus*)				✓
Robin (*Erithacus rubecula*)				
Rook (*Corvus frugilegus*)				
Sand martin (*Riparia riparia*)				
Siskin (*Carduelis spinus*)				
Skylark			✓	
Snipe			✓	
Song thrush (*Turdus philomelos*)				✓
Spotted flycatcher (*Muscicapa striata*)			✓	
Stock dove (*Columba oenas*)				
Stonechat (*Saxicola rubicola*)				
Swallow (*Hirundo rustica*)				
Tree pipit			✓	

Table B-3 – Breeding Bird Walkover Survey Species List and associated Conservation Status

Species	EU Annex I	WCA Sch. 1	BoCC Red-listed	BoCC Amber-listed
Barn owl	✓	✓		
Blackbird				
Blackcap (*Sylvia atricapilla*)				
Blue tit				
Bullfinch (*Pyrrhula pyrrhula*)				✓
Buzzard				
Chaffinch				
Chiffchaff (*Phylloscopus collybita*)				

Species	EU Annex I	WCA Sch. 1	BoCC Red-listed	BoCC Amber-listed
Coal tit (*Periparus ater*)				
Crossbill		✓		
Cuckoo			✓	
Dunnock				✓
Goldcrest (*regulus regulus*)				
Great spotted woodpecker (*Dendrocops major*)				
Great tit (*Parus major*)				
Greylag goose				✓
House martin (*Delichon urbicum*)			✓	
Jackdaw				
Jay (*Garrulus glandarius*)				
Long-tailed tit (*Aegithalos caudatus*)				
Mallard (*Anas platyrhychos*)				✓
Meadow pipit				✓
Mistle thrush				✓
Pied wagtail				
Redpoll			✓	
Common redstart				✓
Robin				
Rook				
Siskin				
Skylark			✓	
Song thrush				✓
Stonechat				
Teal (*Anas crecca*)				✓
Tree pipit			✓	

Species	EU Annex I	WCA Sch. 1	BoCC Red-listed	BoCC Amber-listed
Willow warbler (*Phylloscopus trochilus*)				✓
Woodpigeon (*Columba palumbus*)				✓
Wren (*Troglodytes troglodytes*)				

7 Lochside View
Edinburgh Park
Edinburgh, Midlothian
EH12 9DH

wsp.com