

Volume 4: Appendix 9.1 – Ornithology Technical Report

Emmock and Tealing 400 kV Overhead Line Tie-Ins

Environmental Impact Assessment (EIA)

Volume 4 | Appendix 9.1

Ornithology Technical Report

September 2025



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LIST OF ABBREVIATIONS

Agl:	Above Ground Level
BBS:	Breeding Bird Survey
BoCC:	Birds of Conservation Concern
BSPP:	Bird Species Protection Plan
BTO:	British Trust for Ornithology
CMS:	Conservation of Migratory Species of Wild Animals
EC:	European Commission
EEC:	European Economic Community
EIA:	Environmental Impact Assessment
EIAR:	Environmental Impact Assessment Report
FA:	Flight Activity
FLS:	Forestry and Land Scotland
GIS:	Geographical Information System
HRA:	Habitat Regulations Assessment
IBA:	Important Bird Area
km:	kilometres
LBAP:	Local Biodiversity Action Plan
LNCS:	Local Nature Conservation Site
LNR:	Local Nature Reserve
LOD:	Limit of Deviation
NBN:	National Biodiversity network
NCI:	Nature Conservation Importance
NHZ:	Natural Heritage Zone
NNR:	National Nature Reserves
NPPG:	National Planning Policy Guidance
OHL:	Overhead Line
pch:	Potential Collision Height
RSPB:	Royal Society for the Protection of Birds
SBL:	Scottish Biodiversity List
SPA:	Special Protection Area
SPEC:	Species of European Conservation Concern
SPP:	Scottish Planning Policy
SSSI:	Site of Special Scientific Interest
SWT:	Scottish Wildlife Trust
UK:	United Kingdom

UK BAP: UK Biodiversity Action Plan

VP: Vantage watch point

WCA: *Wildlife and Countryside Act, 1981 (as amended)*

WeBS: Wetland Bird Survey

9. ORNITHOLOGY

9.1 Introduction

This appendix presents information relevant to the Proposed Development. It should be read in conjunction with **Volume 2, Chapter 9: Ornithology** and **Volume 2, Chapter 3: Project Description** of the Environmental Impact Assessment Report (EIAR) for full details of the Proposed Development.

9.1.1 This appendix is supported by the following figures (**Volume 3** of this EIAR):

- **Figure 9.1: The Proposed Development and Ornithology Survey Area;**
- **Figure 9.2: Ornithological Designated Sites within 20 km and 5 km;**
- **Figure 9.3: Flight Activity Surveys; and**
- **Figure 9.4: Winter Goose Foraging Surveys.**

9.2 Requirement for the Report

9.2.1 LUC was commissioned by Scottish and Southern Energy Networks (SSEN Transmission), hereafter referred to as 'the Applicant' to undertake an ornithological desk study together with bird surveys to aid the design process and to inform an assessment of the bird resource present. This included determining the presence or likely absence of Special Protection Area (SPA)/Ramsar qualifying species, species of conservation concern and Schedule 1/Annex 1 bird species that may be affected by the Proposed Development.

9.3 Terminology and Survey Area

9.3.1 The following terminology will be used throughout this report:

- **Site:** Defined as the Proposed Development plus Limit of Deviation (LOD) of up to 200 m; refer to Volume 3, **Figure 3.1: Proposed Development for which Section 37 Consent and Deemed Planning Permission Consent is sought;**).
- **Proposed Development:** The infrastructure including the access tracks, temporary diversions of the OHL and their temporary towers and temporary construction compounds (refer to **Volume 2, Chapter 3: Project Description**).
- **Breeding Bird Survey (BBS) Area:** The Site plus a 250 m buffer.
- **Flight Activity Area:** Survey area to 10 km distance from SPAs/Ramsar sites which coincide with the Proposed Development (collectively with the BBS Area designated the **Survey Area**).
- **Study Area:** The area within which ornithology desk-based studies were undertaken (up to 20 km from the Proposed Development, as shown in **Volume 3, Figure 9.2: Ornithological Designated Sites within 20 km and 5 km**).

9.4 Relevant Legislation and Policy Summary

9.4.1 Relevant legislation and guidance documents have been reviewed and considered as part of this ornithology assessment. Of relevance are:

- *The European Council Directive on the Conservation of Wild Birds 2009/147/EC* (the Birds Directive)¹;
- *The Wildlife and Countryside Act 1981* (as amended)²;
- *The Conservation of Habitats and Species Regulations 2017 (Amendment) (EU Exit)*³;

¹ UK Government, 2009. *Directive 2009/147/EC of the European Parliament and of the Council*. [Online] Available at: <https://www.legislation.gov.uk/eudr/2009/147/contents>.

² UK Government, 1981. *Wildlife and Countryside Act 1981*. [Online] Available at: <https://www.legislation.gov.uk/ukpga/1981/69>.

³ *The Conservation of Habitats and Species Regulations 2017 (Amendment) (EU Exit)*. [Online] Available at: <https://www.legislation.gov.uk/ukdsi/2019/9780111176573>

- *The Conservation (Natural Habitats, &c.) (EU Exit) (Scotland) (Amendment) Regulations 2019*⁴
- *The Convention on Wetlands of International Importance especially as Water-fowl Habitat (Ramsar Convention)*⁵;
- *The Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention)*⁶
- *The Nature Conservation (Scotland) Act 2004* (as amended)⁷;
- *The National Planning Framework 4* (NPF4)⁸;
- *The Scottish Biodiversity Strategy to 2045*⁹;
- *The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (the EIA Regulations)*¹⁰; and
- The Tayside Local Biodiversity Action Plan¹¹

The European Council Directive on the Conservation of Wild Birds 2009/147/EC (the Birds Directive)

- 9.4.2 The Birds Directive¹ aims to protect all naturally occurring wild bird species present in the EU and their most important habitats. In addition to halting the decline or disappearance of bird species, the Directive aims to allow bird species to recover and thrive over the long-term. Through the protection and restoration of bird habitats, member states (including the UK) will ensure sufficient habitat diversity and area to support all wild bird species.
- 9.4.3 As part of the Birds Directive, member states must classify SPAs as European Sites (formerly known as ‘Natura’ Sites) for species listed in Annex 1 of the Birds Directive. In addition to threatened bird species, SPAs include other migratory birds and pay particular importance to the protection of wetlands of international importance.
- 9.4.4 The ‘Natura 2000’ network extended to a Europe-wide system of sites, which were designated for their ecological value. Sites which have been designated for the protection of birds were, and are, designated as SPAs. SPAs support bird assemblages and/or qualifying bird species where >1% of a population uses the area for breeding, roosting and/or migration. The term “European Site” is used to refer to what were previously known as “Natura” sites¹². These sites were originally designated as part of the “Natura 2000” protected areas network. Since “exit day”¹³, references to Natura 2000 should now be construed as references to the “national site network”, in terms of regulation 3(10) of *The Conservation of Habitats and Species Regulations 2017* (“the Habitats Regulations”). National site network is defined in terms of regulation 3(1) of the Habitats Regulations.
- 9.4.5 Ramsar sites, which support internationally important wetland habitats, are listed under the *Convention on Wetlands of International Importance as ‘Waterfowl Habitat’* (Ramsar Convention, 1971, as amended 1982)¹⁴. Updated policy on the protection of Ramsar Sites came into force on 9 July 2025¹⁵ such that all listed Ramsar Sites in Scotland should be treated as if they were European sites for the purposes of land change and decision making.

⁴ *The Conservation (Natural Habitats, &c.) (EU Exit) (Scotland) (Amendment) Regulations 2019*. [Online] Available at: <https://www.legislation.gov.uk/sdsi/2019/9780111041062>

⁵ UNESCO, 2024. *Convention on Wetlands of International Importance especially as Waterfowl Habitat*. [Online] Available at: <https://www.unesco.org/en/biodiversity/wetlands>.

⁶ CMS, n.d. *Convention on the Conservation of Migratory Species of Wild Animals*. [Online] Available at: <https://www.cms.int/>.

⁷ UK Government, 2004. *Nature Conservation (Scotland) Act 2004*. [Online] Available at: <https://www.legislation.gov.uk/asp/2004/6/contents>.

⁸ Scottish Government, 2024. *National Planning Framework 4*. [Online] Available at: [National Planning Framework 4 - gov.scot](https://www.gov.scot/national-planning-framework-4)

⁹ Scottish Government, 2024. *Scottish Biodiversity Strategy to 2045*. [Online] Available at: [Scottish Biodiversity Strategy to 2045 - gov.scot](https://www.gov.scot/scottish-biodiversity-strategy-to-2045)

¹⁰ UK Government, 2017. *Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017* [Online] Available at: [The Electricity Works \(Environmental Impact Assessment\) \(Scotland\) Regulations 2017](https://www.legislation.gov.uk/uksi/2017/1041/contents/made)

¹¹ Tayside Biodiversity Partnership, 2016. *Action Plan – New LBAP 2016-2026*. [Online] Available at: <https://www.taysidebiodiversity.co.uk/action-plan/action-plan-new-lbap-2015/>.

¹² Defined in this context by Regulation 8 of *The Conservation of Habitats and Species Regulations 2017*.

¹³ 31 January 2020 at 11pm: cf Section 20(1) of the European Union (Withdrawal) Act 2018.

¹⁴ UNESCO, 1971. *Convention on Wetlands of International Importance especially as Waterfowl Habitat*. [Online] Available at: <https://www.ramsar.org/official-documents>.

¹⁵ Scottish Government. 2025. *Wetlands – protecting Ramsar sites: updated Scottish Government policy*. [Online] Available at: [Wetlands - protecting Ramsar sites: updated Scottish Government policy - gov.scot](https://www.gov.scot/wetlands-protecting-ramsar-sites-updated-scottish-government-policy)

9.4.6 Considerable protection is given to SPAs and Ramsar sites through the Habitats Regulations and these protections are normally reflected in national and local planning policy and decision-making processes. Where developments have the potential to adversely affect SPAs/Ramsars, an assessment process known as a Habitats Regulations Appraisal (HRA) must first be undertaken.

9.4.7 In order that potential effects on the national site network can be fully understood, it is important that they are considered fully in EIAR desk studies.

9.4.8 There is no change to the protection of SPAs, as identified under the 'Natura 2000' network, because of the United Kingdom's exit from the European Union¹⁶.

The Wildlife and Countryside Act 1981 (as amended)

9.4.9 *The Wildlife and Countryside Act 1981 (as amended)* (WCA)² is UK wide legislation that gives rise to Designated Sites (Sites of Special Scientific Interest (SSSI)), regulates the management of invasive species and provides protections for species of national conservation importance. Important features of the legislation in relation to birds are set out below.

9.4.10 All wild birds are protected by law under the WCA. It is an offence to:

- kill or injure any wild bird;
- capture or keep (dead or alive) any wild bird;
- destroy or take the eggs of any wild bird;
- sell or advertise for sale any wild bird or its eggs; and
- destroy, damage, interfere with, take or obstruct the use of the nest of any wild birds while it is in use or being built.

9.4.11 This legislation means that birds are fully protected in Scotland, and that any planned activity which may affect them requires careful consideration to ensure both legal compliance and no significant ecological impact.

9.4.12 In addition, certain species listed on Schedule 1 of the WCA are offered further protection whereby it is an offence to intentionally or recklessly cause disturbance during the breeding season without a licence (including whilst Schedule 1 birds are building a nest, whilst in, on, or near a nest with eggs or young and includes the disturbance of dependent young of such species).

The Conservation of Habitats and Species Regulations 2017 (Amendment) (EU Exit);

9.4.13 The Conservation of Habitats and Species Regulations 2017 (Amendment) (EU Exit) Regulations 2019³, amend the 2017 Regulations to ensure they function effectively after the UK's withdrawal from the European Union. These amendments primarily address the transition of responsibilities and references from an EU context to a UK-specific one, ensuring continued protection of habitats and species.

The Conservation (Natural Habitats, &c.) Regulations 1994 (as amended)

9.4.14 In Scotland, the *European Habitats Directive* (Directive 92/43/EEC¹⁷) has been transposed into national legislation via the *Conservation (Natural Habitats &c.) Regulations 1994 (as amended in Scotland)*¹⁸ and known as the 1994 Regulations). The Conservation of Habitats and Species Regulations 2017 (known as and referred to herein as the "Habitats Regulations") have replaced the 1994 Regulations for specific and devolved activities on land in Scotland. These provisions apply in respect of decisions by the Scottish Ministers to grant statutory consent for development authorised under Section 37 of the Electricity Act 1989, which includes not only the necessary Section 37 Consent but also deemed planning permission under Section 57(2) of the Town and Country Planning (Scotland) Act 1997.

¹⁶ Scottish Government, 2020. *EU Exit: habitats regulations in Scotland*. [Online] Available at: <https://www.gov.scot/publications/eu-exit-habitats-regulations-scotland-2/pages/2/>.

¹⁷ UK Government, 2020. Council Directive 92/43/EEC. [Online] Available at: <https://www.legislation.gov.uk/eudr/1992/43/contents>.

¹⁸ UK Government, 1994. *The Conservation (Natural Habitats, &c.) Regulations 1994*. [Online] Available at: <https://www.legislation.gov.uk/ukSI/1994/2716/contents>.

The Habitats Regulations provide the highest level of legal protection available to ornithological and ecological features.

The Convention on Wetlands of International Importance especially as Water-fowl Habitat (Ramsar Convention)

- 9.4.15 The Convention's Contracting Parties (including the UK) have assumed a wide range of related obligations covering all aspects of wetland conservation, the implementation of which is facilitated under three main branches of activity: the designation of wetlands of international importance as Ramsar sites; the promotion of the wise-use of all wetlands in the territory of each country; and international co-operation with other countries to further the wise-use of wetlands and their resources. Since July 2025 the policy of the Scottish Ministers has been to treat Ramsar sites as European sites, subject to equivalent protection under the Habitats Regulations.

The Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention)

- 9.4.16 The *Convention on the Conservation of Migratory Species of Wild Animals* (Bonn Convention or CMS) came into force in 1985. Contracting Parties work together to conserve migratory species and their habitats by providing strict protection for endangered migratory species (listed in Appendix 1 of the Convention) and concluding multilateral agreements for the conservation and management of migratory species which require or would benefit from international cooperation (listed in Appendix 2 of the Convention).

The Nature Conservation (Scotland) Act 2004 (as amended)

- 9.4.17 *The Nature Conservation (Scotland) Act 2004*¹⁹ places a specific duty on all public bodies to further the conservation of biodiversity and to consider Scotland's biodiversity¹⁹. The 2004 strategy aims to achieve by 2030 a landscape where "*Organisms can move, feed, reproduce and disperse effectively, and are better able to adapt to changing circumstances of land use and climate change*".

National Planning Framework 4

- 9.4.18 On 13 February 2023, the Scottish Ministers adopted National Planning Framework (NPF)⁴⁸. This forms part of the statutory development plan and its supplementary guidance. NPF4 supersedes National Planning Framework 3 and Scottish Planning Policy (SPP) (2014).

- 9.4.19 The document sets out the following key policies:

- **Policy 1** is relevant to all developments: "When considering all development proposals significant weight will be given to the global climate and nature crises". This policy marks a considerable shift to previous national planning policy. It clearly denotes that when considering proposed developments, tackling climate change should be at the forefront for decision makers.
- **Policy 3 Biodiversity** seeks to "protect biodiversity, reverse biodiversity loss, deliver positive effects from development and strengthen nature networks". Development proposals, wherever feasible, are required to provide nature-based solutions to be integrated into the design of development to ensure significant biodiversity enhancements are provided to sites. Biodiversity enhancements should be proportionate to the nature and scale of the development using best practice methods and in accordance with national and local guidance.
- **Policy 4 Natural Places** seeks to "protect, restore and enhance natural assets making best use of nature-based solutions". Policy 4 adopts a precautionary principle when evaluating potential significant effects a Proposed Development may have on national or local designated landscapes. It states that a development will not be supported if it will have a significant effect on the integrity of a designated area or the qualities for which it has been identified for; this is unless any significant effects are clearly outweighed by social, environmental or economic benefits. Furthermore, it states that where adverse effects on species protected by legislation may occur, development proposals will only be supported where the relevant statutory tests are met.

¹⁹ Scottish Executive, 2024. Scotland's Biodiversity. [Online] Available at:
<https://webarchive.nrsotland.gov.uk/3000/https://www.gov.scot/Resource/Doc/25954/0014583.pdf>.

Scottish Biodiversity Strategy to 2045

- 9.4.20 The Scottish Biodiversity Strategy to 2045⁹ and the National Planning Framework 4 (NPF4) are interconnected strategies aimed at addressing the nature crisis in Scotland. The Scottish Biodiversity Strategy to 2045 sets the overall direction and ambitions for biodiversity in Scotland with NPF4 providing the spatial planning framework to turn these into actions.
- 9.4.21 In summary, The Scottish Biodiversity Strategy to 2045 has the following ambitions:
- Vision: To have restored and regenerated biodiversity across Scotland's land, freshwater, and seas by 2045.
 - Goal: To become "Nature Positive" by 2030, meaning reversing the decline of biodiversity and ensuring it is increasing.
 - Key Elements: The strategy focuses on healthy ecosystems, diverse and thriving habitats, and resilient species adapting to climate change. It also emphasizes the role of people in stewarding nature and supporting a sustainable economy.
 - Milestones: The strategy includes milestones for halting biodiversity loss by 2030 and achieving the overall vision by 2045.
 - Specific Areas: The strategy covers rural environments, marine, freshwater, coastal, and urban environments, as well as overall ecosystem health and connectivity across Scotland.
- 9.4.22 The Biodiversity Strategy sets the overarching vision and goals for Scotland to be "Nature Positive" by 2030 and to restore and regenerate biodiversity by 2045. The following outlines the Strategy objectives that are implemented in the planning framework by NPF4:
- accelerate restoration and regeneration;
 - protect nature on land and at sea, across and beyond protected areas;
 - embed nature-positive farming, fishing and forestry;
 - protect and support the recovery of vulnerable and important species and habitats;
 - invest in nature; and,
 - take action on the indirect drivers of biodiversity loss.

The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (the EIA Regulations)¹⁰

- 9.4.23 The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (the EIA Regulations)¹⁰ are a set of Scottish regulations that implement the EU Directive on Environmental Impact Assessments for electricity projects. These regulations detail the requirements for developers to assess the environmental impact of certain electricity projects and obtain consent from the Scottish Ministers. The regulations ensure that the environmental effects of certain electricity projects are properly assessed before consent is granted and apply to projects requiring consent under the Electricity Act 1989²⁰, specifically those concerning generating stations and overhead electric lines.

Local Biodiversity Action Plans

- 9.4.24 The Tayside Local Biodiversity Action Plan¹¹, like other Local Biodiversity Action Plans (LBAP), has been designed to help translate national and regional targets for biodiversity and sustainability into local action. The LBAP contributes to national targets, wherever these are relevant in Tayside, and also set local targets through the preparation of local action plans.

9.5 Scope

²⁰ UK Government 1989. The Electricity Act 1989. [Online] Available at:
https://assets.publishing.service.gov.uk/media/5a80c002ed915d74e62303b1/Electricity_Act_1989__Energy_Bill_2015-16_Keeling_Schedule_.pdf

Breeding Bird Surveys

- 9.5.1 Breeding bird surveys were carried out in summer 2023 and 2024 within the BBS Area to inform this assessment as described below.

Winter Goose Foraging surveys

- 9.5.2 Surveys for foraging geese were carried out in early 2023 to inform the assessment in relation to SPA/Ramsar foraging birds within the development boundary.

Flight Activity Surveys

- 9.5.3 Flight activity surveys of target species were carried out in 2023/2024 across the Site and up to 2 km beyond the Site as part of surveys for the Kintore to Tealing 400 kV OHL EIAR to determine use of the air space associated with the OHL infrastructure, to inform of potential collision risk to populations and to target mitigation steps.

9.6 Methods

Overview of Ornithology Scope

Target Species

- 9.6.1 The ornithology scope of baseline surveys was agreed with NatureScot prior to commencement (refer to **Volume 2, Chapter 9: Ornithology, Table 9.1: Summary of Consultation of relevance to Ornithology**), with reference to both the proposed Emmock substation and the 400kV OHL between Tealing and Kintore. A range of Target Species was identified for which desk study and field surveys were implemented. This was defined to include those species groups that NatureScot has identified as priority species which are potentially at risk from onshore wind farms²¹, as this list also pertains to the construction and operation of OHLs. These species include Schedule 1/Annex 1 birds, those qualifying features of SPAs/Ramsar sites whose core foraging ranges have potential overlap with the Proposed Development and non-passerine Birds of Conservation Concern (BoCC).
- 9.6.2 NatureScot has identified a list of priority species which are potentially at risk from onshore wind farms (*Assessing the significance of impacts on bird populations from onshore windfarms that do not affect protected areas*, Table A1 and Table A2²¹).
- 9.6.3 Target Species encountered during survey and for which desk records were obtained include:
- Whooper Swan (*Cygnus cygnus*);
 - Greylag Goose (*Anser anser*);
 - Pink footed Goose (*Anser brachyrhynchos*);
 - Merlin (*Falco columbarius*);
 - Herring Gull (*Larus argentatus*); and
 - Curlew (*Numenius arquata*).
- 9.6.4 All sensitive species listed within the NatureScot guidance (Table A1 and Table A2²¹) that were present within the Survey Area were recorded and mapped as appropriate.
- 9.6.5 Desk study and baseline field surveys were carried out to inform the assessment of effects as follows.

Baseline Data Collection: Desk Study

- 9.6.6 A desk study was undertaken to obtain historical ornithological information relating to the Site, to identify potential breeding/site use of target species. The following resources and guidance were used to inform the desk study:
- The NatureScot SiteLink website²²;

²¹ NatureScot 2025. Guidance note – Assessing the significance of impacts on bird populations from onshore wind farms that do not affect protected areas. [Online] Available at <https://www.nature.scot/doc/guidance-note-assessing-significance-impacts-bird-populations-onshore-wind-farms-do-not-affect>

²² NatureScot, n.d. SiteLink. [Online] Available at: <https://sitelink.nature.scot/home>.

- National Biodiversity Network (NBN)²³;
- Royal Society for the Protection of Birds (RSPB) - bird records within 2 km of the Proposed Development included Schedule 1 and Annex 1 bird species together with breeding waders and Black Grouse (*Lyrurus tetrix*);
- Data on Schedule 1 and Annex 1 raptors was requested from the local Raptor Study Groups and obtained from Forestry and Land Scotland (FLS); and
- British Trust for Ornithology (BTO) publication²⁴ together with the associated publicly available dataset, showing the 'sensitivity' of 1 km squares of wader habitat was used to determine potential breeding wader receptors; and
- BTO Wetland Bird Survey (WeBS) data²⁵ was also referenced.

Designated Sites

- 9.6.7 A desktop search for statutory designated nature conservation sites was conducted within 20 km and 5 km of the Proposed Development, including sites of international importance such as SPA and Ramsar sites, and sites of national importance, such as SSSIs and National Nature Reserves (NNRs). A search for non-statutory Designated Sites within 2 km of the Proposed Development was also conducted: these included RSPB reserves and Scottish Wildlife Trust (SWT) reserves with ornithological resource.
- 9.6.8 The NatureScot SiteLink website²² was consulted to identify designated nature conservation sites that may have connectivity to the Proposed Development. This included a search of up to 20 km for sites of international importance (including where the qualifying feature(s) core range extends to 20 km) and a search of 2 km for sites of national importance. Refer to **Table 9.1.1: Statutory Designated Sites Study Area Descriptions: Desk-Based Studies**.

Target Species

- 9.6.9 A desktop search for Target Species was conducted using publicly available biological records (post-2000), within 5 km of the Proposed Development. Records were requested from the NBN Atlas²³ as well as the resources outlined below.
- 9.6.10 A data request was raised with the RSPB in March 2023 with data received on 13 April 2023 for bird records of Target Species within 2 km of the Proposed Development.
- 9.6.11 A data request to the Raptor Study Group was raised on 11 March 2023 and subsequently on 13 December 2023. At the time of writing (August 2025) no data have been received.
- 9.6.12 A recent BTO publication²⁶ (hereafter referred to as the Bird Habitat Appraisal), together with the associated publicly available dataset²⁷, showing the 'sensitivity' of 1 km squares with regard to wader habitat (based on previous breeding bird survey work), was used to help determine potential breeding wader receptors across the Proposed Development and to inform the focus areas for breeding bird surveys (see below). In brief, those areas through which the Proposed Development runs that were predicted as being Curlew breeding habitat of good quality (2 and above on a scale of 1-5 of sensitivity for the species²⁶), were selected for Breeding Bird Surveys.
- 9.6.13 The BTO also coordinates the monitoring and collection of survey data of the UK's internationally important non-breeding waterbirds. Wetland sites are counted once per month, providing data for population and trends in abundance and distribution of wintering waterbirds, including for geese and swans at SPA and Ramsar sites. Data were obtained from the publicly available summaries for count sites²⁵ that were associated with the Designated Sites

²³ National Biodiversity Network, 2024. NBN Atlas. [Online] Available at: <https://data.nbn.org.uk/>.

²⁴ O'Connell, P., Wilson, M., Wetherhill, A. & Calladine, J., 2021. *Sensitivity mapping for breeding waders in Britain: towards producing zonal maps to guide wader conservation, forest expansion and other land-use changes. Report with specific data for Northumberland and north-east Cumbria*. [Online] British Trust for Ornithology, p. 80. Available at: <https://www.bto.org/our-science/publications/research-reports/sensitivity-mapping-breeding-waders-britain-towards>. A report to the Forestry Commission, England BTO Research Report 740.

²⁵ British Trust for Ornithology, n.d., Wetland Bird Survey Data. [Online] Available at: <https://www.bto.org/our-science/projects/wetland-bird-survey/data>.

²⁶ O'Connell, P., Wilson, M., Wetherhill, A. and Calladine, J., 2021. *Sensitivity mapping for breeding waders in Britain: towards producing zonal maps to guide wader conservation, forest expansion and other land-use changes*. Report with specific data for Northumberland and north-east Cumbria. BTO Research Report, 740, BTO, Thetford, UK.

²⁷ BTO data available online: <https://app.bto.org/wader-map/>

identified using the NatureScot SiteLink²² (refer to **Table 9.1.1: Statutory Designated Sites Study Area Descriptions: Desk-Based Studies**).

Baseline Data Collection: Field surveys

9.6.14 Ornithological field survey was carried out in 2023 and 2024 using published guidance^{28,29} and professional judgement together with consultation with NatureScot (refer to **Volume 2, Chapter 9: Ornithology, Table 9.1: Summary of Consultation of relevance to Ornithology**). The following surveys were used to inform assessment of the Proposed Development:

- Breeding Bird Surveys: BBS were carried out in 2023 and 2024 within the BBS Areas;
- Winter Goose Foraging Surveys: Surveys for foraging geese were carried out from January to March 2023, to inform the assessment in relation to SPA/Ramsar foraging birds within 5 km of the Proposed Development; and
- Flight activity surveys: Flight activity surveys of Target Species were carried out from September 2023 to March 2024 across the Proposed Development and beyond to 2 km, to determine use of the air space associated with the OHL infrastructure (Flight Activity Area). These flight activity surveys were undertaken to inform the potential for collision risk to bird populations using these habitats and to identify and target appropriate mitigation. Flight activity surveys gave particular reference to foraging SPA/Ramsar species (namely Pink-footed Geese and Greylag Geese).

9.6.15 Bird species can range over wide areas, therefore surveys to characterise the Proposed Development's baseline extended to appropriate distances to include all relevant habitats. Survey distances are species-specific and take account of the likely distances over which individuals may be affected by the presence of the Proposed Development.

Survey Personnel

9.6.16 Surveys were undertaken by Jonathan Daisley (JND), Andrew McDonald (AM), Sean Kerr (SK), Darren Wilson (DW), Megan Collie (MC) and Victoria Curley (VC). All are experienced surveyors with appropriate training in the field survey methods used.

Breeding Bird Surveys (BBS)

9.6.17 BBS was carried out for the Emmock substation and to 250 m out with this Site (the BBS Area). In addition, survey was focussed on areas of suitable habitat for wading bird species within 1 km of the Proposed Development, as informed by Desk Study historical records and the Bird Habitat Appraisal data^{26,27}. BBS were carried out in 2023 (visits on the 10 and 31 May and 28 June) and again in 2024 (visits on the 19 April, 25 May and 6 June).

9.6.18 In addition, BBS focussing on wading birds was conducted using BTO sensitivity mapping with regard to Curlew²⁶. Predicted abundance of Curlew are provided on a level of 1 to 5, with 1 the lowest density of breeding Curlew and 5 the highest density. BBS Areas across the Proposed Development were predicated on BTO-modelled habitat sensitivity described as good quality Curlew breeding habitat (ie level 2 or above on the scale 1-5)²⁶ were surveyed.

9.6.19 Areas of unenclosed and enclosed land within the BBS Area were surveyed for breeding waders based on the Brown and Shepherd (1993)³⁰ method for censusing breeding wader populations as updated in Calladine *et al.*³¹. Three separate survey visits were carried out in May and June in 2023 and 2024, with survey visits more than seven days apart. A systematic search of the BBS Area (see definition above) was completed for each survey visit. All surveys were completed in appropriate conditions³⁰, ie in wind of Beaufort force less than 4 and in dry with good visibility weather conditions. It is considered that these surveys provide a robust assessment of the breeding wader

²⁸ NatureScot, 2016. Guidance: Assessment and mitigation of impacts of power lines and guyed meteorological masts on bird. SNH, Battleby.

²⁹ NatureScot, 2016. Guidance: Recommended bird survey methods to inform impact assessment of onshore wind farms. SNH, Battleby.

³⁰ Brown, A.F & Shepherd, K.B., 1993. A method for censusing upland breeding waders. Bird Study 40: 189–195.

³¹ Calladine, J., Garner, G., Wernham, C. & Thiel, A. (2009) The influence of survey frequency on population estimates of moorland breeding birds. Bird Study, 56: 3, 381-388

assemblage present throughout the BBS Area, including the distribution and numbers of breeding waders potentially present within moorland and farmland.

9.6.20 All survey data were collected on Geographic Information System (GIS)-enabled field tablets to increase accuracy and facilitate robust interpretation. The BBS methods are outlined below.

9.6.21 The following criteria were used to establish whether birds (all species) were breeding:

- presence of nest, eggs and/or chicks;
- alarm calling indicative of nest, young or territory;
- displaying or in song-flight;
- performing a distraction display;
- birds aggressively defending territories; and
- birds seen carrying food to nest or young.

9.6.22 For all raptors:

- if a pair was attached to a territory.

9.6.23 For waders:

- birds singing or alarm calling.

9.6.24 All other behaviour was considered as being indicative of non-breeding activities.

Flight activity surveys

9.6.25 Flight activity surveys were carried out for the Kintore to Tealing 400 kV OHL EIAR from appropriately spaced Vantage Points (VPs) and the data gathered during these surveys has been used to define the baseline ornithology in the Survey Area. The flight activity surveys were focussed on the SPA/Ramsar target species with potential connectivity as well as other waterfowl, together with Schedule 1/Annex 1 raptor species. The Proposed Development was overseen by a single VP (VP25) with information on bird flight activity collected during systematic watches from this VP between 27 September 2023 to 27 March 2024 inclusive, to determine zones of potential collision risk. The VP was situated within the Survey Area to provide good views of the airspace within and surrounding the Proposed Development, in order to assess potential collision and displacement effects.

9.6.26 VP watches were of between one to three hours in duration. The survey effort aimed for 18 hours of watches during daylight hours. The viewshed from the VP was defined by an arc of 180 degrees centred on a fixed viewing angle and extending to 2.5 km from the VP location (refer to **Volume 3, Figure 9.3: Flight Activity Surveys** for results).

9.6.27 VP watches were undertaken by scanning airspace in front of the observer and 90 degrees either side to 2 km. The front viewing direction was fixed, meaning that each watch from a particular VP scanned a consistent 180-degree arc in front of the observer. Bespoke GIS field-mapping was used by surveyors for each VP with the viewing area indicated.

9.6.28 Watches were undertaken from sunrise to sunset to provide coverage of Target Species and potential wildfowl movements from the identified SPAs/Ramsar sites (as detailed in **Table 9.1.1: Statutory Designated Sites Study Area Descriptions: Desk-Based Studies**). Watches were undertaken in a range of weather conditions, but observers aimed to ensure that visibility allowed the detection of flight activity within the viewshed being observed. If conditions deteriorated during a watch, the session was suspended until conditions improved (refer to **Table 9.1.3: Vantage Point survey times and weather conditions**).

9.6.29 During each VP watch the area in view was scanned constantly by eye and using binoculars/telescope until a Target Species was detected in flight. Once detected, the bird/flock was visually followed until it ceased flying or was lost from view. The direction of the flight and height was recorded and the route followed by the bird or flock mapped on a GIS using a field tablet. In order to characterise the flights, the following flight height bands were used to reflect the collision risk area posed by the Proposed Development:

- less than 10 m above ground level (agl);

- between 10 and 75 m agl; and
- greater than 75 m agl.

9.6.30 VPs were undertaken during all weather conditions, except when conditions prevented recording of Target Species' flights. **Table 9.1.3: Vantage Point survey times and weather conditions** provides a breakdown of the weather conditions experienced during flight activity surveys.

9.6.31 Species mapped during VP watches were Target Species and included species considered to be at particular risk from the Proposed Development due to the risk of collision and potential for impact to SPA/Ramsar populations, including;

- Pink-footed Geese –Firth of Tay and Eden Estuary SPA/Ramsar qualifying feature.

Winter Goose Foraging Surveys

9.6.32 As agreed with NatureScot (refer to **Volume 2, Chapter 9: Ornithology, Table 9.1: Summary of Consultation of relevance to Ornithology**), surveys to explore the foraging distribution of wintering goose species were undertaken. Winter Goose Foraging Survey was carried out up to 2 km from the Site. Survey involved systematic searches using the road network to count and map feeding birds, to describe the food sources being used and to plot flight lines of birds moving between feeding sites.

9.6.33 Three visits were carried out to determine the foraging distribution of wintering goose species between 26 January until 14 March 2023. In addition, further Winter Goose Foraging Surveys were carried out between September 2023 and March 2024, as surveyors drove between VPs for flight activity surveys associated with the Kintore to Tealing 400kV OHL.

Field Survey Limitations

9.6.34 No access was granted to Balkemback Farm or private residential buildings to the north-east of the Site but within the BBS Areas. The grounds were viewed from publicly accessible areas and given the scale of the works required for the Proposed Development, this is not considered to limit the conclusions of the report.

9.7 Baseline Ornithology Conditions: Desk Study Results

Designated Sites

9.7.1 Designated Sites include SPAs and Ramsar sites of international importance, SSSIs and NNRs of national importance. The statutory Designated Sites that coincide with, or where their qualifying features show potential for connectivity (for example where core ranges of the species coincide with the Proposed Development) are set out below in **Table 9.1.1: Statutory Designated Sites Study Area Descriptions: Desk-Based Studies** and shown in **Volume 3, Figure 9.2: Ornithological Designated Sites within 20 km and 5 km**.

Table 9.1.1: Statutory Designated Sites Study Area Descriptions: Desk-Based Studies

Site Name	Qualifying Features	Distance from Proposed Development at its Closest	Connectivity with Proposed Development
Special Protection Areas- SPAs			
Firth of Tay and Eden Estuary SPA	• Bar-tailed Godwit (<i>Limosa lapponica</i>; non-breeding); • Common Scoter (<i>Melanitta nigra</i>; non-breeding); • Cormorant (<i>Phalacrocorax carbo</i>; non-breeding); • Dunlin (<i>Calidris alpina</i>; non-breeding);	c. 7.5 km south of the Proposed Development	Potential connectivity with Greylag and Pink-footed Geese as within core foraging range (20 km).

Site Name	Qualifying Features	Distance from Proposed Development at its Closest	Connectivity with Proposed Development
	- Eider (<i>Somateria mollissima</i>; non-breeding); - Goldeneye (<i>Bucephala clangula</i>; non-breeding); - Goosander (<i>Mergus merganser</i>; non-breeding); - Grey Plover (<i>Pluvialis squatarola</i>; non-breeding); - Greylag Goose (non-breeding); - Icelandic black-tailed Godwit (<i>Limosa limosa islandica</i>; non-breeding); - Little Tern (<i>Sternula albifrons</i>; breeding); - Long-tailed Duck (<i>Clangula hyemalis</i>; non-breeding); - Marsh Harrier (<i>Circus aeruginosus</i>; breeding); - Oystercatcher (<i>Haematopus ostralegus</i>; non-breeding); - Pink footed Goose (non-breeding); - Red-breasted Merganser (<i>Mergus serrator</i>; non-breeding); - Redshank (<i>Tringa totanus</i>; non-breeding); - Sanderling (<i>Calidris alba</i>; non-breeding); - Shelduck (<i>Tadorna tadorna</i>; non-breeding); - Velvet Scoter (<i>Melanitta fusca</i>; non-breeding); and - Waterfowl assemblage (non-breeding).		
Outer Firth of Forth and St. Andrews Bay SPA	- Arctic Tern (<i>Sterna paradisaea</i>; breeding); - Black-headed Gull (<i>Chroicocephalus ridibundus</i>; non-breeding);	c. 7.5 km south of the Proposed Development	Outer Firth of Forth and St. Andrews Bay SPA is designated for breeding seabirds including Herring Gull that may forage inland. There is potential connectivity with the

Site Name	Qualifying Features	Distance from Proposed Development at its Closest	Connectivity with Proposed Development
	- Common Gull (<i>Larus canus</i>; non-breeding); - Common Scoter (non-breeding); - Common Tern (<i>Sterna hirundo</i>; breeding); - Eider (non-breeding); - Gannet (<i>Morus bassanus</i>; breeding); - Goldeneye (non-breeding); - Common Guillemot (<i>Uria aalge</i>; breeding & non-breeding); - Herring Gull (<i>Larus argentatus</i>; breeding & non-breeding); - Kittiwake (<i>Rissa tridactyla</i>; breeding & non-breeding); - Little Gull (<i>Hydrocoloeus minutus</i>; non-breeding); - Long-tailed Duck (non-breeding); - Manx Shearwater (<i>Puffinus puffinus</i>; breeding); - Puffin (<i>Fratercula arctica</i>; breeding); - Razorbill (<i>Alca torda</i>; non-breeding); - Red-breasted Merganser (non-breeding); - Red-throated Diver (<i>Gavia stellata</i>; non-breeding); - Seabird assemblage (breeding and non-breeding); - Shag (<i>Gulosus aristotelis</i>; breeding & non-breeding); - Slavonian Grebe (<i>Podiceps auritus</i>; non-breeding); - Velvet Scoter (non-breeding); and - Waterfowl assemblage (non-breeding).		Proposed Development and the SPA.
Loch of Lintrathen SPA	Greylag Goose (non-breeding).	c. 18 km northwest of the Proposed Development	Potential connectivity with Greylag and Pink-footed

Site Name	Qualifying Features	Distance from Proposed Development at its Closest	Connectivity with Proposed Development
			Geese as within core foraging range (20 km).
Loch of Kinnordy SPA	• Greylag Goose (non-breeding); and • Pink footed Goose (non-breeding).	c. 15.5 km northwest of the Proposed Development	Potential connectivity with Greylag and Pink-footed Geese as within core foraging range (20 km).
RAMSAR sites			
Firth of Tay and Eden Ramsar	<u>Criterion 2</u> • Marsh harrier (breeding) • Little tern (breeding) <u>Criterion 5</u> • Velvet scoter (non-breeding) • Cormorant (non-breeding) • Shelduck (non-breeding) • Eider <i>Somateria mollissima</i> (non-breeding) • Common scoter (non-breeding) • Black-tailed godwit <i>Limosa limosa islandica</i> (non-breeding) • Goldeneye (non-breeding) • Red-breasted merganser (non-breeding) • Goosander (non-breeding) • Oystercatcher (non-breeding) • Grey plover (non-breeding) • Sanderling (non-breeding) • Dunlin (non-breeding) • Long-tailed duck (non-breeding) <u>Criterion 6</u>	7.5 km south of the Proposed Development	Potential connectivity with Greylag and Pink-footed geese, as the Proposed Development lies within their core foraging range (within 20 km of the Ramsar site).

Site Name	Qualifying Features	Distance from Proposed Development at its Closest	Connectivity with Proposed Development
	- Bar-tailed godwit (non-breeding) - Redshank (non-breeding) - Pink-footed goose (non-breeding) - Greylag goose (non-breeding)		
Loch of Kinnordy Ramsar	<u>Criterion 6</u> - Greylag goose (non-breeding); and - Pink-footed goose (non-breeding).	15.5 km northwest of the Proposed Development	Potential for connectivity with Greylag and Pink-footed geese, as the Proposed Development is within their core foraging range from the Ramsar site (20 km).
Loch of Lintrathen Ramsar	<u>Criterion 6</u> Greylag goose (non-breeding).	18 km northwest of the Proposed Development	Potential for connectivity with Greylag geese, as the Proposed Development is within their core foraging range from the Ramsar site (20 km).
Site of Special Scientific Interest - SSSI			
Loch of Kinnordy SSSI	Greylag goose (non-breeding)	15.5 km northwest of the Proposed Development	Potential for connectivity with Greylag and Pink-footed geese, as the Proposed Development is within their core foraging range from the Ramsar site (20 km).
Loch of Lintrathen SSSI	Greylag goose (non-breeding)	18 km northwest of the Proposed Development	Potential for connectivity with Greylag geese, as the Proposed Development is within their core foraging range from the Ramsar site (20 km).
National and Local Statutory Sites within 5 km			
There are no national or local statutory sites within 5 km of the Proposed Development with ornithological features – the following LNR/RSPB reserves underpin the above-listed Designated Sites as follows:			
Inner Tay Estuary LNR	LNR bird resource listed under Firth of Tay and Eden Estuary Ramsar & SPA (also Important Bird Area (IBA)).	c. 7.5 km south of the Proposed Development	Potential connectivity with SPA Greylag and Pink-footed Geese as within core foraging range (20 km).
Loch of Kinnordy RSPB Nature Reserve	Bird resource as for Loch of Kinnordy SPA, Ramsar and SSSI (also IBA).	c. 15.5 km northwest of the Proposed Development	Potential connectivity with SPA Greylag and Pink-footed Geese as within core foraging range (20 km).
Non-Statutory Sites within 2 km			
There were no non-statutory sites within 2 km of the Proposed Development with ornithological features.			

- 9.7.2 There are no non-statutory designations, eg nature reserves, with ornithological interest/designation within 2 km of the Proposed Development.

Historical Records

- 9.7.3 As outlined in **Section 9.6.6**, a search for publicly available ornithological records was undertaken within 2 km of the Proposed Development (including NBN³²).
- 9.7.4 No Schedule 1 breeding bird records were noted in the RSPB data request of April 2023 for the Survey Area.
- 9.7.5 No response has been received from the Tayside Raptor Study Group following data requests in 2023 and 2024.
- 9.7.6 NBN data search provided the following list of target species and Birds of Conservation Concern (BoCC⁵) Red and Amber-listed species within the last 10 years and within 2 km of the Site (refer to **Table 9.1.2: Number of breeding bird territories recorded on survey visits: all NCI moderate sensitivity species**). In addition, nesting Barn owl (*Tyto alba*) (Schedule 1 species) was recorded c. 1.7 km from the Site in 2010, Quail (*Coturnix coturnix*) over 2 km from the Proposed Development in 2011 and Merlin (*Falco columbarius*), with records of birds in winter within 5 km of the Proposed Development in 2021.
- 9.7.7 The RSPB data request did not return any records of Schedule 1/Annex 1 species, breeding waders or Black grouse within 2 km of the Site.

Firth of Tay and Eden Estuary SPA/Ramsar site

Greylag Geese

- 9.7.8 Reference to Mitchell³³ shows that traditional foraging sites for the qualifying species of geese from the Firth of Tay and Eden Estuary SPA/Ramsar site are present within 5 km of the Proposed Development. However, foraging of both Greylag and Pink footed goose species at the Firth of Tay and Eden Estuary SPA/Ramsar is predominantly at greater distance. The Firth of Tay and Eden Estuary SPA/Ramsar Greylag geese which roost on the Firth were noted to fly to foraging sites to the north, notably over the Sidlaw hills and onto the Strathmore area. Some traditional foraging sites are present 5 km to the southwest of the Proposed Development. A decline in the number of foraging records was apparent from 2007/2008 onwards, with WeBS counts across the five years 2018/19 to 2022/23 averaging 300 birds on the Tay estuary²⁵ (previously 1,200 birds comprised the SPA/Ramsar population from 1990/91 to 1994/95³⁴).

Pink-footed geese

- 9.7.9 Pink-footed geese of the Firth of Tay and Eden Estuary SPA/Ramsar were noted as having largely abandoned the Firth in the middle of the last century, with no notable foraging areas recorded within approximately 10 km of the Proposed Development³³. Tay estuary WeBS counts average 3,183 Pink-footed geese over the last five years, although the 2022/23 counts were of 573 birds only²⁵. This suggests a general increase in the local population, since the SPA/Ramsar citation is of 2,800 individuals across both the Firth and estuary areas³⁴.

Outer Firth of Forth and St. Andrews Bay SPA

Herring gull

- 9.7.10 It is considered that Herring gull (a Red-listed BoCC) are likely to range on average 10.5 km from breeding sites with some foraging flights potentially to greater distances³⁵. The Outer Firth of Forth and St. Andrews Bay SPA was cited as holding 3,044 individuals of the species from 1980 to 2006 (1.1% of the then UK population³⁶). Birds from this population are considered likely to nest as close as 7.5 km from the Proposed Development, in and around

³² National Biodiversity Network, n.d. NBN Atlas Scotland website. [Online] Available at: <https://scotland.nbnatlas.org/>.

³³ Mitchell, C. 2012. *Mapping the distribution of feeding Pink-footed and Iceland Greylag Geese in Scotland*. Wildfowl & Wetlands Trust/Scottish Natural Heritage Report, Slimbridge. 108pp.

³⁴ NatureScot, n.d.: Firth of Tay and Eden Estuary SPA. [Online] Available at: <https://sitelink.nature.scot/site/8501>.

³⁵ Thaxter, C. B., Ross-Smith, Viola H., Bouten, Willem, Clark, Nigel A., Conway, Greg J., Masden, Elizabeth A., Clewly, Gary D., Barber, Lee J., Burton, Niall H.K., 2019. *Avian vulnerability to wind farm collision through the year: Insights from lesser black-backed gulls (Larus fuscus) tracked from multiple breeding colonies*. Journal of Applied Ecology, 56(11), p.2410-2422.

³⁶ NatureScot, n.d. SiteLink - Outer Firth of Forth and St Andrews Bay Complex SPA. [Online] Available at: <https://sitelink.nature.scot/site/10478>.

Dundee³⁷. However, the SPA population of the species is likely associated more heavily with the Fife coast and areas of cliffs and buildings within the confines of the SPA extent. Over 12,000 birds are supported by the SPA within the non-breeding season (when SPA habitats are used for roosting and foraging). These birds are also likely to forage to similar distances as breeding birds but will likely inter-mingle with a wider North Sea population present in Scotland during the Winter period³⁸. Tay estuary WeBS counts averaging 1,191 birds were recorded across the last five years, with St. Andrews Bay area holding 152 birds²⁵.

Birds of Conservation Concern (BoCC Red list; non-passerines)

Curlew

- 9.7.11 The BTO wader sensitivity map demonstrates good breeding habitat for Curlew within 1 km of the Site. As a result, breeding bird surveys covered all this ground (surveys predicated on Curlew-sensitivity data). NBN desk records also show presence of the species within the 10 km square in which the site lies (NO33).
- 9.7.12 Curlew is a widespread breeding resident in Scotland with a breeding population of approximately 58,800 pairs (16-27 % of the European breeding population)³⁸. The wintering population, which also includes immigrants from Fennoscandia, is approximately 85,700 birds. This figure includes 20 % of the East Atlantic Flyway non-breeding population³⁹ and therefore Curlew is included in the UK Red List of Birds of Conservation Concern⁴⁰. It is also a species with unfavourable conservation status in Europe and is listed as a UK BAP priority species.

³⁷ Balmer, D.E., Gillings, S., Caffrey, B. J., Swann, R.L., Downie, I.S., and Fuller, R.J., 2013. Bird Atlas 2007-11: The Breeding and Wintering birds of Britain and Ireland. BTO Books.

³⁸ Forrester, R.W., Andrews, I.J., McInerney, C.J., Murray, R.D., McGowan, R.Y., Zonfrillo, B., Betts, M.W., Jardine, D.C. & Grundy, D.S. (eds), 2007. *The Birds of Scotland*, The Scottish Ornithologists' Club, Aberlady.

³⁹ van Roomen M., Nagy S., Foppen R., Dodman T., Citegetse G. & Ndiaye A. 2015. Status of coastal waterbird populations in the East Atlantic Flyway. With special attention to flyway populations making use of the Wadden Sea. Programme Rich Wadden Sea, Leeuwarden, The Netherlands, Sovon, Nijmegen, The Netherlands, Wetlands International, Wageningen, The Netherlands, BirdLife International, Cambridge, United Kingdom & Common Wadden Sea Secretariat, Wilhelmshaven, Germany.

⁴⁰ Stanbury, A.J. Burns, F., Aebischer, N.J., Baker, H., Balmer, D., Brown, A.F., Dunn, T., Lindley, P., Murphy, M., Noble, D.G., Owens, R. & Quinn, L., 2024. *The status of the UK's breeding seabirds: an addendum to 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*. [Online] British Trust for Ornithology. Available at: <https://www.bto.org/our-science/publications/peer-reviewed-papers/status-uk%E2%80%99s-breeding-seabirds-addendum-fifth-birds>

9.8 Baseline Ornithology Conditions: Survey Results

Breeding bird surveys

- 9.8.1 The BBS Area supports an assemblage of species that would be expected from a site on lowland agricultural habitat in the east of Scotland. The BBS Area for the proposed Emmock substation was found to hold the BoCC species as outlined below in **Table 9.1.2: Number of breeding bird territories recorded on survey visits: all NCI moderate sensitivity species**. The table provides a summary of the bird resource recorded in the BBS Area. The maximum count, ie the greatest number of registrations of breeding activity on any single visit across the season, together with professional judgement, was used to assess the number of breeding pairs of each species. In addition, the 2023 breeding bird surveys, focussing on wading birds and raptors, also recorded House sparrow (*Passer domesticus*) and Linnet (*Linaria cannabina*) within the BBS Area. These species were not recorded in 2024; however, it is considered likely that these species were holding territory out with the BBS Area.

Table 9.1.2: Number of breeding bird territories recorded on survey visits: all NCI moderate sensitivity species

Species	BoCC (RAG)	Desk Records	Surveys	No. pairs in BBS Area	No. pairs on Site	Scottish population ⁷
Curlew <i>Numenius arquata</i>	Red	Present	Not recorded	-	-	58,800
Oystercatcher <i>Haematopus ostralegus</i>	Amber	Present	Present	2	2	84,500-116,500
Skylark <i>Alauda arvensis</i>	Red	Present	Present	16	8	290,000-557,000
Willow Warbler <i>Phylloscopus trochilus</i>	Amber	Present	Not recorded	-	-	540,000-590,000
Grasshopper Warbler <i>Locustella naevia</i>	Red	Present	Not recorded	-	-	900-3,700
Song thrush <i>Turdus philomelos</i>	Red	Present	Not recorded	-	-	250,000-260,000
Redstart <i>Phoenicurus phoenicurus</i>	Amber	Present	Not recorded	-	-	20,000-30,000
Wheatear <i>Oenanthe oenanthe</i>	Amber	Present	Present	1	1	35,000-95,000
Spotted flycatcher <i>Muscicapa striata</i>	Red	No	Present	1	0	10,000-20,000
Starling <i>Sturnus vulgaris</i>	Red	Present	Not recorded	-	-	180,000-320,000
House sparrow	Red	Present	Present	n/a	n/a	600,000-900,000
Tree sparrow <i>Passer montanus</i>	Red	No	Present	8	6	4,600-8,100
Bullfinch <i>Pyrrhula pyrrhula</i>	Amber	Present	Not recorded	-	-	50,000-90,000
Greenfinch <i>Carduelis chloris</i>	Red	Present	Not recorded	-	-	120,000-250,000
Twite <i>Carduelis flavirostris</i>	Red	Present	Not recorded	-	-	5,600-13,800
Linnet	Red	Present	Present	n/a	n/a	70,000-90,000
Yellowhammer <i>Emberiza citrinella</i>	Red	Present	Present	7	4	140,000-220,000
Reed bunting <i>Emberiza schoeniclus</i>	Amber	No	Present	3	1	15,000-30,000

- 9.8.2 Common snipe (*Gallinago gallinago*; BoCC Amber-listed species) was recorded on a single occasion in the drainage channel that runs north-south at the east of the Site on 10 May 2023. No further records of the species were noted in the 2024 surveys.

- 9.8.3 Curlew were recorded to the north of the Proposed Development only, with a potential pair located 650 m north near the hamlet of Coldstream.
- 9.8.4 No Lapwing were recorded, likely a reflection on the lower BTO wader sensitivity rating of the habitat present and that both species are in range contraction.
- 9.8.5 Oystercatcher (BoCC Amber-listed species) were recorded as breeding on the Site in 2023 when two pairs were noted on newly ploughed fields (likely for spring-sown crops) at the east of the Site and in the west on the 10 May 2023. It is unknown if these pairs were successful, since no chicks were recorded during the late June 2023 visit. No Oystercatcher were recorded during the 2024 BBS visits.
- 9.8.6 No target raptor species were recorded breeding within the Survey Area; Buzzard (*Buteo buteo*) was seen, however during the winter VP/flight activity surveys. The open farmland with a lack of suitable tree cover and mature trees present in the vicinity of the Site suggests that there is little opportunity for nesting Schedule 1 raptor species that could be present in the local area.

Flight Activity Surveys

- 9.8.7 Flight Activity Surveys were undertaken with the survey times, survey periods and associated weather conditions as shown below in **Table 9.1.3: Vantage Point survey times and weather conditions** Table 9.1.3: Vantage Point survey times and weather conditions.

Table 9.1.3: Vantage Point survey times and weather conditions

Session	Date	VP	Surveyor ⁴¹	Start	End	Duration (h)	VP Hour	Cloud cover (10ths)	Cloud base (m agl)	Wind Force (Beaufort)	Wind direction	Visibility (km)	Precip. ⁴²	Notes ⁴³
230927_VP25_SK	27 September 2023	25	SK	11:40	14:40	2	1st hour	8	700	4	ESE	5	1	
230927_VP25_SK	27 September 2023	25	SK	11:40	14:40	2	2nd hour	8	700	4	ESE	5	1	
230927_VP25_SK	27 September 2023	25	SK	11:40	14:40	2	3rd hour	8	700	4	ESE	5	1	
231101_VP25_SK	01 November 2023	25	SK	12:40	15:40	2	1st hour	10	800	3	ENE	2	3	
231101_VP25_SK	01 November 2023	25	SK	12:40	15:40	2	2nd hour	10	800	3	ENE	2	3	
231101_VP25_SK	01 November 2023	25	SK	12:40	15:40	2	3rd hour	10	800	3	ENE	2	3	
231205_VP25_AM	05 December 2023	25	AM	14:10	17:10	2	1st hour	5	3000	2	N	5	0	
231205_VP25_AM	05 December 2023	25	AM	14:10	17:10	2	2nd hour	3	3000	2	N	5	0	
231205_VP25_AM	05 December 2023	25	AM	14:10	17:10	2	3rd hour	2	4000	1	W	5	0	
240117_VP25_JND	17 January 2024	25	JND	08:05	10:05	2	1st hour	0	0	2	W	5	0	
240117_VP25_JND	17 January 2024	25	JND	08:05	10:05	2	2nd hour	0	0	1	W	5	0	
240215_VP25_DW	15 February 2024	25	DW	07:10	10:10	2	1st hour	10	200	1	NNE	1	0	Visibility poor throughout due to low lying fog. Geese (small groups) were heard but not seen on two occasions

⁴¹ Refer to Paragraph 9.6.16 for surveyor names.

⁴² Precipitation across watch hour – 0 (none); 1 (intermittent light rain); 2 (continuous light rain); 3 (intermittent heavy rain); 4 (continuous heavy rain); S –(snow) .

⁴³ Additional comments by the surveyor during VP watches – including reference to weather and species present.

TRANSMISSION

Session	Date	VP	Surveyor ⁴¹	Start	End	Duration (h)	VP Hour	Cloud cover (10ths)	Cloud base (m agl)	Wind Force (Beaufort)	Wind direction	Visibility (km)	Precip. ⁴²	Notes ⁴³
														(07:45 and 08:12). Visibility around 600 m average during survey
240215_VP25_DW	15 February 2024	25	DW	07:10	10:10	2	2nd hour	10	200	1	NNE	5	0	
240215_VP25_DW	15 February 2024	25	DW	07:10	10:10	2	3rd hour	10	100	1	NNE	1	0	
240319_VP25_JND	19 March 2024	25	JND	16:00	19:00	2	1st hour	7	750	2	W	5	0	
240319_VP25_JND	19 March 2024	25	JND	16:00	19:00	2	2nd hour	7	750	2	W	5	0	
240319_VP25_JND	19 March 2024	25	JND	16:00	19:00	2	3rd hour	7	750	2	W	5	0	
230927_VP25_SK	27 March 2024	25	SK	12:40	15:40	2	1st hour	8	700	4	ESE	5	1	
230927_VP25_SK	27 March 2024	25	SK	12:40	15:40	2	2nd hour	8	700	4	ESE	5	1	
230927_VP25_SK	27 March 2024	25	SK	12:40	15:40	2	3rd hour	8	700	4	ESE	5	1	

- 9.8.8 Flights of Target Species were recorded as presented below in **Table 9.1.4: Vantage Point survey results – Target Species flights recorded**, and are also shown in **Volume 3, Figure 9.3 Flight Activity Surveys**.
- 9.8.9 Flight activity was recorded in relation to the proposed Kintore to Tealing 400 kV OHL EIAR and to 2 km from the VP position, and only a proportion of flights were identified as occurring over the Site.

Table 9.1.4: Vantage Point survey results – Target Species flights recorded

Session	Date	Species	Number ⁴⁴	Flight number	Vantage Point	Crossing ⁴⁵	South tower	North tower	At pch ⁴⁶
230927_VP25_SK	27 September 2023	PG – Pink-footed goose	8	1	25	No	N/A	N/A	FALSE
230927_VP25_SK	27 September 2023	PG – Pink-footed goose	57	2	25	Yes	AT8	AT9	FALSE
230927_VP25_SK	27 September 2023	PG – Pink-footed goose	57	2	25	Yes	TW179	WT9	FALSE
230927_VP25_SK	27 September 2023	PG – Pink-footed goose	52	3	25	Yes	TW2	TW3	FALSE
230927_VP25_SK	27 September 2023	PG – Pink-footed goose	52	3	25	Yes	TE1	TE2	FALSE
231205_VP25_AM	05 December 2023	WS – Whooper swan	3	196	25	Yes	TW1	TW	TRUE
231205_VP25_AM	05 December 2023	WS – Whooper swan	3	196	25	Yes	TE1	TE2	TRUE
240117_VP25_JND	17 January 2024	PG – Pink-footed goose	425	301	25	No	N/A	N/A	FALSE
240117_VP25_JND	17 January 2024	PG – Pink-footed goose	30	308	25	No	N/A	N/A	FALSE
240117_VP25_JND	17 January 2024	PG – Pink-footed goose	1200	309	25	No	N/A	N/A	FALSE
240117_VP25_JND	17 January 2024	PG – Pink-footed goose	750	311	25	No	N/A	N/A	FALSE
240117_VP25_JND	17 January 2024	PG – Pink-footed goose	450	330	25	Yes	KFT only	KFT only	TRUE
240215_VP25_DW	15 February 2024	PG – Pink-	1	390	25	Yes	TW1	TW2	FALSE

⁴⁴ Number of birds recorded in flight line

⁴⁵ If the tracked flight line was drawn over the Proposed Development 'Yes' ; if the flight line did not intersect the Proposed Development at any point 'No'.

⁴⁶ Birds described as flying at pch ('TRUE' 10-75m agl) or above/below pch ('FALSE')

Session	Date	Species	Number ⁴⁴	Flight number	Vantage Point	Crossing ⁴⁵	South tower	North tower	At pch ⁴⁶
		footed goose							
240215_VP25_DW	15 February 2024	PG – Pink-footed goose	1	390	25	Yes	TW1	TW2	FALSE
240215_VP25_DW	15 February 2024	PG – Pink-footed goose	12	392	25	Yes	AT8	AT9	FALSE
240215_VP25_DW	15 February 2024	PG – Pink-footed goose	12	392	25	Yes	WT10	WT11	FALSE
240319_VP25_JND	19 March 2024	PG – Pink-footed goose	235	456	25	Yes	WT10	WT11	FALSE
240319_VP25_JND	19 March 2024	PG – Pink-footed goose	235	456	25	Yes	TW1	TW2	FALSE
240319_VP25_JND	19 March 2024	PG – Pink-footed goose	235	456	25	Yes	TE3	692	FALSE
240319_VP25_JND	19 March 2024	PG – Pink-footed goose	235	458	25	No	N/A	N/A	FALSE

Firth of Tay and Eden Estuary SPA/Ramsar: Greylag geese

9.8.10 No Greylag geese were recorded in flight during the VP watches in 2023/2024.

Firth of Tay and Eden Estuary SPA/Ramsar: Pink-footed geese

9.8.11 Flight activity surveys recorded 12 flights of 3,467 Pink footed geese. Of these, five flights and 357 birds were recorded crossing the Proposed Development; no flights were recorded at potential collision height, (refer to **Table 9.1.4: Vantage Point survey results – Target Species flights recorded**).

Outer Firth of Forth and St. Andrews Bay SPA: Herring Gull

9.8.12 Flight activity surveys were carried out across the non-breeding season only. Herring Gull flight activity was recorded sporadically across the non-breeding season, with records of generally low numbers (max. count seven birds within the Proposed Development) during the Winter surveys of 2023/2024.

Other Target species: Whooper swan

9.8.13 A single flock of three Whooper swans was recorded flying over the Proposed Development on 5 December 2023. The birds flew at potential collision height and crossed the Proposed Development over two spans: TW1/TW2 and TE1/TE2 (refer to **Table 9.1.4: Vantage Point survey results – Target Species flights recorded** Table 9.1.4: Vantage Point survey results – Target Species flights recorded).

Winter Goose Foraging Surveys

9.8.14 A summary of Winter Goose Foraging Surveys is presented below in **Table 9.1.5: Winter Goose Foraging Survey results (including additional results from VP watch surveys)** and in **Volume 3, Figure 9.4: Winter Goose Foraging Surveys**.

Firth of Tay and Eden Estuary SPA/Ramsar: Greylag geese

- 9.8.15 A flock of 22 Greylags was recorded foraging in pasture fields approximately 1.5 km to the west of the Tealing Substation in early 2023, during Winter Goose Foraging Surveys.

Firth of Tay and Eden Estuary SPA/Ramsar: Pink-footed geese

- 9.8.16 Foraging Pink-footed geese were recorded in fields to the west of Tealing Substation, adjacent to the Fithie burn during Winter Goose Foraging Surveys. A flock of 950 birds was recorded on 14 March 2023, feeding in the wet pasture fields under the existing OHL. Another flock of 235 pink-feet was recorded on 19 March 2023 in a field to the south of Fithie burn. Smaller foraging flocks were also noted towards Balkello. All observations of Pink-footed geese were recorded within the 10 km square NO33 in which the Proposed Development lies.

Outer Firth of Forth and St. Andrews Bay SPA: Herring gull

- 9.8.17 A flock of 200 mixed gull species, including 80 Herring gull, was recorded on 19 April 2024 foraging in fields 200 m beyond the west of the Site. No Herring gull breeding behaviour was recorded across the BBS surveys.

Table 9.1.5: Winter Goose Foraging Survey results (including additional results from VP watch surveys)⁴⁷

Species	Date	Number	Behaviour	Habitat/notes	Easterly	Northerly	Record number
PG - Pink footed Goose	11 January 2024	282	feeding/loafing	On winter-sown cover crop, half of geese asleep/laying on ground	339787	736018	1
GJ - Greylag Goose	26 January 2023	22	feeding/loafing	Pasture	337802	736949	2
PG - Pink footed Goose	19 March 2024	235	feeding/loafing	-	338981	737069	3
PG - Pink footed Goose	26 January 2023	235	feeding/loafing	Pasture	339171	737095	4
PG - Pink footed Goose	14 March 2023	950	feeding/loafing	Pasture field (wet)	339325	737334	5
PG - Pink footed Goose	14 March 2023	5	feeding	Pasture	336697	737701	6

Firth of Tay and Eden Estuary SPA and Ramsar site Summary

- 9.8.18 The Winter Goose Foraging and Flight Activity surveys recorded Firth of Tay and Eden Estuary SPA/Ramsar species Pink-footed goose and Greylag goose. Pink-footed geese were recorded flying over the Proposed Development and using fields within and adjacent to the Site for foraging. A maximum count of 950 Pink-footed geese was recorded foraging on a wet pasture field under the Proposed Development OHL tie-in, with a flock of 235 seen from a VP watch flying directly over the Proposed tie-in OHL. Greylag geese were recorded on one occasion only, with birds foraging in fields to the west of the Site

Outer Firth of Forth and St. Andrews Bay SPA Summary

- 9.8.19 The non-breeding flight activity surveys did record Outer Firth of Forth and St. Andrews Bay SPA species Herring gull. The species citation is part of a breeding population at the SPA, and therefore these birds cannot be assigned

⁴⁷ Also refer to **Volume 3, Figure 9.4: Winter Goose Foraging Surveys**

specifically to the SPA. Herring gulls were recorded during BBS surveys foraging on farmland within the BBS Area at the start of the breeding season.

9.9 Line marking

9.9.1 Embedded Mitigation with respect to collision risk mortality was designed through the use of bird flight diverters (BFDs; refer to **Volume 2, Chapter 9 Ornithology**). Line marking has been carried out within the design under the following circumstances:

- where flight activity across any OHL span is judged to be substantial (adjacent OHL spans also to be marked).

9.9.2 Flight activity surveys were used to determine the high-risk, 'hot-spot', spans of the Proposed Development.

9.9.3 'Hot-spots' were defined in reference to the SPA/Ramsar site to which the goose flights were assigned. Spans where over 80% of the SPA birds were calculated as crossing the Proposed Development were recorded as 'high-risk' spans. These were supplemented by flight activity within the LOD ie flights which were recorded within the LOD but were not seen to cross the Proposed Development.

9.9.4 Towers between which the spans are to be marked as outlined below in **Table 9.1.6: Line-marking and rationale**

rationale Table 9.1.6: Line-marking and rationale. This includes the flight rate of combined SPA/Ramsar site species crossing the line per hour of watch. Across the non-breeding (winter) season, a conservative estimate of at least 1,000 available flying hours is present for wildfowl. Flight activity in the non-breeding season is at least 2,500 hours; however, given foraging activities, distances from roosts and roost usage across the season etc, it is considered likely that flight activity would be relatively restricted in the foraging areas at the Proposed Development. The rate, expressed across the season, was divided by the SPA goose species resource (ie citation population), to estimate the proportion of the SPA population that would cross the Proposed Development every year. The Tay and Eden SPA and Ramsar site citation of Pink-footed and Greylag geese combined is 4,000 birds, with those spans where more than 75% of the population (3,200 birds across each season) are calculated as crossing every year are to be marked.

Table 9.1.6: Line-marking and rationale

North Tower	South Tower	Crossing flights	% SPA/Ramsar site population crossing	Rationale for marking
Alyth – Tealing OHL Diversion				
AT7	AT8	N/A	N/A	Adjacent span
AT8	AT9	69 PG (2 flights)	>100%	Flight activity (high-risk)
Westfield – Tealing OHL Diversion				
WT10	WT11	247 PG (2 flights)	>300%	Flight activity (high-risk)
	WT9	57 PG (1 flight)	>80%	Flight activity (high-risk)
Tie-back - West TT				
TW1	TW2	236 PG (2 flights); 3 WS (1 flight)	>300%	Flight activity (high-risk)
TW2	TW3	53 PG (2 flights)	>80%	Flight activity (high-risk)/Adjacent span
Tie-back – East TT				
TE1	TE2	52 PG (1 flight); 3 WS (1 flight)	>80%	Flight activity (high-risk)
TE3	TE4	1 PG (1 flight)	<5%	Flight activity (high-risk)/Adjacent span

9.10 Summary

Designated sites and their qualifying features

- 9.10.1 The Site does provide foraging for SPA/Ramsar qualifying goose species. Flight activity of Pink-footed geese was recorded over the Site, with Embedded Mitigation (line-marking using BFDs) to be implemented where this interaction has been recorded as potentially having an impact at 'hot-spot' spans.
- 9.10.2 Herring gulls were not recorded as foraging during the winter and breeding bird surveys within the Site. Occasional birds were recorded as flying over the Site and birds were noted foraging on one occasion adjacent to the Proposed Development.

Schedule 1 Species

- 9.10.3 No breeding Schedule 1 species are present within the Site (or up to 2 km from the Site, with regards to target raptors).

BoCC species

- 9.10.4 Breeding Red-list species Tree sparrow, Skylark and Yellowhammer were recorded holding territories within the BBS Area. The BBS Area represents a small proportion only of the Scottish populations of these species.
- 9.10.5 No Red-list waders were recorded breeding within the BBS Area. Two breeding attempts by Oystercatcher (Amber-listed BoCC species) were recorded in 2023, but they were not present in 2024 surveys. Curlew were present in good quality habitat located over 650 m north of the Proposed Development.

Statement of Expertise

Full Name	Credentials	Statement of Expertise
Jonathan Daisley LUC	PhD BSc (Hons) ACIEEM	The Ornithological Impact Assessment has been authored by Jonathan Daisley, a Principal Ecologist with 15 years' experience in ecological survey and assessment with a particular specialism in ornithology. He has worked in renewable projects, including wind farms, OHLs and hydro-schemes, as well as associated infrastructure and has provided EIA input as well as survey and ECoW experience.
Iain Mackenzie	BSc (Hons) MSc MCIEEM	The Ornithological Impact Assessment was supported by Iain Mackenzie, Director of Ecology. Iain has 24 years of experience as a professional ornithologist and ecologist, working within the consultancy sector and as a project manager and conservation advisor. He has managed ornithological input at over 35 wind farm and power line developments and taken a lead role in ecological survey and assessment at over 20 projects in a range of sectors. Iain regularly undertakes technical reporting, EcIA and HRA and has advised clients via feasibility studies, constraints mapping, project design and mitigation strategies.