Environmental Impact Assessment Report

Teindland Wind Farm

Volume 1

Chapter 7: Ornithology

Document prepared by Envams Ltd for: Teindland Wind Farm Ltd

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Contents

7 ORNITHOLOGY

7.1 INTRODUCTION

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 Teindland Wind Farm (the Development) on land owned by Forestry and Land Scotland approximately 3 km north of Rothes, Moray, (the Site). The Development is described in Chapter 4.

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'1.

The chapter (and accompanying Technical Appendices) provide 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 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).

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

The assessment has been carried out by Avian Ecology Ltd. The lead author was Mr Graeme Garner BSc (Hons) (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 Mr Howard Fearn MSc MCIEEM (Managing Director) who has 23 years of ecology consultancy experience, including in the preparation and review of EIAR chapters and Habitats Regulations Appraisals for onshore wind energy developments.

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

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

The following confidential figures can be found in Volume 5, as these contain sensitive information regarding the locations of Schedule 1 species which should not be made publicly available:

- Figure 7.6a: Flight activity survey results Year 1 - osprey (confidential);
- Figure 7.6b: Flight activity survey results Year 2 - osprey (confidential);

[1] CIEEM (2018 (updated 2024)). Guidelines for Ecological Impact Assessment in the UK and Ireland. Terrestrial, Freshwater, Coastal and Marine. Chartered Institute of Ecology and Environmental Management, Winchester.

- Figure 7.7: Breeding Schedule 1 raptor survey results (confidential); and
- Figure 7.8: Proposed osprey platform locations (confidential).

The chapter should also be read in conjunction with the following Technical Appendices (TAs) presented in Volume 3:

- TA A7.1: Ornithology Baseline Report – provides further details of data gathering methods and results which have informed the impact assessment;
- TA A7.2: Collision Risk Model (CRM) Analysis – provides details of the methods of analysis and parameters used in the CRM; and
- TA A7.4: Information to Inform a Habitats Regulations Appraisal – provides a "shadow" Habitats Regulations Appraisal (HRA) to determine the potential for likely significant effects on relevant internationally designated sites for nature conservation.

The following confidential appendix can be found in Volume 5, as this contains sensitive information regarding the locations of Schedule 1 species which should not be made publicly available:

- TA A7.3: Confidential Ornithology.

For non-avian ecological features please refer to Chapter 6: Ecology. Details of the Outline Habitat Management (OHMP) are presented in TA A6.5.

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

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 TA A7.1: Ornithology Baseline Report, and includes common names, scientific (Latin) names and relevant conservation status.

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

- Study Area(s): these are survey-specific and are defined in the text (see TA A7.1: Ornithology Baseline Report) and are illustrated on Figure 7.1 and Figure 7.2; and
- Core Ornithology Survey Area: the part of the Site originally identified for locating the proposed turbines and upon which baseline ornithology study areas were established (see Figure 7.2).

7.2 RELEVANT LEGISLATION, GUIDANCE AND POLICY

General legislation and planning policy relevant to the Development are detailed in the Planning Statement, which accompanies this Environmental Statement as part of the application.

Legislation, policy and guidance of specific relevance to ornithology, and taken into account in the assessment presented within this chapter, are 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 (NPF) 4;
- Moray Local Development Plan (2020); and
- North East Scotland Biodiversity Partnership 4 Year Strategic Plan 2022-2026.

Guidance

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[2];
- Recommended bird survey methods to inform impact assessment of onshore wind farms[3];
- Assessing connectivity with Special Protection Areas (SPAs)[4];
- Assessing significance of impact from onshore windfarms on birds outwith designated areas[5];
- Avoidance rates for the onshore SNH wind farm collision risk model[6];
- Assessing the cumulative impact of onshore wind farms on birds[7];
- Natural Heritage Zones (NHZ) bird population estimates[8];
- Windfarms and birds - calculating a theoretical collision risk assuming no avoiding action[9];
- Developing field and analytical methods to assess avian collision risk at wind farms[10];
- Scottish Biodiversity List (SBL) 2022[11];
- "Fifth Birds of Conservation Concern" (BoCC)[12];
- Disturbance distances in selected Scottish bird species[13]; and

[2] CIEEM (2018 (updated 2024)). Guidelines for Ecological Impact Assessment in the UK and Ireland. Terrestrial, Freshwater, Coastal and Marine. Chartered Institute of Ecology and Environmental Management, Winchester.

[3] SNH (2017). Recommended bird survey methods to inform impact assessment of onshore wind farms. Scottish Natural Heritage Guidance: Version 2 - March 2017. Scottish Natural Heritage, now NatureScot, Inverness.

[4] SNH (2016). Assessing connectivity with Special Protection Areas (SPAs). Scottish Natural Heritage Guidance: Version 3 - June 2016. Scottish Natural Heritage, now NatureScot, Inverness.

[5] SNH (2018a). Assessing significance of impacts from onshore windfarms on birds outwith designated areas. Scottish Natural Heritage Guidance. Scottish Natural Heritage, now NatureScot, Inverness.

[6] SNH (2018b). Avoidance Rates for the onshore SNH Wind Farm Collision Risk Model. Scottish Natural Heritage Guidance: Version 2 - September 2018. Scottish Natural Heritage, now NatureScot, Inverness.

[7] SNH (2018c). Assessing the cumulative impacts of onshore wind farms on birds. Scottish Natural Heritage Guidance Note. Scottish Natural Heritage, now NatureScot, Inverness.

[8] Wilson, M. W., Austin, G. E., Gillings S. and Wernham, C. V. (2015). Natural Heritage Zone Bird Population Estimates. SWBSG Commissioned report.

[9] SNH (2000). Windfarms and birds - calculating a theoretical collision risk assuming no avoiding action. Scottish Natural Heritage Guidance Note. Scottish Natural Heritage, now NatureScot, Inverness.

[10] Band, W., Madders, M., and Whitfield, D.P. (2007). Developing field and analytical methods to assess avian collision risk at wind farms. In: de Lucas, M., Janss, G.F.E. and Ferrer, M. (eds.) Birds and Wind Farms: Risk Assessment and Mitigation: 259-275. Quercus, Madrid.

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

[12] Stanbury, A., Eaton, M., Aebischer, N., Balmer, D., Brown, A., Douse, A., Lindley, P., McCulloch, N., Noble, D. and Win, I. (2021). The status of our bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain. British Birds, 114: 23-747.

[13] Goodship, N.M. and Furness, R.W. (MacArthur Green) (2022). Disturbance Distances Review: an updated literature review of disturbance distances of selected bird species. NatureScot Research Report 1283.

- Pre-application guidance for onshore wind farms (NatureScot, 2024a[14]).

7.3 CONSULTATION

Formal consultation took place via the submission of the Scoping Report submitted in July 2022. Note that the proposed layout at the time of Scoping was larger than that which is now being proposed.

Additionally, informal consultation with NatureScot was undertaken to agree the scope of baseline data gathering methods. This consultation was undertaken in June 2021, so that comments received regarding survey methods could inform survey design and effort during the second year of survey.

Subsequently, advice was sought from NatureScot in May 2024 regarding ospreys.

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
Responses to Scoping Report		
Moray Council (August 2022)	No comment received to specific question as to whether the proposed scope of the ornithology assessment was acceptable.	In the absence of information requiring a different approach, the ornithology data gathering methods and subsequent assessment have been carried out in accordance with that set out in the Scoping Report.
NatureScot (August 2022)	As ospreys from the Moray and Nairn Coast Special Protection Area (SPA) commute over, or close to, the Site, information to inform a Habitats Regulations Appraisal should be included with the EIA.	Information to inform a HRA is provided in **TA A7.4** and includes an appraisal of the potential for a likely significant effect on ospreys associated with the Moray and Nairn Coast SPA.
	If qualifying features of SPAs are recorded, it is likely that a second non-breeding season would require surveys.	Two full years of ornithology baseline surveys, covering two breeding seasons and two non-breeding seasons, have been completed and inform the impact assessment.
RSPB Scotland (August 2022)	There are historical records (2004-2007) from the Site of breeding goshawk and long-eared owl and possible breeding by capercaillie and hen harrier.	During baseline ornithology surveys, goshawk, capercaillie and hen harrier were treated as “target species” and long-eared owl was regarded as a “secondary species” (see **TA A7.1**) and, thus, were appropriately surveyed. The field survey and desk study results, which included sourcing historic capercaillie records, are considered sufficient for determining potential impacts on these ornithological features.
	It is agreed that the ornithology surveys proposed are adequate, but a second non-breeding season may need to be undertaken dependent on survey findings.	Two full years of ornithology baseline surveys, covering two breeding seasons and two non-breeding seasons, have been completed and inform the impact assessment.
Informal Survey Scoping		
NatureScot (June 2021)	Ospreys breeding within, or passing over, the Site should be regarded as birds from the Moray and Nairn Coast SPA. Two years of surveys will be required to inform the assessment and HRA	Information to inform a HRA is provided in **TA A7.4** and includes an appraisal of the potential for a likely significant effect on ospreys associated with the Moray and Nairn Coast SPA. Two years of vantage point surveys, as well as breeding Schedule 1 raptor searches in two breeding

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

Consultee	Issued Raised	Response/Action Taken
	will need to be undertaken by the competent authority.	seasons, have been completed and inform the impact assessment.
	Capercaillie are present in the wider area and there are historic records from the Site. Data should be obtained to determine current status. Capercaillies are considered to have a "meta-population", with all birds treated as being integral to the protection of SPA populations.	Capercaillie data have been obtained from Forestry and Land Scotland and RSPB Scotland, and this data informs the impact assessment. A capercaillie habitat suitability assessment was undertaken as part of the programme of baseline ornithology surveys on Site. Capercaillie has been identified as an IOF and an impact assessment on this species is included (see **7.9.3 Capercaillie**).
	There are historic breeding records of merlin and this species requires consideration.	Schedule 1 raptor species were treated as "target species" during survey and assessment. Note the moorland area to the west of the forest is no longer included in the Site.
	The Site has potential connectivity with SPAs designated for non-breeding goose populations and survey effort suitable for assessing potential impacts (two non-breeding seasons) will be required.	Two years of vantage point surveys, including two non-breeding seasons, have been completed and inform the impact assessment. Pink-footed goose and greylag goose have both been identified as IOFs, as has Moray and Nairn Coast SPA (see **7.9 Impact Assessment**).
Consultation Regarding Ospreys		
NatureScot (July 2024)	Regarding the disturbance buffer to be applied to osprey nests [350-750m] the larger buffer would normally be expected unless there is adequate screening from the nest (e.g. by topography) or where birds are already habituated to similar disturbance levels.	Osprey breeding in the vicinity of the Site have some habituation to human activity, with nests within 200m of existing forest roads, used by forestry vehicles and recreationists. Potential disturbance impacts are fully assessed for osprey (see **7.6.2.1 Disturbance and Displacement (construction and operation)**), including mitigation measures.
	Regarding potential mitigation for osprey, including creation of alternative nest sites, further details were requested to be able to provide comment.	Project design and associated mitigation measures for osprey had yet to be finalised at the time of correspondence. Mitigation for ospreys is set out within this chapter (see **7.10 Mitigation**).

7.4 ASSESSMENT METHODOLOGY

7.4.1 Scope of Assessment

The assessment presented within this chapter has been undertaken in accordance with CIEEM guidelines (2018) and considers potential impacts upon ornithological features from the Development, throughout the lifetime of the project (construction, operation and decommissioning phases).

To ensure proportionality and, in accordance with guidance (e.g. SNH, 2018a and CIEEM, 2018), the focus of the assessment is those species considered potentially sensitive to the Development, and which are classed in this assessment as Important Ornithological Features (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.

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 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 any population scale) can reasonably be dismissed. Where

ornithological features are unlikely to be significantly affected, as evidenced by baseline information, these features are "scoped out" from full assessment.

For all ornithological features, justification is provided for either "scoping in" or "scoping out" of the assessment (see **7.8 Identification of Important Ornithological Features)**.

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 Development irrespective of the IOFs identified. Further information about embedded mitigation is provided in the relevant section (**7.7 Embedded Mitigation).**

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

7.4.2 Data Gathering Methods

7.4.2.1 Desk Study

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 sites listed for species with large foraging ranges (specifically wintering pink-footed goose and greylag goose). Additionally, locally designated (non-statutory) sites were searched for within 2 km of the Site (see **TA A7.1: Ornithology Baseline Report**).

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 **TA A7.1: Ornithology Baseline Report**. The organisations contacted comprised Forestry and Land Scotland (FLS), Royal Society for the Protection of Birds (RSPB) Scotland and the Raptor Study Groups (RSGs) for Highland and Northeast Scotland.

Supplementary ornithological data to inform the assessment was also sourced in available literature. This included information about wintering goose foraging areas (Mitchell, 2012[15]) and species records included within local bird reports[16] (see **TA A7.1: Ornithology Baseline Report**).

7.4.2.2 Baseline Ornithological Studies

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

- Vantage Point (VP) flight activity surveys (April 2021 to March 2023);
- Adapted Moorland Breeding Bird Survey (MBBS) (2021 and 2022);
- Breeding Schedule 1 raptor searches (2021 and 2022);
- Black grouse searches (2021); and
- Capercaillie Habitat Suitability Assessment (2022).

Survey areas are illustrated on **Figure 7.1** (VP locations and viewsheds) and **Figure 7.2** (baseline ornithology survey areas).

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**).

Survey methodologies and results are presented in **TA A7.1: Ornithology Baseline Report.**

7.4.2.3 Collision Risk Modelling

The results of the VP flight activity surveys were used to undertake Collision Risk Modelling (CRM) for relevant species. Further details of the CRM undertaken are presented in **TA A7.2: Collision Risk Model Analysis**.

[15] Mitchell, C. (2012). Mapping the distribution of feeding Pink-footed and Iceland Greylag Geese in Scotland. Wildfowl & Wetlands Trust / Scottish Natural Heritage Report. WWT Slimbridge.

[16] Available from: https://birdsinmorayandnairn.org/2011-onwards/ (Accessed February 2025).

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.

Please note that CRM analysis was begun before NatureScot guidance (NatureScot, 2024b[17]) 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)[18] 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*".

7.4.2.4 Data Gathering Limitations

Potential limitations in the assessment arising from issues in data recording and analysis are discussed in **TA A7.1: Ornithology Baseline Report** (field survey limitations) and **TA A7.2: Collision Risk Model Analysis** (limitations in the 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.

7.4.3 Impact Assessment Methods

The assessment presented within this chapter has been undertaken following the principles advocated in CIEEM guidance (2018) 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.

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; and
- Assessment of the significance of any residual effects following mitigation.

7.4.3.1 Characterising Important Ornithological Features

The "importance" of ornithological features has been determined with reference to current guidance (CIEEM, 2018 and SNH, 2018a), taking into account of the results of baseline field surveys and desk study findings.

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

In addition, the value of the Site itself 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.

The value of ornithological features is considered using the criteria set out in **Table 7.2**. The criteria presented in **Table 7.2** are not intended to be seen as definitive, and professional judgement has been applied where considered appropriate.

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

[18] Band, W. (2024). Using a collision risk model to assess bird collision risks for onshore wind farms. NatureScot Research Report 909.

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 breeding/wintering bird assemblage of the Site and immediate surrounding area.

7.4.3.2 Characterising Impacts

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.

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.

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: 1-2 years;
- Medium-term: for 3-9 years;
- Long-term: for 10-35 years; and
- Permanent: >35 years (a period longer than the life-time of the Development).

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 Natural Heritage Zone (NHZ) population) (see below);
- 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.

In accordance with NatureScot guidance (SNH, 2018a), the assessment of impacts has generally been undertaken at a "regional" scale with regards to species populations, unless an alternative geographical scale is considered appropriate on the basis of best available information, or where data regarding regional population status is not available.

The NHZ (Natural Heritage Zone) is considered to be the most appropriate default regional scale[19].

The Site is mostly located within NHZ 21: Moray Firth, whilst the western part of the Site is located within NHZ 10: Central Highlands. Just to the south of the Site, and within 500 m of the Site at its nearest point, lies NHZ 12: North East Glens. The meeting of three NHZs in the vicinity of the Site is reflective of the Site's location inland of the coastal plain of the Moray Firth and in the foothills of the more mountainous terrain that characterises the NHZs to the southwest and southeast.

As the Site lies within both NHZ 10 and NHZ 21, both NHZs are assessed as one combined area in the assessment, unless otherwise stated and justified.

The boundaries of the NHZs in the context of the Site are illustrated on **Figure 7.3**.

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.

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.

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**.

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 simply 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.

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.
Moderate	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 its ability to sustain some part of itself in the long term. For example, affecting >6-20% of the NHZ population.
Minor	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.

[19] 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.

Sensitivity to change varies between species and 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 ornithological features is taken into account during the assessment where this information exists.

7.4.3.3 Assessing the Significance of Effects

CIEEM guidance (2018) defines a "significant effect" as an effect that either supports or undermines biodiversity conservation objectives for "important ornithological features", or for biodiversity in general.

CIEEM guidance (2018) 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".

Table 7.4 summarises how significant or non-significant effects have been concluded in the assessment.

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.
	Moderate 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.
Not significant	Minor 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.

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.

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.

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.

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 high. 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.

Note that the scale of significance does not necessarily relate to 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.

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

Where the assessment proposes measures to mitigate adverse impacts on ornithological features (whether or not a significant effect has been predicted), a further assessment of residual effects, taking into account such measures, has been undertaken.

Finally, it should be noted that CIEEM guidelines (2018) 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*".

7.4.3.4 Mitigation and Compensation

Embedded mitigation is built into the project to minimise the potential for any negative impacts associated with the 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.

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 Development.

Additional mitigation measures are 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.

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 Development has been predicted:

- Avoidance is used where an impact has been circumvented, for example through changes in the Development design;
- Mitigation is used to refer to specific additional measures required 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.

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.

In addition to mitigation measures, "enhancement" measures are also included as part of the 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**; however, where specific measures are relevant to the assessment of ornithological features these measures are described, where relevant, within this chapter.

7.5 BASELINE CONDITIONS

7.5.1 Designated Sites

Statutory sites with ornithological qualifying interests located within 10 km of the Site (extended to within 20 km for sites with migratory geese as a qualifying feature due to the larger foraging distances of these species), are illustrated in **Figure 7.4** and summarised in **Table 7.5**. The designated areas include SPAs and SSSIs.

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

Table 7.5: Statutory designated sites with ornithological qualifying features

Site Name	Designation	Distance from Site	Qualifying Ornithological Interests
Moray and Nairn Coast	SPA	5.0 km	Osprey - breeding Bar-tailed godwit - non-breeding Pink-footed goose - non-breeding Greylag goose - non-breeding Redshank - non-breeding, and Assemblage - non-breeding (comprising the above species plus red-breasted merganser, dunlin, oystercatcher and wigeon).
	Ramsar site	5.0 km	Osprey - breeding Bar-tailed godwit - non-breeding Red-breasted merganser - non-breeding Dunlin – non-breeding Oystercatcher – non-breeding Wigeon – non-breeding Pink-footed goose - non-breeding Greylag goose - non-breeding, and Redshank - non-breeding.
Moray Firth	SPA	8.8 km	Shag – breeding and non-breeding Great northern diver - non-breeding Red-throated diver - non-breeding Slavonian grebe - non-breeding Scaup - non-breeding Eider - non-breeding Long-tailed duck - non-breeding Common scoter - non-breeding Velvet scoter - non-breeding Goldeneye - non-breeding, and Red-breasted merganser - non-breeding
Loch Spynie	SPA	10.5 km	Greylag goose – non-breeding
	Ramsar site	10.5 km	Greylag goose – non-breeding
	SSSI	10.5 km	Greylag goose – non-breeding Assemblage – breeding (including shoveler, great-crested grebe, water rail and grasshopper warbler)

In reference to core foraging distances (SNH, 2016), osprey (10 km), pink-footed goose (15-20 km) and greylag goose (15-20 km), where listed, have foraging ranges that suggest the potential for connectivity between the listed designated areas and the Site. For all other qualifying features for all identified sites, their foraging ranges and/or their coastal or marine habitat requirements, mean that these features would have no connectivity with the Site.

7.5.2 Desk Study – Species Records

Data returned from third party data requests are summarised in **TA A7.1: Ornithology Baseline Report**.

Note that the only data returned regarding Schedule 1 raptor species were provided by FLS, which confirmed the presence of breeding osprey and goshawk in the vicinity of the Site. Relevant records are illustrated on confidential **Figure 7.7** in **TA A7.3: Confidential Ornithology**. The FLS data confirmed the continued presence (as of 2024) of an osprey nest within the Site, which was also recorded during baseline surveys (see **7.5.3.3 Breeding Schedule 1 Raptor Searches**). FLS data also included a record of a probable osprey nesting attempt by a new pair in 2024 (after completion of baseline surveys), close to the

eastern edge of the Site. This nest site is located approximately 1,300 m from the nearest proposed turbine. Although this nest site indicates potential colonisation of a new home range, the incomplete nest that was found may not represent the nesting location that would be used in future. The goshawk records returned included a number of confirmed and probable nest sites. These indicate the location of two territories: one in the central part of the Site and one in the southeastern part of the Site.

RSPB and FLS data showed that capercaillie used to be present on Site, but the most recent evidence of presence was recorded in 2016. The Moray capercaillie population has undergone a notable decline in recent years and may now be extinct from the local area around the Site (one lekking male in Moray and Nairn in 2023).

The returned data, in conjunction with Mitchell (2012)[20], show that the nearest regularly used foraging areas of greylag and pink-footed goose are located more than 5 km from the Site. Also, there are no important feeding areas within foraging distance of the designated areas listed in **Table 7.5** for which the Development would lie on the daily flight path as all regularly used foraging areas are located to the north of the Site (closer to the designated areas).

Other Schedule 1 species of relevance identified in the desk study comprised crested tit and crossbill[21], which are present in Teindland Forest and may breed within the Site, and barn owl, which is present in suitable habitat along the River Spey to the east and south of the Site.

7.5.3 Results of Baseline Ornithological Surveys

7.5.3.1 Vantage Point Flight Activity Surveys

The VP surveys have determined the level of flight activity across the proposed turbine area for target species, following the survey methods set out in **TA A7.1: Ornithology Baseline Report**.

The target species[22] flights mapped during VP surveys are illustrated on the following figures: pink-footed goose Year 1 (**Figure 7.5a**), other species Year 1 (**Figure 7.5b**) (excluding pink-footed goose and osprey), pink-footed goose Year 2 (**Figure 7.5c)** and other species Year 2 (**Figure 7.5d**) (excluding pink-footed goose and osprey). Flights for osprey are shown separately as the flight activity illustrated is indicative of nest site locations. Osprey activity in Year 1 (**Figure 7.6a** (confidential)) and Year 2 (**Figure 7.6b** (confidential)) are provided in **TA A7.3: Confidential Ornithology**.

Full details of all target species flights recorded are provided in Annex 3 of **TA A7.1: Ornithology Baseline Report**.

The flights recorded during the VP surveys were examined to determine which flights were at potential collision risk, following the methods set out in **TA A7.2: Collision Risk Model Analysis.**

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 potential minimum rotor swept height (25 m) and potential maximum rotor swept height (230 m)), during the two-year baseline survey campaign, were taken forward for CRM.

[20] Mitchell, C. (2012). Mapping the distribution of feeding Pink-footed and Iceland Greylag Geese in Scotland. Wildfowl & Wetlands Trust / Scottish Natural Heritage Report. WWT Slimbridge.

[21] “Crossbill” in this chapter refers to common crossbill and Scottish crossbill collectively. Although these two forms are currently treated as separate species it is not possible to reliably identify birds to either species within areas where their ranges overlap. Thus, they are best treated together (both species having Schedule 1 status).

[22] 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, black grouse and capercaillie.

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 Development, and these species were excluded from CRM in the interests of proportionality.

All target species flights with at least some time recorded in a height band that overlapped with rotor swept height were considered to have been at PCH (see **TA A7.2: Collision Risk Model Analysis**). Due to the height bands used during survey, only flights in the lowest height band (<25 m) could be removed from the analysis as not being at-risk flights. Flights in the highest height band (height band 5; >180 m) were included in the analysis[23], although this is considered precautionary as it is likely that at least some of the flights recorded in this height band would have actually been above maximum rotor swept height (200-230 m). To offset this potential bias, for pink-footed goose (a species that was noted as passing over the Site on migration) flights that were recorded only in height band 5 (eight flights) were apportioned and 50% of the total number of birds recorded in each flight were considered to be at-risk, based on available literature of pink-footed goose flight heights (Patterson, 2015)[24].

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 analysis, species-specific seasons have been used (see **TA A7.2: 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	No. of flights	No. of individuals
Breeding Season (April to August (both baseline survey years))				
Curlew	2	2	1	1
Goshawk	5	5	3	3
Hobby	1	1	1	1
Mute swan	1	1	-	-
Osprey	95	111	71	84
Peregrine	1	1	-	-
Pink-footed goose	1	50	1	50
Snipe	1	1	-	-
Non-breeding Season (September to March (both baseline survey years))				
Golden plover	1	65	-	-
Goshawk	17	18	11	12
Greylag goose	2	43	2	43
Lapwing	1	2	1	2
Pink-footed goose	58	7,754	44	4,822

[23] With the exception of one osprey flight noted as being 'a great height' and which was therefore taken as being above at-risk height.

[24] Patterson, I.J. (2015). Goose flight activity in relation to distance from SPAs in Scotland, including an analysis of flight height distribution. Scottish Natural Heritage Commissioned Report No. 735. Scottish Natural Heritage, now NatureScot, Inverness.

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 **TA A7.2: Collision Risk Model Analysis**.

Table 7.7: Collision risk estimates for relevant Important Ornithological Features

Species	Season of Occupancy	At-Risk Flights		
		Year 1	Year 2	Average
Greylag goose	Breeding season	0.000	0.000	0.000
	Non-breeding season	0.154	0.000	0.077
	Annual estimate	**0.154**	**0.000**	**0.077**
Pink-footed goose	Non-breeding season	7.738	6.219	6.979
	Annual estimate	**7.738**	**6.219**	**6.979**
Goshawk	Breeding season	0.021	0.115	0.068
	Non-breeding season	0.042	0.044	0.043
	Annual estimate	**0.064**	**0.159**	**0.111**
Osprey	Breeding season	0.498	0.963	0.731
	Annual estimate	**0.498**	**0.963**	**0.731**

7.5.3.2 Adapted Moorland Breeding Bird Survey

No target species of the Adapted MBBS (breeding waders, waterfowl, gulls or grouse) were recorded. The forest nature of the Site means that there is little suitable habitat within the study area (which included a small area of open ground within 500 m of the western edge of the forest) for moorland breeding species (**Figure 7.2**).

7.5.3.3 Breeding Schedule 1 Raptor Searches

Two species of Schedule 1 raptor were recorded as breeding within the vicinity of the Site.

Two osprey nests were recorded, which were active during both baseline survey years. One nest was present within the Site and was located 250 m from an existing forest road and 630 m from the nearest proposed turbine. The second nest was located outside the Site boundary, 180 m from the nearest existing forest road and 520 m from the nearest proposed turbine. The locations of these nests are provided in **TA A7.3: Confidential Ornithology** and illustrated on **Figure 7.7**. To minimise disturbance, the osprey nests were not closely monitored once occupancy had been proven, and so breeding outcomes were not confirmed. However, it is believed that in Year 1 (2021) both nests were successful in fledging juvenile(s) but that both nests failed in Year 2 (2022).

Goshawk was also shown to be breeding within the vicinity of the Site. In the southeast of the Site a nest was located in 2022, with this going on to successfully fledge juveniles. This nest is located 500 m from the nearest forest road (but 50 m from a track), and would be 620 m from the nearest proposed turbine. A territory was suspected in the southwest of the Site in both survey years, though no active nest was located. Records in this area included a calling female and nest in good condition but which was unused during the survey period. Suitable habitat also exists in the north of the Site and records here included a displaying male in 2022 recorded 1.7 km from the active nest and which may have represented an additional territory, although no evidence of breeding was recorded from this area. Relevant goshawk records are presented in **TA A7.3: Confidential Ornithology** and illustrated on **Figure 7.7**.

7.5.3.4 Black Grouse Searches

No black grouse leks were recorded during the dedicated surveys. Nor were any black grouse recorded during any of the ornithology surveys completed during the two years of baseline surveys. It is concluded that no black grouse are present in the vicinity of the Site.

7.5.3.5 Capercaillie Habitat Suitability Assessment

The assessment identified little favourable habitat for capercaillie within the Site. The rotational felling of the plantation has created typical habitats of clearfelled areas, coupes of young thicket stage trees and dense mature plantation with a sparse ground flora. In addition, there is a relatively extensive network of tracks through the Site that are used by members of the public for recreation, and which means few areas of the forest are sufficiently undisturbed to be of value to capercaillie. Two small areas in the edge of the Site were regarded as having potential of holding capercaillie, with mature trees and more open areas containing heather and limited heathland ground flora. However, both are small in extent and isolated from other areas of favourable habitat. The identified areas overlap with coupes within the forest being managed for low impact silviculture and long-term retention and it is acknowledged that such measures may improve habitat suitability for capercaillie over time. Regardless, the small extent of these areas suggest that capercaillie would be unlikely to be regularly present.

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

7.5.4 Future Baseline

In the absence of the Development, the habitats within the Site would be expected to remain under the existing regime, with large areas of the plantation forestry on Site continuing to be managed through thinning, rotational felling and replanting in accordance with existing management plans. Thus, there are parts of the Site that are currently forested that would be thinned or clearfelled, and parts of the Site that were recently felled or replanted during the baseline period which would develop over time into mature forestry. The breeding bird community on Site would, therefore, be required to adapt to these localised changes in habitat, irrespective of the Development.

Despite these localised changes in bird distributions, and notwithstanding the typical inter-annual variability that occurs naturally in bird populations, it can be expected that the baseline ornithological conditions on Site would remain similar to that recorded during the baseline survey campaign for most bird species in the medium and long term.

For certain species, population trends could result in changes to their status. For example, the population of ospreys in NHZ 21 is increasing (Wilson et al., 2022)[25], with this evidenced by the fact a new pair of ospreys has been recorded on Site since the baseline surveys were completed.

It should be acknowledged that even where local populations remain similar to baseline conditions in future, a species' overall conservation status could still change (becoming more or less favourable). Additionally, new protected sites could be designated in future that have connectivity with the Site. However, where such changes can be anticipated, these changes would be unlikely to qualitatively alter the conclusions of the impact assessment.

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.

7.6 POTENTIAL IMPACTS

The following generic risks to ornithological features have been identified for wind farm projects. Impacts applicable to the Development and associated ornithological features are assessed in the **Impact Assessment** section (**7.9**).

[25] Wilson, M., Challis, A. & Wernham, C.V. (2022). Scottish Raptor Monitoring Scheme Trends for 2009-2018: Methods and Analysis of Gaps. A report to the SRMG.

7.6.1 Potential Impacts During the Construction Phase

7.6.1.1 Habitat Loss

The construction of turbine bases, new 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.** The impact of habitat loss upon ornithological features depends 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).

Where a development is constructed on habitats that are prevalent in the wider area (as is the case for the 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 to a species' regional population.

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 **7.7 Embedded Mitigation**); and as embedded mitigation is taken into consideration from the outset, such losses are not included in the assessments.

The area lost to ornithological features indirectly, as a result of avoidance of construction activities, is considered below (see **7.6.1.2 Disturbance and Displacement**).

7.6.1.2 Disturbance and Displacement

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.

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.

7.6.2 Potential Impacts During the Operational Phase

7.6.2.1 Disturbance and Displacement

The level of human activity on Site during the operational phase of the Development would be considerably lower than during the construction phase but is assumed to be higher than during the baseline. Forestry operations are assumed to continue. 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.

In addition, there may be displacement close to infrastructure, particularly the turbines, throughout the operational period; resulting in potential indirect habitat loss.

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 have found to vary between species. Relevant literature, where available, has informed the impact assessment.

7.6.2.2 Barrier Effect

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.

7.6.2.3 Collision

The erection of tall structures with moving parts could result in flying birds colliding with these structures. Additionally, any associated infrastructure of the Development, such as overhead lines or fences, could provide a collision risk for susceptible species such as woodland grouse. Collisions with structures is considered fatal.

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.

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.

7.6.3 Potential Impacts During the Decommissioning Phase

7.6.3.1 Disturbance and Displacement

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 would occur during the construction phase. As such, decommissioning phase impacts of the Development upon ornithological features are not considered separately within this assessment. Instead, the assessments for decommissioning phase impacts are taken to be the same as for the construction phase (in terms of magnitude of impact and significance of effect).

7.7 EMBEDDED MITIGATION

7.7.1 Design Considerations

Following the identification of nesting locations for Schedule 1 raptor species within the Site, the turbine layout has avoided the placement of any proposed turbines within minimum disturbance buffers of these nest sites (in reference to Goodship & Furness (2022)[26]).

In addition, the proposed turbines avoid the eastern part of the Site. Thus, a wide buffer adjacent to the valley of the River Spey has been kept clear of turbines for the benefit of bird species that may follow this natural corridor, such as foraging ospreys.

7.7.2 Best Practice Measures

7.7.2.1 Construction Environmental Management Plan

A Construction Environmental Management Plan (CEMP; an outline of which is provided in TA A4.1) would be prepared for the Development in consultation with Moray Council, NatureScot and other relevant stakeholders.

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

The CEMP, once finalised, would include for all standard measures to ensure the 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.

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.

[26] Goodship, N.M. and Furness, R.W. (MacArthur Green) (2022). Disturbance Distances Review: an updated literature review of disturbance distances of selected bird species. NatureScot Research Report 1283.

Additionally, the CEMP would include for a Breeding Bird Protection Plan (BBPP) to be prepared for agreement through consultation with Moray Council 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 tree felling, 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. This is set out in section 10 of the oCEMP (TA A4.2).

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.

7.7.2.2 Outline Habitat Management Plan

A Habitat Management Plan (HMP; an outline of which is provided in TA A6.5) would also be prepared for the Development in consultation with Moray Council, NatureScot and other relevant stakeholders. The OHMP is discussed in **Chapter 6: Ecology.**

A key aim of the HMP would be to improve biodiversity and structure of woodland within the Site, which would have direct and indirect benefits for ornithological features (see **7.10.4 Habitat Enhancement**).

7.8 IDENTIFICATION OF IMPORTANT ORNITHOLOGICAL FEATURES

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, 2018)) and focuses solely on those features for which there is potential for a significant effect as a result of the Development (those identified as IOFs).

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 **7.5 Mitigation and** Compensation

Embedded mitigation is built into the project to minimise the potential for any negative impacts associated with the 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.

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 Development.

Additional mitigation measures are 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.

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 Development has been predicted:

- Avoidance is used where an impact has been circumvented, for example through changes in the Development design;
- Mitigation is used to refer to specific additional measures required 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.

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.

In addition to mitigation measures, “enhancement” measures are also included as part of the 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**; however, where specific measures are relevant to the assessment of ornithological features these measures are described, where relevant, within this chapter.

Baseline Conditions**),** 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.

7.8.1 Ornithological Features Scoped In

Those species and designated sites that have been scoped into the assessment are detailed in **Table 7.8**. These features are referred to hereafter as being IOFs (Important Ornithological Features) in the context of the Development. For each IOF, the potential impact(s) that require assessment are listed in the table.

Table 7.8: Important Ornithological Features and impacts included in the assessment

IOF	Status	Potential Impact	Phase
Greylag goose	The Site does not support suitable habitat for greylag goose and key foraging areas for birds wintering in the region are located to the north of the Site and more than 5 km distant (Mitchell, 2012). Nevertheless, greylag goose qualified for CRM based on the two at-risk flights (43 birds) recorded during baseline VP surveys. Flight activity is not sufficient to suggest a potential barrier effect.	Collision	Operation
Pink-footed goose	The Site does not support suitable habitat for pink-footed goose and key foraging areas for birds wintering in the region are located to the north of the Site and more than 5 km distant (Mitchell, 2012). Nevertheless, there was regular pink-footed goose flight activity across the Site and therefore there is the potential for impacts from collision and barrier effects.	Collision Barrier effect	Operation
Capercaillie	The data gathered highlighted that capercaillie were historically on Site but are no longer present. However, given the high conservation status of this species and the importance of considering potential impacts that could isolate the separate populations that make up the wider regional meta-population, capercaillie is scoped in for assessment.	Disturbance/ displacement Collision	Construction Operation
Osprey	Osprey was recorded as breeding on Site and relatively high flight activity was recorded.	Disturbance/ displacement Collision Barrier effect	Construction Operation
Goshawk	Goshawk was recorded as breeding on Site and flight activity was sufficient to qualify for CRM.	Disturbance/ displacement Collision	Construction Operation
Moray and Nairn Coast SPA and Ramsar site	The designated area is located 5 km from the Site. There is considered to be no risk to the wader and waterfowl qualifying features, which comprise species associated with coastal habitats. Mitchell (2012) showed that key foraging areas for wintering geese associated with the SPA are located to the north of the Site and more than 5 km distant. However, the other qualifying feature, osprey, regularly uses the Site (including to breed) and these may be considered to be SPA birds. Note that Moray and Nairn Coast SPA/ Ramsar site is also separately assessed within **TA A7.4: Information to Inform a Habitats Regulations Appraisal**.	Disturbance/ displacement Collision Barrier effect (osprey only)	Construction Operation

7.8.2 Ornithological Features Scoped Out

Table 7.9 lists the ornithological features that are scoped out from further assessment. Note that species which were not recorded during baseline surveys (or highlighted from desk study) are automatically excluded from the assessment.

Table 7.9: Ornithological features scoped out of the assessment

Ornithological Feature	Justification for Scoping Out
Mute swan	Mute swan was treated as a target species during VP flight activity surveys. One bird was recorded but this was not an at-risk flight. There is no suitable habitat for mute swan within the Site. No significant effects concluded without need for further assessment.
Black grouse	Black grouse was not recorded during the baseline ornithology surveys, including during dedicated surveys undertaken to record lekking birds. There is no evidence of black grouse presence in the vicinity of the Site and so there is no route to impact.
All wader species	The habitat on Site is not favourable to breeding waders, with the potential exception of large clearfelled areas that could be used by snipe. However, none were recorded as breeding during the baseline surveys. Flight activity across the Site was very low for all wader species (**Table 7.6**), with at-risk flights recorded only for curlew (one bird) and lapwing (two birds) across two years of VP surveys. No significant effects concluded for all wader species without need for further assessment.
Barn owl	The desk study highlighted that this Schedule 1 species is present in suitable habitat along the Spey Valley, close to the Site. However, the Site itself does not support suitable nesting locations, and any nest sites that are present in the wider area (e.g. barns, outbuildings, owl boxes) would not be impacted by the Development. Clearfelled areas on Site could provide foraging opportunities but studies have shown that barn owls will continue to use suitable habitat close to turbines and are at very low risk of collision[27]. No significant effects concluded for barn owl.
Hobby and peregrine	These target raptor species were both recorded once (one individual) during two years of VP flight activity surveys. Although both species could potentially breed within the wider area neither species is believed to have bred close to the Site (within 2 km). It is possible to conclude no significant effects on these two ornithological features without need for further assessment.
Schedule 1 passerines (crossbill[21] and crested tit)	Crested tit and crossbills were identified through desk study as being present in the vicinity of the Site. Crested tit has been recorded as breeding in Teindland Forest and it is likely that crossbill also breed on Site, albeit the crossbill population is irruptive and varies markedly year to year. Embedded mitigation measures for the Development, which would include pre-felling nest checks when works are to be undertaken in the breeding season would protect breeding attempts of all Schedule 1 species. Wind farm impacts on passerines are very localised and the Development would not have a significant effect on their regional populations.
Secondary species	Secondary species[28] recorded during the VP flight activity surveys compromised common buzzard, common gull, great black-backed gull, herring gull, kestrel, lesser black-backed gull, mallard, raven and sparrowhawk. These are widespread species that are not qualifying features of any statutory sites within 10 km of the Site. Nests of any species breeding on Site (e.g. common buzzard) would be protected through embedded mitigation measures, including pre-felling nest checks. No significant effects are concluded for all secondary species, at a regional population level, without need for further assessment.
Loch Spynie SPA, Ramsar site and SSSI	Although the designated area is located within core foraging range of its main qualifying feature, greylag goose, the data gathered indicates that greylag geese from the SPA do not regularly pass over the Site; with only two flights recorded during baseline surveys and key foraging areas for geese associated with the SPA located within 7 km of the loch (Mitchell, 2012). Based on separation distance there is no route to impact for species that qualify as part of the breeding assemblage (SSSI only). Note, however, that Loch Spynie SPA/ Ramsar site is separately assessed within **TA A7.4: Information to Inform a Habitats Regulations Appraisal**.

[27] Information available from: https://www.barnowltrust.org.uk/hazards-solutions/barn-owls-wind-turbines/ (Accessed February 2025)

[28] 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.

Ornithological Feature	Justification for Scoping Out
Moray Firth SPA	The qualifying features of the Moray Firth SPA (waterbird species) are strictly coastal and marine species during the seasons for which they are designated. Furthermore, the SPA is located approximately 9 km from the Site. There is considered to be no route to impact on these ornithological features.

7.9 IMPACT ASSESSMENT

The IOFs and associated impacts listed in **Table 7.8** are assessed in turn below.

7.9.1 Greylag Goose

For greylag goose the only potential impact scoped in for assessment is collision impact during the operational phase.

7.9.1.1 Status

The population of greylag goose in Scotland consists of a 'native' breeding population, formerly located in the northwest of the country and a 'feral' population breeding elsewhere (these two populations now being indistinguishable (Mitchell, 2012)), plus the Icelandic breeding population that winters in the UK in internationally important numbers. Greylag goose is amber-listed on BoCC (Stanbury et al., 2021)[29] but has no other conservation designations. The most recent UK census (2022/23) estimated 83,915 individuals, of which 59,303 were considered to be Icelandic birds (Woodward et al., 2024)[30]. There are no regional (NHZ) population estimates for greylag goose.

During the baseline surveys, the VP flight activity surveys recorded two flights (43 individuals) of greylag goose, both from the same date in November 2021. The lowland plain south of the Moray Firth is used by wintering greylag geese but there are no key foraging areas within 5 km of the Site and the Site is not located between regularly used roosting and foraging areas. Although only two flights were recorded, the number of individuals meant that CRM was undertaken for greylag goose. This produced annual estimates of 0.000 and 0.154, giving an average of 0.077 collisions per year.

In the context of the Site, greylag goose is given low (local) importance.

7.9.1.2 Collision (operation)

The estimated mortality risk calculated for greylag goose is very small, at 0.077 birds per annum and would be undetectable against the UK wintering population. There is not a regional population estimate to assess impacts against, but Moray and Nairn Bird Reports provide counts that indicate the local population. This is shown to be highly variable between years. The numbers presented are generally individual flock counts but a recent peak count of 3,610 (November 2020) (Cook, 2024) is considered a realistic local population estimate for use in the assessment. The collision mortality would be equivalent to 0.002% of this local population estimate. Therefore, it can be concluded that the potential collision risk would be undetectable on the population even at a local scale.

Collision impacts as a result of the Development are predicted to have a **negligible adverse impact** on greylag goose during the operational phase and **no significant effect** is concluded.

[29] Stanbury, A., Eaton, M., Aebischer, N., Balmer, D., Brown, A., Douse, A., Lindley, P., McCulloch, N., Noble, D. and Win, I. (2021). The status of our bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain. British Birds, 114: 23-747.

[30] Woodward, I.D., Calbrade, N.A., Birtles, G.A., Feather, A., Peck, K., Wotton, S.R., Shaw, J.M., Balmer, D.E. and Frost, T.M. (2024). Waterbirds in the UK 2022/23: The Wetland Bird Survey and Goose & Swan Monitoring Programme. BTO/ RSPB/JNCC/NatureScot. Thetford.

7.9.2 Pink-footed Goose

For pink-footed goose the potential impacts scoped in for assessment are barrier and collision impacts during the operational phase.

7.9.2.1 Status

Pink-footed goose is a common and widespread species in Scotland, on migration and in the non-breeding season, but is amber-listed on BoCC due to the international importance of the population that winters in the UK (Stanbury *et al*., 2021). The Scottish population of pink-footed goose increased 25% between 2011/12 and 2021/22 (and has increased 85% in the last 25 years) (Woodward *et al*., 2024). Peak estimates are provided for the NHZ regions, with the estimate for NHZ 21 being 35,750 individuals. (NHZ 10 does not support migratory/wintering pink-footed geese and has an estimate of seven individuals) (Wilson *et al*., 2015). The continued population increase suggests that the NHZ estimate may now be greater than that cited.

Pink-footed geese were recorded during baseline VP flight activity surveys passing over the Site. Peak passage was in the autumn, particularly November, with lower numbers on spring passage and occasional records in winter. The Site is not located between regularly used foraging areas and roosting sites and the data suggests the birds passing over the Site were on migration rather than local commuting flights. CRM was undertaken for pink-footed goose and this produced mortality estimates of 6.219 to 7.738 birds per annum, an average of 6.979 collisions per year.

In the context of the Site pink-footed goose is classed as having medium (regional) importance, based on the level of flight activity across the Site.

7.9.2.2 Barrier Effect (operation)

As the data gathered indicates that the Site is not located between regularly used foraging areas and known roosting sites, there are no daily movements of pink-footed geese over the Site and so no barrier effect can be concluded. For birds on migration, any avoidance of the Development would have a negligible impact on a mobile and highly migratory species like pink-footed goose, especially in the context of the Site's location within the edge of the Grampian Mountains, which already act as a natural barrier.

Barrier impacts as a result of the Development are predicted to have a **nil or negligible adverse impact** on pink-footed goose during the operational phase and **no significant effect** is concluded.

7.9.2.3 Collision (operation)

The collision mortality estimate of 6.979 is equivalent to 0.020% of the regional (NHZ 21) population. Even if this was to come to pass, such a small increase in mortality to the regional population would be undetectable. The population of pink-footed geese has shown a marked increase in recent decades, despite the growth in the number of wind farm developments within their range, and the nominal increase in potential mortality as a result of the Development would not be expected to change this increasing population trend.

Collision impacts as a result of the Development are predicted to have a **negligible adverse impact** on pink-footed goose during the operational phase and **no significant effect** is concluded.

7.9.3 Capercaillie

Capercaillie is scoped into the impact assessment for potential disturbance and displacement impacts during construction and disturbance/ displacement and collision impacts during the operational phase of the Development.

7.9.3.1 Status

Capercaillie is a species of high conservation concern, being listed on Schedule 1, Annex 1, SBL and red-listed on BoCC due to sharp declines in population and range (Stanbury *et al*., 2021). The most recent national census, from 2021/22, estimated 542 individuals in

Scotland[31]. In 2023 there were 168 lekking males, but only one male was recorded in Moray and Nairn. This follows a clear decline locally, with five lekking males having been present in Moray and Nairn in 2021 and 14 males in 2016 (Proctor, 2024)[32].

Capercaillie was not recorded during baseline surveys. Further data was sought, and this shows that the most recent evidence of capercaillie being on Site came from 2016 and from within 10 km of the Site the last male recorded during annual lek monitoring was recorded in 2017.

7.9.3.2 Disturbance and Displacement (construction and operation)

As the data gathered has shown that capercaillie are not present on Site, nor within 1,000 m (the maximum buffer recommended in Goodship and Furness (2021) to prevent disturbance), it can be concluded that the Development would have no disturbance impacts on capercaillie. The typical distance covered by adult birds during seasonal movements between summer and winter home ranges is 1-2 km (Moss *et al*., 2006). The data suggests there are now no birds present within this range of the Site, so a displacement impact can be ruled out for all times of year.

The inclusion of capercaillie as an IOF allows an assessment of whether the Development could impact the wider meta-population: i.e., all birds are considered important to sustaining the regional population, as are suitable areas of habitat that could be used as 'stepping stones' between isolated parts of the birds' range.

Juvenile capercaillie in northeast Scotland have been shown to disperse up to 30 km, although movements are typically much less than this (Moss et al., 2006)[33]. Therefore, there is potential for the Site to be used, albeit occasionally and temporarily, by dispersing young birds. It is considered very unlikely that young birds would disperse into the Site as the Site is now located outside occupied range and not between existing populations.

A habitat suitability assessment showed that the plantation forestry in the vicinity of the Development is of low value to capercaillie, being subject to relatively high human disturbance and having little ground fauna such as blaeberry. More suitable habitat is present within the Site away from the Development and particularly within the forest that lies to the south of the Site. These areas would remain available to dispersing birds and the loss of forest in the vicinity of infrastructure would result in a minimal loss of available suitable habitat.

Disturbance and displacement impacts as a result of the Development, during both the construction and operational phases, are predicted to have **at most a negligible adverse impact** on capercaillie, and **more likely no impact** due to the remote likelihood of dispersing birds being impacted. **No significant effect** is concluded.

7.9.3.3 Collision (operation)

As capercaillie was not recorded during the VP flight activity surveys, no collision impacts with turbines would be concluded based on the baseline data.

In the rare event that a dispersing capercaillie may reach the Site, it is considered likely that although birds would likely fly at height across the adjacent valleys to reach the Site from neighbouring forests, once the Site is reached it would be expected that movements within the forest would be below the canopy, reflecting the typical behaviour of this shy species. Such flights are very unlikely to be at rotor swept height.

However, capercaillie are known to collide with deer fences, particularly dispersing young birds (NatureScot, 2022)[34]. Thus, there is potential for birds to collide with infrastructure on-Site, especially any structures located close to woodland edges or within narrow rides within

[31] Available from: https://cairngormscapercaillie.scot/capercaillie-lek-count-report-2023/ (Accessed February 2025).

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

[33] Moss, R., Picozzi, N. and Catt, D.C. (2006). Natal dispersal distances of capercaillie Tetrao urogallus in northeast Scotland. Wildlife Biology 12(2): 227-232.

[34] NatureScot (2022). Review of capercaillie conservation and management - report to the scientific advisory committee. NatureScot, Inverness.

the forest. Due to the maintenance of gaps between turbines and forest edge in key-holed areas and no requirement for fencing, there would be minimal collision risk, especially given the number of dispersing birds that would ever be exposed to this risk.

Collision impacts as a result of the Development are predicted to have a **negligible adverse impact** on capercaillie during the operational phase and **no significant effect** is concluded.

7.9.4 Osprey

Osprey is scoped into the impact assessment for potential disturbance and displacement impacts during construction, and barrier effects, disturbance/ displacement and collision during the operational phase of the Development.

7.9.4.1 Status

Osprey is a Schedule 1 and Annex 1 listed species and is on the SBL. Osprey is amber-listed (Stanbury *et al*., 2021) due to its historic decline and relatively small population, however the Scottish population has shown an increasing trend and range expansion in recent decades. An osprey breeding population estimate for 2021 was of 229 pairs in Scotland (Eaton *et al*., 2023); whilst NatureScot estimate between 250 and 300 breeding pairs[35]. The regional estimates are of eight pairs in NHZ 10 and 35 pairs in NHZ 21 (Wilson et al., 2015)[36]. This differs slightly from the estimate of the Scottish Raptor Monitoring Scheme (SRMS) for NHZ 21 of 32 pairs (2018), though this is caveated as likely being an under-estimate (Wilson et al., 2022)[37]. The regional trend is of an increasing population, with the SRMS estimate for NHZ 21 from 2009 being 18 pairs; which indicates there may have been potential growth of up to 78% in the breeding population from 2009-2018. (SRMS do not provide trends for NHZ 10).

The baseline surveys confirmed an active nest within the Site, to the east of the proposed turbine area. Another pair in the east of the Site was present in 2024 (post baseline surveys). An active nest was also identified a short distance to the south of the Site during baseline surveys. Flight activity was high, but with the majority of flight activity recorded in the vicinity of the nests. The baseline flight activity data was used to calculate collision mortality estimates and these provided estimates of 0.498 to 0.963, giving an average mortality of 0.731 birds per annum.

In the context of the Site osprey is given medium (regional) importance.

7.9.4.2 Barrier Effect (operation)

There is potential for a barrier impact should the Development be located on a regularly used flight-path between an active nest and key foraging areas. Regular flight paths across the Development are not evidenced by the results of the VP flight activity surveys (confidential **Figures 7.6a** and **7.6b**), which show a wide arc of dispersal from the nest locations, with all compass directions followed rather than repeated use of the same flight "corridor".

Ospreys have a core foraging range of 10 km, but some birds regularly forage up to 20 km from nests sites (SNH, 2016)[38]. The long commuting flights that ospreys regularly take, and which would appear to have some flexibility, suggests that avoidance of the Development, even where this could lead to longer commuting flights for nests close to the Development, are unlikely to have a measurable detrimental impact.

[35] Available from: https://www.nature.scot/plants-animals-and-fungi/birds/freshwater-birds/osprey#:~:text=Ospreys%20have%20since%20spread%20slowly,and%20parts%20of%20the%20north. (Accessed February 2025).

[36] Wilson, M. W., Austin, G. E., Gillings S. and Wernham, C. V. (2015). Natural Heritage Zone Bird Population Estimates. SWBSG Commissioned report.

[37] Wilson, M., Challis, A. & Wernham, C.V. (2022). Scottish Raptor Monitoring Scheme Trends for 2009-2018: Methods and Analysis of Gaps. A report to the SRMG.

[38] SNH (2016). Assessing connectivity with Special Protection Areas (SPAs). Scottish Natural Heritage Guidance: Version 3 - June 2016. Scottish Natural Heritage, now NatureScot, Inverness.

Barrier impacts as a result of the Development are predicted to have a **negligible adverse impact** on osprey during the operational phase and **no significant effect** is concluded.

7.9.4.3 Disturbance and Displacement (construction and operation)

The location of the osprey nests recorded in the vicinity of the Site during the baseline surveys have been taken into account, as much as possible, at the project design stage. The distances of the two identified nests during baseline surveys are 520 m and 630 m to the nearest proposed turbines, which is within the upper part of the range for recommended disturbance buffers cited by Goodship and Furness (2022) of 350-750 m. The breeding attempt recorded by FLS in 2024 was more than 1,300 m from the nearest proposed turbine and over 800 m from the proposed substation.

As the Site is commercial plantation with regular forestry operations, and as the extensive network of tracks on Site have a relatively high usage for recreational activity, it can be concluded that any ospreys nesting in the vicinity of the Site have some habituation and an existing tolerance of human activity, which precludes the need for application of the maximum avoidance buffer, at least during the operational phase when activity on Site would be relatively low. This is supported by the fact the nests are located less than 350 m (the minimum disturbance buffer recommended in guidance) from existing forest roads (actual distance: 180 m to 250 m).

Disturbance remains a potential impact however, during the construction phase, as the level of potential disturbing activity on Site would be considerably more than during the baseline, in terms of duration and intensity (visually and audibly). It is therefore possible that disturbance during the construction phase could impact breeding pairs close to construction works, which as a worst-case scenario could result in abandonment of the nest during the breeding season(s) in which construction works are taking place. For the pairs involved this would result in an unsuccessful breeding season, but this would not prevent the birds returning post-construction.

The two nests identified during baseline surveys are located in trees/ groups of trees that would not require felling for the Development. The breeding attempt recorded in 2024 is, however, located in an area of storm damaged trees that would be cleared by 2027 within the forestry management plan, irrespective of the Development. Any nest identified at the time of felling would be retained, however.

Following construction, the level of activity on Site would be much reduced and likely to fall back within the threshold of disturbance to which birds are already habituated. Infrastructure associated with the Development would be no nearer to the nest locations than existing forest tracks and roads. Therefore, operational disturbance is unlikely to have a negative impact on the existing nest sites, especially as any ground-level human activity in the vicinity of proposed turbines (or the substation) would be shielded from line of sight by trees and/ or topography.

However, although not expected, the physical presence of the operational turbines has potential to cause displacement to nests close to the Development, possibly resulting in nest abandonment and relocation. This relocation is most likely to occur at a local scale, i.e., the displaced pair can be expected to relocate within the Site or the surrounding area. It is not anticipated that any pair would be lost from the regional breeding population.

Where nests remain in use, any avoidance of turbines (or other infrastructure) during the operational phase would not result in displacement from foraging areas. Ospreys feed exclusively on fish and the Site does not support any suitable foraging habitat (see also **Barrier Effect (operation)** above).

Disturbance and displacement impacts on osprey as a result of the Development during the **construction phase** are predicted to have a **minor, short-term, adverse impact** for which **no significant effect** is concluded.

Disturbance during the **operational phase** is predicted to have a **negligible impact** and **no significant effect**.

Displacement impact during the **operational phase** is predicted to have a **minor adverse impact** (precautionary) and **no significant effect** is concluded for the Development.

Additional mitigation is proposed for ospreys (see **7.10 Mitigation**).

7.9.4.4 Collision (operation)

Osprey flight activity was recorded primarily in the vicinity of the identified nest sites, as would be expected, with relatively few flights passing through the proposed turbine area. The CRM analysis undertaken, which incorporates flights from within the turbine envelope plus a 300 m buffer, is considered precautionary. The mortality estimate was variable between the two years (0.498 to 0.963) and provides an average collision risk of 0.731 birds per annum. This is equivalent to 0.85% of the regional population (NHZ 10 and NHZ 21 populations combined) of 43 breeding pairs. Note this total excludes non-breeding birds, which nevertheless are likely to have contributed a small part to the collision risk estimate.

Survival rates for osprey (the proportion of birds surviving each year) are 60% for juvenile birds and 85% for adult birds. Therefore, assuming a regional population of 43 breeding pairs, it can be expected that in any one year 13 adult birds (15%) would not survive. The regional osprey population is increasing strongly, against a background level of mortality in the region of this magnitude.

The small addition to mortality within the regional population as a result of the Development may have a slight observable impact but it is considered highly unlikely to be sufficient to reverse the increasing population trend.

Collision impacts as a result of the Development are predicted to have a **minor adverse impact** on osprey during the operational phase and **no significant effect** is concluded.

Additional mitigation is proposed for ospreys (see **7.10 Mitigation**).

7.9.5 Goshawk

For goshawk, the potential impacts scoped in for assessment are potential disturbance and displacement impacts during construction and disturbance/ displacement and collision impacts during the operational phase of the Development.

7.9.5.1 Status

Goshawk is a Schedule 1 species, but has a favourable conservation status and is green-listed on BoCC (Stanbury *et al*., 2021). The breeding population given by Wilson *et al*. (2015) is for an estimated 12 pairs in NHZ 10, whilst the estimate is zero for NHZ 21. This is acknowledged as probably being highly conservative. As the baseline surveys have recorded goshawk as breeding within NHZ 21, the stated NHZ population estimates can indeed be concluded as being an under-estimate. The Scottish breeding population is estimated at 283 pairs (Eaton et al., 2023)[39], which is much greater than the national estimate of 103 pairs used to estimate the NHZ populations and might suggest that a more realistic estimate of 33 pairs is appropriate for the two NHZs combined (if an equivalent multiplier is applied).

The baseline surveys indicated that there are potentially three goshawk territories within the Site. During baseline surveys, breeding was confirmed for one pair in the southeast of the Site. The FLS data suggests this pair may have moved nest location east (away from the Development) the following year. For the second pair, in the southwest of the Site, no active nest was found but the data suggested territory occupancy. No evidence of breeding was gathered for the third potential territory during baseline surveys, but a bird was recorded in suitable habitat sufficiently distant from the other territories to suggest this was third territory. This area has also been used historically by goshawk, as confirmed by FLS data. Flight activity was sufficient to undertake CRM and the annual estimates for goshawk were calculated as being in the range of 0.064 to 0.159; an average estimate of 0.111 birds per annum.

Goshawk is classed as having medium (regional) importance.

7.9.5.2 Disturbance and Displacement (construction and operation)

Mitigation by design has sought to minimise potential disturbance impacts on goshawk. The disturbance buffer around nesting locations cited in Goodship and Furness (2022) of 300-500 m has been applied to the active nest located in 2022 (620 m from nearest proposed

[39] Eaton, M.A. & the Rare Breeding Birds Panel (2023). Rare Breeding Birds in the United Kingdom in 2021. British Birds 116: 615-676.

turbine), although the data suggests the same territory has alternative nest locations to the east and more distant from the Development. The buffer has also been applied to the unused (during survey) nest within the occupied territory in the southwest of the Site (500 m from nearest proposed turbine). It is acknowledged that for the latter territory any active nest was not identified during the baseline surveys and so remains "unbuffered", but the avoidance of the alternative nest ensures a nest site within the territory remains available. An active nest was not located in the third goshawk territory but of the known historical nest sites the closest to the Development lies more than 500 m from a proposed turbine; although the baseline data suggests the territory may now have shifted northeast (and away from the Development) (**Figure 7.7**).

Keyholing of the forest for the Development would minimise the loss of forestry cover within the Site and would leave the coupes containing the nests intact.

Based on the distance between identified and suspected nesting locations and the Development, it is anticipated that disturbance during construction would be avoided. Any new nest sites discovered during pre-construction surveys would be protected (see **7.7 Embedded Mitigation**).

Although it is not anticipated that nesting sites would be lost as a result of the Development, there is potential for displacement of goshawk from around turbines, although relevant literature on this topic could not be found. As a worst-case scenario, this displacement could result in a territory no longer being viable if a territory sufficiently overlaps with the turbine area. Based on the size and location of the Development in relation to the territory locations identified on Site, it is considered that if displacement did result in territory loss this would occur to one territory at most (**Figure 7.7**); that in the southwest of the Site. As goshawks hold exclusive territories, the remainder of the Site may not be able to "absorb" a displaced pair.

The loss of one territory would represent 8.3% of the regional population based on the NHZ estimates (Wilson *et al.*, 2015). However, as stated above, the suggested estimate of 33 pairs is considered a more likely regional estimate against which assessments should be made. The actual breeding population may in fact be higher than this, based on the Site holding three pairs and the large extent of similar habitat within NHZ 10 and NHZ 21. Using this higher estimate, the loss of one territory would equate to 3.0% of the regional breeding population; if it assumed that the territory is indeed lost and that the birds do not relocate to another suitable area of forest within the wider area.

It should be noted that, as with all birds nesting in commercial forestry, breeding locations would be subjected to rotational felling, thinning and planting in accordance with site management plans, and any impacts of the Development should be regarded in that context. Scotland's goshawk population has a favourable status, despite being overwhelmingly located in commercial forestry where extensive clearfelling within territories is widespread.

Disturbance impacts as a result of the Development, during both the construction and operational phases, and displacement impacts during the construction phase, are all predicted to have a **negligible adverse impact** on goshawk and **no significant effect** is concluded.

Displacement impacts during the operational phase are predicted to have a **minor adverse impact** on goshawk and **no significant effect** is concluded.

7.9.5.3 Collision (operation)

Despite goshawk territories being confirmed within the Site, collision risk was estimated to be relatively low. This is indicative of goshawk's typical behaviour of most flight activity being below the canopy (and below at-risk height). Assessed against the stated NHZ breeding population of 12 pairs, the mortality estimate of 0.111 deaths per year is equal to 0.463% of the regional breeding population. Assessing the collision impact against the higher regional population of 33 pairs, suggests a more realistic 0.168% of the regional breeding population being impacted per annum. Note that these regional population estimates do not include non-breeding birds, and immature birds accounted for some of the at-risk flights.

Survival rates in goshawk (the proportion surviving each year) are 40% for juvenile birds and 83% for adult birds[40]. An additional mortality of 0.168% is highly unlikely to be detectable within a breeding population with an existing annual mortality of 17% and so the current status of goshawk can be expected to remain unchanged.

On this basis, collision impacts as a result of the Development are predicted to have a **negligible adverse impact** on goshawk during the operational phase and **no significant effect** is concluded.

7.9.6 Moray and Nairn Coast SPA and Ramsar Site

The Moray and Nairn Coast SPA and Ramsar site is scoped in for assessment of impacts on osprey only. All other qualifying features have been scoped out from full assessment. The impacts for consideration are: disturbance and displacement during construction, and barrier effects, disturbance/ displacement and collision during the operational phase of the Development.

For brevity “designated area” is used in the assessment and the term is used to cover both designated sites (SPA and Ramsar).

7.9.6.1 Status

The designated area comprises two discrete areas, the nearest to the Site covering the lower reaches of the River Spey (that within approximately 5.5 km of the coast) and which is located 5 km to the northeast of the Site at its nearest point. The other area comprises Findhorn Bay and the Moray coast to the west. This part of the designated area is located over 22 km from the Site.

The SPA and Ramsar site citations[41,42] (based on the 2008-2012 five-year mean) state that the designated area supports seven breeding pairs of ospreys within the site (7% of the Great Britain (GB) population) and supports up to nine pairs within foraging range (4.5% of the GB population) (the mismatch in percentage values is not explained). The Joint Nature Conservation Committee (JNCC) Data Form[43] for the SPA gives a population of 16 breeding pairs (no separation of breeding and foraging birds). This is taken to supersede the 14 individuals (count from the early 1990s) stated in the Ramsar site Information Sheet[44].

7.9.6.2 Barrier Effect (operation)

There is potential for a barrier impact should the Development be located on a regularly used flight-path between active osprey nests and the designated area. The nearest part of the designated area is the lower stretch of the River Spey, 5 km to the northeast of the Site. It is assumed that there is no potential for the Development to have a barrier impact on the other part of the designated area around Findhorn Bay and Nairn coast, which is more than 22 km from the Site.

The two osprey nest locations on Site are located to the east of the Development and a direct commute northeast to the designated area would not need to cross the Development.

The eastern edge of the Development could, however, lie between the other identified nest (that located to the south of the Site) and the designated area; but this theoretical commuting route is not well used, as evidenced by the baseline data (confidential **Figures 7.6a** and **7.6b**). This suggests the designated area is not the key foraging area for this pair, with closer parts of the River Spey and the fishery in Glen of Rothes providing alternative foraging areas nearer to the nest site.

[40] Available from: https://www.bto.org/understanding-birds/birdfacts/goshawk (Accessed February 2025).

[41] Available from: https://www.nature.scot/sites/default/files/special-protection-area/8550/spa-citation.pdf (Accessed February 2025).

[42] Available from: https://www.nature.scot/sites/default/files/ramsar-site/8447/ramsar-site-citation.pdf (Accessed February 2025).

[43] Available from: https://jncc.gov.uk/jncc-assets/SPA-N2K/UK9001625.pdf (Accessed February 2025).

[44] Available from: https://rsis.ramsar.org/RISapp/files/RISrep/GB890RIS.pdf?language=en (Accessed February 2025).

There may be other breeding ospreys further to the south or southwest of the Site that have potential connectivity with the designated area and which could regularly pass across the Development but this was not indicated by the baseline surveys. It may be that any such commutes follow the obvious corridor provided by the Spey valley, rather than passing over the high ground of the Site.

Barrier impacts as a result of the Development are predicted to have a **negligible adverse impact** on osprey, as qualifying feature of the Moray and Nairn Coast and Ramsar site, during the operational phase. **No significant effect** on the designated area is concluded.

7.9.6.3 Disturbance and Displacement (construction and operation)

As the Site is located a minimum of 5 km from the designated area, there would be no disturbance or displacement impact to ospreys within the vicinity of the designated area. The only route to impact would be potential disturbance and displacement impacts to breeding birds at the nest and which are considered to have connectivity with the designated area. The nests in the vicinity of the Site are located 6.8 km to 9.6 km from the designated area. The core foraging range of osprey is 10 km and can be up to 20 km (SNH, 2016) and so ospreys breeding in the vicinity of the Site require consideration.

The flight activity recorded during baseline surveys provides little indication that the designated area is a core foraging area for the ospreys recorded nesting in the vicinity of the Development, with flights going to/ from nests in a variety of directions and no clear pattern of systematic commuting flights in the direction of the designated area. Therefore, an assumption that the ospreys on-Site are connected to the designated area, such that the birds are dependent on the foraging resource it provides, is considered very precautionary.

Two of the nests in the vicinity of the Development are located within potential disturbance distance during construction, these being 520 m and 630 m, respectively, from the nearest proposed turbine. These distances are 170 m-280 m above the minimum disturbance buffer distance (350m) recommended in guidance (Goodship and Furness, 2022)[45]. The third nest site is located above maximum disturbance distance from proposed turbines and the proposed substation. As the Site is commercial plantation with regular forestry operations, and as the network of tracks on Site have a relatively high usage for recreational activity, it can be concluded that the ospreys have some habituation and an existing tolerance of human activity, which should preclude the need for application of the maximum avoidance buffer (750 m), at least during the operational phase when activity on Site would be relatively low. This is supported by the fact the nests are located 180 m to 250 m from existing forest roads.

Disturbance remains a potential impact however during the construction phase, as clearly the level of potential disturbing activity on Site would be considerably more than during the baseline, in duration and intensity (visually and audibly). It is therefore possible that disturbance during the construction phase could impact breeding pairs close to construction works, which as a worst case scenario could result in abandonment of the nests during the breeding season(s) in which construction works are taking place. For the pair involved this would result in an unsuccessful breeding season, but this would not prevent the birds returning post-construction, thus maintaining the population of the designated area.

Following construction, the level of activity on Site would be much reduced and likely to fall back within the threshold of disturbance to which birds are already habituated. Infrastructure associated with the Development would be no nearer to the nest locations than existing forest tracks and roads. Therefore, operational disturbance is unlikely to have a negative impact on the existing nest sites, especially as any ground-level human activity in the vicinity of proposed turbines (or the substation) would be shielded from line of sight by trees and/ or topography.

However, although not expected, the physical presence of the operational turbines has potential to cause displacement to nests close to the Development, resulting in nest abandonment and relocation. Where relocation occurs in the local area the pair would remain within foraging range of the designated area.

[45] Goodship, N.M. and Furness, R.W. (MacArthur Green) (2022). Disturbance Distances Review: an updated literature review of disturbance distances of selected bird species. NatureScot Research Report 1283.

Disturbance and displacement impacts on osprey, as qualifying feature of the Moray and Nairn Coast and Ramsar site, as a result of the Development during the **construction phase** are predicted to have a **minor, short-term, adverse impact** for which **no significant effect** is concluded.

Disturbance during the **operational phase** is predicted to have a **negligible impact** and **no significant effect**.

Displacement impact during the **operational phase** is predicted to have a **minor adverse impact** (precautionary) on osprey, as a qualifying feature of the Moray and Nairn Coast and Ramsar site, and **no significant effect** is concluded for the Development.

Additional mitigation is proposed for ospreys (see **7.10 Mitigation**).

7.9.6.4 Collision (operation)

The mortality estimate calculated by CRM analysis used all at-risk flights recorded during baseline surveys. It is unknown whether all osprey flights through the surveyed area relate to birds associated with the designated area; for example, records may have included non-breeding birds and birds that breed within core range of the Site but not of the designated area. However, as the great majority of flight activity will have referred to birds with nests in the vicinity of the Site, it is appropriate to assess potential collision impacts against the breeding population of the designated area.

The mortality risk estimated by CRM analysis is for 0.731 birds a year. Assessed against the designated area breeding population of 16 pairs (32 birds), this estimate equates to the loss of 2.28% of this breeding population per annum. This increase in potential mortality may have a small observable impact on species abundance, but it is unlikely to change the status of osprey as a qualifying feature (i.e., to cause a decline in the population of ospreys breeding within foraging distance of the designated area).

The level of potential collision impact from the Development is predicted to have a **minor adverse impact** on osprey, as qualifying feature of the Moray and Nairn Coast and Ramsar site, and **no significant effect** is concluded.

Additional mitigation is proposed for ospreys (see **7.10 Mitigation**).

7.10 MITIGATION

Having undertaken the impact assessment, the following mitigation measures would be included as part of the Development. The measures relate to mitigation for breeding ospreys.

7.10.1 Relocation of an Osprey Nest

The baseline VP surveys showed that the high flight activity recorded on Site was very much associated with the presence of two osprey nests close to the Development (**Figures 7.6a** and **7.6b** (confidential)), particularly the nest to the east. It is reasonable to conclude that in the absence of the nest that the associated flight activity in that area would be greatly reduced, i.e., the birds are present in the vicinity of the Development solely because of their nesting locations.

Therefore, the osprey nest located within the Site, close to the eastern edge of the Development, would be relocated. The tree supporting the existing nest would be removed during the non-breeding season when not in use.

An array of artificial nesting platforms would be erected within the Site (see **7.10.2 Erection of Artificial Osprey Nest Platforms**) to enable the pair to relocate within the local area. The nearest identified location for an artificial platform, and which would be erected prior to construction and removal of the existing nest, would be located approximately 850 m from the current nest, and 1 km from the nearest proposed turbine (**Figure 7.8** (confidential)).

By relocating this nest, the pair would be expected to remain on Site, thus maintaining baseline conditions; whilst reducing the potential impact of the Development (**7.11 Although not** the primary aim of the HMP, the measures proposed for habitat enhancement would have a benefit for ornithological features. For example, the planting of native deciduous trees would benefit those species that favour broadleaved woodland habitats, adding to avian diversity on Site. Sympathetic woodland management, including leaving of fallen and

standing deadwood would create nest sites for birds, such as crested tit, and increase the food resource for invertebrate-eating bird species. Creation of additional riparian corridors for the benefit of fish would lead to an increase in food resource for piscivorous species, such as osprey.

Residual Effects).

Note that the nest to be removed is located on an isolated dead tree. Such a location would be expected to be naturally lost in the short-medium term through decay of the tree or as a result of winter storms. The relocation of the nest should be considered in this context.

The other identified osprey breeding locations would not be relocated; however, the provision of alternative nest sites may benefit these pairs.

7.10.2 Erection of Artificial Osprey Nest Platforms

The provision of artificial nest sites for osprey is a long recognised technique that has been an integral part of expanding the range of osprey within the UK[46]. Studies into the use of artificial platforms by ospreys have shown that as well as increasing a local breeding population, their use can also increase productivity, i.e., more chicks are fledged from artificial nest sites (e.g., Rhodes (1971)[47]; Houston and Scott (1992)[48]).

It is also recognised as a method to relocate ospreys, for example it has been used to successfully relocate a pair at an electricity substation in Perthshire[49] and at a proposed wind farm in Caithness (RWE, 2023)[50].

Therefore, there can be confidence that the provision of alternative nest sites would allow for the successful relocation of the osprey nest highlighted above (see **7.10.1 Relocation of an Osprey Nest**).

To maximise the likelihood of success, an array of artificial nest platforms would be erected within the Site. Confidential **Figure 7.8** illustrates the locations identified. The five locations presented should be regarded as being indicative only, as micro-siting would be required to best position each platform. The provisional locations have been identified based on positioning within parts of the forest that shall allow for the long-term retention of the platforms (recently clearfelled areas, areas with no planned felling for at least 25 years and areas of low impact silviculture management), whilst also avoiding on-Site tracks and other sources of potential disturbance as much as possible. Additionally, all locations are sited to the east and northeast of the Development to allow access to the River Spey valley and to minimise flight activity in the vicinity of proposed turbines.

For the newly established pair in the east of the Site, which settled in 2024 in an area to be clearfelled under the forest management plan, the siting of an artificial platform in this area would benefit this pair, should felling in the vicinity of the nest make the existing nesting location less favourable. Platforms here would be erected following the cessation of forestry operations in this area. All other artificial nest platforms would be in place ahead of construction of the Development.

The commitment to providing artificial nest platforms for osprey would be agreed through planning condition, in agreement with NatureScot, Moray Council and FLS, as part of the Habitat Management Plan (an outline of which is provided in TA A6.5).

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[46] Available from: https://www.roydennis.org/animals/raptors/osprey/nest-building/ (Accessed February 2025).

[47] Rhodes, L.I. (1972). Success of osprey nest structures at Martin National Wildlife Refuge Journal of Wildlife Management 36: 1296-1299.

[48] Houston, C.S. and Scott, F. (1992). The effect of man-made platforms on osprey reproduction at Loon Lake, Saskatchewan. Journal of Raptor Research 26: 152-158.

[49] Available from: https://www.ssen-transmission.co.uk/projects/project-map/alyth-275kv-substation--reactive-compensation/ (Accessed February 2025).

[50] RWE (2023). Golticlay Wind Farm Section 36 C Variation: Environmental Impact Assessment Report Volume 2a Main Report - Chapter 10 (Ornithology). Available from: https://golticlaywindfarm.com/wp-content/uploads/eiar-volume-2a-main-report-chapter-10-ornithology.pdf

After positioning, the artificial nest platforms would be monitored annually to monitor occupancy, for up to five years.

7.10.3 Application of Disturbance Buffers

As already set out above (see **7.7 Embedded Mitigation**), active nests at the time of construction would be protected under the measures set out in a BBPP and which would include pre-felling checks and the application of appropriate buffers around nests at risk of destruction or disturbance (Schedule 1 species).

For clarity, the maximum disturbance buffer of 750 m (Goodship and Furness, 2022) would be applied to osprey nests, where an active nest has been identified and until the breeding attempt has reached its conclusion. This would ensure that disturbance would be minimised during the period of greatest potential impact.

7.10.4 Habitat Enhancement

Although not the primary aim of the HMP, the measures proposed for habitat enhancement would have a benefit for ornithological features. For example, the planting of native deciduous trees would benefit those species that favour broadleaved woodland habitats, adding to avian diversity on Site. Sympathetic woodland management, including leaving of fallen and standing deadwood would create nest sites for birds, such as crested tit, and increase the food resource for invertebrate-eating bird species. Creation of additional riparian corridors for the benefit of fish would lead to an increase in food resource for piscivorous species, such as osprey.

7.11 RESIDUAL EFFECTS

With no additional mitigation measures proposed for greylag goose, pink-footed goose and goshawk, the findings of the impact assessments presented above (**7.9 Impact Assessment**) remain unchanged for these IOFs.

For osprey, and Moray and Nairn Coast SPA/ Ramsar site (osprey as qualifying feature), the mitigation measures described above (**7.10 Mitigation**) require a revised impact assessment to be carried out, taking into account the expected outcomes from the mitigation measures proposed.

7.11.1 Residual Impact Assessment

7.11.1.1 Osprey: Disturbance and Displacement (construction and operation)

During construction the maximum disturbance buffer recommended for osprey of 750 m (Goodship and Furness, 2022) would be implemented around known nest locations. Activity occurring outside this buffer would not be expected to initiate a disturbance response. Therefore, the potential for displacement from active nests (abandonment) would be avoided.

Residual disturbance and displacement impacts on osprey (and osprey as a qualifying feature of Moray and Nairn Coast SPA/ Ramsar site) as a result of the Development during the **construction phase** are reduced from **minor to negligible, short-term, adverse impacts**, with **no significant effect** concluded.

The removal of an osprey nest would clearly displace this pair from their existing breeding site. However, the provision of multiple artificial platforms, including at three locations within 2 km of the existing nest[51], provides reasonable confidence that the pair would relocate within the Site.

It is not expected that the other osprey pairs would be displaced during the operational phase. However, although located over 500 m from the nearest proposed turbine, it is acknowledged in the initial impact assessment that there is a small risk that the physical presence of the turbines could result in displacement of the pair in this location. In the unlikely event of this occurring, the provision of multiple alternative nest sites (see **7.10.2**

[51] Ospreys may move to an alternative nest within 2 km of an existing nest following breeding failure (Hardey *et al.,* 2013) and so a platform within this distance is considered more likely to be utilised.

Erection of Artificial Osprey Nest Platforms) increases the likelihood of any relocation being within the Site.

Ospreys do not defend a home range and can nest semi-colonially and close together (Hardey *et al*., 2013)[52]. Therefore, the relocation of a pair to one of the artificial platforms erected on Site would not prevent other pairs from also utilising one of the other platforms.

The residual displacement impact on osprey as a result of the Development during the **operational phase** is reduced from a **minor to a negligible adverse impact**, based on an expectation that any relocation of breeding pairs would be within the local area. Therefore, **no significant effect** is concluded.

The residual displacement impact on osprey, as a qualifying feature of Moray and Nairn Coast SPA/ Ramsar site, as a result of the Development during the **operational phase** is reduced from a **minor to a negligible adverse impact**, based on an expectation that any relocation of breeding pairs would remain within foraging range of the designated area. Therefore, **no significant effect** is concluded.

7.11.1.2 Osprey: Collision (operation)

The CRM analysis has been rerun in the absence of flights associated with the osprey nest that would be relocated (**Figure 7.6a** and **7.6b**). This is considered to be a reasonable approach as the baseline level of flight activity recorded during VP surveys would no longer characterise the situation on Site following removal of this nest. Although the occasional flight from a relocated nest may still pass through the CRZ, the updated CRM estimate is considered to be much more representative of the potential risk.

The revised mortality estimates calculated were 0.271 (Year 1) and 0.234 (Year 2), giving an average of 0.253 birds per year. This is a reduction from the 0.731 birds per year estimated without mitigation.

The updated mortality estimate is equivalent to 0.29% of the regional population (NHZ 10 and NHZ 21 populations combined) of 43 breeding pairs. No observable impact on the regional population would be expected for this magnitude of risk.

Collision impacts on osprey as a result of the Development are predicted to have a **negligible adverse impact** during the **operational phase** and **no significant effect** is concluded.

When assessed against the cited (but potentially outdated) osprey population of the Moray and Nairn Coast SPA/ Ramsar site (16 pairs), the updated mortality risk of 0.251 birds per year equates to 0.79% of the designated population. No observable impact on the population of the designated area would be expected from this magnitude of risk.

Collision impacts on osprey, as a qualifying feature of the Moray and Nairn Coast SPA and Ramsar site, as a result of the Development are predicted to have a **negligible adverse impact** during the **operational phase** and **no significant effect** is concluded.

7.11.2 Summary of Residual Impacts

A summary of the impact assessments for all IOFs is provided in **Table 7.10**.

Note that all impacts are adverse.

Table 7.10: Summary of residual effects on important ornithological features

IOF	Pre-mitigation Impact	Significance of Effect	Mitigation	Residual Impact	Residual Significance
Construction and Decommissioning Phases					
Disturbance and Displacement					
Capercaillie	Nil or negligible	Not significant	No mitigation	Nil or negligible	Not significant
Osprey	Minor	Not significant	Artificial nests	Negligible	Not significant

[52] Hardey, J., Crick, H., Wernham, C., Riley, H., Etheridge, B. and Thompson, D. (2013). Raptors: a field guide to survey and monitoring. Third Edition. The Stationary Office, Edinburgh.

IOF	Pre-mitigation Impact	Significance of Effect	Mitigation	Residual Impact	Residual Significance
			Disturbance buffer		
Goshawk	Negligible	Not significant	No mitigation	Negligible	Not significant
Moray and Nairn Coast SPA and Ramsar site (osprey)	Minor	Not significant	Artificial nests Disturbance buffer	Negligible	Not significant
Operational Phase					
Disturbance					
Capercaillie	Nil or negligible	Not significant	No mitigation	Nil or negligible	Not significant
Osprey	Negligible	Not significant	No mitigation	Negligible	Not significant
Goshawk	Negligible	Not significant	No mitigation	Negligible	Not significant
Moray and Nairn Coast SPA and Ramsar site (osprey)	Negligible	Not significant	No mitigation	Negligible	Not significant
Displacement					
Capercaillie	Nil or negligible	Not significant	No mitigation	Nil or negligible	Not significant
Osprey	Minor	Not significant	Nest relocation Artificial nests	Negligible	Not significant
Goshawk	Minor	Not significant	No mitigation	Minor	Not significant
Moray and Nairn Coast SPA and Ramsar site (osprey)	Minor	Not significant	Nest relocation Artificial nests	Negligible	Not significant
Barrier Effect					
Pink-footed goose	Negligible	Not significant	No mitigation	Negligible	Not significant
Osprey	Negligible	Not significant	No mitigation	Negligible	Not significant
Moray and Nairn Coast SPA and Ramsar site (osprey)	Negligible	Not significant	No mitigation	Negligible	Not significant
Collision					
Greylag goose	Negligible	Not significant	No mitigation	Negligible	Not significant
Pink-footed goose	Negligible	Not significant	No mitigation	Negligible	Not significant
Capercaillie	Negligible	Not significant	No mitigation	Negligible	Not significant
Osprey	Minor	Not significant	Nest relocation	Negligible	Not significant
Goshawk	Negligible	Not significant	No mitigation	Negligible	Not significant
Moray and Nairn Coast SPA and	Minor	Not significant	Nest relocation	Negligible	Not significant

IOF	Pre-mitigation Impact	Significance of Effect	Mitigation	Residual Impact	Residual Significance
Ramsar site (osprey)					

7.12 CUMULATIVE EFFECTS

7.12.1 Method for Assessing Cumulative Impacts

An assessment of potential impacts on IOFs as a result of the Development on its own is presented above (**7.9 Impact Assessment** and **7.11 Although not** the primary aim of the HMP, the measures proposed for habitat enhancement would have a benefit for ornithological features. For example, the planting of native deciduous trees would benefit those species that favour broadleaved woodland habitats, adding to avian diversity on Site. Sympathetic woodland management, including leaving of fallen and standing deadwood would create nest sites for birds, such as crested tit, and increase the food resource for invertebrate-eating bird species. Creation of additional riparian corridors for the benefit of fish would lead to an increase in food resource for piscivorous species, such as osprey.

Residual Effects). 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).

The spatial extent used to identify relevant projects for inclusion in the cumulative assessment is the regional scale. As the Site lies within both NHZ 10 (Central Highlands) and NHZ 21 (Moray Firth), a regional scale that includes projects within both NHZs is considered appropriate.

However, an assessment using projects within the relevant NHZs is not considered an appropriate approach for the Moray and Nairn Coast SPA and Ramsar site (osprey as listed feature). For this IOF, the assessment should consider projects based on potential connectivity to the designated area. This assessment is covered in the “in combination” assessment included in **TA A7.4: Information to Inform a Habitats Regulations Appraisal** and is not repeated here.

Relevant projects were identified using the search function within the planning portals of Moray Council[53], Highland Council[54] and the Scottish Government’s Energy Consents Unit (ECU)[55].

Only wind farm projects are included in the CIA, with no other projects identified for inclusion by consultees.

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; and
- Wind farm applications that have been formally submitted and are awaiting determination (noting that such projects may be subject to change in design).

Developments which have been withdrawn or refused are not considered. 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.

Small wind farm developments, including those of less than three turbines, or micro wind turbine projects, have also 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.

Not all IOFs and impacts assessed for the Development on its own (see **7.9 Impact Assessment**Ornithological Features Scoped In) are included within the CIA. IOFs and

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

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

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

associated impacts for inclusion or exclusion from the CIA are presented in **Table 7.11**, with justification provided.

Table 7.11: Impacts on Important Ornithological Features for inclusion in the Cumulative Impact Assessment

IOF	Impact	Included in CIA (y/n)?	Justification
Pink-footed goose Osprey	Barrier effect	No	The Development is not located on a regularly used "commuting" route for any ornithological feature; thus, no possible cumulative impact.
Greylag goose	Collision	No	The collision risk (<0.1 bird per year) predicted for the Development would contribute such a tiny addition to cumulative risk as to not warrant assessment.
Pink-footed goose	Collision	**Yes**	Although a negligible impact was predicted for the Development, the addition of 6.98 birds per year to the cumulative mortality risk could become significant.
Capercaillie	All impacts	No	No capercaillie are present within the vicinity of the Development; thus, no possible cumulative impact.
Osprey	Disturbance	No	A negligible (and unquantifiable) impact is predicted for the Development. This is not considered to be a risk that can be assessed cumulatively.
	Displacement	No	Any relocations are expected to result in no overall change in status. This is not considered to be a risk that can be assessed cumulatively.
	Collision	**Yes**	Although a negligible impact was predicted for the Development, the addition of 0.25 birds per year to the cumulative mortality risk could become significant.
Goshawk	Disturbance	No	A negligible (and unquantifiable) impact is predicted for the Development. This is not considered to be a risk that can be assessed cumulatively.
	Displacement	**Yes**	There is potential for displacement of one pair. The potential for multiple displacements from cumulative projects should be assessed.
	Collision	**Yes**	The CRM estimate predicted for the Development was low, but as it was >0.1 the potential for a more than negligible cumulative impact is assessed.
Moray and Nairn Coast SPA and Ramsar site (osprey)	All impacts	-	Due to the differing approach to assessment needed, this IOF is not assessed within the CIA. Instead see **TA A7.4: Information to Inform a Habitats Regulations Appraisal**.

Based on the search criteria set out above, the projects identified for inclusion in the CIA are listed in **Table 7.12**. Information was found for most projects.

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

Project (Wind Farm)	No. of Turbines	Development Stage	Relevant Data Available?
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	9	In Planning	Yes
Dunmaglass	33	Operational	No
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	No
Paul's Hill II	7	Consented	Yes
Rothes I	22	Operational	Limited
Rothes II	18	Operational	Limited
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			
No relevant projects identified.			

7.12.2 Cumulative Impact Assessment

7.12.2.1 Summary of cumulative impacts

The data from other projects for use in the CIA are presented in **Table 7.13**.

The information stated for other projects is presented without prejudice, noting that CRM analysis for other projects may have been undertaken in a way that is inconsistent with that completed for the Development.

Where a range of collision mortality estimates are presented for a project, the mean is presented. Where a species was recorded during baseline flight activity surveys but no at-risk flights were identified or very low activity meant that CRM was not undertaken for a particular project, a collision estimate of <0.001 has been used in the table. These values have not been included in the cumulative totals.

Impacts are residual impacts following mitigation, where relevant.

Table 7.13: Cumulative Impact Assessment for selected ornithological features

Wind Farm	Collision (annual mortality estimate)			Displacement
	Pink-footed goose	Osprey	Goshawk	Goshawk
Teindland Wind Farm (Development)	6.979	0.253	0.111	Potential loss of one pair

Wind Farm	Collision (annual mortality estimate)			Displacement
	Pink-footed goose	Osprey	Goshawk	Goshawk
Aberarder	0.025	0.038	0.006	No breeding close to project
Berry Burn/ Berry Burn Extension	0.124	0.024	0.009	No breeding close to project
Cairn Duhie	0.581	0.001	<0.001	No breeding close to project
Clash Gour	0.555	0.028	0.268	No displacement predicted
Cloiche	<0.001	<0.001	Not recorded	Not recorded
Corriegarth/ Corriegarth 2	0.003	<0.001	Not recorded	Not recorded
Culachy	0.001	<0.001	Not recorded	Not recorded
Dell	Not assessed	<0.001	Not recorded	Not recorded
Farr	Not assessed	<0.001	<0.001	No breeding close to project
Glen Kyllachy	<0.001	<0.001	<0.001	No breeding close to project
Hill of Glaschyle	<0.001	Not recorded	Not recorded	Not recorded
Kellas Drum	Not assessed	<0.001	0.023	No breeding close to project
Moy	Not assessed	Not assessed	Not assessed	No breeding close to project
Ourack	0.077	<0.001	0.303	No breeding close to project
Paul's Hill II	0.155	Not recorded	Not recorded	Not recorded
Rothes I	No information	No information	Not recorded	Not recorded
Rothes II	No information	No information	<0.001	No breeding close to project
Rothes III	4.510	<0.001	0.110	No breeding close to project
Stronelairg	<0.001	Not recorded	Not recorded	Not recorded
Tom nan Clach	0.580	<0.001	Not recorded	Not recorded
Tom nan Clach Extension	Not assessed	<0.001	<0.001	No breeding close to project

7.12.2.2 CIA – Pink-Footed Goose

Cumulative impacts are assessed for collision during the operational phase only.

The cumulative mortality estimate for pink-footed geese is 13.590 birds per annum. Based on the cited non-breeding population estimates for the two relevant NHZs, the regional population of pink-footed geese is 35,750 individuals; though this may now be an under-estimate of current numbers. The cumulative mortality estimate is equivalent to a maximum of 0.04% of the regional population. This represents an indiscernible increase in mortality to the regional population.

The population of pink-footed geese has shown a marked increase in recent decades, despite the growth in the number of wind farm developments within their range, and this would not be expected to change based on the results of the CIA.

Cumulative collision impacts are predicted to have a **negligible adverse impact** on pink-footed goose during the operational phase and **no significant effect** is concluded.

7.12.2.3 CIA – Osprey

Cumulative impacts for osprey are assessed for collision during the operational phase only.

The cumulative collision mortality estimate for osprey is 0.344 birds per annum. This is equivalent to 0.40% of the regional population, based on the estimate of 43 breeding pairs[56]. No observable impact on the regional population would be expected as a result of this level of risk.

Cumulative collision impacts are therefore predicted to have a **negligible adverse impact** on osprey during the operational phase and **no significant effect** is concluded.

7.12.2.4 CIA – Goshawk

Cumulative impacts are assessed for collision and displacement during the operational phase.

The cumulative collision mortality estimate for goshawk is 0.830 birds per annum. Assessing this level of risk against a regional estimate of 33 pairs, as used in the impact assessment for the Development on its own (see **7.9.5 Goshawk**), gives a level of mortality equivalent to 1.26% of the regional breeding population. This level of additional mortality within the regional population may have a very slight observable impact on species abundance but it is considered highly unlikely that it would result in species decline or a change of status within the region.

Cumulative collision mortality to goshawk is predicted to have a **minor adverse impact** during the operational phase and **no significant effect** is concluded.

No other projects in the region have predicted displacement of breeding goshawks. Therefore, the assessment for the Development on its own, that gave a precautionary conclusion of one pair being displaced, remains unchanged. Note, however, that an absence of pairs being displaced from other areas, at least as a result of wind farm projects, perhaps increases the likelihood of any displaced pairs being able to relocate within the region.

Cumulative displacement impacts during the operational phase are predicted to have a **minor adverse impact** on goshawk and **no significant effect** is concluded.

7.13 SUMMARY OF EFFECTS

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 Development on ornithological features.

IOFs have been identified, with full assessment undertaken for greylag goose, pink-footed goose, capercaillie, osprey, goshawk, and Moray and Nairn Coast SPA and Ramsar site. Potential impacts have been assessed as a result of the Development both on its own and cumulatively with other relevant projects.

Embedded mitigation measures have been taken into account when undertaking the assessments. Additional mitigation measures are included for osprey, including the creation of artificial nest platforms to be located within the Site and distant from the Development. Residual impacts following the addition of these mitigation measures have been included in the assessment.

For all IOFs, the impacts of the Development during the construction, operational and decommissioning phases have been concluded as being negligible, with the exception of minor (adverse) magnitude impacts predicted for displacement of goshawk and collision impacts on goshawk (cumulative impacts only). No significant effects have been predicted.

Table 7.14 provides a summary of the conclusions for the IOFs and impacts assessed.

Table 7.14: Summary of impacts

Residual Impact	Significance of Effect
IMPACTS OF DEVELOPMENT	
Greylag goose	

[56] For transparency, inclusion of the pre-mitigation mortality estimate for the Development, would produce a cumulative mortality risk of 0.816 birds per annum.

Residual Impact	Significance of Effect
Operational Phase - Collision	
Negligible	Not significant
Pink-footed goose	
Operational Phase – Barrier Effect	
Negligible	Not significant
Operational Phase - Collision	
Negligible	Not significant
Capercaillie	
Construction Phase/ Decommissioning Phase – Disturbance & Displacement	
Nil or negligible	Not significant
Operational Phase - Disturbance & Displacement	
Nil or negligible	Not significant
Operational Phase - Collision	
Nil or negligible	Not significant
Osprey	
Construction Phase/ Decommissioning Phase – Disturbance & Displacement	
Negligible	Not significant
Operational Phase - Disturbance & Displacement	
Negligible	Not significant
Operational Phase – Barrier Effect	
Negligible	Not significant
Operational Phase - Collision	
Negligible	Not significant
Goshawk	
Construction Phase/ Decommissioning Phase – Disturbance & Displacement	
Negligible	Not significant
Operational Phase - Disturbance	
Negligible	Not significant
Operational Phase - Displacement	
Minor	Not significant
Moray and Nairn Coast SPA and Ramsar Site (osprey only)	
Construction Phase/ Decommissioning Phase – Disturbance & Displacement	
Negligible	Not significant
Operational Phase - Disturbance & Displacement	
Negligible	Not significant
Operational Phase – Barrier Effect	
Negligible	Not significant
Operational Phase - Collision	
Negligible	Not significant
CUMULATIVE IMPACTS	
Pink-footed goose	

Residual Impact	Significance of Effect
Operational Phase - Collision	
Negligible	Not significant
Osprey	
Operational Phase - Collision	
Negligible	Not significant
Goshawk	
Operational Phase - Displacement	
Minor	Not significant
Operational Phase - Collision	
Minor	Not significant
Moray and Nairn Coast SPA and Ramsar Site	
see **TA A7.4: Information to Inform a Habitats Regulations Appraisal**	

7.14 STATEMENT OF SIGNIFICANCE

This Chapter has assessed the likely significance of effects of the Development on ornithological resources. The Development has been assessed as having the potential to result only in effects that are assessed as not significant.