Chapter 7 Ornithology

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List of Abbreviations

Abbreviation	Description
BDMP	Bird Disturbance Management Plan
BoCC	Birds of Conservation Concern
BTO	British Trust for Ornithology
CIEEM	Chartered Institute of Ecology and Environmental Management
CRAA	Collision Risk Analysis Area
CRM	Collision Risk Model
ECoW	Ecological Clerk of Works
EIA	Environmental Impact Assessment
EU	European Union
GEPM	Golden Eagle Population Model
GET	Golden Eagle Topographical
HRA	Habitats Regulation Appraisal
IOF	Important Ornithological Feature

NCI	Nature Conservation Importance
NHZ	Natural Heritage Zone
OBEMP	Outline Biodiversity Enhancement Management Plan
RSPB	Royal Society for the Protection of Birds
SNH	Scottish Natural Heritage
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
UK	United Kingdom
VP	Vantage Point

7. Ornithology

7.1. Executive Summary

7.1.1. Chapter 7 evaluates the potential effects of the Proposed Development on ornithology (including designated sites). The assessment is based on best practice guidance including the Chartered Institute for Ecology and Environmental Management's (CIEEM) Guidelines for Ecological Impact Assessment in the UK and Ireland. The scope of the ornithological assessment and baseline conditions were determined through a combination of desk study, targeted surveys, and consultation with relevant nature conservation organisations.

7.1.2. This process established ornithological features that could potentially be affected by the Proposed Development. No potential effects on statutory designated sites were identified. Golden eagle and merlin were identified to be breeding within the 2 km survey area. Black grouse were also identified to be present in the 1-5 km survey area with up to 11 lek areas located. Wader activity in the 500 m survey area was low with only curlew, golden plover and woodcock recorded during surveys and of these only a small number of golden plover were identified to be breeding.

7.1.3. The Proposed Development has been designed to minimise impacts on important ornithological interests as far as practicable. This has been achieved through embedded mitigation and the iterative design process. This process, combined with further commitments to certain mitigation measures pre-construction, during construction, and during operation allowed potential effects on several target species present to be scoped-out of the assessment. The following Important Ornithological Features (IOFs) were taken forward to the assessment stage: black grouse, golden eagle and golden plover.

7.1.4. Assessment of potential effects and their significance were determined through consideration of the sensitivity of the feature and the magnitude of change. The only potentially significant effect that was identified in the assessment was disturbance/displacement to black grouse during the construction phase, with all other effects during construction or operation on black grouse, golden eagle and golden plover predicted to be not significant. Cumulative effects were also considered and were not predicted to be significant.

7.1.5. A Biodiversity Enhancement Management Plan (BEMP) (Technical **Appendix 3.3**) is included as part of the Proposed Development which will further mitigate the effects on black grouse and provide additional enhancement measures. With the implementation of the BEMP, adverse effects on black grouse would be expected to reduce further through the restoration and enhancement of habitats. The implementation of the BEMP will also provide enhanced habitat for foraging golden eagle and breeding golden plover.

7.2. Introduction

7.2.1. This chapter assesses the potential for significant effects on ornithological features associated with construction, operation and decommissioning of the Proposed Development (see **Chapter 3: Project Description**). The specific objectives of the chapter are to:

- Describe the ornithological baseline conditions;
- Describe the assessment methodology and significance criteria used in completing the assessment on ornithological features;
- Assess the potential effects due to direct, indirect, and cumulative impacts;
- Describe the mitigation measures proposed to address any likely significant effects; and
- Assess the residual effects following the implementation of mitigation and enhancement.

7.2.2. The assessment has been carried out by MacArthur Green in accordance with NatureScot and Chartered Institute of Ecology and Environmental Management (CIEEM, 2018) guidelines. All staff contributing to this chapter have undergraduate and/or postgraduate degrees in relevant subjects, have extensive professional ornithological impact assessment experience, and hold professional membership of the and abide by the CIEEM Code of Conduct.

7.2.3. Effects on habitats and non-avian protected species are addressed separately in **Chapter 8: Ecology**.

7.2.4. This chapter is supported by the following technical appendices:

- Technical Appendix 7.1: Ornithology (including Annexes A to E);
- Technical Appendix 7.2: Confidential Ornithology; and
- Technical Appendix 7.3: Golden Eagle Population Model.

7.2.5. It is also supported by the following figures:

- Figure 7.1 Site Boundary and study areas;
- Figure 7.2 Vantage Points and Viewsheds: 2012-2014;
- Figure 7.3 Vantage Point and Viewshed: 2021-2022;
- Figure 7.4 Ornithological Designated Sites within 20 km;
- Figure 7.5a Black Grouse Lek Locations and Activity: 2012-2014;
- Figure 7.5b Black Grouse Lek Locations and Activity: 2022;
- Figure 7.6 Flight Activity: Black Grouse;
- Figure 7.7a Flight Activity: Golden Eagle 2012-2014;
- Figure 7.7b Flight Activity: Golden Eagle 2021-2022;
- Figure 7.8 Raptor Activity;
- Figure 7.9 Flight Activity: Hen Harrier;
- Figure 7.10 Flight Activity: Merlin;
- Figure 7.11 Flight Activity: Osprey;
- Figure 7.12 Flight Activity: Peregrine Falcon;
- Figure 7.13 Flight Activity: Red Kite;
- Figure 7.14 Wader Activity;
- Figure 7.15 Flight Activity: Golden Plover;
- Figure 7.16 Wildfowl Activity;
- Figure 7.17 Flight Activity: Greylag Goose;
- Figure 7.18 Flight Activity: Pink-Footed Goose;
- Figure 7.19 Flight Activity: Whooper Swan;
- Confidential Figure 7.2.1 Golden Eagle Activity and Nest Locations;
- Confidential Figure 7.2.2 Merlin Activity and Nest Locations;
- Confidential Figure 7.2.3 Golden Eagle Topographical (GET) Model;
- Confidential Figure 7.2.4 Golden Eagle Topographical (GET) Model and Golden Eagle Activity.

7.2.6. Figures and technical appendices are referenced in the text where relevant.

7.3. Legislation, Policy and Guidelines

Legislation

7.3.1. Relevant European Union (EU) legislation has been considered as part of this ornithological assessment. Of particular relevance is the following:

- EU Directive 2009/147/EC on the Conservation of Wild Birds ('Birds Directive');
- EU Directive 92/43/EEC on Conservation of Natural Habitats and of Wild Fauna and Flora ('Habitats Directive'); and
- EU Environmental Impact Assessment Directive 2014/52/EU.

7.3.2. The following national legislation, which has been amended as a consequence of EU exit (Scottish Government 2019, 2020), is also considered as part of the ornithology assessment:

- The Wildlife and Countryside Act 1981;
- The Conservation (Natural Habitats &c.) Regulations 1994 (as amended) ('The Habitats Regulations');
- The Nature Conservation (Scotland) Act 2004 (as amended); and
- The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (as amended).

Policy

7.3.3. This ornithological assessment considers the relevant aspects of Scottish policy, Planning Advice Notes and other relevant guidance. Of relevance to ornithology are the following policies:

- UK Post-2010 Biodiversity Framework (2012);
- Scottish Biodiversity Strategy to 2045;
- Scottish Government (2000). Planning Advice Note 60: Planning for Natural Heritage;
- Scottish Government (2017). Planning Advice Note 1/2013-Environmental Impact Assessment, Revision 1.0;
- National Planning Framework 4 ('NPF4') (February 2023);
- The Highland Nature Biodiversity Action Plan 2021 to 2026; and
- The Scottish Biodiversity List.

Guidance

7.3.4. Guidance on the following topics has also been considered:

- Environmental impact assessment: NatureScot (SNH 2016a, 2018a, 2018b, NatureScot 2020a), CIEEM (2018), SERAD (2000);
- Designated sites: SNH (2016b), European Commission (2010);
- Collision risk modelling: SNH (2000, 2018c), Band *et al.* (2007);
- Cumulative assessments: SNH (2018d);
- Bird populations/species specific guidance: Stanbury *et al.* (2021), SNH (2014, 2017), Pearce-Higgins (2021); and
- Construction and birds: SNH (2016c).

7.4. Consultation

7.4.1. In undertaking the assessment, consideration has been given to the scoping responses and other consultation which has been undertaken as detailed in **Table 7.1.**

Table 7.1 – List of Consultee Responses

Consultee	Consultation Response	Applicant Action
NatureScot Pre-Scoping Consultation 30th August 2021	NatureScot (NS) agrees that a single year of additional survey work is likely to be sufficient given the previous survey work, the species present in 2012-2014, and the proposal's location in relation to designated sites. NS advise that Golden Eagle Topographical (GET) modelling should be undertaken as part of the updated assessment. Information e.g. satellite tag data, post-construction monitoring for existing wind farms and any survey undertaken for nearby proposals should be considered. White-tailed eagles and osprey may show much more flight activity than in the 2012-14 surveys.	Additional year of bird surveys was undertaken between October 2021 and August 2022. GET modelling was undertaken and the results are shown on **Confidential Figure 7.2.3**. Records of all target species (including osprey and white-tailed eagle) are summarised below.
The Highland Council Pre-Application Consultation Feedback 1st December 2021	Survey work should follow NatureScot recommended guidance. Impacts to species associated with Special Protection Areas (SPAs) should be assessed against the conservation objectives for the site. Impacts to wider countryside species (i.e. those not connected to a protected area) should be assessed against the relevant Natural Heritage Zone (NHZ). A cumulative assessment will also need to be fully considered in relation to birds. Consideration of the possible effects of turbine lighting on birds may also be required.	Surveys all followed NatureScot guidance available at the time of the surveys. Noted. A cumulative assessment is provided in this chapter. Consideration of turbine lighting is provided in the assessment.
RSPB Scotland Scoping Response 14th March 2022	No comments.	N/A
NatureScot Scoping Response 28th March 2022	NS were in general "satisfied with the proposed survey methodology and proposed scope of assessment". NS advises that common scoter from the West Inverness-shire Lochs SPA and the Glendoe Lochans Site of Special Scientific Interest ('SSSI') should be included within the scope of assessment. Consideration should be given to the theoretical assessments undertaken for the Beinneun and Stronelairg wind farms.	Noted (n.b. NatureScot's response is on the basis of the inclusion of the 2012-2014 data as noted in row 1 of this table). Consideration of common scoter in relation to the West Inverness-shire Lochs SPA and Glendoe Lochans SSSI is provided in the Designated Sites section below.
The Highland Council Scoping Response	The Environmental Impact Assessment ('EIA') Report chapter must provide a baseline survey of the bird interest on site. It needs to be categorically established which species are present on the site, and where, before a future application is submitted. It is expected that the EIA Report will address	Records of all target species (including Schedule 1 species) recorded during baseline surveys are summarised below and breeding activity of target

Consultee	Consultation Response	Applicant Action
7th April 2022	whether or not the development could assist or impede delivery of elements of relevant Biodiversity Action Plans. The presence of protected species such as Schedule 1 Birds must be included and considered as part of the planning application process, not as an issue which can be considered at a later stage. The EIA Report should address the likely impacts on the nature conservation interests of all the designated sites in the vicinity of the Proposed Development. It should provide proposals for any mitigation that is required to avoid these impacts or to reduce them to a level where they are not significant. The potential impact of the development proposals on other designated areas such as SSSI's should be carefully and thoroughly considered and, where possible, appropriate mitigation measures outlined in the EIA Report.	species was considered during the design process. Consideration of potential impacts on statutory designations with ornithological features within 20 km has been considered within the chapter.
Energy Consents Unit Scoping Response 3rd May 2022	It is recommended that decisions on bird surveys – species, methodology, vantage points, viewsheds and duration – site specific and cumulative – should be made following with The Highland Council, NatureScot and RSPB Scotland. The Highland Council, RSPB Scotland and NatureScot should be contacted to discuss and agree designated sites to be included in the EIA Report and the survey work and further in-depth modelling and research to be undertaken.	Noted.

7.5. Assessment Methods and Significance Criteria

Scope of Assessment

7.5.1. This chapter considers any impacts of construction, operation and decommissioning of the Proposed Development upon those ornithological features identified during the review of desk-based information and field surveys. The following identified potential impacts upon ornithological features are assessed:

- Direct temporary and permanent habitat loss for birds through construction and operation of the Proposed Development;
- Displacement of birds from the Proposed Development and its surrounding area due to construction and decommissioning disturbance, turbine operation, maintenance, and visitor disturbance. This also includes potential barriers to commuting or migrating birds due to the presence of the Proposed Development turbines;
- Habitat modification due to change in land type or changes in hydrological regime, and consequent impacts on bird populations; and
- Death or injury of birds through collisions with turbine blades, or fences (if any) associated with the Proposed Development.

7.5.2. The chapter also assesses the potential for additional cumulative impacts when considered in addition to other consented or Proposed Developments which are subject EIA.

7.5.3. The assessment is based on the Proposed Development as described in **Chapter 3: Project Description**.

Assessing Wider-Countryside Ornithological Features

7.5.4. The evaluation for wider-countryside features (i.e., features unrelated to SPAs, but including Sites of Special Scientific Interest ('SSSIs') and Ramsar Sites) has been made using the following process:

- Identifying the potential impacts associated with the Proposed Development on an ornithological feature;
- Considering the likelihood of occurrence of potential impacts on an ornithological feature;
- Defining the sensitivity of a feature to an impact from its Nature Conservation Importance ('NCI') and conservation status;
- Establishing the magnitude of the impact (both spatial and temporal);
- Based on the above criteria, making a judgement as to whether or not the resultant effect on an ornithological feature is significant with respect to the EIA Regulations;
- If a potential effect is determined to be significant, suggesting measures to mitigate or compensate the effect where required; and
- Considering residual effects after mitigation, compensation and/or enhancement.

Habitats Regulations Appraisal (HRA) Process

7.5.5. The method for assessing the likely significant effects on a European site (in this context, an SPA) is different from that outlined above for wider-countryside ornithological interests. This is based on the Habitats Directive, which is transposed into domestic legislation by the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended in Scotland) Regulation 48 and includes a number of steps to be taken by the competent authority before granting consent (these are referred to here as an HRA). In order of application, the first four are:

- Step 1: consider whether the proposal is directly connected to or necessary for the management of the SPA (Regulation 48(1)(b)).
- if not, Step 2: consider whether the proposal (alone or in combination) is likely to have a significant effect on the SPA (Regulation 48(1)(a)).
- if so, Step 3: make an Appropriate Assessment of the implications for the SPA in view of that SPA's conservation objectives (Regulation 48(1)(a)).
- Step 4: consider whether it can be ascertained that the proposal will not adversely affect the integrity of the SPA ("Integrity Test") having regard to the manner in which it is proposed to be carried out or to any conditions or restrictions subject to which they propose that the consent, permission or other authorisation should be given (Regulation 48(5) and 48(6)).

7.5.6. It can clearly be established that the Proposed Development does not meet the criteria for Step 1. Where likely significant effects have been identified (Step 2), the results of baseline surveys and scientific conclusions presented in this chapter are therefore used to inform the HRA process, and allow the competent authority, in this case, the Scottish Ministers, to conduct an Appropriate Assessment (Step 3), and to conclude whether any adverse effects on site integrity can be ascertained (Step 4) if required.

Assessing the Sensitivity of Features

7.5.7. The sensitivity of ornithological features on or near to the Proposed Development site is assessed in line with best practice guidance, legislation, statutory designations and/or professional judgement.

7.5.8. Determination of the level of sensitivity of an ornithological feature is based on a combination of the feature's NCI and conservation status. There are three levels of NCI as detailed in **Table 7.2.**

Table 7.2 – Determining Factors of a Feature's Nature Conservation Importance

Importance	Description
High	Populations receiving protection by an SPA, proposed SPA, Ramsar Site, SSSI or which would otherwise qualify under selection guidelines. Species present in nationally important numbers (>1 % national breeding or wintering population).
Medium	The presence of breeding species listed on Schedule 1 of the Wildlife and Countryside Act 1981. The presence of species listed in Annex I of the Birds Directive (but population does not meet the designation criteria under selection guidelines). The presence of rare, Red-listed breeding species noted on the latest Birds of Conservation Concern ('BoCC') Red list (Stanbury *et al.* 2020). Regularly occurring migratory species, which are either rare or vulnerable, or warrant special consideration on account of the proximity of migration routes, or breeding, moulting, wintering or staging areas in relation to the Proposed Development. Species present in regionally important numbers (>1 % regional breeding population).
Low	All other species' populations not covered by the above categories.

7.5.9. Important Ornithological Features ('IOFs', as per CIEEM 2018) to be assessed for the purposes of the EIA Report, are taken to be those species of high or medium NCI.

7.5.10. As defined by NatureScot (SNH 2018a), the conservation status of a species is "*the sum of the influences acting on it which may affect its long-term distribution and abundance, within the geographical area of interest*". Conservation status is considered by NatureScot (SNH 2018a) to be 'favourable' under the following circumstances:

- "*population dynamics indicate that the species is maintaining itself on a long-term basis as a viable component of its habitats;*
- *the natural range of the species is not being reduced, nor is likely to be reduced for the foreseeable future;* and
- *there is (and probably will continue to be) a sufficiently large habitat to maintain its population on a long-term basis*."

7.5.11. NatureScot (SNH 2018a) recommends that "*the concept of favourable conservation status of a species should be applied at the level of its Scottish population, to determine whether an impact is sufficiently significant to be of concern. An adverse impact on a species at a regional scale (within Scotland) may adversely affect its national conservation status*". Thus, "*An impact should therefore be judged as of concern where it would adversely affect the existing favourable conservation status of a species or prevent a species from recovering to favourable conservation status, in Scotland*."

7.5.12. In the case of non-designated sites in Scotland, the relevant regional context for many breeding species is considered to be the appropriate Natural Heritage Zone ('NHZ', SNH 2002) which the site falls within. The majority of the Proposed Development is within NHZ 10 (Central Highlands), but the access route and a single turbine would be just within the boundary of NHZ 7 (northern Highlands) (**Figure 7.1**). For the purposes of this assessment and based on most likely impacts being associated with bird populations to the south of the Great Glen, effects are considered within the context of the NHZ 10 populations only.

7.5.13. For wintering or migratory species, the national UK population or flyway population is considered to be the relevant scale for determining effects on the conservation status, and this approach is applied here.

Assessing the Magnitude of Impact

7.5.14. An impact is defined as a change of a particular magnitude to the abundance and/or distribution of a population as a result of the Proposed Development. Impacts can be adverse, neutral, or beneficial.

7.5.15. In determining the magnitude of impacts, the resilience of a population to recover from temporary adverse conditions is considered in respect of each potentially affected population.

7.5.16. The sensitivity of individual species to anthropogenic activities is considered when determining spatial and temporal magnitude of impact and is assessed using guidance described by Goodship & Furness (2022).

7.5.17. Impacts are judged in terms of magnitude in space and time. There are five levels of spatial and temporal effect magnitude as detailed in **Table 7.3** and **Table 7.4** respectively.

Table 7.3 – Spatial Magnitude of Impact

Spatial Magnitude	Description
Very high	Total/near total loss of a bird population due to mortality or displacement. Total/near total loss of productivity in a bird population due to disturbance. Guide: >80 % of population lost or increase in additive mortality.
High	Major reduction in the status or productivity of a bird population due to mortality or displacement or disturbance. Guide: 21-80 % of population lost or increase in additive mortality.
Medium	Partial reduction in the status or productivity of a bird population due to mortality or displacement or disturbance. Guide: 6-20 % of population lost or increase in additive mortality.
Low	Small but discernible reduction in the status or productivity of a bird population due to mortality or displacement or disturbance. Guide: 1-5 % of population lost or increase in additive mortality.
Negligible	Very slight (or no discernible) reduction in the status or productivity of a bird population due to mortality or displacement or disturbance. Reduction barely discernible, approximating to the "no change" situation. Guide: <1 % of population lost or increase in additive mortality.

Table 7.4 – Temporal Magnitude of Impact

Temporal Magnitude	Description
Permanent	Effects continuing indefinitely beyond the span of one human generation (taken as approximately 25-30 years), except where there is likely to be substantial improvement after this period. Where this is the case, long-term may be more appropriate.
Long-term	Approximately 15-25 years or longer (see above).
Medium-term	Approximately 5-15 years.
Short-term	Up to approximately 5 years.
Negligible	<12 months.

Criteria for Assessing Significance

7.5.18. The potential significance of effect was determined through a standard method of assessment based on professional judgement, considering both the sensitivity of a feature and magnitude of impact as detailed in **Table 7.5**. **Major** and **moderate** effects are considered 'significant' in the context of the EIA Regulations.

Table 7.5 – Determining Significance of Effects

Significance of Effect	Definition
Major	The impact is likely to result in a long-term significant effect on the integrity of a feature.
Moderate	The impact is likely to result in a medium term, potentially significant effect on the integrity of a feature.
Minor	The impact is likely to affect a feature at an insignificant level by virtue of its limitations in terms of duration or extent, but there will probably be no effect on its integrity.
Negligible	No material impact.

Assessing Cumulative Effects

7.5.19. Cumulative effects are assessed in **Section 7.10** and present information about the potential impacts of the Proposed Development combined with other operational, consented or proposed wind farm projects located within NHZ 10.

7.5.20. NatureScot (SNH 2018d) has provided guidance on assessing the cumulative effects on birds. This assessment follows the principles set out in that guidance.

7.5.21. Cumulative effects may include cumulative disturbance-displacement, collision mortality, habitat loss or barrier effects. Some cumulative effects, such as collision risk, may be summed quantitatively, but according to NatureScot (SNH 2018d) "In *practice, however, some effects such as disturbance or barrier effects may need considerable additional research work to assess impacts quantitatively. A more qualitative process may have to be applied until quantitative information becomes available for developments in the area, e.g., from post-construction monitoring or research*".

7.6. Baseline Conditions

Survey and study areas

7.6.1. A range of surveys were employed to accurately record baseline ornithological conditions within the site and appropriate survey buffers. Terms referred to are as follows:

- 'survey area' is defined as the area covered by each survey type at the time of survey; and
- 'study area' is defined as the area of consideration of impacts on each species at the time of assessment and as the area used for any desk-based study (**Figure 7.1**).

7.6.2. The spatial extent of each survey area is detailed in **Technical Appendix 7.1: Ornithology**.

7.6.3. The ornithology assessment considers the following study areas which are based on the final turbine layout and associated infrastructure (**Figure 7.1**, with the exception of the cumulative NHZ scale as these are pre-defined by NatureScot):

- Designated sites – the Proposed Development and a 20 km study area buffer (from the proposed turbines) (based on the greatest foraging range for any species, as provided in SNH 2016b) (**Figure 7.4**);
- Collision risk modelling – the results of the flight activity surveys have been used to inform collision modelling. A Collision Risk Analysis Area ('CRAA') has been created using a 500 m buffer around the proposed turbine locations to create a wind farm area (as per relevant guidance, SNH 2017) (see **Figure 7.2**, **Figure 7.3** and subsequent relevant figures);
- Scarce breeding birds[1] – the Proposed Development and a 2 km (turbines) / 800 m (access track) study area buffer (SNH 2017) (**Figure 7.1**);
- Black grouse – the Proposed Development and a 1.5 km (turbines) / 750 m (access track) study area buffer (SNH 2017) (**Figure 7.1**);
- Breeding upland waders and wintering waders, raptors, owls and wildfowl – the Proposed Development and a 500 m study area buffer (around the proposed turbine locations and infrastructure) (SNH 2017) (**Figure 7.1**);
- Cumulative assessment – as per NatureScot guidance (SNH 2018b), the NHZ 10 level is considered practical and appropriate for breeding species of wider countryside interest.

Desk Study

7.6.4. The following data sources were considered as part of the assessment:

- NatureScot SiteLink website[2] for designated site information;
- Highland Raptor Study Group ('HRSG') for historic raptor breeding data; and
- Various EIA reports and monitoring documents for wind farm projects within NHZ 10.

Field Surveys

7.6.5. Fieldwork within and surrounding the site was undertaken from October 2012 to August 2014 (undertaken by MacArthur Green for the previous Proposed Development EIA submission) and October 2021 to August 2022 (undertaken by MacArthur Green for the Proposed Development) and was confirmed to be appropriate in consultation with NatureScot (**Table 7.1**). This covers three breeding seasons (2013, 2014 and 2022) and three non-breeding seasons (2012/2013, 2013/2014 and 2021/2022). It should be noted that the complete baseline dataset for the

[1] Scarce breeding birds are those listed on Annex 1 of the EU Birds Directive or Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) and in the case of the Proposed Development consists of any raptor and owl species listed on either Annex 1 or Schedule 1.
[2] https://sitelink.nature.scot/home (accessed July 2023).

previous Proposed Development EIA submission was purchased by the Applicant and is included as part of the baseline dataset for this submission.

7.6.6. The following surveys were undertaken (see **Technical Appendix 7.1: Ornithology** for details):

- Flight activity surveys – October 2012 to August 2014 and October 2021 to August 2022;
- Scarce breeding bird surveys – spring/summer 2013, 2014 and 2022;
- Black grouse surveys – spring 2013, 2014 and 2022;
- Breeding bird surveys – spring/summer 2013, 2014 and 2022; and
- Winter walkover surveys– autumn/winter 2012/2013, 2013/2014 and 2021/2022.

7.6.7. Field surveys were conducted following various revisions of the NatureScot survey guidance (SNH 2010, 2013, 2014, 2017) depending on survey date (refer to **Technical Appendix 7.1: Ornithology Annex B** for details of the survey methodologies and year specific survey areas).

Designated Sites

7.6.8. There are no statutory designations with ornithological features within the Proposed Development site. The desk-based study has identified three SPAs and four SSSIs (three of which underpin the SPAs) within 20 km of the Proposed Development (**Figure 7.4**). Note that the distances provided below are to the nearest proposed turbine.

- Loch Knockie and nearby Lochs SPA, 3.7 km to the nearest proposed turbine (underpinned by Knockie Lochs SSSI, Glendoe Lochans SSSI), **Table 7.6**;
- West Inverness-shire Lochs SPA, 7.5 km to the nearest proposed turbine (underpinned by West Inverness-shire Lochs SSSI), **Table 7.7**;
- Creag Meagaidh SPA, 10 km to the nearest proposed turbine (underpinned by Creag Meagaidh SSSI), **Table 7.8**; and
- Monadhliath SSSI, 14.7 km, to the nearest proposed turbine, **Table 7.9.**

Table 7.6 – Qualifying Features of the Loch Knockie and nearby Lochs SPA (and underpinning Knockie Lochs SSSI* and Glendoe Lochans SSSI^)

Feature	Qualifying Feature Category	Condition	Description
Slavonian grebe, breeding	SPA, SSSI*^	Unfavourable no change: July 2002	Supports a breeding population of European importance (1992 to 1995, up to six pairs/10 % of the GB population).
Common scoter, breeding	SSSI^	Favourable maintained: March 2005	Supports a breeding population of national importance (two pairs, 4 % of the British population).

Table 7.7 – Qualifying Features of the West Inverness-shire Lochs SPA (and underpinning West Inverness-shire Lochs SSSI)

Feature	Qualifying Feature Category	Condition	Description
Black-throated diver, breeding	SPA, SSSI	Favourable maintained: June 2010	Supports a breeding population of European importance (average between 1990 and 2005, 6.6 pairs/3.4 % of the maximum estimate of the GB population).
Common scoter, breeding	SPA, SSSI	Unfavourable declining: August 2018	Supports a breeding population of European importance (average between 1994-2000 and 2004-2006, 7.8 pairs/8.2 % of the GB population).

Table 7.8 – Qualifying Features of the Creag Meagaidh SPA (and underpinning Creag Meagaidh SSSI)

Feature	Qualifying Feature Category	Condition	Description
Dotterel, breeding	SPA	Unfavourable declining: July 2011	Supports a breeding population of European importance (1987 to 1994, average of 23 pairs/3 % of the British population). SPA is considered an important spring staging area for dotterel that breed in Scotland and Scandinavia.
Breeding bird assemblage	SSSI	Favourable maintained: June 2013	Supports a varied breeding bird assemblage that includes golden eagle, black grouse, ring ouzel, twite and dotterel.

Table 7.9 – Qualifying Features of the Monadhliath SSSI

Feature	Qualifying Feature Category	Condition	Description
Dotterel, breeding	SSSI	Unfavourable no change: July 2011	Breeding population of national importance.
Breeding bird assemblage	SSSI	Favourable maintained: May 2022	Supports a range of breeding upland birds including raptors, golden plover, dunlin, ring ouzel, wheatear, stonechat, red grouse, meadow pipit and dipper.

7.6.9. On the basis of the species listed on the Creag Meagaidh SPA (and associated SSSI) and Monadhliath SSSI, and the distance to the Proposed Development there is considered to be no potential for connectivity. Consequently, the Creag Meagaidh SPA (and associated SSSI) and Monadhliath SSSI are scoped out of the assessment as no likely significant effects on the SPA are predicted.

7.6.10. It has been identified that there is potential for connectivity between Loch Knockie and nearby Lochs SPA (and associated SSSIs) and West Inverness-shire Lochs SPA (and associated SSSI) and the Proposed Development in relation to the common scoter population (refer to NatureScot's Scoping consultation response in **Table 7.1**). Available guidance on connectivity distances for SPAs (SNH 2016b) does not provide a defined distance and so a review based on the landscape and known species behaviour has been undertaken. Breeding common scoter tend to be associated with upland waterbodies and Forrester *et al.* (2012) note that "*In Caithness and Sutherland, it* [common scoter] *selects small, shallow, peaty lochs or bog pool systems within open blanket bog, although preferring those with a pH above 6 and with slightly elevated nutrient status. In the west Highlands, much larger but relatively nutrient-poor lochs at higher altitudes are preferred*". There are no suitable waterbodies (i.e., bog pools or lochs) located within the site or immediately adjacent to the site and so it can be concluded that common scoter associated with either SPA would not be displaced from potential breeding/foraging habitat. Furthermore, in the wider context of movements of common scoter between the composite parts of the two SPAs, the Proposed Development is not considered to present a 'barrier' to any movement as it is situated to the south of the most southern parts of the Loch Knockie and nearby Lochs SPA and West Inverness-shire Lochs SPA (**Figure 7.4**). Consequently, there is not considered to be any potential for a likely significant effect upon either SPA as a consequence of the Proposed Development and Loch Knockie and nearby Lochs SPA and West Inverness-shire Lochs SPA are scoped out of the assessment.

Flight Activity Summary

7.6.11. A summary of all target species recorded during flight activity surveys at the site is presented in **Table 7.10** and **Table 7.11**. This summarises all flights observed during the baseline periods (October 2012 and August 2014 and October 2021 and August 2022) regardless of the location of the flights in relation to the Proposed Development. For further details of the flight activity surveys, refer to **Technical Appendix 7.1: Ornithology**.

7.6.12. A summary of the collision risk model results is presented in **Table 7.12** (refer to **Technical Appendix 7.1: Ornithology Annex E** for detailed results). Five species (black grouse, golden plover, merlin, osprey and red kite) were recorded during flight activity surveys, but no flights were considered to be 'at-risk' (i.e., the flights were outside of the CRAA and associated viewshed and/or were only recorded flying below/above the rotor swept area) and are therefore not included in **Table 7.12.**

Table 7.10 – Target Species Recorded During Flight Activity Surveys, 2012-14

Species	Total Number of Flights Recorded	Total Number of Birds Recorded	Total Bird Seconds[3] Recorded
Black grouse	18	90	2984
Golden eagle	187	230	80445
Golden plover	6	7	92
Greylag goose	24	522	87839
Hen harrier	5	5	1781

[3] Bird seconds are calculated for each observation as the product of flight duration and number of individuals. This has then been summed to provide the total bird seconds for each species recorded over the entire survey period.

Species	Total Number of Flights Recorded	Total Number of Birds Recorded	Total Bird Seconds[3] Recorded
Merlin	13	15	646
Osprey	1	1	420
Peregrine falcon	16	16	2569
Pink-footed goose	4	56	9765
Red kite	1	1	1380
Whooper swan	9	94	34434

Table 7.11 – Target Species Recorded During Flight Activity Surveys, 2021-2022

Species	Total Number of Flights Recorded	Total Number of Birds Recorded	Total Bird Seconds[3] Recorded
Black grouse	1	9	252
Golden eagle	7	9	1397

Table 7.12 – Predicted Collision Rates

Species	Mean Breeding Season[4]	Mean Non-Breeding Season[5]	Mean Annual	Number of Years per Collision
Golden eagle	0.0431	0.1028	0.1459	6.9
Greylag goose	0	0.0231	0.0231	43
Hen harrier	0.0001	0	0.0001	7,156
Peregrine falcon	0	0.0061	0.0061	165
Pink-footed goose	0	0.0012	0.0012	821
Whooper swan	0	0.0002	0.0002	5,994

[4] Calculated by taking the average of the 2013, 2014 and 2022 breeding season collision estimates (refer to **Technical Appendix 7.1: Ornithology** for a breakdown per season).
[5] Calculated by taking the average of the 2012/2013, 2013/2014 and 2021/2022 non-breeding season collision estimates (refer to **Technical Appendix 7.1: Ornithology** for a breakdown per season).

Black Grouse

7.6.13. Surveys in 2013, 2014 and 2022 identified 11 lek areas during the baseline surveys (summarised in **Table 7.13**, with all black grouse records shown on **Figure 7.5a** and **Figure 7.5b**). Black grouse activity was highest in 2013 with peak counts of 11 males and seven females and up to eight lek areas in use. Surveys in 2014 and 2022 identified less active lek areas (five and four respectively) and also lower peak counts (nine males and one female in 2014 and three males and no females in 2022). Overall, lek 3 and lek 4 appear to be key lekking areas with the highest attendance and presence in multiple years. Female attendance at leks was generally low and not recorded at all lek areas.

Table 7.13 – Black Grouse Leks 2013, 2014 and 2022: Maximum Counts

Lek	2013	2014	2022
1	2 males, 0 females (4 records)	-	2 males, 0 females (1 record)
2	1 male, 0 females (1 record)	-	3 males, 0 females (1 record)
3	11 males, 5 females (5 records)	6 males, 0 females (2 records)	2 males, 0 females (1 record)
4	10 males, 0 females (10 records)	6 males, 0 females (3 records)	-
5	2 males, 0 females (2 records)	-	-
6	1 male, 0 females (1 record)	1 male, 0 females (1 record)	-
7	2 males, 0 females (1 record)	-	-
8	2 males, 0 females (1 record)	-	-
9	-	2 males, 0 females (2 records)	-
10	-	2 males, 0 females (2 records)	-
11	-	-	1 male, 0 females (1 record)

7.6.14. Flight activity surveys recorded 19 flights (**Tabel 7.10** and **Table 7.11, Figure 7.6**), none of which were identified to be 'at-risk' and therefore no risk collision is predicted.

7.6.15. Considering the lek activity recorded within the study area and the species' potential sensitivity to wind farm disturbance (e.g., SNH 2018a), black grouse is scoped in to the assessment.

Raptors and Owls

Golden Eagle

7.6.16. Two occupied golden eagle territories have nest sites within 6 km of the site (**Confidential Figure 7.2.1**). Breeding was confirmed at both territories in 2013, 2014 and 2022 (refer to **Confidential Technical Appendix 7.2: Confidential Ornithology** for detail).

7.6.17. Collision risk modelling predicted a mean annual collision rate of 0.1459, or one bird every 6.9 years (**Table 7.12**).

7.6.18. Considering the presence of occupied nest sites within 6 km of the site and the predicted collision risk, golden eagle is scoped into the assessment.

Hen Harrier

7.6.19. No evidence of breeding hen harrier was located within 2 km of the site. Flight activity surveys recorded five flights (**Table 7.10** and **Table 7.11**, **Figure 7.9**), and collision risk modelling predicted a mean annual collision rate of one bird every 7,156 years (**Table 7.12**).

7.6.20. Considering this species' lack of breeding activity, infrequent occurrence and negligible predicted risk of collision, hen harrier is scoped out of the assessment.

Merlin

7.6.21. A merlin pair was identified breeding at the same location in 2013, 2014 and 2022 with activity concentrated around the nest area (**Confidential Figure 7.2.2**). The nest is 2 km from the nearest proposed turbine and 1.5 km from the proposed access track.

7.6.22. Flight activity surveys recorded 13 flights (**Table 7.10** and **Table 7.11**, **Figure 7.10**), which were not identified to be 'at-risk' and therefore no risk of collision was predicted.

7.6.23. Considering that the potential territory is at least 1.5 km from the nearest infrastructure, Site usage is infrequent and there was no predicted risk of collision, merlin is scoped out of the assessment.

Osprey

7.6.24. An osprey was recorded fishing off site at Glendoe Lochans in August 2014 and at a small loch near the southern end of the access track in July 2014 (**Figure 7.8**). No evidence of breeding was located within 2 km of the site.

7.6.25. Flight activity surveys recorded one flight (**Table 7.10** and **Table 7.11**, **Figure 7.11**), which was not identified to be 'at-risk' and therefore no risk of collision is predicted.

7.6.26. Considering this species' lack of breeding activity, infrequency within the study area and no predicted risk of collision, osprey is scoped out of the assessment.

Peregrine Falcon

7.6.27. Peregrine falcon were recorded on seven occasions during walkover surveys (**Figure 7.8**) with all bar one record of a single adult (and one record of a pair). No evidence of breeding was located within 2 km of the site.

7.6.28. Collision risk modelling predicted a mean annual collision rate of one bird every 165 years (**Table 7.12**).

7.6.29. Considering this species' lack of breeding activity, infrequency within the study area and negligible predicted risk of collision, peregrine falcon is scoped out of the assessment.

Red Kite

7.6.30. No evidence of breeding red kite was located within 2 km of the site.

7.6.31. Flight activity surveys recorded one flight (**Table 7.10** and **Table 7.11**, **Figure 7.13**), which was not identified to be 'at-risk' and therefore no risk of collision is predicted.

7.6.32. Considering this species' lack of breeding activity, infrequency within the study area and no predicted risk of collision, red kite is scoped out of the assessment.

White-Tailed Eagle

7.6.33. A single adult white-tailed eagle was recorded on two occasions during walkover surveys in January 2022 (**Figure 7.8**). No evidence of breeding was located within 2 km of the site.

7.6.34. Considering this species' lack of breeding activity, infrequency within the study area and no predicted risk of collision, white-tailed eagle is scoped out of the assessment.

Waders

Curlew

7.6.35. Two incidental records of curlew were noted in May and June 2013 however no evidence of breeding was confirmed across the baseline survey period.

7.6.36. Considering this species' lack of breeding activity, infrequency within the study area and no predicted risk of collision, curlew is scoped out of the assessment.

Golden Plover

7.6.37. Three to five golden plover breeding pairs were identified in 2013 with up to two breeding pairs in 2014 (**Figure 7.14**). No breeding was confirmed in 2022 with only a single incidental record of a bird calling in April 2022.

7.6.38. Flight activity surveys recorded six flights (**Table 7.10** and **Table 7.11**, **Figure 7.15**), which were not identified to be 'at-risk' and therefore no risk of collision is predicted.

7.6.39. Considering this species' potential for breeding within the site, golden plover is scoped in to the assessment.

Woodcock

7.6.40. Incidental records of woodcock were noted in November 2012, March 2013, May 2013 and June 2013; however no evidence of breeding was confirmed.

7.6.41. Considering this species' lack of breeding activity, infrequency within the study area and no predicted risk of collision, woodcock is scoped out of the assessment.

Wildfowl

Greylag Goose

7.6.42. Flocks of greylag geese (one to 45 individuals) were recorded on 12 occasions from October 2012 to March 2013 and November 2021 to April 2022 (**Figure 7.16**).

7.6.43. Collision modelling predicted a mean annual collision rate of one bird every 43 years (**Table 7.12**).

7.6.44. Considering the evidence that the site appears to be of no foraging or roosting importance to migratory waterfowl (as birds were only recorded overflying the site rather than utilising it) and the low predicted risk of collision, greylag goose is scoped out of the assessment.

Pink-Footed Goose

7.6.45. Flocks of pink-footed geese (one to 100 individuals) were recorded on five occasions from November 2012 to April 2013 (**Figure 7.16**).

7.6.46. Collision risk modelling predicted a mean annual collision rate of one bird every 821 years (**Table 7.12**).

7.6.47. Considering the evidence that the site appears to be of no foraging or roosting importance to migratory waterfowl (as birds were only recorded overflying the site rather than utilising it) and the low predicted risk of collision, pink-footed goose is scoped out of the assessment.

Whooper Swan

7.6.48. Flocks of whooper swan (one to 27 individuals) were recorded on seven occasions from October 2012 to January 2013 (**Figure 7.16**).

7.6.49. Collision risk modelling predicted mean annual collision rate of one bird every 5,994 years (**Table 7.12**).

7.6.50. Considering the evidence that the site appears to be of no foraging or roosting importance to migratory waterfowl (as birds were only recorded overflying the site rather than utilising it) and the low predicted risk of collision, whooper swan is scoped out of the assessment.

Summary of Scoped In Important Ornithological Features

7.6.51. The assessment is applied to those scoped in IOFs of medium or high NCI (**Table 7.2**), as confirmed through survey results and consultations outlined above. These are: black grouse, golden eagle and golden plover.

Table 7.14 – Scoped In IOFs

Feature	NCI	Reason for Inclusion
Black grouse	Medium	BoCC Red listed, priority bird species for assessment in Scotland (SNH 2018a).
Golden eagle	Medium	Schedule 1 and Annex I listed, priority bird species for assessment in Scotland (SNH 2018a).
Golden plover	Medium	Annex I listed, priority bird species for assessment in Scotland (SNH 2018a).

7.6.52. The conservation status of these IOFs is detailed in **Table 7.15**.

Table 7.15 – Conservation Status of Scoped In IOFs

IOF	Conservation Status	Information
Black grouse	BoCC Red list (HD, BDp[1], BDp[2], BDMr[2])	Black grouse is Red-listed due to an historical decline in the UK between 1800 and 1995, without substantial recent recovery. It also qualifies due to a severe decline in the UK breeding population size of >50 % over 25 years. Breeding numbers in the UK declined by 80 % between 1991 and 2004. Sim *et al*. (2008) estimated there to be 5,078 male black grouse in the UK in 2005, with approximately two-thirds of these occurring in Scotland. However, Forrester *et al.* (2012) estimate that in Scotland there are around 3,550 to 5,750 lekking males, representing about 71 % of the British population. In Scotland the breeding range is

IOF	Conservation Status	Information
		contracting, and numbers are declining, though the rate of decline varies regionally, being higher in south western Scotland (-49 %) compared to north Scotland (-16 %). Evidence therefore suggests that the national and regional populations are in unfavourable conservation status. Wilson *et al.* (2015) estimated the NHZ 10 (Central Highlands) population to be 114 (range 62-170) displaying males.
Golden eagle	Annex I, BoCC Green list	The Scottish golden eagle population has been relatively stable over the last few decades and has more recently shown signs of increasing, from a total of 442 breeding pairs estimated at the 2003 Scottish national census (Eaton *et al*. 2007) to 508 territories following the 2015 Scottish national census (Hayhow *et al*. 2017). The NHZ 10 golden eagle population was determined by Whitfield *et al*. (2008) to be in unfavourable conservation status because, in 2003, only 12 ranges out of 26 known at that time were occupied. Benn and Whitfield (2020) reported that there were at least 24 pairs/occupied territories (out of a potential 31 territories) in 2020. As of 2020, territory occupancy in NHZ 10 is 77 % and it is therefore considered that the criteria for favourable condition (>66% occupancy) has been met for the NHZ.
Golden plover	Annex I, BoCC Green list	The most recent national breeding golden plover population was estimated to be 32,500-50,500 pairs in 2016 (Woodward *et al.* 2020) and the Scottish population is estimated to be between 15,000 pairs (Forrester *et al.* 2012). The BTO Bird Trends[6] website states that there has been no change in the UK breeding population between 1995 and 2020. Overall, the national and NHZ 10 breeding populations are considered to in favourable conservation status. Wilson *et al.* (2015) estimated the NHZ 10 population to be 2,702 (range 2,476-2,928) pairs.
BoCC Red-list criteria (Stanbury *et al.* 2021) HD = historical decline in the breeding population. BDp$^{1/2}$ = severe breeding population decline over 25 years/longer term. **BoCC Amber-list criteria (Stanbury *et al*. 2021)** BDMr$^{1/2}$ = moderate breeding range decline over 25 years/longer term.		

7.7. Potential Effects

Future Baseline

7.7.1. In the absence of the Proposed Development, assuming the continuation of current predominately commercial estate land management practices within and around the site and allowing for changes in bird behaviour and distribution related to climate change, the bird populations are likely to continue to be present in largely similar abundances and distributions to those described in the baseline. Any changes in numbers and diversity of species are likely to be a reflection of their wider population trends and influences such as climate change (e.g.,

[6] https://www.bto.org/our-science/publications/birdtrends

delayed breeding, reduced or increased breeding success depending on the species range, Pearce-Higgins (2021)), rather than site-specific factors.

Project Assumptions

7.7.2. The assessment of potential effects is based on the Proposed Development description outlined in **Chapter 3: Project Description**). In relation to describing effects on ornithological features, the relevant specifications used to determine the 'worst-case' Proposed Development involve:

- Up to eight turbines with a maximum tip height of 200 m and a maximum rotor diameter of 162 m. Total generating capacity of the Proposed Development would be in excess of 50 MW.
- The associated infrastructure will include wind turbines and associated foundations, access tracks, crane hardstandings, underground cabling, on-site substation and maintenance building, energy storage facility, temporary construction compounds, batching plant, laydown area and potential excavations/borrow pits.
- Existing access roads will be reused where possible.
- The construction period will last for approximately 24 months, comprising a construction programme as described in **Chapter 3: Project Description**. The number of bird breeding seasons potentially disrupted would depend on the month in which construction commences and the breeding season of the potentially affected species. The main breeding season of most birds at the site extends from March to August. For the purposes of this assessment, it is assumed that, for any given species of bird, construction activities would commence during the breeding season and would therefore potentially affect up to three breeding seasons. This, therefore, represents a worst-case scenario.

7.7.3. In addition to the above considered during the design process, this Chapter has been prepared on the basis of the assumptions/embedded mitigation listed below:

- All electrical cabling between the proposed turbines and the associated infrastructure will be underground in shallow trenches which would be reinstated post-construction and, in most cases, follow the proposed access tracks.
- Any disturbance areas around permanent infrastructure during construction will be temporary and land will be reinstated or restored before the construction period ends. The only excavation in these areas will be for cabling as noted above and otherwise may only be periodically used for side-casting of spoil until reinstatement.
- Borrow pits will be excavated during the construction period and will be reprofiled/restored at the end of the construction period.
- To ensure all reasonable precautions are taken to avoid disturbance to birds and comply with environmental legislation, prior to construction and decommissioning the Applicant will appoint a suitably qualified Ecological Clerk of Works ('ECoW') who will advise the Applicant and the Principal Contractor on all ornithological matters (with the assistance of a suitably qualified/licenced ornithologist if required). The ECoW will be required to be present on Site during the construction and decommissioning periods and will carry out monitoring of works and briefings with regards to any ornithological sensitivities on the site to the relevant staff within the Principal Contractor and the subcontractors.
- A Bird Disturbance Management Plan ('BDMP') will be implemented during construction of the Proposed Development. The BDMP will detail measures to ensure legal compliance and safeguard breeding birds known to be in the area and will include species-specific guidance. The BDMP shall include pre-construction surveys and good practice measures during construction. Pre-construction surveys will be undertaken to check for any new breeding bird activity in the vicinity of the construction works. The ECoW will oversee the implementation of the above measures.

Assessment Limitations

7.7.4. In general, survey effort either met or exceeded the minimum requirements stipulated in NatureScot guidance (SNH 2017). In general, weather conditions were appropriate for the surveys, but where not, surveys were suspended (or additional surveys were undertaken) (refer to **Technical Appendix 7.1: Ornithology**).

7.7.5. Limitations exist with regard to the knowledge base on how some species, and the populations to which they belong, react to impacts associated with onshore wind farms and associated construction activities. A precautionary approach is taken in these circumstances, and as such it is considered that these limitations do not affect the robustness of this assessment.

Construction

7.7.6. The main potential impacts of construction activities due to the Proposed Development are the displacement and disruption of breeding, foraging or roosting birds as a result of noise and general disturbance over a short-term period (either the duration of a particular construction activity within working hours, or the duration of the whole construction period).

7.7.7. Impacts on breeding birds would be confined to areas in the locality of temporary construction compounds, turbines, tracks and other infrastructure.

7.7.8. Direct habitat loss would also occur due to the Proposed Development's construction, which would be both temporary (e.g., construction compounds) and long-term (access tracks, turbines and substation). This has the potential to affect breeding or foraging individuals.

Black Grouse

7.7.9. **Impact:** lekking or foraging black grouse may be displaced during construction, either by disturbance or direct habitat loss.

7.7.10. **Sensitivity:** medium NCI (**Table 7.14**) and unfavourable conservation status (**Table 7.15**). Consequently, black grouse sensitivity is considered to be medium-high.

7.7.11. **Magnitude of Impact:** according to an expert review by Goodship and Furness (2022), leks may be actively disturbed at up to 500 m to 750 m from a disturbance source, and NatureScot generally advocates that a buffer of up to 750 m should be applied to avoid all disturbance during the construction phase, based on information in Zwart *et al.* (2015). Seven of the 11 leks identified are within 750 m of infrastructure associated with the Proposed Development (**Table 7.16**, **Figure 7.5a** and **Figure 7.5b**), however it should be noted that whilst there will be some small direct loss of breeding/foraging habitat within 750 m of the leks, there will be no direct habitat loss to any of the lek sites themselves.

7.7.12. Black grouse activity around the site has been largely focussed in the lower altitude area (below 400 m above sea level (asl)) to the north west of the Proposed Development with a smaller volume of activity focussed in around the upper reaches of Glen Tarff (**Figure 7.5a** and **Figure 7.5b**), again below 400 m asl. Of the seven leks within 750 m of the Proposed Development, five of these (Leks 2, 4, 5, 8 and 9; **Table 7.16**) are only within 750 m of the access track for the Proposed Development in this north west area. Lek activity is this area has been recorded over a wide area with the males attending these leks appearing to be relatively mobile both within the same season and between seasons.

7.7.13. A maximum of 31, 17 and eight lekking male black grouse were recorded across all leks in 2013, 2014 and 2022 respectively, however given the fluid nature of the lekking activity recorded, an annual peak count is likely to provide a more accurate estimate of the number of males present at/around the site.

7.7.14. **Table 7.17** provides a review of the annual number of leks and the maximum numbers of males recorded during any one survey which is considered to be a more reasonable estimate of the local population for each year.

Table 7.16 – Black Grouse Leks and Distances

Lek	Distance to Nearest Turbine	Distance to Nearest Infrastructure
1	1 km (T5)	438 m (borrow pit near T5)
2	3 km (T1)	724 m (access track)
4	3 km (T1)	29 m (access track)
5	2.5 km (T1)	206 m (access track)
8	2.8 km (T1)	658 m (access track)
9	3.5 km (T1)	584 m (access track)
10	439 m (T5)	373 m (internal access track)

Table 7.17 – Maximum Annual Black Grouse Lek Counts of Leks (within 750 m of the Proposed Development)

Lek	Number of Leks in Use	Maximum Number of Males Recorded in any One Survey	Minimum Number of Females Recorded in any One Survey
2013	8 (5)	11 (10)	1 (1)
2014	5 (3)	9 (6)	1 (1)
2022	4 (2)	3 (3)	1 (2)

7.7.15. Wilson *et al.* (2015) estimated the NHZ 10 population to be 114 displaying males and so the potential disturbance of between ten and three lekking males (**Table 7.17**) would represent 8.7 % to 2.6 % of the NHZ 10 population.

7.7.16. This worst-case scenario of the temporary loss of up to ten lekking males is considered to be of medium spatial and short-term temporal magnitude.

7.7.17. **Significance of Effect:** the unmitigated effect on the NHZ 10 black grouse population as a result of construction disturbance is considered to be moderate adverse and therefore **significant** in the context of the EIA Regulations.

Golden Eagle

7.7.18. **Impact:** breeding or foraging golden eagle may be displaced from the site during construction, either by disturbance or direct habitat loss.

7.7.19. **Sensitivity:** medium NCI (**Table 7.14**) and favourable conservation status (**Table 7.15**). Consequently, golden eagle sensitivity in the context of the site is considered to be medium.

7.7.20. **Magnitude of Impact:** there are two active golden eagle territories within 6 km of the site (**Confidential Figure 7.2.1**). Goodship and Furness (2022) and NatureScot (SNH 2014)

recommend a buffer of 1 km as a safe operating distance from active golden eagle nests. The nest sites associated with occupied territories EA_G and EA_K are 4.3 km and 2.1 km from the nearest turbine/infrastructure respectively, and so are considered to be at sufficient distance that it will be beyond any risk of direct construction disturbance.

7.7.21. Both occupied territories are likely to overlap with the turbine area to some extent. For territory EA_G, the Development is likely to be at the outer extent of the territory, based on distance to nearest nest site (**Confidential Figure 7.2.1**)

7.7.22. **Confidential Figure 7.2.3** presents the outputs of the Golden Eagle Topographical ('GET') model, which assigns a score between 1 and 10 at a 50 m pixel resolution. Habitat with a GET score of 6+ is a good indicator of potential golden eagle activity; habitat with a score of 5 or less is used infrequently by golden eagles (note that **Confidential Figure 7.2.3** and **Confidential Figure 7.2.4** only show the habitat with a GET score of 6 upwards). In general, the GET model results reflect the work undertaken during the design programme to ensure that the turbines are within land which has a score of less than 6 and therefore less preferred by golden eagles. The GET model also correlates well with golden eagle flight data recorded during baseline surveys (**Confidential Figure 7.2.4**).

7.7.23. The GET model predicts both an abundance of higher value habitat closer to the nest site and that the area around the proposed turbines is primarily of less preferred golden eagle topographical conditions (GET model scores of 5 or lower). Although it is possible that on occasion, foraging birds may be affected by localised construction activities, territory occupation and productivity, particularly over the long-term, is unlikely to be affected by any temporary construction disturbance to this pair.

7.7.24. For territory EA_K, the Proposed Development is closer to the nest site, albeit there would be no infrastructure within 2 km. The GET model (**Confidential Figure 7.2.3**) predicts more preferred golden eagle topography (scores of 6-10) to the west and south of the nest site than to the east, closer to the Proposed Development, or within the site. Although due to proximity it is perhaps more likely that the site is used by pair EA_K rather than EA_G (although this may not be the case since territory EA_G is long-established, and the pair may therefore be dominant), the availability of preferred foraging areas away from construction activities means that territory occupation or long-term productivity of the pair is unlikely to be significantly affected by incidences of short-term construction disturbance to foraging birds.

7.7.25. The overall impact of temporary incidences of construction disturbance on the two pairs, and by extension the NHZ 10 population is predicted to be of negligible and short-term magnitude.

7.7.26. **Significance of Effect:** overall, the unmitigated effect on the NHZ 10 golden eagle population as a result of construction is considered to be **minor adverse** and therefore **not significant** in the context of the EIA Regulations.

Golden Plover

7.7.27. **Impact:** breeding golden plover may be displaced from the site during construction, either temporarily by disturbance or temporarily or permanently via direct habitat loss.

7.7.28. **Sensitivity:** medium NCI (**Table 7.14**) and favourable conservation status (**Table 7.15**). Consequently, golden plover sensitivity in the context of the site is considered to be medium.

7.7.29. **Magnitude of Impact:** up to three golden plover territories were recorded to be within 500 m of Proposed Development infrastructure (**Figure 7.14**) and are most likely to be subject to disturbance associated with construction activities. The golden plover NHZ 10 breeding population is estimated to be 2,702 pairs (Wilson *et al.* 2015), and the potential temporary loss of up to three pairs would represent up to 0.11 % of the breeding population. In practice it is unlikely that this number of pairs would be lost to the population, with some birds more likely to move away from the disturbance areas into nearby suitable habitat, which based on survey

results is also suitable for golden plover. Indeed Sansom *et al.* (2016) found that disturbance activity during an onshore wind farm's construction had no significant effect on golden plover breeding abundance or distribution.

7.7.30. The impact of construction disturbance on the NHZ 10 golden plover breeding population as a result of construction activities is therefore predicted to result in an impact of negligible and short-term magnitude.

7.7.31. **Significance of Effect:** the unmitigated effect on the NHZ golden plover population as a result of construction is considered to be **minor adverse** and therefore **not significant** in the context of the EIA regulations.

Operation – Displacement

7.7.32. The displacement of nesting, foraging or roosting birds from the Proposed Development has the potential to extend beyond the construction phase, as described above, and to occur during the operational phase.

7.7.33. Evidence of displacement away from operational turbines has been found to occur in a number of individual wind farm studies, although the effects vary considerably between sites and species. It is recognised that disturbance may occur due to maintenance or recreational activities throughout the operational phase, although since these are likely to be of shorter duration and smaller extent than construction activities, effects would be lower than those predicted for construction effects.

Black Grouse

7.7.34. **Impact:** wind farm operation may cause some displacement of lekking, breeding and foraging black grouse from areas close to turbines and other infrastructure.

7.7.35. **Sensitivity:** medium-high.

7.7.36. **Magnitude of Impact:** according to an expert review by Goodship and Furness (2022), leks may be actively disturbed at 300 m to 500 m from a disturbance source, and NatureScot has also advocated that a buffer of up to 500 m should be applied to avoid all potential displacement effects during wind farm operation. Evidence from Austria has suggested that leks may be adversely affected by wind farms, although it is not clear what the exact causes may be – potentially a combination of turbine noise, maintenance activities or collisions (Zeiler and Grünschachner-Berger 2009).

7.7.37. Of the 11 lekking areas located during the baseline survey period, two (lekking areas 4 and 10) were recorded within 500 m of the proposed turbine locations and substation/battery storage (**Table 7.13, Figure 7.5**). It should however be noted that lekking area 4 spans a relatively wide extent and only one record (of six males in 2014) of the 11 lekking records associated with this lekking area is within 500 m of the substation/battery storage. This record is considered to be an outlier with the activity predominately concentrated further east of this single record (**Figure 7.5**). Consequently, it is considered likely that there should be sufficient separation distance for lekking area 4 to continue to be occupied despite the presence of the substation and battery storage during the operation of the Proposed Development.

7.7.38. Lekking area 10 is just within 500 m of the nearest proposed turbine locations, and although it is located downhill of those turbines, and therefore may be screened to some extent, it is considered here as a worst-case that the proximity to infrastructure and possible loss of connectivity with other lekking areas could result in a loss of up to two males from the local population.

7.7.39. Wilson *et al.* (2015) estimated the NHZ 10 population to be 114 displaying males and so the potential displacement of two males (lek 10, **Table 7.13**) would represent 1.7 % of the NHZ 10 population, which is considered to be of low, long-term magnitude.

7.7.40. **Significance of Effect:** the unmitigated effect on the NHZ 10 black grouse population as a result of operational displacement is considered to be **minor adverse** and therefore **not significant** in the context of the EIA regulations.

Golden Eagle

7.7.41. **Impact:** golden eagle may be at risk of displacement from foraging habitat, thereby impacting on productivity, fitness and survival rates.

7.7.42. **Sensitivity:** medium.

7.7.43. **Magnitude of Impact:** as described above for construction effects, due to the distance of nearest known nest sites from proposed turbines (>1 km), displacement of nesting birds is considered very unlikely.

7.7.44. As well as impacts on nest sites, the likelihood of a territory being impacted sufficiently to result in it becoming unviable is also based on the loss of foraging habitat due to the presence of infrastructure. The actual impacts on a breeding pair are likely to depend on a range of factors such as experience of the pair, availability of alternative nest sites or territories, and the quality of foraging habitat within and outside of the turbine area.

7.7.45. Behaviour evidence from satellite tagged golden eagles in Scotland, compiled by Fielding *et al.* (2021, 2022), has shown that there is clear avoidance of wind farms by foraging golden eagles, and likely, out to 300 m around individual turbines, depending on habitat quality. Both breeding territories EA_G and EA_K may overlap with the turbine area to some extent, however as discussed above in paragraphs 7.7.21 and 7.7.24, given the distance of the turbine area in relation to nest sites, and the siting of the turbines in predominantly unpreferred habitat of GET scores less than 6, the loss of foraging area within each pair's territory is unlikely to be of an extent, or an importance, to result in territory abandonment. It is possible that in some years, e.g. when prey resources are lower, that productivity may be affected by the added constraints on the territory due to the presence of operational turbines, however when considering these impacts at a NHZ 10 population level (in favourable conservation status), they are considered to be of no more than a low, long-term magnitude.

7.7.46. **Significance of Effect:** overall, the unmitigated effect on the NHZ 10 golden eagle population as a result of operational displacement is considered to be **minor adverse** and therefore **not significant** in the context of the EIA regulations.

Golden Plover

7.7.47. **Impact:** nesting or foraging golden plover may be at risk of displacement from habitat around turbines, thereby affecting productivity or survival rates.

7.7.48. **Sensitivity:** medium.

7.7.49. **Magnitude of Impact:** up to three golden plover territories were recorded within 500 m of turbines (**Figure 7.14**). The golden plover NHZ 10 breeding population is estimated to be 2,702 pairs (Wilson *et al*. 2015), and the potential permanent loss of up to three golden plover territories (maximum breeding activity) would result in a loss of 0.11 % of the breeding population.

7.7.50. Evidence suggests that complete displacement of pairs within 500 m is unlikely (e.g., Douglas *et al.* 2011; Pearce-Higgins *et al*. 2012; Fielding and Haworth 2013). Sansom *et al.* (2016) did show in their study that breeding golden plover abundance may be reduced by 79 % up to 400 m away from operational turbines, although hatching and fledging success were not affected by proximity to turbine locations.

7.7.51. However, even as a worst-case where all breeding birds would be lost rather than displaced, an impact of negligible and long-term magnitude on the NHZ 10 breeding population is predicted.

7.7.52. **Significance of Effect:** the unmitigated effect on the NHZ golden plover population as a result of operational displacement is considered to be **minor adverse** and therefore **not significant** in the context of the EIA Regulations.

Operation – Turbine Lighting

7.7.53. Where turbines have a tip height over 150 m, lighting would be required, in accordance with Article 222 of the Air Navigation Order 2016 ('ANO') (in line with current guidance from the Civil Aviation Authority (CAA, 2016). As advised by NatureScot (2020b), there are potential lighting effects on birds which require consideration within an EIA.

7.7.54. **Impact:** Lighting could have various impacts on birds: they may be attracted to lights and thereby placed at higher risk of collisions, have migration patterns disrupted, show avoidance of lights with a consequent displacement effect, or be subject to increased predation threat. NatureScot (2020b) has identified attraction (phototaxis) as posing the principal threat to birds, in relation to wind turbines.

7.7.55. **Sensitivity:** medium to medium-high.

7.7.56. **Magnitude of Impact:** In NatureScot's (2020a) advice on the scope of assessment for turbine lighting, it is identified that an assessment of the possible effects of lighting on birds may be required in the following three situations, where risk is greater: (i) wind turbines on or adjacent to a seabird colony that hosts burrow nesting species; (ii) wind turbines that are on or adjacent to protected areas that host large concentrations of wintering waterbirds, where such sites are located within open country away from other sources of artificial light; and (iii) where wind farms are located on migratory corridors or bottlenecks for nocturnally migrating passerines.

7.7.57. It is clear that the Proposed Development does not fit the first two situations. In the case of migrating species, there is no evidence to suggest that the site is of any importance as a migration route. The habitats within the site are generally poor for foraging or roosting, the topography does not suggest that it would be a significant flight corridor (e.g., such as a natural feature such as a valley), and it is distant from coastal areas which would be of greater importance to continental migrants.

7.7.58. As such, based guidance provided by NatureScot (2020a, 2020b), it is considered that there is little evidence to indicate that any species would be significantly affected either adversely or beneficially by lighting requirements of the Proposed Development. An effect of negligible, long-term magnitude is therefore predicted for all IOFs.

7.7.59. **Significance of Effect:** the unmitigated effect on IOFs as a result of operational turbine lighting is predicted to be **negligible** and **not significant** in the context of the EIA Regulations.

Operation – Collision Risk

7.7.60. **Impact (all IOFs):** Birds that utilise the airspace within the Proposed Development at potential collision heights may be at risk of collision with wind turbines, thereby increasing the annual mortality rate of the population above background levels. For the collision risk modelling methods used see **Technical Appendix 7.1: Ornithology Annex E**. Black grouse and golden plover were not identified to be flying 'at-risk' and consequently are considered to have an effect of **negligible** significance.

Golden Eagle

7.7.61. **Sensitivity:** medium.

7.7.62. **Magnitude of Impact:** the collision risk model predicted a mean annual collision rate of 0.1459, or one bird every 6.9 years.

7.7.63. To determine the impacts that this additional mortality would have on the NHZ 10 population over the long-term, population modelling has been undertaken (**Technical Appendix 7.3**). The model is based on the golden eagle population model ('GEPM') in Whitfield *et al.* (2006, 2008), Fielding and Haworth (2010) and Haworth (2014) which has been used to assess potential impacts for some Scottish wind farm projects on golden eagles. The model uses a deterministic matrix formulation and can be used to explore how additional eagle mortality may affect predicted growth rates of a golden eagle population. NHZ 10 data from 2015 to 2020 were obtained from the 2020 Regional Eagle Conservation Management Plan (RECMP) report (Benn & Whitfield, 2020), with historic information from the Whitfield *et al.* (2008) golden eagle conservation report for NatureScot.

7.7.64. Full details of the model's input parameters and outputs are presented in **Technical Appendix 7.3**, but in summary, the results of the GEPM suggest that:

- Based on the increase in number of occupied territories between 2003 and 2020 (from 12 to 24 out of 31), and a mean 2015-2020 productivity rate of c.0.81 which passes the test for favourable conservation status in Whitfield *et al*. (2008), the NHZ 10 golden eagle population is likely to be in favourable conservation status.
- Under a baseline scenario (without Proposed Development, zero collisions) the model predicted that population growth will continue until the NHZ 10's carrying capacity of 31 pairs is reached after six years.
- When additional mortality associated with collisions with turbines at the Proposed Development (0.1443 per year) is taken into consideration, population growth would still likely take place, with no increase in duration until the carrying capacity is met (again, six years).

7.7.65. The results of the GEPM therefore suggest that, with the NHZ 10 population likely to be in favourable conservation status, this additional mortality is considered to be of low spatial and long-term temporal magnitude.

7.7.66. **Significance of Effect:** the unmitigated effect on the NHZ golden eagle population as a result of turbine collisions is considered to be **minor adverse** and therefore **not significant** in the context of the EIA regulations.

Decommissioning

7.7.67. Decommissioning effects for the Proposed Development are difficult to predict with any confidence because of the long timeframe until their occurrence. Decommissioning effects are considered for the purpose of this chapter to be similar in nature to those of construction effects but are likely to be of shorter duration. The significance of effects predicted in the construction section are therefore considered appropriately precautionary for assessing decommissioning effects on IOFs.

7.8. Mitigation

Construction

7.8.1. The only identified effect during the construction phase (and decommissioning phase) that was considered to be potentially significant for any IOF was disturbance to lekking black grouse (**minor-moderate adverse**). Specific construction mitigation for black grouse, in addition to standard procedures within the BDMP, has been considered and is summarised below.

7.8.2. No significant unmitigated effects were predicted for golden plover or golden eagle, and therefore no specific mitigation other than the standard mitigation outlined in paragraph 7.7.3 (BDMP, ECoW and pre-construction surveys) is required. These measures will aim to ensure that no breeding activity is disrupted by construction activities.

Black Grouse

7.8.3. Specific pre-construction surveys for lekking black grouse will be undertaken during the main black grouse lekking season (March to May, following methodology provided by Gilbert *et al.* (1998) and NatureScot (SNH 2017) to provide an up-to-date understanding of where black grouse are lekking within 750 m of the Proposed Development.

7.8.4. To avoid a significant disturbance effect occurring during construction, the BDMP will also extend to protection of black grouse leks (as well as nest sites). If pre-construction surveys do record lekking black grouse within a potential disturbance zone (up to 750 m of any proposed works), all potentially disturbing construction activities would be prohibited until a risk assessment is undertaken. The risk assessment would consider the likelihood and possible implications of the associated construction activities on the lek and set out necessary measures to ensure that no disturbance occurs. Restrictions to construction activity would likely be within two hours of dawn during core lekking period of March to May, but the exact timing of restrictions and/or extent of any disturbance-free zone, within which any construction activity that is considered to be potentially disturbing would be prohibited in that area until the core lekking period has passed, would be agreed with NatureScot. Furthermore, to minimise the possibility of disturbance outside these times to any leks within 750 m of access tracks, a maximum speed limit of 15 mph will be enforced, and personnel will remain within vehicles wherever possible. Where possible, gates within 750 m of lek sites will remain open after first arrival, therefore avoiding the need for every subsequent entry to open and close the gate and the associated potential disturbance to the lek due to pedestrian activity.

7.8.5. The ECoW will oversee the implementation of the above measures.

Operation

7.8.6. No significant unmitigated effects were predicted for black grouse, golden eagle or golden plover, and therefore no specific mitigation is required.

7.8.7. The Outline Biodiversity Enhancement Plan (OBEMP, **Technical Appendix 8.6**) would however include habitat enhancement measures which would be of benefit to these, and other species of conservation value. The main management measures of the OBEMP would be:

- Aim 1: Restore and enhance the wet modified and blanket bog habitats across Management Unit A.
  - Objective 1.1: Increase the abundance and distribution of major peat forming species, particularly Sphagna (particularly key blanket mire indicator species such as *Sphagnum papillosum* and *S. medium*).
- Aim 2: Enhance habitat for Black Grouse within Management Unit B.
  - Objective 2.1: Plant native broadleaved woodland to optimise habitat for black grouse.
- Aim 3: Enhance Habitat for Golden Eagle within Management Unit C.
  - Objective 3.1: Improve the condition of dry heath, wet heath and blanket bog habitats in order to improve golden eagle prey resource.

7.9. Residual Effects

Construction

7.9.1. Following the mitigation detailed above (paragraphs 7.8.3 and 7.8.4), the residual effect for the NHZ 10 black grouse population as a result of construction disturbance is considered to be **minor adverse** and therefore **not significant** in the context of the EIA Regulations.

7.9.2. No significant unmitigated effects were predicted for golden eagle or golden plover and so the residual effect on their NHZ 10 populations remains unchanged (**minor adverse** and therefore **not significant** in the context of the EIA Regulations).

Operation

7.9.3. No significant unmitigated effects were predicted for black grouse, golden eagle or golden plover and so the residual effect on their NHZ 10 populations remains unchanged (**minor adverse** and therefore **not significant** in the context of the EIA Regulations).

7.10. Cumulative Effects

7.10.1. This section assesses the potential cumulative effects of the Proposed Development combined with other operational, consented or proposed wind farm projects that are located within the appropriate spatial context on the basis of the species considered.

Methods

7.10.2. The main projects likely to cause similar effects to those associated with the Proposed Development are other operational wind farm developments, or those under construction, consented, or in the planning process within NHZ 10 (**Table 7.18**).

7.10.3. Wind farm projects at scoping stage have been scoped out of the cumulative assessment because either they do not have sufficient information on potential effects to be included; because the baseline survey period is ongoing; or because results have not been published. Projects that have been refused (and no longer capable of appeal) or withdrawn have also been scoped out of the cumulative assessment.

7.10.4. Small wind farm projects with three or fewer turbines have also been scoped out from the cumulative assessment as often these projects are not subject to the same level of detail of ornithological assessment, and so there are no directly comparable data. Because of the small scale of such projects, effects are likely to be negligible on the IOFs assessed here. No other renewable or non-renewable projects within NHZ 10 were identified that could have a cumulative effect on the IOFs.

7.10.5. **Table 7.18** identifies the wind farm projects in NHZ 10 that have been scoped in to the cumulative assessment, and their latest known status. This information was obtained from a combination of the last updated version of the NatureScot wind farm database (mid-2019) and an extensive search of the Moray and The Highland Council Planning portals and the Energy Consents Unit planning portal for changes/new projects between mid-2019 and July 2023.

Table 7.18 – Other NHZ 10 Wind Farm Projects

Wind Farm	Status	No. Turbines	EIA Information Available
Berry Burn	Operational	30	Ornithology chapter
Corriegarth	Operational	23	Ornithology chapter

Wind Farm	Status	No. Turbines	EIA Information Available
Dunmaglass	Operational	33	Ornithology chapter
Farr	Operational	40	Ornithology chapter
Glen Kyllachy	Operational	20	Ornithology chapter
Moy	Operational	20	Ornithology chapter
Paul's Hill I	Operational	28	No information available
Rothes I (Cairn Uish)	Operational	28	No information available
Rothes II	Operational	18	No information available
Stronelairg	Operational	66	Ornithology chapter
Tom na Clach (2nd application - 'repowering')	Operational	13	Information from Corriegarth II cumulative assessment
Aberarder	Construction	12	Ornithology chapter
Berry Burn Ext.	Consented	9	Ornithology chapter
Cairn Duhie	Consented	20	Ornithology chapter
Clash Gour	Consented	48	Ornithology chapter
Dell	Consented	14	Ornithology chapter
Hill of Glaschyle	Consented	12	Ornithology chapter
Kellas	Consented	8	Ornithology chapter
Meikle Hill	Consented	9	Ornithology chapter
Paul's Hill II	Consented	6	Ornithology chapter
Rothes III	Consented	28	Ornithology chapter
Cairn Duhie (redesign)	Application	16	Ornithology chapter
Cloiche	Application	36	Ornithology chapter
Corriegarth II	Application	16	Ornithology chapter
Lethen	Application	17	Ornithology chapter

Wind Farm	Status	No. Turbines	EIA Information Available
Ourack	Application	18	Ornithology chapter
Tom na Clach Ext.	Application	7	Ornithology chapter

Scope of Assessment

7.10.6. Based on the conclusions of the assessment presented in **Section 7.7**, and the committed mitigation outlined in **Section 7.8**, the following have been scoped out of the cumulative assessment:

- Cumulative construction effects for black grouse, golden eagle and golden plover – negligible effects considering the proposed embedded and additional mitigation;
- Cumulative collision effects for black grouse and golden plover due to negligible predicted collision risk; and
- Cumulative operational displacement effects for black grouse, golden eagle and golden plover (negligible residual effects when considering enhancement associated with the OBEMP, **Technical Appendix 8.6**).

7.10.7. The remaining cumulative effects are considered below:

- Cumulative collision effects on golden eagle.

Golden Eagle – Collision Risk

7.10.8. The total predicted annual collision rate associated with all wind farm projects within NHZ 10 (where information is available) is 0.9655 (**Table 7.19**), which rises to 1.1114, or one every 0.9 years, when including the annual collision rate of 0.1459 associated with the Proposed Development (**Table 7.19**). It is the case however that, based on survey results for a number of other projects, golden eagle collision risk is not necessarily attributable to NHZ breeding birds, and so this should be seen as a worst-case estimate.

Table 7.19 – Predicted Golden Eagle Collision Rates – NHZ 10 Wind Farm Projects

Phase	Cumulative Collisions (99% Avoidance)	Detail
Operational and under Construction Wind Farms	0.4985	Golden eagle recorded at six of the 11 projects.
Consented Wind Farms	0.022	Golden eagle recorded at one of the ten projects.
Application Wind Farms (excluding the Proposed Development)	0.445	Golden eagle recorded at five of the six projects.
Total	0.9655	n/a

7.10.9. The GEPM (**Technical Appendix 7.3**) has been used to consider this cumulative collision impact within an NHZ 10 context, assuming all losses are to NHZ 10 breeding birds, and all projects within the NHZ will become operational with a full rollout of the proposed number of turbines.

7.10.10. When running the model with this additional annual mortality (1.1114), it was found that with additional collision mortality from the Proposed Development and all other wind farm projects within NHZ 10, annual population growth rate would remain beneficial, but be reduced (to 2.7%), resulting in a predicted delay until the NHZ 10 carrying capacity would be attained, by two years (to eight years) compared with the baseline and Proposed Development alone scenarios. Favourable conservation status would still be maintained.

7.10.11. Overall, the results of the GEPM therefore suggest that the NHZ 10 golden eagle population is likely to be able to continue to expand, despite the additional mortality predicted to be associated with collisions at wind farm projects within NHZ 10, should all become operational. The main historical limiting factor of the expansion of the NHZ 10 population, persecution, may have been reduced in recent years as a result of monitoring as part of the RECMP (see Benn & Whitfield, 2020) and for wind farm projects, which means that survival rates may now be higher than the conservative values considered in the model, which have been based on historic rates.

7.10.12. The magnitude of impact is therefore considered to be low, long-term, and the overall significance of the cumulative collision effect on the NHZ 10 population is **minor adverse** and **not significant** in the context of the EIA Regulations.

7.11. Summary

7.11.1. The ornithological assessment is based on best practice guidance including the Chartered Institute for Ecology and Environmental Management's (CIEEM) Guidelines for Ecological Impact Assessment in the UK and Ireland. The scope of the ornithological assessment and baseline conditions were determined through a combination of desk study, targeted surveys, and consultation with relevant nature conservation organisations.

7.11.2. This process established ornithological features that could potentially be affected by the Proposed Development. No potential effects on statutory designated sites were identified. In terms of ornithological interests on the site, golden eagle and merlin were identified to be breeding within the survey area. Black grouse were also identified to be present in the area with up to 11 lek areas located. Wader activity in the survey area was low with only curlew, golden plover and woodcock recorded during surveys and of these only a small number of golden plover were identified to be breeding.

7.11.3. Assessment of potential effects and their significance were determined through consideration of the sensitivity of the feature and the magnitude of change. The following Important Ornithological Features (IOFs) were taken forward to the assessment stage: black grouse, golden eagle and golden plover. The only potentially significant effect that was identified in the assessment was disturbance/displacement to black grouse during the construction phase, with all other effects during construction or operation on black grouse, golden eagle and golden plover predicted to be not significant. Cumulative effects were also considered and were not predicted to be significant.

7.11.4. A Biodiversity Enhancement Management Plan (BEMP) for the Proposed Development would be developed to further mitigate the effects on black grouse (in addition to the specific mitigation provided for black grouse during construction in the Bird Disturbance Management Plan (BDMP) that reduces the potentially significant construction effect on black grouse to not significant) and to provide additional enhancement measures. With the implementation of the BEMP, adverse effects on black grouse would be expected to reduce further through the restoration and enhancement of habitats. The implementation of the BEMP will also provide enhanced habitat for foraging golden eagle and breeding golden plover.

Table 7.20 – Summary of Effects

Description of Effect	Significance of Potential Effect		Mitigation Measure	Significance of Residual Effect	
	Significance	Beneficial/Adverse		Significance	Beneficial/Adverse
Construction displacement: black grouse	**Moderate / Potentially significant**	Adverse	Specific targeted pre-construction surveys for black grouse to identify up to date lek areas within 750 m of construction activity immediately prior to construction commencing. Extension of the BDMP to include protection of lek sites and specific construction control measures to minimise lek disturbance for any leks within 750 m of the Proposed Development.	Minor / Not significant	Adverse
Construction displacement: golden eagle and golden plover	Minor / Not significant	Adverse	No mitigation prescribed	Minor / Not significant	Adverse
Operational displacement: black grouse, golden eagle and golden plover	Minor / Not significant	Adverse	No mitigation prescribed	Minor / Not significant	Adverse
Operational collision risk: golden eagle	Minor / Not significant	Adverse	No mitigation prescribed	Minor / Not significant	Adverse
Turbine lighting: black grouse, golden eagle, and golden plover	Negligible / Not significant	N/A	No mitigation prescribed	Negligible / Not significant	N/A
Cumulative: golden eagle	Minor / Not significant	Adverse	No mitigation prescribed	Minor / Not significant	Adverse

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