Galileo 05 Limited

Lynemore Wind Farm

Environmental Impact Assessment Report (Volume 1)

Chapter 7 - Ornithology

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GALILEO EMPOWER

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7 ORNITHOLOGY

7.1 Introduction

7.1.1 This chapter of the Environmental Impact Assessment Report (EIAR) assesses the potential for significant effects upon ornithological features in relation to the construction, operation and decommissioning of the Proposed Development.

7.1.2 The assessment is based upon comprehensive baseline data, compiled through ornithological field surveys, desk study and consultation with nature conservation bodies, and is based on the Chartered Institute of Ecology and Environment Management (CIEEM) 'Guidelines for Ecological Impact Assessment (EcIA) in the UK and Ireland' (CIEEM, 2024).

7.1.3 The chapter provides the following information:

- a description of data gathering methods and ornithological baseline conditions;
- a description of the assessment methodology and significance criteria used to complete the impact assessment;
- identification of Important Ornithological Features (IOFs), for which impacts are fully assessed, and discussion of other ornithological interests with justification provided as to whether these are included or omitted from full assessment;
- a description of the potential impacts of the Proposed Development, including direct, indirect and cumulative impacts;
- a description of mitigation measures proposed to avoid, reduce and offset any potentially significant effects (where required); and
- an assessment of the significance of residual effects remaining following the implementation of mitigation measures (where applied).

7.1.4 The assessment focusses on IOFs, with the methodology for identifying such features set out within the chapter.

7.1.5 The assessment has been carried out by Avian Ecology Ltd. The lead author was Mr Graeme Garner (Principal Ornithologist). Mr Garner has over 15 years' experience in ecological consultancy. Over the course of his professional experience, he has contributed to, authored and reviewed EIAR chapters and reports to inform Habitats Regulations Appraisal, for numerous onshore wind energy developments throughout the UK. The chapter has been reviewed by Thomas Goater (Technical Director) who has 18 years of ecology consultancy experience, including in the preparation and review of EIAR chapters and Habitats Regulations Appraisals for onshore wind energy developments.

7.1.6 This chapter is supported by the following figures, which are available in **Volume 2a**:

- **Figure 7.1**: Ornithological survey areas;
- **Figure 7.2a**: Vantage point locations and viewsheds September 2022 to January 2023;
- **Figure 7.2b**: Vantage point locations and viewsheds February and March 2023;
- **Figure 7.2c**: Vantage point locations and viewsheds April 2023 to August 2024;
- **Figure 7.3**: Statutory designated sites with ornithological interests;

- **Figure 7.4a**: Flight activity survey results – Year 1 (raptor species);
- **Figure 7.4b**: Flight activity survey results – Year 1 (other species);
- **Figure 7.4c**: Flight activity survey results – Year 2 (raptor species);
- **Figure 7.4d**: Flight activity survey results – Year 2 (other species);
- **Figure 7.5a**: Moorland breeding bird survey results – Year 1; and
- **Figure 7.5b**: Moorland breeding bird survey results – Year 2.

7.1.7 The chapter should also be read in conjunction with the following Technical Appendices presented in **Volume 3**:

- **Technical Appendix 7.1**: Ornithology Baseline Report;
- **Technical Appendix 7.2**: Collision Risk Model (CRM) Analysis;
- **Technical Appendix 7.3**: Confidential Ornithology; and
- **Technical Appendix 7.4**: Information to Inform a Habitats Regulations Appraisal.

7.1.8 Information presented in **Technical Appendix 7.3** contains information regarding the location of Schedule 1[1] breeding bird species. Such information is considered confidential and will not be made publicly available but will be provided to The Highland Council (THC) and NatureScot, to help inform their appraisals of the Proposed Development upon ornithological features. Relevant survey is data illustrated on:

- **Figure 7.6**: Breeding Schedule 1 raptor survey results (confidential)

7.1.9 **Technical Appendix 7.3** also included details of a Golden Eagle Topographical (GET) Model.

7.1.10 As well as the Environmental Impact Assessment, information to inform a Habitats Regulations Appraisal (HRA) can be found in **Technical Appendix 7.4: Information to Inform a Habitat Regulations Appraisal**. This provides screening for likely significant effects (LSE) on relevant statutory sites for nature conservation and, where a LSE cannot be ruled out, a shadow Appropriate Assessment is presented.

7.1.11 For non-avian ecological features please refer to **Chapter 6: Ecology and Biodiversity**. Details of the (OHEMP) are presented in **Appendix 6.5**.

7.1.12 Note that in the interest of concision, information contained in other chapters and appendices is not repeated herein unless beneficial for understanding.

7.1.13 Only common bird species names are referred to within the main body of this chapter. A summary of the bird species referred to herein and in associated appendices is provided in **Technical Appendix 7.1: Ornithology Baseline Report**, and includes common names, scientific (Latin) names and relevant conservation status.

7.1.14 In this chapter, the following terms of reference are used:

- **Proposed Development**: the physical infrastructure of the proposed wind farm project, and most often used in this chapter in reference to the proposed turbines;
- **The Site**: the area within the application red line boundary as shown on **Figure1.1 and Figure 1.2 (Chapter 1: Introduction)** and

[1] Bird species listed on Schedule 1 of the Wildlife & Countryside Act 1981. These species have additional protection to prevent disturbance at the nest. Due to the sensitivity of these species, nesting locations should not be made publicly available.

- **Study Area(s)**: these are survey-specific and are defined in the text (**Technical Appendix 7.1: Ornithology Baseline Report**) and are illustrated on **Figure 7.1**.

7.2 Statutory and Planning Context

7.2.1 Legislation and planning policy relevant to the Proposed Development are detailed in **Chapter 3: Planning and Renewable Energy Policy Context**.

7.2.2 Legislation, policy and guidance of specific relevance to ornithology, and taken into account as part of the assessment presented within this chapter, is outlined below.

Legislation

- Conservation (Natural Habitats, &c.) Regulations 1994, as amended in Scotland by the Conservation (Natural Habitats, &c.) (EU Exit) (Scotland) (Amendment) Regulations 2019 (collectively 'the Habitats Regulations');
- European Council Directive 2009/147/EC on the conservation of wild birds (Birds Directive);
- The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017;
- The Wildlife and Countryside Act (WCA) 1981 (as amended);
- The Wildlife and Natural Environment (Scotland) Act 2011; and
- The Nature Conservation (Scotland) Act 2004.

Planning Policy

- Scottish Government (2008) Scottish Government Planning Advice Note 60: Planning for Natural Heritage 2008;
- Scottish Government (2022a) The Scottish Biodiversity Strategy to 2045;
- Scottish Government (2022b) Onshore Wind Policy Statement;
- Scottish Government (2023) National Planning Framework 4 (NPF4);
- Highland-wide Local Development Plan (2012); and
- The Highland Council (2021) Highland Nature: Biodiversity Action Plan 2021-2026.

Guidelines

7.2.3 The following best practice guidelines, guidance and associated sources have informed the baseline studies and subsequent assessment presented within this chapter:

- Guidelines for Ecological Impact Assessment in the UK and Ireland. Terrestrial, Freshwater, Coastal and Marine (CIEEM, 2022);
- Recommended bird survey methods to inform impact assessment of onshore wind farms (SNH, 2017);
- Assessing connectivity with Special Protection Areas (SPAs) (SNH, 2016);
- Assessing significance of impact from onshore windfarms on birds outwith designated areas (SNH, 2018a);
- Avoidance rates for the onshore SNH wind farm collision risk model (SNH, 2018b);
- Assessing the cumulative impact of onshore wind farms on birds (SNH, 2018c);
- Natural Heritage Zones (NHZ) bird population estimates (Wilson *et al*., 2015);

- Windfarms and birds - calculating a theoretical collision risk assuming no avoiding action (SNH, 2000);
- Developing field and analytical methods to assess avian collision risk at wind farms (Band, *et al*., 2007);
- Scottish Biodiversity List (SBL) 2022[2];
- 'Fifth Birds of Conservation Concern' (BoCC) (Stanbury *et al*., 2021);
- Disturbance distances in selected Scottish bird species (Goodship & Furness, 2022);
- Pre-application guidance for onshore wind farms (NatureScot, 2024a[3]); and
- Biodiversity Enhancement Planning Guidance (The Highland Council, 2024[4]).

7.3 Consultation Undertaken

7.3.1 Informal consultation with NatureScot was undertaken in September 2023, following the first year of baseline data gathering, so that comments received on survey methods and results could inform survey design and effort during the second year of survey.

7.3.2 Subsequently, formal consultation with statutory consultees was undertaken through the production of a Scoping Report, submitted in April 2024. Responses in relation to ornithology were received from NatureScot and THC. Note that no response was received from the Royal Society for the Protection of Birds (RSPB).

7.3.3 A summary of the issues covered through consultation and scoping (ornithology only) is presented in **Table 7.1**.

Table 7.1: Summary of consultation responses relevant to ornithology

Consultee	Issued Raised	Response/Action Taken
NatureScot (October 2023)	The Proposed Development is unlikely to lie on the flight-path of SPA Slavonian grebes [birds associated with Loch Ruthven SPA or Loch Ashie SPA] and it can be concluded that there is unlikely to be a collision risk. Slavonian grebe should, however, remain a key focus species during data collection.	Slavonian grebe was treated as a target species during baseline surveys, but none were recorded. The conclusion of no collision risk remains valid. Loch Ruthven SPA and Loch Ashie SPA are, however, included in Stage 1: Screening of the information for HRA (see **Technical Appendix 7.4: Information to Inform a Habitats Regulations Appraisal**).
	Greylag goose associated with the Inner Moray Firth SPA require assessment through a shadow HRA.	A shadow HRA for the Inner Moray Firth SPA (greylag goose only) is provided in **Technical Appendix 7.4: Information to Inform a Habitats Regulations Appraisal**.
	NatureScot does not hold ornithological data relevant to the Site.	Other data sources have been explored.

[2] Available from: https://www.nature.scot/doc/scottish-biodiversity-list (Accessed January 2025)

[3] Available from: https://www.nature.scot/doc/naturescot-pre-application-guidance-onshore-wind-farms (Accessed January 2025)

[4] Available from: https://www.highland.gov.uk/downloads/file/28840/biodiversity_enhancement_planning_guidance (Accessed January 2025)

Consultee	Issued Raised	Response/Action Taken
	In trying to obtain background bird data, *BirdTrack* could potentially be worth trying, although it is acknowledged that the remote location of the Site is unlikely to have had many records submitted.	Based on a preliminary examination of *BirdTrack* data and previous experience, we agree that useful data would not be obtained for the Site, given its location. A formal request to the British Trust for Ornithology (BTO) for *BirdTrack* data was not considered necessary.
	As Raptor Study Group data is not available (see **Desk Study Records of Ornithological Features**) it should be ensured that spatial and temporal aspects of the bird surveys be completed to a good standard. Two survey seasons may be required due to the paucity of background data.	Two years of baseline ornithology surveys have been completed including two seasons of Schedule 1 raptor searches. Survey effort has generally met, or exceeded, that suggested in guidance and is considered sufficient for informing the assessment. See **Baseline Methodology** and **Technical Appendix 7.1: Ornithology Baseline Report** for further details of surveys completed.
	VP1 is located very close to a proposed turbine [based on the indicative layout and viewshed figure provided at that time].	The proposed turbine array has evolved since the indicative layout originally provided. The location of 'VP1' also moved during surveys and VP1b, which was utilised for 18 months of the two-year baseline survey period, was located sufficiently distant from the nearest proposed turbine. It is considered that bird activity in this area would not have been influenced by surveyor presence (see **Figures 7.2a-c**). Limitations of the VP surveys are discussed in Section 3.2 of **Technical Appendix 7.1: Ornithology Baseline Report**.
	Clarification should be provided regarding survey coverage outside the Site, especially where proposed turbines are located at the edge of the Site boundary and the adjacent buffer lies outside the area of surveyor access.	The proposed layout no longer has turbines hard against the southern Site boundary. The study areas covered are described in **Technical Appendix 7.1: Ornithology**. Any limitations in the baseline surveys are acknowledged (see Section 3.2 of **Technical Appendix 7.1: Ornithology Baseline Report**). Although not all proposed turbine buffers were fully covered, it is considered highly unlikely that any restrictions on access will have led to key species being missed.
	'Possible' and 'probable' breeding attempts should be reported upon, not just those for which breeding was confirmed.	The results from the breeding bird surveys are provided in **Moorland Breeding Bird Surveys (MBBS)** and in **Technical Appendix 7.1: Ornithology Baseline Report**, and this includes information regarding breeding status. Where breeding status was uncertain, a precautionary approach has been taken that assumes an active territory.
NatureScot (May 2024)	It is recommended that areas proposed for habitat restoration or enhancement are covered by appropriate survey and assessment.	Where habitat restoration and enhancement measures are proposed in areas that were not covered by baseline surveys for the Proposed Development, appropriate ornithology surveys would be completed ahead of works.

Consultee	Issued Raised	Response/Action Taken
	The EIAR should demonstrate that vantage point locations have provided sufficient coverage of the Site.	The locations of the VPs used during baseline surveys are illustrated on **Figures 7.2a** - **7.2c**. Survey limitations are discussed in **Technical Appendix 7.1: Ornithology Baseline Report**. Not all proposed turbine locations received VP coverage throughout the baseline survey period, and this is acknowledged. However, the information provided shows that the VPs utilised were adequate for determining baseline flight activity.
	The EIAR should explain where recommended survey buffers were not fully accessed and how these have been assessed.	Details of survey methods, including survey areas and survey limitations, are discussed in **Technical Appendix 7.1: Ornithology Baseline Report**.
	The assessment should cover potential impacts through habitat loss, disturbance and/or displacement, and collision risk, for the Proposed Development on its own and cumulatively with other projects.	All potential impacts on relevant ornithological features have been assessed (where 'scoped in' to assessment as IOFs), with the assessment provided in the **Impact Assessment** section.
	The cumulative assessment should be carried out at the Natural Heritage Zone (NHZ) level.	Where relevant, the NHZ 10 populations of relevant species are used in the assessment, including the cumulative assessment. Details are provided where appropriate within the assessment, including any deviations from this approach.
	Details of mitigation options should be included in the EIAR.	Embedded mitigation measures are considered at the outset (see **Embedded Mitigation**). Where required, additional mitigation is considered, as set out in **Mitigation and Enhancement**. Also included in this chapter are proposed habitat enhancement measures that would benefit ornithological features. An OHEMP is provided in **Appendix 6.5**.
	A shadow HRA should be completed for greylag geese associated with the Inner Moray Firth SPA.	A shadow HRA for the Inner Moray Firth SPA (greylag goose only) is provided in **Technical Appendix 7.4: Information to Inform a Habitats Regulations Appraisal**.
	Impacts on 'wider countryside birds' should be assessed. This should include collision risk and displacement from foraging habitat for raptor species, such as golden eagle, red kite and short-eared owl, and habitat loss and modification impacts for upland breeding waders.	Relevant impacts are assessed for species identified as IOFs, as set out in **Impact Assessment**.

Consultee	Issued Raised	Response/Action Taken
	Where certain ornithological features are scoped out from detailed assessment, a brief justification should be included.	Some ornithological features can be concluded as not being significantly affected by the Proposed Development without the need for detailed impact assessment. These species have been scoped out. Justification for either scoping in or scoping out an ornithological feature from full assessment is provided in **Identification of Important Ornithological Features.**
	Habitat enhancement measures should happen within the development site, where possible. However, off-site delivery may be justified where there is not sufficient opportunity on-site or better outcomes are more likely off-site.	Habitat enhancement measures include for peatland restoration on-site. These measures would benefit bird species found in bog and moorland habitats,
The Highland Council (August 2024)	The presence of Schedule 1 species must be considered as part of the planning application process.	The conservation status of ornithological features recorded on Site, including Schedule 1[1] and Annex 1[5] listed species, is considered and discussed in the assessment.
	An assessment on impacts to birds through collision, disturbance. and displacement from foraging/ breeding/ roosting habitat, will be required for the Proposed Development and cumulatively with other projects.	All potential impacts are identified, and relevant impacts are fully assessed for IOFs. The assessment includes a Cumulative Impact Assessment.
	The EIAR should be clear on survey methods and any deviations from guidance.	Baseline ornithological survey methods are described in **Technical Appendix 7.1: Ornithology Baseline Report**.

7.4 Approach to the Assessment

Scope of Assessment

7.4.1 The assessment presented within this chapter has been undertaken in accordance with CIEEM guidelines (2022) and considers potential impacts upon ornithological features from the Proposed Development, throughout the lifetime of the project (construction, operation and decommissioning phases).

7.4.2 To ensure proportionality and, in accordance with guidance (e.g. SNH, 2018a and CIEEM, 2022), the focus of the assessment is those species considered potentially sensitive to the Proposed Development, and which are classed in this assessment as 'IOFs'. The identification of IOFs has been determined based upon baseline information, relevant guidance and literature, professional judgement of the author and, where relevant, the opinions of statutory advisory bodies provided through consultation.

7.4.3 A detailed assessment of impacts is not included for all ornithological features identified as being present in the vicinity of the Site, e.g., those with populations that are sufficiently

[5] Annex I of the Birds Directive.

widespread, unthreatened or resilient, or species which were only recorded occasionally in very small numbers, do not receive full assessment; as a significant effect on the population of these features (at a local scale and above) can reasonably be dismissed. Where ornithological features are unlikely to be significantly affected, as evidenced by baseline information, these features are 'scoped out'. Some ornithological features were previously identified for scoping out in the Scoping Report (dated April 2024) and these are listed within the relevant section of the assessment (**Ornithological Features Scoped Out of Assessment**). For all ornithological features, justification is provided for either 'scoping in' or 'scoping out' of the assessment (see **Identification of Important Ornithological Features**).

7.4.4 Following the principle of proportionate EIA, embedded mitigation is considered at the outset, including standard best practice and construction management measures that would be a core part of the Proposed Development irrespective of the IOFs identified. Further information about embedded mitigation is provided in the relevant section (**Embedded Mitigation**).

7.4.5 Where potential impacts of the Proposed Development are fully assessed, this is undertaken for the project itself as well as assessing the potential cumulative impacts with other relevant projects.

Baseline Methodology

Data Gathering

7.4.6 Full details of data gathering methods are provided in **Technical Appendix 7.1: Ornithology Baseline Report**. This includes details of 'target species' and how such ornithological features have been identified.

Desk Study

7.4.7 A desk study has been undertaken to identify the presence of any designated area for nature conservation with ornithological interests in the vicinity of the Site. The search investigated statutory sites within 10 km of the Site, extended to 20 km for internationally designated sites listed for species with large foraging ranges (specifically wintering pink-footed goose and greylag goose). The search was undertaken using NatureScot Sitelink[6].

7.4.8 The desk study also included data requests to relevant third parties for existing records of notable bird species within relevant proximity to the Site. Details of the desk study undertaken, including the third parties contacted and requests submitted, are presented in **Technical Appendix 7.1: Ornithology Baseline Report**. Organisations contacted included RSPB Scotland and Highland Biological Recording Group. The latter request also included information regarding any non-statutory protected areas within 10 km of the Site.

Field Surveys

7.4.9 The following ornithological surveys were completed during the baseline survey period:

- Vantage Point (VP) flight activity surveys (September 2022 to August 2024);

[6] Available from: https://sitelink.nature.scot/map (Accessed January 2025)

- Moorland Breeding Bird Surveys (MBBS) (2023 and 2024);
- Breeding Schedule 1 raptor searches (2023 and 2024); and
- Breeding black grouse searches (2023).

7.4.10 Survey areas are illustrated on **Figure 7.1** (ornithological survey areas) and **Figures 7.2a, 7.2b** and **7.2c** (VP locations and viewsheds (three iterations)).

7.4.11 All surveys have been undertaken by suitably competent and experienced field ornithologists, who were in possession of a Schedule 1 licence where required and were based on survey methods set out in NatureScot guidance (SNH, 2017). Survey methods had previously been provided to NatureScot for agreement (**Table 7.1**).

7.4.12 Survey methodologies and results are presented in **Technical Appendix 7.1: Ornithology Baseline Report**.

Modelling

Collision Risk Modelling (CRM)

7.4.13 The results of the VP flight activity surveys were used to undertake CRM for relevant species. Further details of the CRM undertaken are presented in **Technical Appendix 7.2: Collision Risk Model Analysis**.

7.4.14 In accordance with the principle of proportionate EIA, only those ornithological features for which there was judged to be a potential significant effect as a result of collision impacts underwent CRM.

7.4.15 Please note that CRM was undertaken before NatureScot guidance (NatureScot, 2024b[7]) was updated, in accordance with the revised collision risk model (Band, 2024). However, the main aim of the updated guidance is to standardise the approach to CRM and the previous approach is still considered valid. Band (2024) states that the methods are 'mathematically equivalent' and that the estimates produced 'should not differ substantially from those deriving from earlier SNH [now NatureScot] guidance'.

Golden Eagle Topographical (GET) Model

7.4.16 Supplementary data to inform the impact assessment for golden eagle has been gathered through an analysis of potential habitat loss using the GET Model. The GET model determines 'good' eagle habitat based solely on topographical features and scores every 50m pixel across Scotland to determine likely golden eagle activity at that location. By applying this to known golden eagle home ranges, any loss in good habitat caused by birds avoiding wind farm developments, can be assessed to determine the level of habitat loss and whether this has potential to lead to the loss of that home range. Further details of the GET Model analysis carried out for the Proposed Development are presented in **Technical Appendix 7.3: Confidential Ornithology**.

Difficulties and Uncertainties

7.4.17 Potential limitations in the assessment arising from issues in data recording and analysis are discussed in **Technical Appendix 7.1: Ornithology Baseline Report** (field survey

[7] Available from: https://www.nature.scot/doc/guidance-using-updated-collision-risk-model-assess-bird-collision-risk-onshore-wind-farms (Accessed January 2025)

limitations) and **Technical Appendix 7.2: Collision Risk Model Analysis** (limitations in collision risk analysis). However, no substantive limitations have been identified and the use of the data gathered has resulted in what is considered to be a robust impact assessment.

Assessment Methodology

7.4.18 The assessment presented within this chapter has been undertaken following the principles advocated in CIEEM guidance (2022) and in reference to NatureScot guidance (SNH, 2016 and 2018a) regarding the assessment of wind farm developments close to designated sites and those located within the wider countryside.

7.4.19 The assessment includes the following stages:

- determination and evaluation of IOFs (Important Ornithological Features);
- identification and characterisation of impacts;
- outline of mitigation measures to avoid and reduce significant effects (where required);
- identification of appropriate compensation and enhancement measures;
- assessment of the significance of any residual effects following mitigation; and
- impacts of the Proposed Development are then also assessed cumulatively with those of other relevant projects.

7.4.20 Note that embedded mitigation measures (those that would be an integral part of the Proposed Development irrespective of the ornithological features identified) are considered from the outset, when determining impacts. See **Embedded Mitigation**.

7.4.21 In accordance with current NatureScot guidance (SNH, 2018a) and consultation (**Table 7.1**) the assessment of impacts has been undertaken at a 'regional' scale with regards species populations, unless an alternative geographical scale is considered appropriate on the basis of best available information. The Natural Heritage Zone (NHZ) is considered to be the most appropriate default regional scale[8]. The Site is located entirely within NHZ 10: Central Highlands, and the upland location of the Site is typical of the landscape character of NHZ 10, making this the appropriate region for use in the assessment. However, NHZ 21: Moray Firth is located close to the north of the Site (approximately 1 km distant at its nearest point) and this region is also used in the assessment where it is considered appropriate for the ornithological feature.

Characterising Important Ornithological Features

7.4.22 The 'importance' of ornithological features has been determined with reference to current guidance (CIEEM, 2022 and SNH, 2018a), the application of professional judgement, and by taking account of the results of baseline field and desk study findings.

7.4.23 Importance does not necessarily relate solely to the level of legal protection that a feature receives, and ornithological features may be important for a variety of reasons, such as

[8] NHZs are established biogeographical spatial units used by NatureScot to reflect the variations between, and commonalities within, regions based on landscape character, ecological condition and land use. There are 21 NHZs in Scotland.

their connectivity to a designated site, rarity, or the geographical location of a population relative to their known range.

7.4.24 In addition, the value of the Site is also considered. For example, a species associated with a nearby internationally designated area will not automatically be given 'international' importance if it is only rarely recorded within the vicinity of the Site. So, whilst the conservation importance of a species is considered, the number of individuals is also taken into account.

7.4.25 For the purposes of this assessment, the importance of an ornithological feature is classified, ranging from 'Very High' to 'Negligible', as detailed in **Table 7.2**.

Table 7.2: Criteria for determining importance of ornithological features

Importance	Description
Very High (International)	An internationally designated site, e.g. SPA and/or Ramsar Site or proposed site (pSPA). A regularly occurring species present in internationally important numbers (>1% of its biogeographic population) listed under Annex 1 of the Birds Directive, or regularly occurring migratory species listed under Annex 2 of the Birds Directive connected to an internationally designated site for this species.
High (National)	A nationally designated site, e.g. Site of Special Scientific Interest (SSSI), or area meeting criteria for national level designations. A regularly occurring species present in nationally important numbers (>1% of its Scottish population) and that is a priority species (e.g. listed on the SBL), a red-listed Bird of Conservation Concern (BoCC) (Stanbury *et al*., 2021) and listed under Schedule 1 of the Wildlife & Countryside Act or Annex 1 of the Birds Directive.
Medium (Regional)	A regularly occurring species present in regionally important numbers (>1% of its relevant Natural Heritage Zone (NHZ) population or appropriate alternative) and that is a priority species (e.g. listed on the SBL), a red-listed BoCC (Stanbury *et al*., 2021) or listed under Schedule 1 of the Wildlife & Countryside Act or Annex 1 of the Birds Directive.
Low (Local)	All other species that are widespread and common and which are not present in regionally or nationally important numbers, but which contribute to the local breeding/wintering bird assemblage.

Characterising Impacts

7.4.26 This section sets out how an identified impact is characterised for the purposes of the assessment. The potential impacts resulting from wind farm projects that are considered in the assessment are discussed later; see **Potential Impacts**.

7.4.27 Impacts may be 'adverse' or 'beneficial' as set out below:

- Adverse: an impact which has the potential to decrease the value or status of a feature relative to baseline conditions; or
- Beneficial: an impact which has the potential to increase the value or status of a feature relative to baseline conditions.

7.4.28 Potential impacts upon ornithological features are described with reference to their magnitude, their direction (adverse or beneficial) and duration, where this is relevant to understanding the nature of an effect and determining its significance.

7.4.29 For the purposes of the ornithological assessment, the temporal nature of potential impacts (i.e. their duration) has been defined as follows, and refers to the time for which an impact is expected to last before recovery to baseline conditions:

- Negligible: of inconsequential duration;
- Short-term: for 1-5 years;
- Medium-term: for 5-10 years;
- Long-term: for 10-30 years; and
- Permanent: >30 years.

7.4.30 The geographical scale of an impact is also taken into consideration, using the following definitions:

- Local: impacting the population of the Site or that found immediately adjacent to the Site;
- Regional: impacting the regional population (typically the NHZ population);
- National: impacting the Great Britain or UK population; and
- International: impacting the appropriate transboundary population, such as the northwestern European population or East Atlantic flyway population.

7.4.31 For some ornithological features, more than one geographical scale may be assessed. For example, upland wader species may have a regional breeding population estimate, but in the non-breeding season when the population is not tied to a discrete area and may be peripatetic in nature, an assessment against the national wintering population may be more appropriate.

7.4.32 Where reference is made to population level impacts, the most up to date population estimates available have been used in the assessment. In some cases, these estimates may no longer be considered accurate and such values should be regarded as a guide only. Where there is a doubt over referenced population estimates this is highlighted and the approach to assessment justified.

7.4.33 The magnitude of change refers to the size of the impact and is determined on a quantitative basis, where possible, for example the predicted loss of individuals from a population. The criteria used to determine magnitude of change is presented in **Table 7.3**.

7.4.34 Note that it may be impossible to equate an impact to actual population loss, for example, where birds may be displaced from a wind farm site as a result of construction or operational activities, such a loss may be temporary or may reasonably result in the relocation of birds to suitable habitats elsewhere within the immediate or wider area. Where uncertainty arises, professional judgement is used on the basis of best available evidence, whilst taking a precautionary approach.

7.4.35 Note also that sensitivity to change varies between species and may very between populations of the same species, for example, a bird may be more sensitive to disturbance when nesting than during the non-breeding season, and birds that live in an area of human activity may be more tolerant to disturbance than species in remote areas.

The sensitivity of ornithology features is therefore also taken into account during the assessment, where this information exists.

Table 7.3: Criteria for determining magnitude of potential impacts

Magnitude	Summary
Very Large	The impact (either on its own or cumulatively with other projects) may result in the permanent total or almost complete loss of a site and/or species status or productivity. For example, affecting >80% of the NHZ population.
Large	The impact (either on its own or cumulatively with other projects) may adversely affect the conservation status of a site and/or species population, in terms of the coherence of its ecological structure and function (integrity), across its whole area, that enables it to sustain the habitat, complex of habitats and/or the population levels of species of interest. For example, affecting 21-80% of the NHZ population.
Medium	The impact (either on its own or cumulatively with other projects) would not adversely affect the conservation status of a site and/or species, but some element of the functioning might be affected, and impacts could potentially affect the ability of the site and/or species (at an appropriate scale) to sustain some part of itself in the long term. For example, affecting >6-20% of the NHZ population.
Small	The impact (either on its own or cumulatively with other projects) would not result in a loss of function to the conservation status of a site and/or species, but some adverse impact to species abundance would be observable, although this may only be temporary. For example, affecting 1%-5% of an NHZ population; short-term impacts to 5-20% of the NHZ population.
Negligible	A very slight (indiscernible) reduction in a site and/or species status or productivity and/or no observable impact. For example, affecting <1% of the NHZ population; short-term impacts to <5% of the NHZ population.

Assessing the Significance of Effects

7.4.36 CIEEM guidance (2022) defines a 'significant effect' as an effect that either supports or undermines biodiversity conservation objectives for 'important ornithological features', or for "biodiversity in general".

7.4.37 CIEEM guidance (2022) states that for the Ecology discipline of an EIA (taken here to also include Ornithology), a matrix approach and the production of a 'significance score' (as is often used in EIA Reports) should be avoided for this discipline, as this would require creating artificial values that are not easily quantified. Instead, CIEEM guidance uses only two categories to classify effects: 'significant' or 'non-significant'.

7.4.38 **Table 7.4** summarises how significant or non-significant effects have been concluded in the assessments.

Table 7.4: Significance criteria

Significance	Impact	Definition
Significant	Very large/ Large Adverse or Beneficial	A very high or high, medium-term or long-term adverse or beneficial effect, or a medium magnitude, or above, permanent effect, upon the integrity of an ornithological feature at a national (Scottish) or international level.
	Medium Adverse or Beneficial	A medium or high, medium-term or long-term adverse or beneficial effect upon the integrity of an ornithological feature at a regional level or above.
Non-Significant	Small Adverse or Beneficial	The impact (either on its own or in-combination with other proposals) would not adversely affect the conservation status of a site and/ or species, but some element of the functioning might be affected and impacts could potentially affect its ability to sustain some part of itself in the long term.
	Negligible Adverse or Beneficial	A negligible or low adverse or beneficial effect upon the integrity of an ornithological feature, typically at a site level or below.

7.4.39 Significance is determined by considering the importance of the ornithological feature and the magnitude of the impact (as set out above) and by applying professional judgement as to whether the integrity of the feature will be affected.

7.4.40 The term 'integrity' is used here to refer to the maintenance of the conservation status of a population of a species at a specific location or geographical scale.

7.4.41 Professional judgement takes into consideration bird species ecology, population trends and evidence from studies of bird and wind farm interactions, where such evidence exists. Relevant data sources are referenced within the assessment, as appropriate.

7.4.42 Effects are more likely to be considered significant where the ornithological feature affected is of higher conservation importance or where the magnitude of the impact is large. Effects not considered to be significant would be those where the integrity of the feature is not threatened, those affecting features of low conservation importance, or where the magnitude of the impact is low. Justification for the conclusions made are provided within the assessment.

7.4.43 Potentially significant effects are assessed at an appropriate geographic scale. For the purposes of this assessment, regional (NHZ) population estimates are generally used, where these are available and relevant, or unless more up to date reliable data sources are available; in accordance with NatureScot advice (**Table 7.1**). However, the significance of effects may also be expressed with reference to the national scale, if relevant (e.g. mobile species in the non-breeding season), or if a regional population estimate is not available. The significance of effects at a local scale may also be assessed if sufficient information allows a meaningful assessment.

7.4.44 Note that the scale of significance is not necessarily always determined by the importance of an ornithological feature. For example, an effect on a species which is considered of national importance, may not have a significant effect upon its national population.

7.4.45 In cases of reasonable doubt, where it is not possible to robustly justify a conclusion of no significant effect, a significant effect will be assumed as a precautionary approach. Where uncertainty exists, this will be acknowledged.

7.4.46 Where the assessment proposes measures to mitigate adverse effects on ornithological features, a further assessment of residual effects, taking into account such measures, has been undertaken.

7.4.47 Finally, it should be noted that CIEEM guidelines (2022) state: "*A significant effect does not necessarily equate to an effect so severe that consent for the project should be refused planning permission… many projects with significant negative ecological effects have been lawfully permitted following EIA procedures*".

7.5 Existing Environment / Baseline

Designated Sites

7.5.1 Designated areas[6] with qualifying ornithological interests located within 10 km of the Site (extended to within 20 km for internationally designated sites with migratory geese as a qualifying feature, due to the larger foraging distances of these species) are illustrated in **Figure 7.3** and summarised in **Table 7.5**.

7.5.2 Where a designated area lies more than 10 km from the Site and has been identified due to its migratory goose interests only, the 'non-goose' interests are listed in *italics*. The 'non-goose' ornithological features are considered not to have connectivity with the Site, with reference to foraging ranges provided in NatureScot guidance (2016) and, for species associated with coastal or marine habitats, due to the inland location of the Site.

7.5.3 Distances refer to the nearest point between the Site and the boundary of the designated area.

Table 7.5: Statutory designated sites with qualifying ornithological features

Designated area	Distance from Site	Qualifying ornithological interests
International		
Loch Ashie SPA	8.7 km northwest	Slavonian grebe (passage (post-breeding))
Loch Ruthven SPA	9.4 km southwest	Slavonian grebe (breeding)
Loch Ruthven Ramsar Site	9.4 km southwest	Slavonian grebe (breeding)

Designated area	Distance from Site	Qualifying ornithological interests
Inner Moray Firth SPA	11.9 km north	Breeding • *Common tern;* and • *Osprey.* Non-breeding • *Waterfowl assemblage;* • *Bar-tailed godwit;* • *Cormorant;* • *Curlew;* • *Goldeneye;* • *Goosander;* • Greylag goose; • *Oystercatcher;* • *Red-breasted merganser;* • *Redshank;* • *Scaup;* • *Teal; and* • *Wigeon.*
Inner Moray Firth Ramsar Site	11.9 km north	Non-breeding • *Waterfowl assemblage;* • Greylag goose; • *Redshank;* • *Red-breasted merganser; and* • *Bar-tailed godwit.*
National		
Loch Ashie SSSI	8.7 km northwest	Slavonian grebe (passage (post-breeding))
Loch Ruthven SSSI	9.4 km southwest	Slavonian grebe (breeding) Breeding bird assemblage (15 species including: curlew, little grebe, oystercatcher, red-breasted merganser, snipe, tufted duck and wigeon).
Non-Statutory		
Loch Ruthven RSPB Reserve	9.4 km southwest	Breeding Slavonian grebe and red-throated diver, woodland bird assemblage.

Desk Study Records of Ornithological Features

7.5.4 Selected data returned from the desk study are provided in **Technical Appendix 7.1: Ornithology Baseline Report**.

7.5.5 The RSPB provided a small number of records, which included records of Schedule 1 raptor species seen within 2 km of the Site and all from 2012, comprising red kite (two

records), goshawk (one record) and white-tailed eagle (one record); all were individuals with no evidence of breeding.

7.5.6 The RSPB data also included a record of a male capercaillie seen flying over the A9 within 2 km of the Site in late 2021. This was a 'casual' sighting, with the forest here not one that is routinely surveyed by the RSPB. A further request was then made to Forestry & Land Scotland (FLS) for any records held in FLS managed forestry in the Moy, Tomatin and Daviot area. FLS confirmed that they believed capercaillie to be absent from these forests (last record being from 2004) and confirmed that formal surveys are not conducted. Therefore, the male recorded in 2021 is concluded as being a dispersing bird and not part of a resident local population.

7.5.7 The Highland Raptor Study Group (RSG) made a decision not to share data held regarding breeding Schedule 1 raptors in the vicinity of the Site due to the wider area of the Central Highlands in which the Site is located being regarded as a persecution 'hotspot'.

Field Survey Records of Ornithological Features

Vantage Point Flight Activity Surveys

7.5.8 The VP surveys have determined the level of flight activity across the Site for target species, following the survey methods set out in **Technical Appendix 7.1: Ornithology Baseline Report.**

7.5.9 The target species[9] flights mapped during VP surveys are illustrated on **Figure 7.4a** (raptor species) and **Figure 7.4b** (other species) for Year 1 (September 2022 to August 2023); and on **Figure 7.4c** (raptor species) and **Figure 7.4d** (other species) for Year 2 (September 2023 to August 2024). Full details of all target species flights recorded are provided in Annex 3 of **Technical Appendix 7.1: Ornithology Baseline Report**.

7.5.10 The flights recorded during the VP surveys were examined to determine which flights were at potential collision risk, following the methods set out in **Technical Appendix 7.2: Collision Risk Model Analysis**.

7.5.11 Only species for which there were three or more flights (or ten or more individuals) recorded within the 'collision risk zone' (CRZ) (a single, continuous area covering the proposed turbines and a 300 m buffer around the outermost turbine locations) at 'potential collision height' (PCH) (between minimum and maximum rotor swept height: 38-200 m), during the two-year baseline survey campaign, were taken forward for CRM.

7.5.12 Ornithological features which were rarely present and for which the number of qualifying flights was insufficient to meet these criteria were considered as being highly unlikely to experience significant effects as a result of collisions associated with the Proposed Development, and these species were excluded from CRM in the interests of proportionality.

7.5.13 All target species flights with at least some time recorded in a height band that overlapped with rotor swept height (38-200 m) were considered to have been at PCH. With the height

[9] Target species during VP surveys comprised: Schedule 1 and Annex 1 listed raptors and owls, all wader species, all waterfowl (swans, geese and ducks but excluding feral species and mallard), divers, grebes and black grouse.

bands used during surveys changing from February 2023, PCH was considered as encompassing height bands 3 (30-50 m) and 4 (50-200 m) during the period September 2022 to January 2023, and encompassing height bands 2 (20-40 m), 3 (40-160 m) and 4 (160-200 m) during the period February 2023 to August 2024. This is considered to be a precautionary approach as there will be some flights considered at-risk which in reality will have been below rotor swept height.

7.5.14 **Table 7.6** lists all the target species recorded during the VP flight activity surveys, combined for the full two year survey period. The seasons presented are generic 'breeding' and 'non-breeding' seasons; but note that when undertaking the CRM, species-specific seasons have been used (see **Technical Appendix 7.2: Collision Risk Model Analysis**). The table presents the number of flights (and the constituent number of individuals) that were recorded during VP surveys in total, irrespective of actual collision risk, as well as presenting the totals for at-risk flights only (those within the CRZ at PCH). The species highlighted in bold were those with sufficient at-risk flights to qualify for CRM.

Table 7.6: Summary of target species recorded during flight activity surveys

Species	All flights		At-risk flights	
	No. of flights	No. of individuals[10]	No. of flights	No. of individuals[10]
Breeding season (April to August)				
Curlew	1	1	1	1
Dunlin	9	11	4	5
Golden eagle	7	8	3	3
Golden plover	8	15	5	9
Pink-footed goose[11]	1	64	1	64
Hen harrier	2	2	0	0
Merlin	1	1	0	0
Red kite	52	54	42	44
White-tailed eagle	11	11	7	7
Non-breeding season (September to March)				
Golden eagle	3	3	1	1
Golden plover	9	111	5	71
Goshawk	1	1	0	0
Greylag goose	1	2	0	0
Gyr falcon	4	4	1	1

[10] The sum total of flock size for each flight. Note in some cases this refers to the same bird(s) seen more than once.

[11] Pink-footed goose met the criteria for CRM in terms of total numbers of at-risk flights (four) and individuals (272) recorded, but in accordance with NatureScot guidance CRM was not undertaken for this species as the pink-footed geese recorded passing over the Site are not considered to be SPA birds.

Species	All flights		At-risk flights	
	No. of flights	No. of individuals[10]	No. of flights	No. of individuals[10]
Hen harrier	1	1	0	0
Peregrine	1	1	0	0
Pink-footed goose[11]	11	679	3	208
Red kite	29	33	11	12
White-tailed eagle	5	7	3	3

7.5.15 A summary of the outputs from the CRM are presented in **Table 7.7**. Further details as to how the CRM was undertaken are presented in **Technical Appendix 7.2: Collision Risk Model Analysis.**

7.5.16 The outputs of the CRM analysis are mortality estimates of 'birds per year'. An estimate of 0.023 birds per annum would be equivalent to one collision every 43 years (approximately). The collision risk estimates should not be taken as the number of bird deaths that would definitely occur as a result of the Proposed Development but are best treated as an indication as to the relative level of risk.

Table 7.7: Collision mortality estimates for key species

Species	Season of occupancy	Collision mortality estimate		
		Year 1	Year 2	Average
Golden plover	Breeding season	0.107	0.128	0.118
	Non-breeding season	0.891	0.302	0.596
	Annual estimate	**0.998**	**0.430**	**0.714**
Dunlin	Breeding season	0.205	0.000	0.103
	Non-breeding season	0.000	0.000	0.000
	Annual estimate	**0.205**	**0.000**	**0.103**
Golden eagle	Breeding season	0.045	0.000	0.023
	Non-breeding season	0.000	0.000	0.000
	Annual estimate	**0.045**	**0.000**	**0.023**
Red kite	Breeding season	0.268	0.360	0.314
	Non-breeding season	0.065	0.083	0.074
	Annual estimate	**0.333**	**0.443**	**0.388**
White-tailed eagle	Breeding season	0.166	0.588	0.377
	Non-breeding season	0.000	0.015	0.008
	Annual estimate	**0.166**	**0.603**	**0.385**

Moorland Breeding Bird Surveys (MBBS)

7.5.17 **Table 7.8** summarises the results of the MBBS for target species[12], with the estimated number of territories recorded within the survey area in each baseline survey year. The estimated central locations of the territories are illustrated on **Figure 7.5a** (2023) and **7.5b** (2024). Further details of the MBBS can be found in **Technical Appendix 7.1: Ornithology Baseline Report**.

7.5.18 **Table 7.8** includes regional population estimates for these species, where these are known, using the data available in Wilson *et al*. (2015) for NHZ 10: Central Highlands. For those species without an NHZ estimate, the Scottish population estimate is presented for context (from Forrester *et al*., 2007). The importance of the breeding population, using the criteria set out in **Table 7.2**, is also provided.

Table 7.8: Moorland Breeding Bird Survey results

Species	No. of territories		Population estimates (breeding)	Importance
	2023	2024		
Curlew	1	0	NHZ 10: 811 pairs	Low
Dunlin	2	1	NHZ 10: 105 pairs	Medium
Golden plover	7	5	NHZ 10: 2,702 pairs	Low
Red grouse	6	3	Scotland: 100,000-150,000 pairs	Low
Snipe	2	0	NHZ 10: 690 pairs	Low

Breeding Schedule 1 Raptor Searches

7.5.19 Osprey was confirmed as nesting over 750 m from the Site, merlin was confirmed as breeding over 3 km from the Site and there was a probable red kite nest over 4 km from the Site. Other red kite territories may be present within the 2 km study area, but no evidence of breeding was recorded and most sightings referred to foraging birds. Goshawk and peregrine also showed evidence of potentially holding territories within the 6 km raptor study area (displaying birds recorded in suitable habitat); the goshawk territory being approximately 2.5 km from the Site and the peregrine territory approximately 4 km from the Site. There are no occupied golden eagle home ranges in the vicinity of the Site.

7.5.20 The habitat on Site is not considered to be favourable for nesting by any of osprey, goshawk, red kite, peregrine or golden eagle.

7.5.21 In 2023, a short-eared owl (not actually a Schedule 1 species but recorded as part of the survey) was recorded in the western edge of the Site in the core breeding season. Although there was no evidence of breeding, this record is treated as representing a bird on territory given the timing of the record (May) and given that the crepuscular behaviour (active at dawn and dusk) of this species could have led to breeding evidence being

[12] Target species for the MBBS were those listed in NatureScot guidance (SNH, 2017) and comprised waders, waterfowl, gulls and red grouse.

overlooked. If nesting occurred it is considered likely that this was located close to, but outwith the Site, based on the lack of further sightings.

7.5.22 Relevant survey records can be found on **Figure 7.6** (**Technical Appendix 7.3**: **Confidential Ornithology**).

Breeding Black Grouse Searches

7.5.23 No black grouse were recorded during the dedicated surveys, nor were they encountered incidentally during the course of the other baseline surveys, and it is, therefore, concluded that this species is not present within the vicinity of the Site.

Future Baseline

7.5.24 In the absence of the Proposed Development, it can be expected that the baseline ornithological conditions on Site (in terms of number, distribution and activity of species) would remain similar in future to those recorded during the baseline survey campaign; notwithstanding any minor inter-annual variability that may occur naturally in bird populations.

7.5.25 In the absence of the Proposed Development, the habitats within the Site would be expected to remain under the existing management regime, comprising moorland managed for grazing and grouse shooting.

7.5.26 It is understood that, excluding the Proposed Development, there are no major changes planned to habitat management on the Site nor are other developments proposed that would alter the baseline ornithological conditions, as reported herein or described more fully in **Technical Appendix 7.1: Ornithology Baseline Report**.

7.5.27 Within the wider area, the management of the commercial forestry that extends to the north of the Site will be subject to rotational felling and replanting, according to the management plan and impact from the proposed A9 dualling on these forested areas. Thus, currently forested land adjacent to the Site could become clear felled, whilst newly planted areas will mature in time into established forestry, resulting in local changes to the community of bird species present. However, these areas are mostly located beyond the distance in which disturbance or displacement impacts would be experienced as a result of the Proposed Development.

7.5.28 Breeding bird densities within the Site would reasonably be expected to remain at comparable levels with those recorded during the baseline period, albeit central territory locations will naturally shift from year to year.

7.5.29 The establishment of new breeding raptor territories within the Site in future years is considered unlikely for most of the Schedule 1 species recorded during baseline surveys, given the general absence of suitable nesting habitat features such as deep heather swards, crags and mature woodland. As set out in the GET Model Report in **Technical Appendix 7.3: Confidential Ornithology**, there is not currently a golden eagle home range within the vicinity of the Site, but there is the potential for a new territory to become established in future and which could have an overlap with the Site. However, the fact that the Site is located in a region regarded as having high raptor persecution (Highland RSG per comms.) might suggest that this is a current limiting factor for raptor population expansion in this area.

7.5.30 The use of a precautionary approach in this impact assessment and the application of standard embedded mitigation and good practice measures (as detailed herein) allows for small changes in ornithological populations, without altering the conclusions of the assessment.

7.5.31 Although populations may remain the same, the status of ornithological features could still change in future, for example in the conservation status of a particular species (more or less favourable) or new protected sites could be designated. However, such changes would be unlikely to qualitatively alter the conclusions of the impact assessment for the Proposed Development.

7.6 Embedded Mitigation

7.6.1 Embedded mitigation is built into the project to minimise the potential for any adverse impacts associated with the Proposed Development, to ensure adherence to good practice guidance and compliance with the Wildlife and Countryside Act 1981, with such measures being followed irrespective of the impact assessment's conclusions.

7.6.2 Where embedded mitigation is considered sufficient to prevent significant adverse effects on ornithological features, this has been taken into consideration in the assessment in order to produce an EIA which is proportionate to the risks posed by the Proposed Development.

Best Practice Measures

Construction Environmental Management Plan

7.6.3 A Construction Environmental Management Plan (CEMP) would be prepared for the Proposed Development in consultation with THC, NatureScot and other relevant stakeholders.

7.6.4 The CEMP would be finalised and implemented in agreement with relevant stakeholders by way of a suitably worded planning condition.

7.6.5 The CEMP, once finalised, would include for all standard measures to ensure the Proposed Development is constructed in accordance with industry good practice applicable at the time of commencement. The CEMP would also include for habitat restoration measures following the completion of construction works.

7.6.6 The CEMP would include for the appointment of an Ecological Clerk of Works (ECoW) during construction, whose role would be to see that works are undertaken in accordance with environmental legislation and good practice, including making contractors aware of any ornithological sensitivities and restrictions.

7.6.7 Additionally, the CEMP would include for a Breeding Bird Protection Plan (BBPP) to be prepared for agreement through consultation with THC and NatureScot. Once finalised, the plan would provide details of survey methods and protocols to protect breeding birds and nests over the course of construction works and, if required, during operational maintenance works. This would include carrying out preconstruction checks ahead of vegetation stripping or excavation works in the breeding season, to identify any active nests. Should a nest be found, it would be protected by a buffer of appropriate distance (Goodship and Furness (2022) and/or in consultation with NatureScot, where required)

in which works would be restricted, until the nesting attempt comes to a natural end. These checks would be carried out by the ECoW or other suitably qualified Environmental Manager.

7.6.8 These measures would ensure that works are carried out in accordance with the Wildlife and Countryside Act 1981. The Wildlife and Countryside Act makes it an offence to intentionally or recklessly kill or injure any wild bird, or to damage or destroy their nest whilst it is in use. In addition, all wild birds listed on Schedule 1 of the Act receive additional legal protection, which make it an offence to intentionally or recklessly disturb these species whilst they are building a nest, or whilst the nest is active.

Habitat Management and Enhancement Plan

7.6.9 The Proposed Development would also include for a Habitat Enhancement Management Plan (HEMP) which would be prepared in consultation with THC, NatureScot and other relevant stakeholders. The Outline HEMP (OHEMP) is discussed in **Chapter 6: Ecology and Biodiversity**.

7.6.10 The primary aim of the OHEMP is to provide large-scale improvements to the condition of degraded peatland habitats. Improving habitat condition and extent would also have a beneficial impact on ornithological features, including for breeding waders, such as golden plover (Annex 1 listed and listed on SBL) and dunlin (listed on SBL and red-listed on BoCC), as well as for species such as red grouse (listed on SBL and amber-listed on BoCC) and songbirds such as skylark (listed on SBL and red-listed on BoCC) and meadow pipit (amber-listed on BoCC).

7.7 Requirements for Avoidance, Mitigation, Compensation or Enhancement

7.7.1 Additional mitigation measures will be necessary to address likely significant adverse effects, where these are concluded. However, it is also good practice to propose measures to reduce impacts irrespective of whether significant effects are predicted.

7.7.2 The mitigation hierarchy has been adopted to avoid, mitigate and compensate for impacts upon ornithological features where a significant effect as a result of the Proposed Development has been predicted:

- Avoidance is used where an impact has been circumvented, for example through changes in the Proposed Development design (see **Embedded Mitigation**);
- Mitigation is used to refer to measures to reduce or remedy a specific adverse impact in situ; and
- Compensation describes measures taken to offset residual effects, i.e. where mitigation in situ is not possible.

7.7.3 Note that in this chapter, these measures are referred to collectively as ‘mitigation’ for brevity when discussing generalities, however the appropriate form of mitigation is included within any discussion of specific requirements.

7.7.4 The significance of residual effects on ornithological features after the implementation of additional mitigation measures is considered and presented as part of the impact assessment.

7.7.5 In addition to mitigation measures, 'enhancement' measures are also included within the Proposed Development. Enhancement is the provision of new benefits for biodiversity that are additional to those provided as part of mitigation or compensation measures, although they can be complementary. Details of these enhancement measures are provided in **Chapter 6: Ecology and Biodiversity**; however, where specific measures are relevant to the assessment of ornithological features these measures are described within this chapter.

7.8 Predicted Effects

Potential Impacts

7.8.1 The following generic risks to ornithological features have been identified for wind farm projects. Impacts applicable to the Proposed Development and associated ornithological features are assessed in the **Impact Assessment** section.

Potential Impacts During the Construction Phase

Habitat Loss

7.8.2 The construction of turbine bases, access tracks and associated infrastructure would lead to temporary losses and changes to habitat as well as direct and permanent habitat losses, as set out in **Chapter 6: Ecology and Biodiversity**. The impact of habitat loss upon ornithological features would depend on the extent of the land-take, the type of habitat affected, the bird species identified as using these areas and the way in which these birds use the habitat (e.g., for breeding or foraging).

7.8.3 Where a development is constructed on habitats that are prevalent in the wider area (as is the case for the Proposed Development), the area of direct habitat loss would be proportionately low compared to the available habitat in the surrounding area, and so the losses would have a local impact only. Habitat loss is only likely to have an impact for species with small territories (e.g. passerines) in the direct vicinity of the development footprint, where the loss of habitat could lead to abandonment of the territory; however, such localised losses are considered unlikely to result in a noticeable change in a species' population.

7.8.4 The main risk from direct habitat loss during construction is the inadvertent destruction or damage to nesting attempts that are active at the time of construction. However, embedded mitigation measures would prevent such damage (see **Embedded Mitigation**); and as embedded mitigation is taken into consideration from the outset, such losses are not included in the assessments.

7.8.5 The area lost to ornithological features indirectly, as a result of avoidance of construction activities, is considered below (see **Disturbance and Displacement).**

Disturbance and Displacement

7.8.6 Noise and visual disturbance associated with construction activity may lead to the short-term disturbance or displacement of breeding and foraging birds within the vicinity of the activity. The level of impact depends on the timing of activities (breeding or non-breeding season), the duration and spatial extent of the activity, the sensitivity of the bird species, and the availability of alternative and equivalent habitats in the surrounding area.

7.8.7 The potential disturbance impacts associated with the construction phase are only likely to occur for as long as activities are taking place. They are thus short-term and can be mitigated for, if necessary, by avoiding sensitive areas (through the implementation of appropriate species-specific buffer zones) or by timing construction activities to avoid periods where sensitive species are present.

Potential Impacts During the Operational Phase

Disturbance and Displacement

7.8.8 The level of human activity on Site during the operational phase of the Proposed Development would be considerably lower than during the construction phase but is assumed to be higher than during the baseline. An increase in human presence has the potential to cause temporary disturbance and to displace birds from around the area of activity, albeit at a very localised level.

7.8.9 In addition, there may be displacement from around infrastructure, particularly the rotating turbines, throughout the operational period, resulting in potential indirect habitat loss.

7.8.10 The area in which birds may be affected by disturbance and displacement impacts depends on the sensitivity of the bird species in question; and may itself change over time if birds become habituated. A number of studies into displacement impacts as a result of wind farms have been undertaken and impacts have been found to vary between species. Relevant literature, where available, has informed the impact assessment.

Barrier Effect

7.8.11 The presence of turbines may create a barrier to movement, if birds avoid passing through the wind farm. For birds that have to regularly fly over or around obstacles this may lead to greater energy expenditure, which could potentially lead to reduced survival. Such regular movements of birds along a particular flight path are most associated with daily movements between roosting and foraging sites for non-breeding birds, or for birds moving between nest sites and favoured feeding areas in the breeding season. There were no species of breeding bird on Site for which barrier effects are considered likely to be a substantive issue. In the non-breeding season, the scale of the Proposed Development is considered unlikely to create a significant barrier to the movements of mobile and migratory species, such as wintering geese, especially in the context of the Site's location in the hills of south Inverness-shire, which already act as a natural barrier to birds passing north-south over this part of Scotland. For these reasons, barrier effects are not considered further in relation to the Proposed Development.

Collision

7.8.12 Tall structures with moving parts in an otherwise, and previously, open landscape could result in flying birds colliding with these structures. Collision with turbine rotors or towers is almost certain to result in the death of the bird.

7.8.13 The likelihood of a collision occurring depends on a number of factors, including aspects of the size and behaviour of the bird species, the nature of the surrounding environment, the structure and layout of turbines, and weather conditions. Collision risk is perceived as being higher for birds that spend much of the time in the air, such as certain large raptors and species which have low manoeuvrability, especially those with regular flight paths, such as swans and geese.

7.8.14 Collision risk impacts and operational phase displacement can be considered as being mutually exclusive in a spatial sense, as a bird that avoids the wind farm area cannot be at risk of collision with the turbine rotors at the same time. However, they are not mutually exclusive in a temporal sense, for example a bird may initially avoid the wind farm but later habituate to it, putting the bird at potential risk of collision.

Lighting

7.8.15 NatureScot guidance (2020) states that the main risk of artificial lighting on wind turbines to ornithological features is that of phototaxis, that is attraction to the lights, which has potential to result in collision with the structures if sufficiently attracted to the light source.

7.8.16 Two types of bird are considered to be at risk from phototaxis: burrow-nesting seabird species and nocturnally migrating passerines. Species that are considered susceptible to collision with turbines more generally, e.g. large raptor and waterfowl species, are not considered to be susceptible to phototaxis. There is no route to impact for burrow-nesting seabirds in relation to the Proposed Development, as such species are highly tied to the marine environment and would not occur on Site.

7.8.17 The Proposed Development is not located in a position that would filter migrating passerines, such as a coastal headland, with migrating birds likely to be passing over the Site on a very broad front. Such migrations would pass over innumerable sources of artificial light and so apportioning risk to the Proposed Development is not considered appropriate. The impact of turbine lighting on ornithological features is therefore not considered further in the assessment.

Potential Impacts During the Decommissioning Phase

7.8.18 Noise and visual disturbance associated with human activity may occur during the decommissioning phase. However, the level of impact is considered to be of a similar scope and magnitude (or lower) than occur during construction phase activities. As such, decommissioning phase impacts of the Proposed Development upon ornithological features are not considered separately within this assessment and are concluded as being consistent with construction phase effects in terms of significance.

Identification of Important Ornithological Features

7.8.19 There will be a number of ornithological features for which no significant effect can reasonably be predicted (following embedded mitigation) without the need for full assessment. These ornithological features are ‘scoped out’, in order that the impact assessment is proportionate (in accordance with guidance (CIEEM, 2024)) and focuses solely on those features for which there is potential for a significant effect as a result of the Proposed Development (those identified as IOFs).

7.8.20 This section of the chapter therefore identifies which ornithological features are scoped in or scoped out for assessment. Sites and species identified through the data gathering process, as set out above (see **Existing Environment**), are listed and justification provided as to whether these features are scoped in for full assessment or whether they can safely be scoped out and given no further consideration within the chapter.

Ornithological Features Scoped Into the Assessment

7.8.21 Those species and designated sites that have been scoped into the assessment are detailed in **Table 7.9.** These features are referred to hereafter as being IOFs in the context of the Proposed Development. For each IOF, the potential impact(s) to be assessed are listed.

Table 7.9: Important Ornithological Features and impacts included in the assessment

Ornithological feature	Status	Potential impact	Development phase
Golden plover	An Annex 1 and SBL listed species but with a favourable (green-listed) conservation status, golden plover bred in the MBBS study area and qualified for CRM.	Disturbance and displacement Collision	Construction Operation
Curlew	A red-listed species and listed on the SBL, curlew bred in the MBBS study area in very small numbers, but is considered for assessment as it is a conservation priority species. Flight activity was very low and curlew did not qualify for CRM, thus a significant impact from collision mortality can be disregarded.	Disturbance and displacement	Construction Operation
Dunlin	A red-listed species and listed on the SBL, dunlin bred in the MBBS study area in small numbers. Flight activity was sufficient to qualify for CRM.	Disturbance and displacement Collision	Construction Operation
Golden eagle	A Schedule 1 and Annex 1 listed species and listed on the SBL, but with a favourable conservation status (green-listed on BoCC). Golden eagle do not breed on Site but are present in the wider area and flight activity was sufficient to qualify for CRM.	Disturbance and displacement Collision	Construction Operation
Red kite	A Schedule 1 and Annex 1 listed species and listed on the SBL, but with a favourable conservation status (increasing population and green-listed on BoCC). Although no suitable nesting habitat occurs on Site, the regularity of foraging birds suggests there is potential for displacement impacts. Flight activity was high, and CRM was undertaken.	Disturbance and displacement Collision	Construction Operation
White-tailed eagle	A Schedule 1 and Annex 1 listed species and listed on the SBL, white-tailed eagle is amber-listed on BoCC but has an increasing population. Flight activity was sufficient to qualify for CRM. However, no suitable nesting habitat occurs on Site and the data suggests the Site is not an important foraging area, so disturbance is not considered to be a substantive issue.	Collision	Operation
Short-eared owl	An Annex 1 listed species and listed on the SBL, short-eared owl is amber-listed on BoCC. It is possible that short-eared owl nested in the vicinity of the Site and so a precautionary approach is taken that	Disturbance and displacement	Construction Operation

Ornithological feature	Status	Potential impact	Development phase
	assumes breeding. However, short-eared owl was not recorded during VP surveys and no significant collision risk is concluded, with any flight activity likely to be below at-risk height.		

Ornithological Features Scoped Out of Assessment

7.8.22 The following ornithological features were previously listed for scoping out within the Scoping Report dated April 2024 (subject to analysis of the full baseline survey dataset); and remain scoped out following NatureScot's consultation responses:

- Loch Ashie SPA and Loch Ruthven SPA and Ramsar site (**Figure 7.3**);
- Inner Moray Firth SPA and Ramsar site (**Figure 7.3**) – with the exception of greylag geese;
- All passerine species; and
- Secondary species[13].

7.8.23 Note that, although Loch Ashie SPA, Loch Ruthven SPA// Ramsar site and Inner Moray Firth SPA/ Ramsar site (listed features exempting greylag goose), have been scoped out of the EIA, these designated areas are assessed in **Technical Appendix 7.4: Information to Inform a Habitats Regulations Appraisal.**

7.8.24 **Table 7.10** lists the additional ornithological features that are also scoped out from further assessment.

Table 7.10: Ornithological Features scoped out of assessment

Ornithological feature	Justification for scoping out
Pink-footed goose	Pink-footed goose is amber-listed on BoCC but has no other conservation designations. Pink-footed goose was only recorded passing over the Site. Flight activity was sufficient to meet the criteria for undertaking CRM but, following NatureScot guidance[14], CRM was not undertaken. CRM analysis is only required where there is connectivity to a designated area, given pink-footed goose's large population and high avoidance, meaning that a significant effect can be ruled out for 'wider countryside' birds. Pink-footed goose is not a listed feature of any designated areas within 20 km (maximum core foraging distance (SNH, 2016)) of the Site.
Greylag goose	Greylag goose is amber-listed on BoCC but has no other conservation designations (except where breeding as part of the native northwest Scotland population). Greylag goose did not breed on Site and was only recorded passing over in flight. This flight activity was very low and only one at-risk flight (two birds) was recorded. The impact on greylag goose as part of the 'wider countryside' population can be concluded as being negligible.

[13] Secondary species comprised: raptor species not listed on Schedule 1 or Annex I (e.g. common buzzard, kestrel, sparrowhawk), all gull species, mallard, Canada goose, raven.

[14] Available from: https://www.nature.scot/professional-advice/planning-and-development/planning-and-development-advice/renewable-energy/onshore-wind-energy/wind-farm-impacts-birds (Accessed December 2024).

Ornithological feature	Justification for scoping out
	(Note that the Inner Moray Firth SPA/ Ramsar Site (greylag goose qualifying interest) was also assessed as a separated ornithological feature).
Red grouse	Red grouse is listed on the SBL and is amber-listed on BoCC, however, it is also a popular game species. Habitat within the Site is partly managed for grouse shooting and breeding occurs. However, red grouse continue to use wind farm sites during operation, where habitat remains otherwise suitable. The Proposed Development is likely to have an indiscernible impact on the regional red grouse population.
Black grouse	No black grouse were recorded during any baseline surveys, and it can be concluded that black grouse are absent from the vicinity of the Site. No impacts on the species are concluded.
Capercaillie	The desk study returned a single sighting of a capercaillie from 2021: a male recorded within 1 km of the Site, seen in flight crossing the A9 (RSPB). The data gathered indicates this represents a dispersing bird and that the conifer woodland to the north of the Site does not hold a regular local population. Any birds dispersing north from known capercaillie forests in Speyside (e.g. from Kinveachy Forest SPA, located 13 km to the southeast of the Site) can be expected to follow the A9 corridor, which contains a network of woodland patches, rather than crossing the upland and open terrain in which the Proposed Development is located. Given the habitats present on Site and the likely rarity and transience of birds in the plantation adjoining the Site to the north, there are likely to be no disturbance and displacement impacts, and a nil or negligible collision impact can also be concluded.
Snipe	Snipe is amber-listed on BoCC but has no other conservation designations. Snipe bred in small numbers on Site, but it is widespread in upland areas of Scotland and its status on Site is of low (local) importance. No at-risk flights were recorded. The Proposed Development is likely to have a negligible impact on the local population and an indiscernible impact on the regional snipe population.
Osprey	Osprey is a Schedule 1 and Annex 1 listed species, is listed on the SBL and is amber-listed on BoCC. A nest site was located during survey, this being more than 750 m from Site. The nest site would not be impacted by disturbance associated with the Proposed Development, in reference to guidance (Goodship and Furness, 2022). The Site does not support suitable habitat for osprey to breed or forage and no flights were recorded passing over the Site, so a nil or negligible collision impact can be concluded.
Goshawk	Goshawk is a Schedule 1 species with a favourable conservation status (increasing population). Goshawk showed evidence of possible breeding within suitable habitat (plantation forestry) more than 2 km from the Site. Any nesting birds would be beyond the maximum distance from which disturbance as a result of the Proposed Development would occur, in reference to guidance (Goodship and Furness, 2022). The Site is little used by goshawk and no at-risk flights were recorded.
Hen harrier	Hen harrier is a Schedule 1 and Annex 1 listed species, is listed on the SBL and is red-listed on BoCC. However, the Site is of low importance for this species. Hen harrier was not recorded during the dedicated breeding raptor searches and the low level of flight activity on Site meant that hen harrier did not qualify for CRM. Therefore, only negligible disturbance and collision risk impacts can be concluded without the need for further assessment.
Merlin	Merlin is a Schedule 1 listed species, is listed on the SBL and is red-listed on BoCC, however, the Site is considered to be of low importance for this species. There was no evidence of breeding on Site, with the only territory recorded during baseline surveys located more than 3 km from the Site. This separation distance is sufficient to determine that no disturbance to breeding

Ornithological feature	Justification for scoping out
	birds would occur, in reference to guidance (Goodship and Furness, 2022). Flight activity was very low and no at-risk flights were recorded.
Gyrfalcon	Gyrfalcon is listed as a Schedule 1 and Annex 1 species but in the UK this species is only recorded as a very rare and sporadic visitor during the non-breeding season. Not all records are genuine wild birds, with escaped falconer's birds also sometimes encountered. A gyrfalcon was recorded on one date during baseline surveys and did not qualify for CRM. The status of this species suggests this was likely to be a 'one-off' occurrence and that it does not require further assessment.
Peregrine	Peregrine is a Schedule 1 and Annex 1 listed species and is listed on the SBL but has a favourable conservation status (green-listed on BoCC). The nearest territories recorded were more than 4 km distant from the Site. Activity on Site was very low and peregrine did not qualify for CRM. Therefore, no disturbance and a negligible collision risk can be concluded without the need for further assessment.
Inner Moray Firth SPA and Ramsar Site (greylag goose only)	The Site lies within the core foraging range of greylag goose of 15-20km (SNH, 2016) from the Inner Moray Firth SPA/ Ramsar Site, but the Site does not provide habitat suitable for foraging or roosting geese and is not located between the designated area and known regularly used foraging areas (in reference to Mitchell, 2012). Only one greylag goose flight (two birds) was recorded during two years of baseline surveys. Therefore, no disturbance and a negligible collision risk can be concluded without the need for further assessment.

Impact Assessment

Golden plover

7.8.25 Golden plover is an Annex 1 listed species and appears on the SBL. Golden plover is green-listed on BoCC (Stanbury *et al*., 2021) as the population is considered to be stable. In NHZ 10 the golden plover breeding population is estimated at 2,702 pairs, with a whole Scotland breeding population estimate of 37,475 pairs (Wilson *et al*., 2015). The wintering population is estimated at 25,000 to 35,000 individuals (Forrester *et al*., 2007).

7.8.26 A small number of golden plovers were recorded as breeding in the vicinity of the Site in both baseline survey years, with five to seven pairs recorded. Small flocks of golden plover were also occasionally recorded using the Site in the non-breeding season. The associated flight activity produced potential collision mortality estimates of 0.430 to 0.998 birds per annum.

7.8.27 In the context of the Site, golden plover is given low (local) importance.

7.8.28 Golden plover is assessed for disturbance and displacement, and collision impacts (**Table 7.9**).

Disturbance and displacement impacts

7.8.29 Goodship and Furness (2022) gives a disturbance distance for golden plover of 200-500 m and therefore golden plover might be expected to avoid nesting and foraging within this distance of construction works. For operational wind farms, studies into the potential impacts of displacement on golden plover breeding in Scotland have found that, in most cases, there is little redistribution away from infrastructure post-construction (e.g.

Douglas *et al*., 2011). Operational monitoring at nearby Farr Wind Farm has shown that breeding densities have remained comparable to pre-construction surveys (Ventient Energy Ltd, 2020). Research from the non-breeding season has found that golden plover will approach to within an average of 175 m of turbines (Hötker *et al*. (2006)).

7.8.30 In the non-breeding season, when the species is highly mobile and site use is occasional and sporadic, disturbance and displacement would have a negligible impact. In the breeding season, when golden plover occupy suitable territories, there may be small changes to the distribution of birds on Site but the evidence suggests these would be very localised and would not be expected to lead to population decline given the extensive upland moorland habitat in the wider area.

7.8.31 Disturbance and displacement impacts as a result of the Proposed Development are predicted to have a **Negligible** adverse impact on golden plover during the construction and operational phases and a **Non-significant effect** is concluded.

Collision impacts

7.8.32 Mortality estimates have been calculated for both the breeding season and non-breeding season. In the breeding season, collision mortality would impact the regional breeding population, which is estimated at 2,702 pairs (5,404 birds) in NHZ 10. The breeding season mortality estimates were similar in both years (0.107 and 0.128), giving an average estimate of 0.118 collisions per breeding season. This is equivalent to 0.002% of the NHZ population. This is a tiny addition to overall mortality levels that would be undetectable against the regional breeding population.

7.8.33 Collision mortality estimates for the non-breeding season were higher, as flock size was greater at this time of year. The estimates showed variation between the two non-breeding seasons (0.302 to 0.891), which reflects the mobile nature of non-breeding golden plover flocks and their sporadic occurrence on Site in the autumn and winter. Impacts in the non-breeding season are best assessed against the wintering population, which is estimated at a minimum of 25,000 individuals. The average mortality estimate of 0.714 is equivalent to less than 0.003% of the wintering golden plover population. This tiny addition would be undetectable in the wintering population.

7.8.34 Collision impacts as a result of the Proposed Development are predicted to have a **Negligible** adverse impact on golden plover during the operational phase and a **Non-significant** effect is concluded.

Curlew

7.8.35 Curlew is listed on the SBL and is red-listed on BoCC due to large declines in its breeding (and wintering) population (Stanbury *et al*., 2021). The NHZ 10 population estimate for curlew was stated by Wilson *et al*. (2015) as being 811 breeding pairs, based on a Scotland-wide population estimate of 35,533 breeding pairs; although the population may have shown a decline since this estimate was calculated.

7.8.36 Curlew bred in the vicinity of the Site in one of the two baseline survey years (one pair in Year 1 (2023)). Curlew was not recorded in the non-breeding season.

7.8.37 Curlew is given low (local) importance in the context of the Site.

7.8.38 Curlew is assessed for disturbance and displacement impacts only (**Table 7.9**).

Disturbance and displacement impacts

7.8.39 Goodship and Furness (2022) give a disturbance distance for curlew in the breeding season of 200-300 m and therefore curlew might be expected to avoid nesting and foraging within this distance of construction works. A multi-site study that looked at operational wind farms found no evidence of displacement on breeding curlews, and also recorded curlews with central territory locations within 200 m of turbines (Whitfield *et al*., 2010).

7.8.40 Based on the available research regarding disturbance and displacement impacts on curlew and the status of this species on Site (intermittent breeder in very small numbers), a negligible impact on the local breeding population, and no impact on the regional population, can be predicted.

7.8.41 Disturbance and displacement impacts as a result of the Proposed Development are predicted to have a **Negligible** adverse impact on curlew during the construction and operational phases and a **Non-significant** effect is concluded.

Dunlin

7.8.42 Dunlin is listed on the SBL and is red-listed on BoCC, mainly due to the decline in its wintering population, although a small decline in its breeding population has also been recorded (Stanbury *et al*., 2021). The NHZ 10 population estimate for dunlin is of 105 breeding pairs, although these regional estimates were stated as being uncertain and likely to be under-estimates (Wilson *et al*. (2015)). The Scottish breeding population was given by Forrester *et al*. (2007) as 8,000-10,000 pairs, but this was also considered to be an under-estimate; notwithstanding a potential population decline since that time.

7.8.43 Dunlin was only recorded on Site during the breeding season, with birds moving to coastal areas during the non-breeding season. One to two pairs were recorded as breeding during the baseline surveys. Although flight activity was relatively low, CRM was undertaken. The potential annual mortality estimates for dunlin are 0.000 to 0.205 individuals.

7.8.44 Dunlin is considered to have medium (regional) importance.

7.8.45 Dunlin is assessed for disturbance and displacement, and collision impacts (**Table 7.9**).

Disturbance and displacement impacts

7.8.46 Goodship and Furness (2022) give a disturbance distance for dunlin in the breeding season of 100-200 m and therefore dunlin might be expected to avoid nesting and foraging within this distance of construction works, leading to very localised displacement impacts. A long-term study of breeding dunlin at nearby Farr Wind Farm found that there was no change to dunlin territory distribution or breeding abundance, as a result of the operational wind farm (Fielding and Haworth, 2015).

7.8.47 Disturbance and displacement impacts as a result of the Proposed Development are predicted to have a **Negligible** adverse impact on dunlin during the construction and operational phases and a **Non-significant** effect is concluded.

7.8.48

Collision impacts

7.8.49 At-risk flights were only recorded in 2023; these producing an annual mortality estimate of 0.205. With no collisions predicted based on the 2024 data, the average estimate across the two baseline survey years is 0.103 individuals. This represents 0.049% of the NHZ 10 breeding population, an increase in mortality that would be undetectable in the regional breeding population.

7.8.50 Collision impacts as a result of the Proposed Development are predicted to have a **Negligible** adverse impact on dunlin during the operational phase and a **Non-significant** effect is concluded.

Golden eagle

7.8.51 Golden eagle is listed on Annex 1 of the Birds Directive and Schedule 1 of the WCA and is listed on the SBL. Golden eagle has a favourable conservation status and is green-listed on BoCC (Stanbury *et al*., 2021). The most recent national survey (2015) gave a Scotland-wide population estimate of 508 breeding pairs, which shows an increasing population (Hayhow *et al*., 2017). The NHZ 10 population was stated by Wilson *et al*. (2015) as an estimated 12 breeding pairs. However, as stated in the GET Model Report in **Technical Appendix 7.3**, there were 27 occupied territories in NHZ 10 in 2024. Within the wider Highland region, a total of 129 golden eagle home ranges were monitored in 2022 (Challis *et al*., 2023).

7.8.52 The Site does not overlap with any currently occupied golden eagle home range. Golden eagle activity on Site was low but sufficient to qualify for CRM. Potential annual mortality estimates of <0.001 to 0.045 individuals were calculated.

7.8.53 In the context of the Site, golden eagle is given low (local) importance.

7.8.54 Golden eagle is assessed for disturbance and displacement, and collision impacts (**Table 7.9**).

Disturbance and displacement impacts

7.8.55 The majority of golden eagle territories in NHZ 10 are in the Monadhliath Mountains, with operational wind farms located between the Site and the nearest occupied home range to the southwest. To the northeast, the Site is separated from suitable golden eagle habitat by the A9 corridor.

7.8.56 With no currently occupied golden eagle home range in the vicinity of the Proposed Development, disturbance and displacement impacts on the nearest occupied territories are considered highly unlikely. However, the GET Model Report in **Technical Appendix 7.3** has investigated the potential for habitat loss, through displacement as a result of turbine avoidance, for a theoretical golden eagle territory that could be occupied in future. It is concluded that the loss of good golden eagle habitat as a result of the Proposed Development (approximately 6.6%) would be unlikely to threaten the viability of any future home range in this area. Additionally, the loss of habitat available to dispersing birds, as a result of the Proposed Development, would be inconsequential given the alternative habitat in the wider area and the distances covered by dispersing birds.

7.8.57 Disturbance and displacement impacts as a result of the Proposed Development are predicted to have a **Negligible** adverse impact on the baseline golden eagle population during the construction and operational phases and a **Non-significant** effect is concluded.

Collision impacts

7.8.58 Tracking studies in Scotland have shown that golden eagles show a very high avoidance of wind turbines and that potential collision impacts are less of a concern than displacement (e.g. Fielding *et al*., 2022). Nevertheless, CRM has been undertaken based on the small number of at-risk flights recorded.

7.8.59 As golden eagles are a resident species, annual collision estimates are most applicable. In the non-breeding season no at-risk flights were recorded. The breeding season mortality estimate was <0.001 in Year 2 but was 0.045 in Year 1. This gives an average annual mortality estimate for golden eagle across both years of 0.023.

7.8.60 It should be noted that the golden eagles recorded during baseline surveys included immature birds (i.e. non-breeding) and that the mortality estimates are derived from impacts on all eagles present. The number of breeding pairs of golden eagles in NHZ 10 (based on the 2024 estimate) and upon which collision impacts are assessed, does not include non-breeding birds, and so the population would in reality be greater than that which has been assessed for collision impacts, thus over-estimating the potential impact. Based on an NHZ population of 27 breeding pairs, the potential additional mortality from collision (based on the average mortality estimate) would equate to 0.042% of the regional breeding population.

7.8.61 For the Proposed Development, 89% of the at-risk flight activity recorded for golden eagle comprised flights from immature birds (second and third calendar year birds). Up to age four, golden eagles exhibit low survival rates, with a natural mortality of 85%[15]. The potential addition to natural mortality as a consequence of collision from the Proposed Development can be expected to be undetectable in the regional population against this background level.

7.8.62 Collision impacts as a result of the Proposed Development are predicted to have a **Negligible** adverse impact on golden eagle during the operational phase and a **Non-significant** effect is concluded.

Red kite

7.8.63 Red kite is a Schedule 1 and Annex 1 listed species and is listed on the SBL. Red kite has a favourable conservation status (green-listed on BoCC) due to continued growth and expansion in its breeding population. Due to this increase, estimates from previous years will under-estimate the current red kite population. Wilson *et al*. (2015) stated there were no breeding red kites in NHZ 10, although 50 pairs were estimated for NHZ 21: Moray Firth, which lies approximately 1km to the northwest of the Site at its nearest point. The Scottish red kite population is estimated at 300-350 breeding pairs[16].

[15] Available from: https://www.bto.org/understanding-birds/welcome-birdfacts (Accessed January 2025)

[16] Available from: https://www.scotlink.org/species/red-kite/#:~:text=The%20world%20population%20of%20red,350%20breeding%20pairs%20in%20Scotland. (Accessed January 2025)

7.8.64 The results of the baseline surveys suggested red kites may be breeding within the 2 km search area around the Site, but not within the Site boundary. The nearest record indicative of a nest was 4 km from the Site. Red kites have a core foraging range of 4 km and maximum foraging range of 6 km (SNH, 2016). Red kite was regularly recorded during baseline VP flight activity surveys and these records may represent breeding birds. CRM was undertaken and potential annual mortality estimates of 0.333 to 0.443 individuals per year were calculated.

7.8.65 The value of red kite, which was regularly recorded but not breeding on Site, is of low (local) importance.

7.8.66 Red kite is assessed for disturbance and displacement, and collision impacts (**Table 7.9**).

Disturbance and displacement impacts

7.8.67 Goodship and Furness (2022) give a disturbance distance for red kite of 150-300 m (and 300-600 m for activities with potential for high visual and audial disturbance), however these distances refer to disturbance to nesting and roosting sites rather than foraging birds, with red kite tolerant of foraging in proximity to human activity. With no breeding or roosting sites within 600 m of the Proposed Development, no disturbance impacts are concluded. In regard to potential displacement of foraging birds, available research into the impacts of wind farms on red kite include monitoring at Braes of Doune Wind Farm (Stirlingshire), which found that flight activity continued within the operational wind farm including between turbines (Duffy and Urquhart, 2014), and a multisite project in Germany also concluded that red kites do not avoid wind farm areas where habitat remains favourable post-construction (Mammen *et al*., 2011). The Site will continue to offer a foraging resource during construction and operation of the Proposed Development and so there is expected to be minimal displacement of red kite.

7.8.68 There is predicted to be no disturbance impact as a result of the Proposed Development, whilst displacement is predicted to have a **Negligible** adverse impact on red kite during the construction and operational phases and a **Non-significant** effect is concluded.

Collision impacts

7.8.69 As red kites are resident, annual collision estimates are most applicable for this species. CRM estimated annual mortality for red kite of 0.333 to 0.443 birds per year, or an average of 0.388. This is considered to be precautionary, as a recent BTO paper looking at potential collision impacts of wind farms on red kites in Wales (where the red kite population is much greater than in Scotland) used an average value of 0.0027 fatalities per year for the developments used in their analysis; based on a model that used 'collisions per exposed bird' (Hereward *et al*., 2024). Clearly the two estimates are not directly comparable, and site-specific estimates should preferentially be used, but this does at least suggest that the CRM output for the Proposed Development may be very precautionary, given the difference in magnitude between the estimates.

7.8.70 Based on the population estimates available (Wilson *et al*., 2015), the potential collision impact on red kites is assessed against the breeding population of the adjacent NHZ 21 (50 pairs), which is understood to make up the large majority of the discrete north of Scotland population, which is centred around the Black Isle (Forrester *et al*., 2007). Using this estimate is considered precautionary, with the red kite population having continued to increase since these population estimates were stated; albeit the rate of growth in the

north of Scotland is slower than elsewhere. The calculated loss through collisions would be equal to 0.388% of the regional population each year. NatureScot-commissioned research (Sansom *et al*., 2016a) found that two to three collisions per year would have a negligible impact on the north Scotland red kite population and would need to be greater than five collisions per year to limit population growth; with the potential impact of the Proposed Development (for the project on its own) considerably below this threshold.

7.8.71 Collision impacts as a result of the Proposed Development are predicted to have a **Negligible** adverse impact on red kite during the operational phase and a **Non-significant** effect is concluded.

White-tailed eagle

7.8.72 White-tailed eagle is Schedule 1 and Annex 1 listed and appears on the SBL. White-tailed eagle has a small but increasing population and is amber-listed on BoCC (Stanbury *et al*., 2021). Due to continued population growth, previous population estimates for white-tailed eagle are under-estimates of the current figure. Wilson *et al*. (2015) stated that there were no breeding pairs in NHZ 10, based on monitoring data gathered in 2013 when there were an estimated 82 territorial pairs in Scotland. The breeding population estimate for 2020 was of approximately 150 pairs[17] and it is almost certain that this includes pairs in new areas that had not been colonised when the NHZ estimates were calculated. In 2022, a total of 67 white-tailed eagle home ranges were monitored in Highland region as a whole (Challis *et al*., 2023).

7.8.73 White-tailed eagle was irregularly recorded during baseline surveys and there was no evidence of breeding in the vicinity of the Site, nor is it considered to be an area of high importance for foraging birds. Nevertheless, white-tailed eagle qualified for CRM and this produced potential annual mortality estimates of 0.166 to 0.603.

7.8.74 In the context of the Site, white-tailed eagle is given low (local) importance.

7.8.75 White-tailed eagle is assessed for collision impacts only (**Table 7.9**).

Collision impacts

7.8.76 The large majority of at-risk flight activity for white-tailed eagle came from the 2024 breeding season, with a CRM estimate of 0.588 contributing to the overall annual estimate of 0.603 birds per year. In the first year of baseline surveys, at-risk activity was lower, with an annual estimate of 0.166 collisions, giving an average of 0.385 birds per year overall.

7.8.77 The NHZ estimates given in Wilson *et al*. (2015) do not provide a relevant population against which impacts can be assessed for white-tailed eagle, so instead the 67 home ranges in Highland region stated in Challis *et al*. (2023) have been used (this being taken to represent 67 pairs, or 134 birds). The average collision estimate calculated for white-tailed eagle of 0.385 is equal to 0.287% of the Highland region population (excluding non-territorial immature birds).

7.8.78 NatureScot commissioned research (Sansom *et al*., 2016b) estimated that the continued growth of the Scottish white-tailed eagle population would not be restricted by additional mortality from wind farm collisions, even at an increased mortality level of 14 individuals

[17] Available from: https://www.rspb.org.uk/birds-and-wildlife/white-tailed-eagle (Accessed January 2025)

per annum. The estimate for the Proposed Development (on its own) is considerably below this threshold. It is possible that increased mortality through collisions could restrict population growth at a local scale by influencing the establishment of pairs in new areas (Sansom *et al*., 2016b). However, based on comment received from Highland RSG regarding the wider area around the Site being known for raptor persecution, it is increased mortality through illegal killing that is likely to be the main driver in the establishment of any breeding pairs in this part of the central Highlands.

7.8.79 Collision impacts as a result of the Proposed Development are predicted to have a **Negligible** impact on white-tailed eagle at a regional population scale during the operational phase and a **Non-significant** effect is concluded.

Short-eared owl

7.8.80 Short-eared owl is an Annex 1 listed species, is listed on the SBL and is amber-listed on BoCC due to a contraction in its breeding range (Stanbury *et al*., 2021). NHZ breeding estimates suggest no short-eared owls breed in NHZ 10, however it is acknowledged that the population is highly variable and that there is a 'dearth of knowledge' as to the true short-eared owl population (Wilson *et al*., 2015). The potential territory in the vicinity of the Site in 2023 is not considered to be unusual in a regional context, despite the NHZ estimate. The Scottish population estimate covers a large range of 125-1,250 pairs (Forrester *et al*., 2007).

7.8.81 The difficulty in proving breeding status for short-eared owl is demonstrated in the baseline survey data, with no breeding behaviour recorded. Taking a precautionary approach, an occupied territory has been assumed due to the presence of a bird seen in the western edge of the Site during a black grouse survey in May 2023. Short-eared owl would be expected to be breeding (egg incubation) at this time of year (Hardey *et al*., 2013). Short-eared owls have a territory with a core radius of 2km and a maximum radius of 5km (SNH, 2016). No short-eared owls were recorded during the 2024 breeding season.

7.8.82 The presence of a breeding pair on Site would give short-eared owl medium (regional) importance.

7.8.83 Short-eared owl is assessed for disturbance and displacement impacts only (**Table 7.9**).

Disturbance and displacement impacts

7.8.84 Based on the results of the field surveys, which recorded presence in the breeding season (one year only) but no evidence of nesting behaviour, short-eared owl is considered most likely to have bred within the 2 km buffer of the Site rather than within the Site boundary. Short-eared owls nest on the ground in tussocky vegetation, so should any nests be established within the Site, the nest would most likely be in the dry heath habitats found in the periphery of the Site, rather than the blanket bog habitat that makes up the interior of the Site. However, there is potential for a disturbance or displacement impact if a nest is located sufficiently close to infrastructure. Disturbance during the construction stage, which would only be expected for any works occurring within 300-500 m of a nest (Goodship and Furness, 2022), would be avoided through embedded mitigation, namely pre-construction nest checks and implementation of a buffer around any nests located.

7.8.85 There is limited literature as to the impact of wind farms on short-eared owl, but any avoidance of construction works or wind farm infrastructure during the operational phase could lead to displacement if a sufficient part of a territory is affected. However, similar species such as barn owl, which also inhabit open country, have been found to continue to use operational wind farm sites for foraging, and as suitable foraging habitat will continue to be present, the Site is considered likely to still be utilised by short-eared owls during the operational phase; albeit nesting locations may not be found within 500 m of turbines.

7.8.86 Short-eared owl nesting locations are not consistent year to year, and indeed the species is nomadic, with breeding both locally and regionally being highly variable between seasons (as has been found for the Proposed Development, with breeding in only one of the two survey years). Thus, displacement from the Site, should it occur, cannot be expected to result in the loss of the breeding pair, but rather relocation to another suitable area within the region or beyond.

7.8.87 Displacement and disturbance impacts as a result of the Proposed Development are predicted to have a **Negligible** adverse impact on short-eared owl during the construction and operational phases and a **Non-significant** effect is concluded.

7.9 Mitigation and Enhancement

7.9.1 Negligible magnitude impacts are predicted for all IOFs and no likely significant effects are concluded as a result of the Proposed Development (on its own). Therefore, no mitigation measures are required for inclusion supplementary to those embedded mitigation measures described above (**Embedded Mitigation**) and which would ensure compliance with legislation and standard protections.

7.9.2 However, measures included within the OHEMP (see **Chapter 6: Ecology and Biodiversity**) to improve peatland habitat would provide a benefit to ornithological features. Restoring peatland through rewetting would increase invertebrate numbers, which would benefit breeding wader species, such as golden plover, dunlin and curlew (IOFs); as well as insect-eating passerines, such as skylark (red-listed on BoCC) and meadow pipit (amber-listed on BoCC). These biodiversity enhancement measures are considered highly likely to have a long-term beneficial impact on these ornithological features at a local level.

7.10 Residual Effects

7.10.1 As no additional mitigation is proposed, the scale of impacts and significance of effects upon IOFs remain unchanged.

7.10.2 A summary of the impact assessments for the identified IOFs is provided in **Table 7.11**.

Table 7.11: Summary of residual effects on important ornithological features

IOF	Pre-mitigation impact	Significance of effect	Mitigation	Residual impact	Residual significance
Construction and decommissioning					
Disturbance and/or displacement					
Golden plover	Negligible adverse	Non-significant	Embedded mitigation only	Negligible adverse	Non-significant
Curlew					
Dunlin					
Golden eagle					
Red kite					
Short-eared owl					
Operational phase					
Disturbance and/or displacement					
Golden plover	Negligible adverse	Non-significant	Embedded mitigation only	Negligible adverse	Non-significant
Curlew					
Dunlin					
Golden eagle					
Red kite					
Short-eared owl					
Collision					
Golden plover	Negligible adverse	Non-significant	Embedded mitigation only	Negligible adverse	Non-significant
Dunlin					
Golden eagle					
Red kite					
White-tailed eagle					

7.11 Cumulative Effects

Assessing Cumulative Impacts

7.11.1 An assessment of potential impacts on IOFs as a result of the Proposed Development on its own is presented above (**Impact Assessment**). This section presents a cumulative impact assessment (CIA) in which other relevant developments are also considered. The CIA has been carried out with reference to NatureScot guidance (SNH, 2018c).

7.11.2 The spatial extent used to identify relevant projects for inclusion in the cumulative assessment is the regional scale, with the inclusion of all projects identified within NHZ 10 used in the assessment. For red kite only, projects in NHZ 21 (Moray Firth) are also included. See the red kite assessment for further details and justification.

7.11.3 Information regarding potential collision impacts from other wind farm projects in NHZ 10 was obtained from NatureScot (November 2024) through an informal request, where relevant data are held. The project-specific values obtained from NatureScot, and which were updated for the Highland Council area in July 2024, have been used in the assessment, whilst acknowledging caveats with these data[18]. The list of wind farm projects for which data were obtained from NatureScot was incomplete, however, and further project data has been sought to make the CIA as comprehensive as possible. EIA data was obtained using the planning portals for THC[19] and Moray Council[20] and the Energy Consents Unit[21].

7.11.4 Only wind farm projects are included in the CIA, with no other development types identified for inclusion.

7.11.5 In accordance with NatureScot guidance (SNH, 2018c), the CIA includes consideration of:

- existing wind farm developments, either operational or under construction;
- consented wind farm developments awaiting implementation (unless no activity in the last eight years since consent granted); and
- wind applications awaiting determination within the planning process and where information exists in the public domain (noting that such projects may be subject to change in design).

7.11.6 Those developments which have been withdrawn and/or refused are not considered, unless an appeal is known to be in progress and information is available. Developments in scoping are also not considered as the data available are generally insufficient and the project will in any case be subject to change, and may not be developed.

7.11.7 Small wind farm developments, including those of less than three turbines, or micro wind turbine projects, have been scoped out of consideration for potentially significant cumulative effects as applications for such developments do not generally consider the potential for impacts upon ornithological features in sufficient detail.

7.11.8 Based on the above criteria, the projects identified for inclusion in the CIA are listed in **Table 7.12**. Ornithological data was found for all projects.

[18] Summary of the caveats with the data used in the CIA: i) the figures are reliant on data from external sources and which may contain errors; ii) the datasets may be incomplete, especially for older projects; iii) figures are subject to human error when entering data and when applying formulae; iv) estimates do not take into account mitigation and/or compensation, which may lead to an over-estimation of risk; v) figures are subject to regular change, e.g. changes to avoidance rates, population figures, etc., since the time the estimates were originally calculated; vi) estimates for different sites may not be directly comparable, depending on the parameters used in the model.

[19] Available from: https://wam.highland.gov.uk/wam/ (Accessed January 2025)

[20] Available from: https://publicaccess.moray.gov.uk/eplanning/ (Accessed January 2025)

[21] Available from: https://www.energyconsents.scot/ApplicationSearch.aspx (Accessed January 2025)

Table 7.12: Projects identified for inclusion in the cumulative impact assessment

Project (wind farm)	No. of turbines	Development stage	Relevant data available?
NHZ 10: Central Highlands			
Aberarder	12	Construction	Yes
Berry Burn	29	Operational	Yes
Berry Burn Extension	9	Consented	Yes
Cairn Duhie	16	Consented	Yes
Clash Gour	48	Consented	Yes
Cloiche	36	Consented	Yes
Corriegarth	23	Operational	Yes
Corriegarth 2	14	Consented	Yes
Culachy	8	In Planning	Yes
Dell re-design	9	In Planning	Yes
Dunmaglass	33	Operational	Limited[22]
Farr	40	Operational	Yes
Glen Kyllachy	20	Operational	Yes
Hill of Glaschyle	12	Operational	Yes
Kellas Drum	8	In Planning	Yes
Moy	20	Operational	Yes
Ourack	18	In Planning	Yes
Paul's Hill	28	Operational	Yes
Paul's Hill II	7	Consented	Yes
Rothes I	22	Operational	Yes
Rothes II	18	Operational	Yes
Rothes III	29	Consented	Yes
Stronelairg	66	Operational	Yes
Tom nan Clach	13	Operational	Yes
Tom nan Clach Extension	7	Consented	Yes
NHZ 21: Moray Firth (red kite only)			
No projects			

[22] Golden eagle data for Dunmaglass is presented in the EIA Reports for other projects that have used this data in their own CIA. The original data could not be located. Data has been found in relation to collision risk for golden eagle only.

Cumulative Collision Impacts

7.11.9 The cumulative impacts of collisions are assessed first. Although only negligible adverse impacts have been concluded for each IOF as a result of the Proposed Development on its own, the small additions to mortality from the other wind farm projects listed in **Table 7.12** could result in a significant effect when summed together.

7.11.10 The collision risk CIA is presented in **Table 7.13**. Where low activity of an ornithological feature meant that CRM was not undertaken for a particular project, a collision estimate of <0.001 has been used in the table. The values have not been included in the cumulative totals.

7.11.11 Note also that the cumulative mortalities are based on annual estimates, and it is unknown what proportion of a site's annual risk applies to the breeding season (population estimates of NHZs being based on the breeding population in the case of the IOFs assessed).

Table 7.13: Cumulative impact assessment: collision impacts

Project	Ornithological feature – annual collision estimates				
	Golden plover	Dunlin	Golden eagle	Red kite	White-tailed eagle
The Proposed Development (Lynemore Wind Farm)	0.714	0.103	0.023	0.388	0.385
Aberarder	<0.001	<0.001	0.114	0.874	<0.001
Berry Burn	<0.001	<0.001	<0.001	<0.001	<0.001
Berry Burn Extension	0.010[23]	<0.001	<0.001	<0.001	<0.001
Cairn Duhie	<0.001	<0.001	<0.001	<0.001	<0.001
Clash Gour	2.967	<0.001	<0.001	<0.001	<0.001
Cloiche	0.020	<0.001	0.014	0.070	0.140
Corriegarth	<0.001	<0.001	<0.001	0.200[23]	<0.001
Corriegarth 2	0.014	<0.001	0.093	0.222	0.311
Culachy	<0.001	<0.001	0.146	<0.001	<0.001
Dell 2 re-design	<0.001	<0.001	0.199	<0.001	<0.001
Dunmaglass	No data	No data	0.290	No data	No data
Farr	<0.001	<0.001	0.042	0.240	<0.001
Glen Kyllachy	<0.001	<0.001	0.043	0.242	<0.001
Hill of Glaschyle	<0.001	<0.001	<0.001	<0.001	<0.001
Kellas Drum	<0.001	<0.001	<0.001	<0.001	<0.001
Moy	<0.001	<0.001	<0.001	0.245	<0.001
Ourack	<0.001	<0.001	0.180	0.050	0.070

[23] Derived from post-construction monitoring of existing wind farm.

Project	Ornithological feature – annual collision estimates				
	Golden plover	Dunlin	Golden eagle	Red kite	White-tailed eagle
Paul's Hill	<0.001	<0.001	<0.001	<0.001	<0.001
Paul's Hill II	<0.001	<0.001	<0.001	<0.001	<0.001
Rothes I	<0.001	<0.001	<0.001	<0.001	<0.001
Rothes II	<0.001	<0.001	<0.001	<0.001	<0.001
Rothes III	3.960	<0.001	<0.001	<0.001	<0.001
Stronelairg	<0.001	<0.001	<0.001	<0.001	<0.001
Tom nan Clach	0.064	<0.001	0.016	0.114	<0.001
Tom nan Clach Extension	<0.001	<0.001	0.012	0.115	<0.001
Cumulative Estimate	**7.814**	**0.103**	**1.172**	**2.760**	**0.906**

Golden plover

7.11.12 A comparatively high cumulative collision mortality estimate has been calculated for golden plover, however the contribution from just two projects makes up a high proportion of the total, with Rothes III Wind Farm contributing 51% to the cumulative estimate and Clash Gour Wind Farm contributing 38% to the total. (The Proposed Development contributes 9% to the total). For both Rothes III and Clash Gour, the greatest at-risk activity involved flocks of birds that were not breeding on site and which, therefore, are best considered as being part of the non-breeding/ wintering Scottish population. However, if the regional population is used to assess the collision impact, the cumulative estimate equates to 0.145% of the NHZ 10 breeding population. Assessed against the Scottish wintering population, the cumulative estimate is equivalent to 0.031% of that population. The natural level of mortality in the UK golden plover population is 27% per year[24] for adult birds (i.e. approximately 1,460 golden plover from the NHZ 10 breeding population would be expected to die in any one year). The very small addition to mortality within the population would be undetectable and it is considered that the population trend would remain stable.

7.11.13 Collision impacts as a result of the Proposed Development cumulatively with other relevant projects are predicted to have a **Negligible** adverse impact on golden plover during the operational phase and a **Non-significant** effect is concluded.

Dunlin

7.11.14 The Proposed Development is the only identified project that has assessed collision impacts for dunlin. Therefore, the impact from the Project on its own is the same as the cumulative impact.

7.11.15 Collision impacts as a result of the Proposed Development cumulatively with other relevant projects are predicted to have a **Negligible** adverse impact on dunlin during the operational phase and a **Non-significant** effect is concluded.

[24] Available from: https://www.bto.org/understanding-birds/birdfacts/golden-plover (Accessed January 2025)

7.11.16

Golden eagle

7.11.17 The 2024 breeding population estimate for NHZ 10 of 27 pairs in considerably greater than the 2015 estimate of 12 pairs (Wilson *et al*., 2015). This shows the increasing population trend for golden eagle in this region in the last 10 years and which has occurred despite the growing number of operational wind farms in this area; whilst acknowledging that the majority of the cumulative mortality estimate for golden eagles comes from projects that are yet to be built.

7.11.18 Golden eagles in Scotland have been shown to exhibit very high avoidance of wind turbines (e.g. Fielding *et al*., 2022), which may indicate a greater avoidance rate than the 99% used in the CRM analysis. Therefore, the output should be considered precautionary.

7.11.19 The cumulative collision estimate has been calculated as 1.172 individuals per annum, with the Proposed Development contributing less than 2% of the total. The cumulative estimate is equivalent to 2.17% of the current NHZ 10 breeding population. However, as discussed above, the actual regional population will also include immature (non-breeding) birds which are not included in the NHZ total. It is these immature birds that are more likely to be susceptible to collision, rather than the adults which exhibit very high avoidance of turbines. Thus, the cumulative estimate can be regarded as very precautionary.

7.11.20 For the projects assessed, the field data showed that a high proportion of the at-risk golden eagle activity recorded was of immature birds and so the large majority of potential losses would be to non-breeding birds. The annual mortality for immature birds is very high at 85%[15], despite the overall favourable status of the golden eagle population. This suggests the impact of collisions would not have a substantive impact on the regional population and would not prevent continued population growth.

7.11.21 Collision impacts as a result of the Proposed Development cumulatively with other relevant projects are predicted to have a **Small** adverse impact on golden eagle during the operational phase and a **Non-significant** effect is concluded.

Red kite

7.11.22 The CIA for red kite has included projects in NHZ 10, in common with the approach used for the other IOFs. However, as stated above, Wilson *et al*. (2015) give a red kite breeding population of zero for NHZ 10. The inclusion of NHZ 10 is considered useful, however, as impacts on range expansion are considered as important as impacts on the population as a whole (NatureScot, *per comms*.); in this case the discrete north of Scotland population. The inclusion of NHZ 21 (Moray Coast) has also been used in the red kite CIA given this region lies approximately 1km from the Site and is likely to be the source population of birds recorded on Site. However, no wind farm projects that meet the criteria set out above have been identified in this NHZ, so although the CIA search area encompasses both regions, all wind farms included in the assessment are within the Central Highlands NHZ (NHZ 10). The search area has not been extended further to include all wind farm projects in the north of Scotland as this is not considered proportionate given the large area this covers, and because NHZ 21 is believed to hold the large majority of the north of Scotland population.

7.11.23 The cumulative collision estimate for red kites has been calculated as 2.760 individuals per annum.

7.11.24 Sansom *et al*. (2016a) concluded that two to three collisions per year would have a negligible impact on the north Scotland red kite population and the estimate would need to be greater than five collisions per year to limit population growth. This suggests that the level of collision risk posed cumulatively in NHZ 21 would not be sufficient to limit population growth and it is unlikely to be sufficient to prevent population range expansion into NHZ 10.

7.11.25 Collision impacts as a result of the Proposed Development cumulatively with other relevant projects are predicted to have a **Small** adverse impact on red kite during the operational phase and a **Non-significant** effect is concluded.

White-tailed eagle

7.11.26 The cumulative collision estimate for white-tailed eagle has been calculated as 0.906 individuals per annum. Two projects contribute to the majority of this total, with the Proposed Development accounting for 42% of the total and Corriegarth 2 (consented) accounting for 34% of the total. This perhaps exaggerates the impact of these two projects compared to other wind farms in the region; with many of the identified projects, especially those that are now operational, having undertaken baseline surveys at a time when fewer birds were present in the region.

7.11.27 The continued growth of the white-tailed eagle population is occurring despite the increase in wind farm projects in recent years. Sansom *et al*. (2016b) concluded that an additional mortality of 14 birds a year as a result of turbine collisions would not prevent population growth nationally. The potential contribution of wind farm projects in NHZ 10 is therefore well short of that needed to reduce, or even slow down, the rate of growth of the Scottish white-tailed eagle population. Given the very large increase in mortality that would be needed to cause a decline in the white-tailed eagle population nationally, the relatively small cumulative collision risk calculated for NHZ 10 is unlikely to prevent continued population growth even at a regional level and range expansion into NHZ 10 would be expected to continue.

7.11.28 A country-wide CIA to fully determine cumulative impacts on the Scottish white-tailed eagle population is beyond the scope of the impact assessment for the Proposed Development.

7.11.29 Collision impacts as a result of the Proposed Development cumulatively with other relevant projects are predicted to have a **Small** adverse impact on white-tailed eagle during the operational phase and a **Non-significant** effect is concluded.

Cumulative Disturbance and Displacement Impacts

Disturbance impacts

7.11.30 Disturbance impacts on all IOFs would be very localised within a regional context (see **Potential Impacts**). Given that most of the projects assessed are operational and those that are to be built would not all be constructed at the same time, the cumulative impact of disturbance can be concluded as being negligible.

7.11.31 Disturbance impacts as a result of the Proposed Development cumulatively with other relevant projects are predicted to have a **Negligible** adverse impact on all ornithological features during the construction and operational phases and a **Non-significant** effect is concluded.

Displacement impacts

7.11.32 For the IOFs for which displacement impacts were assessed for the Proposed Development on its own (**Impact Assessment**), the evidence provided for golden plover, curlew, dunlin and red kite is that these species continue to use wind farm sites post-construction. Therefore, the conclusions of the CIA for displacement impacts on these species would be the same irrespective of the number of projects assessed and the conclusions for the Proposed Development on its own remain valid.

7.11.33 For golden eagle, the GET Model Report in **Technical Appendix 7.3** already takes into account the presence of operational and consented wind farms (within 20km of the Site) when assessing the loss of good golden eagle habitat within the potential (currently unoccupied) home range within which the Proposed Development is located. So for impacts on this home range, the conclusion of the assessment for the Proposed Development on its own is also valid for the CIA.

7.11.34 Regarding the potential for loss of other home ranges within NHZ 10, several of the other identified projects overlapped with known golden eagle territories at the time of baseline surveys (e.g. Corriegarth 2, Dell redesign and Cloiche Wind Farms). In some cases, changes to turbine layouts were made to reduce potential impacts. However, in all cases no significant displacement effects were concluded.

7.11.35 For short-eared owl, only one of the other identified projects recorded short-eared owl as breeding within the vicinity of the site (Ourack Wind Farm). Note, however, that the approach used to determine breeding status will have varied between projects, with some sites that recorded short-eared owls in the core breeding season not regarding them as breeding (unlike the assessment for the Proposed Development) as no conclusive breeding behaviour was obtained. With only two projects in NHZ 10 recording breeding by short-eared owl, a negligible displacement impact can be concluded, especially for such a transient breeding species.

7.11.36 Displacement impacts as a result of the Proposed Development cumulatively with other relevant projects are predicted to have a **Negligible** adverse impact on golden plover, dunlin, curlew, red kite and short-eared owl during the construction and operational phases and a **Non-significant** effect is concluded.

7.11.37 Displacement impacts as a result of the Proposed Development cumulatively with other relevant projects are predicted to have a **Small** adverse impact on golden eagle during the construction and operational phases and a **Non-significant** effect is concluded.

Conclusion

7.11.38 The CIA has determined that displacement and disturbance impacts as a result of the Proposed Development cumulatively with other relevant projects, would be **Negligible** for golden plover, curlew, dunlin, red kite and short-eared owl and that there would be a **Small** adverse impact for golden eagle. **No significant effects** are predicted for all IOFs.

7.11.39 For collision impacts, the CIA has determined that as a result of the Proposed Development cumulatively with other relevant projects, there would be a **Negligible** impact for golden plover and dunlin, whilst there would be a **Small** adverse impact on golden eagle, red kite and white-tailed eagle. **No significant effects** are predicted for all IOFs.

7.12 Summary of Effects

7.12.1 Using a comprehensive programme of baseline ornithological surveys supplemented by desk study data, where available, an assessment has been made as to the potential impacts of the Proposed Development on ornithological features.

7.12.2 IOFs been identified and assessed for potential impacts as a result of the Proposed Development both on its own, and cumulatively with other relevant projects. Embedded mitigation measures have been taken into account when undertaking the assessments.

7.12.3 For all IOFs, the impacts of the Proposed Development during the construction, operational and decommissioning phases have been concluded as being negligible or small (adverse) in magnitude. **No significant effects** have been predicted.

7.12.4 No additional mitigation measures have been proposed. However, measures within the OHEMP will provide habitat enhancements that would benefit ornithological features, such as breeding wader species.

7.12.5 **Table 7.14** provides a summary of the impact assessment on ornithological features. Note that all impacts are adverse.

Table 7.14: Summary of impacts and likely effects

Important Ornithological Feature	Pre-mitigation		Mitigation	Residual	
	Impact	Significance		Impact	Significance
Construction Phase					
Disturbance and/or displacement					
Golden plover	Negligible	Non-significant	Embedded mitigation only	Negligible	Non-significant
Curlew					
Dunlin					
Golden eagle					
Red kite					
Short-eared owl					
Operational Phase					
Disturbance and/or displacement					
Golden plover	Negligible	Non-significant	Embedded mitigation only	Negligible	Non-significant
Curlew					
Dunlin					
Golden eagle					
Red kite					
Short-eared owl					
Collision					

Important Ornithological Feature	Pre-mitigation		Mitigation	Residual	
	Impact	Significance		Impact	Significance
Golden plover	Negligible	Non-significant	Embedded mitigation only	Negligible	Non-significant
Dunlin					
Golden eagle					
Red kite					
White-tailed eagle					
Decommissioning Phase					
Disturbance and/or displacement					
Golden plover	Negligible	Non-significant	Embedded mitigation only	Negligible	Non-significant
Curlew					
Dunlin					
Golden eagle					
Red kite					
Short-eared owl					
Cumulative effects					
Disturbance and/or displacement					
Golden eagle	Small	Non-significant	Embedded mitigation only	Negligible	Non-significant
Golden plover	Negligible				
Curlew					
Dunlin					
Red kite					
Short-eared owl					
Collision					
Golden eagle	Small	Non-significant	Embedded mitigation only	Negligible	Non-significant
Red kite					
White-tailed eagle					
Golden plover	Negligible				
Dunlin					

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