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6. ORNITHOLOGY

6.1 Introduction

6.1.1 This Chapter evaluates the importance of the nature conservation interest (ornithological) and the potential impacts associated with the Proposed Development.

6.1.1 This Chapter outlines the methodologies used to assess potential effects on sensitive ornithological receptors, both within the footprint of the Proposed Development and the surrounding area (including the proposed UGC). It presents an assessment of the significance of potential impacts, along with suggested mitigation measures to avoid or reduce the impacts; and an assessment of predicted residual impacts of the Proposed Development after mitigation measures have been implemented.

6.1.2 The assessment has been prepared by Adam Fraser MRes, MSc, BSc (Hons), Director of Blairbeg Consulting Ltd, a full member of the Chartered Institute of Ecology and Environmental Management (CIEEM), based in Inverness-Shire, Scotland. Mr Fraser has 15 years' experience of producing EIAs / EAs for renewable energy and infrastructure developments across Scotland. The assessment has been carried out in line with CIEEM's code of conduct and relevant standards and guidance. Field surveys were carried out by Adam Fraser (MCIEEM) and Helen Chance (MCIEEM) of Blairbeg Consulting Ltd.

6.1.3 This chapter is supported by:

- **Appendix 6.1:** Ornithological Field Survey Methodology;
- **Appendix 6.2:** Ornithological Survey Results;
- **Appendix 6.3:** Assessment of Ornithological Receptors of Local Value; and
- **Appendix 6.4:** Confidential Appendix of Sensitive Bird Records.

6.1.4 **Figures 6.1 – 6.7** are referenced in the text where relevant.

6.2 Scope of the Assessment

Study Area

6.2.1 The Study Area for this assessment is the area within which ornithological baseline surveys were undertaken, as shown in **Figure 6.1** and **Figure 6.2**, comprising of the following:

- Vantage Point (VP) Surveys: viewsheds extended to 2 km from VP locations;
- Breeding Raptor and Owl Surveys: all suitable breeding habitat within 2 km of the Proposed Development;
- Black Grouse lek survey: suitable lek habitat within 2 km of the Proposed Development; and
- Breeding Bird Survey (BBS): within 250m of the Proposed Development.

6.2.2 Survey areas, including the locations of VPs and the extent of the breeding bird survey area, were agreed in advance between NatureScot and SSEN Transmission in March 2021.

6.2.3 The entire length of the Proposed Development is not covered by VP viewsheds; instead targeted VP surveys were undertaken to cover areas that provide suitable habitat for target species (raptors, grouse, wildfowl and waders) and lie within connectivity distance for those species.

Scoping and Consultation

6.2.4 Key points raised by consultees through the consultation process which are of relevance to the subject area of ornithology are detailed in **Table 6-1**:

Table 6-1: Ornithology Issues Raised During Consultation

Consultee	Issue	Action
NatureScot	NatureScot reviewed and passed no comment on proposed methodologies as presented in March 2021.	Survey methodology as described below was followed to provide baseline for assessment.

6.2.5 Based on the consultation responses and the known environmental sensitivities, this assessment considers the following:

- potential effects on the ornithological features of nearby SPAs;
- removal of habitat (including breeding, foraging and roosting) during construction activities;
- disturbance during construction activities;
- nest destruction during construction activities; and
- collision risk of birds with the Proposed Development, notably raptors and divers.

6.3 Assessment Methodology

Desk Study

6.3.1 Baseline data on the ornithological interest of the Study Area and its surroundings, including information on sites designated for nature conservation and species records, were sought from the following sources:

- Joint Nature Conservation Committee (JNCC) website (<http://www.jncc.gov.uk/>);
- NatureScot Site Link website (<https://sitelink.nature.scot/map/>); and
- large-scale 1:10,000 Ordnance Survey (OS) maps in conjunction with colour 1:25,000 OS map (to determine the presence of ponds and other features of nature conservation interest).

6.3.2 Further information on the potential ornithological features that have potential to be affected by the Proposed Development was obtained through searches of internet sources (e.g. UK Biodiversity Action Plans (UKBAP), Scottish Biodiversity List (SBL), Local Biodiversity Action Plans (LBAP)) and the relevant published literature (i.e. relevant guidance documents and scientific papers).

Field Survey

6.3.3 Surveys were conducted between March 2021 and October 2021. Methodologies and survey effort for field surveys are provided in **Appendix 6.1** and are summarised below.

6.3.4 Following consultation and desk study, the following target species were identified:

- all wild goose, swan and duck species, with the exception of Canada goose and mallard;
- all raptors and owls listed on Annex I of the Birds Directive¹ or Schedule 1 of the Wildlife and Countryside Act 1981 (as amended)²;
- all wader species; and
- all diver species.

6.3.5 Flight information on other species e.g. gulls, were also recorded in a shortened form, noting the species and whether it crossed the Proposed Development at collision risk height.

¹ Bird species listed on Annex I of the EC Directive of the Conservation of Wild Birds (Birds Directive) – http://ec.europa.eu/environment/nature/conservation/wildbirds/threatened/index_en.htm

² Bird species listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) - <https://www.legislation.gov.uk/ukpga/1981/69/schedule/1>

- 6.3.6 VP watches were undertaken between March and October 2021 to collect data on flight activity for target species. The surveys followed standard guidance for onshore wind farms, which forms the accepted standard for surveys related to OHL developments³. Four VP locations were established to monitor the site, the locations of these VPs are shown in **Figure 6.2**. The VPs were selected through a mix of GIS analysis and field trials, maximising ground visibility within the flight activity Study Area. Six hours of watches were completed at each VP location per month. No VP surveys were undertaken during the non-breeding season.
- 6.3.7 Where suitable habitat for target raptor and owl species was present within 2 km of the Proposed Development, specific surveys for these target species were carried out using a combination of walkover surveys combined with miniature VPs in accordance with methods described in Hardey *et al.*, 2013⁴. Four survey visits for breeding raptors and owls were undertaken between March and July 2021. In addition, any raptor flight data from the VP surveys that was indicative of breeding was used to help target the walkover surveys.
- 6.3.8 Four BBS visits using a version of the Brown and Shepherd⁵ method were carried out between April and July 2021.
- 6.3.9 Two walkover surveys were undertaken to search for black grouse in May 2021.
- 6.3.10 Diver surveys were undertaken across all lochs identified in **Figure 6.1**, with two survey visits carried out between May and August 2021.

Determining Magnitude of Change and Sensitivity of Receptors

- 6.3.11 The assessment has been undertaken according to the current guidance detailed by CIEEM⁶.
- 6.3.12 The assessment of the significance of predicted impacts on ornithological receptors is based on both the 'sensitivity' of a receptor and the nature and magnitude of the effect that the Proposed Development will have on it. A key consideration in assessing the effects of any development on ornithological features is to define the species that need to be considered. In identifying these receptors, it is important to recognise that a development can affect ornithological features directly (e.g. destruction of nests) and indirectly, by affecting land beyond the development site (e.g. if birds are displaced through noise generation during the construction phase).
- 6.3.13 It is impractical for such an assessment to consider every species that may be affected, instead it should focus on valued ornithological receptors. These are species that are valued in some way and could be affected by the Proposed Development. Where there is no potential for valued receptors to be affected significantly, it is not necessary for them to be considered in the assessment.
- 6.3.14 Ornithological features have been valued using the scale set out in **Table 6-2** below, with examples provided of criteria used when defining the level of value.

³ Scottish Natural Heritage (2017) Recommended bird survey methods to inform impact assessment onshore wind farms (Version 2). SNH Guidance. SNH, Battleby

⁴ Hardey, J., Crick, H., Wernham, C., Riley, H., Etheridge, B. & Thompson, D. (2013) Raptors: a field guide to survey and monitoring (3rd Edition). The Stationery Office, Edinburgh.

⁵ Brown, A.F. & Shepherd, K.B. (1993) A method for censusing upland breeding waders. *Bird Study*, **40**: 198 – 195.

⁶ Chartered Institute of Ecology and Environmental Management (2018). Guidelines for ecological impact assessment in the United Kingdom. Winchester. Chartered Institute of Ecology and Environmental Assessment.

Table 6-2: Approach to valuing ornithological receptors

Sensitivity of Receptor	Examples (Guidance to Evaluation)
Very High (International)	A species listed as a qualifying feature of an internationally designated site (e.g. SPA). A regularly occurring, substantial population of an internationally important species (listed on Annex I of the Birds Directive), or regularly occurring migratory species listed under Annex II of the Birds Directive connected to an SPA designated for this species.
High (National)	A species listed as a qualifying feature of a nationally designated site (e.g. Site of Special Scientific Interest (SSSI)). Species present in nationally important numbers (>1% UK population). Ecologically sensitive species such as rare birds (<300 breeding pairs in the UK).
Medium (Regional)	A species listed under Schedule 1 of the Wildlife and Countryside Act or Annex I of the Birds directive. Species present in regionally important numbers (>1% of the regional population) Species occurring within SPAs but not crucial to the integrity of the site.
Low (Local)	Species described above but which are present very infrequently or in very low numbers. A regularly occurring, substantial population of a nationally scarce species, including species listed on the UK and Local BAPs e.g. skylark.
Negligible	All other species that are widespread and common and which are not present in locally important numbers and which are considered to be of low conservation concern (e.g. UK Birds of Conservation Concern (BoCC) Green List species).

- 6.3.15 Although the Proposed Development is non-EIA, the process for assessment aligns with EIA Regulations and the levels of significance are equivalent. As such, within the context of the EIA Regulations and in line with current NatureScot guidance⁷, the top three geographical tiers (international, national and regional) are the most important. This means that if there is an effect at this population level, it is considered 'significant' in terms of the EIA regulations. For breeding bird species, NatureScot uses Natural Heritage Zones (NHZ) as the appropriate regional biogeographical unit of assessment. Twenty-one zones covering Scotland have been drawn to reflect biogeographical differences between zones. The Proposed Development lies within the NHZ 7: Northern Highlands. The Scottish Wind Farm Bird Steering Group published a review of NHZ bird populations across Scotland (Wilson *et al.*, 2015)⁸. The regional population estimates used in this EA are mostly derived from this reference but have been superseded where more up-to-date population data are available for individual species.
- 6.3.16 Another key consideration in assessing the effects of any development on ornithological receptors is to define the areas of habitat and the species that need to be considered. This requires the identification of a potential zone of influence, which is defined as those areas and resources that may be affected by biophysical changes caused by project activities, however remote from a site.
- 6.3.17 The zone of sensitivity for ornithological features varies according to the characteristics of the feature and the nature of the potential impact. In this assessment, impacts are assessed for within the site (defined as the Study Area) and the zones as displayed on **Figure 6.1**.
- 6.3.18 The behavioural sensitivity of ornithological receptors is also important when assessing potential impacts. Different species respond differently to stimuli, making some particularly sensitive to development activities and

⁷ SNH (2018) Assessing significance of impacts from onshore wind farms outwith designated areas. (Version 2). SNH

⁸ Wilson, M.W., Austin, G.E., Gillings, S., and Wernham, C.V. (2015) Natural Heritage Zone Population Estimates. SWBSG Commissioned Report: 1504.

others less so. By way of example, sensitivity is determined according to species behaviour, using broad criteria set out in **Table 6-3** below. Sensitivity can vary dependent on the activity the species is undertaking, for example, a species is likely to be less tolerant of disturbance close to its nest during the breeding season than at other times of the year. Thus, sensitivity changes with both space and time.

Table 6-3: Behavioural Sensitivity Criteria

Magnitude	Definition
High	Species occupying remote areas away from human activities and exhibiting strong and long-lasting reactions to disturbance events. Examples include divers, greenshank, eagles, merlin and hen harrier.
Medium	Species that appear to be warily tolerant of human activities and exhibiting short-term reactions to disturbance events. Examples include black grouse, curlew and golden plover.
Low	Species occupying areas subject to frequent human activity and exhibiting mild and brief reaction to disturbance events. Examples include greylag goose and kestrel.

Characterising Potential Effects on Receptors

6.3.19 Effects on ornithological receptors are judged in terms of magnitude and duration. Magnitude refers to the size of an impact, and is determined on a quantitative basis where possible. Magnitude is assessed within four levels as detailed below in **Table 6-4**. Effects can be permanent or temporary; direct or indirect; adverse or beneficial, and can be cumulative. Effects can vary according to scales of size, extent, duration, timing and frequency of impacts. These factors are brought together to assess the magnitude of the effect on the conservation status of the receptor and on the integrity of the habitats that support them:

- Integrity is the coherence of the ecological structure and function of a site or habitat that enables it to sustain its plant and animal communities and populations; and
- Conservation status is the ability of an animal community or population to maintain its distribution and/or extent.

Table 6-4: Magnitude of Effect

Magnitude	Definition
Major (High)	A permanent or long-term effect on the integrity of a site or conservation status of a species assemblage / community, population or group. If adverse, this is likely to threaten its sustainability; if beneficial, this is likely to enhance its conservation status
Moderate (Medium)	A permanent or long-term effect on the integrity of a site or conservation status of a species assemblage / community, population or group. If adverse, this is unlikely to threaten its sustainability; if beneficial; this is likely to be sustainable but is unlikely to enhance its conservation status.
Minor (Low)	A short-term but reversible effect on the integrity of a site or conservation status of a species assemblage / community, population or group that is within the range of variation normally experienced between years.
Negligible	A short-term but reversible effect on the integrity of a site or conservation status of a species assemblage / community population or group that is within the normal range of annual variation.

Determining Significance of Potential Ornithological Effects

6.3.20 Having followed the process of attributing a value to an ornithological receptor, determining its sensitivity and characterising potential effects, the significance of the effect is then determined. The CIEEM guidelines use

only two categories to classify effects: “significant” or “not significant”. The significance of an effect is determined by considering the value of the receptor and the magnitude of the effect and applying professional judgement as to whether the integrity of the receptor will be affected.

- 6.3.21 Effects are more likely to be considered significant where they affect receptors of higher conservation value or where the magnitude of the effect is high. Effects not considered to be significant would be those where the integrity of the receptor is not threatened, effects on receptors of lower conservation value, or where the magnitude of the effect is low.
- 6.3.22 It is noted that some potential effects are not considered significant in EIA terms. Where such effects are identified no specific mitigation is required, however good practice would be to control these effects as far as practicable.

Collision Risk Assessment

- 6.3.23 In line with current guidance from NatureScot⁹, a generic collision risk modelling approach, typically carried out for wind farm developments, has not been undertaken as part of this assessment as this is considered to be less appropriate for assessing collision risk with power lines. Instead, current guidance recommends that emphasis is put on mitigation where the assessment has indicated potential risks. Results of baseline surveys are analysed to identify any ‘hot-spots’ where mitigation may be required.

Limitations and Assumptions

- 6.3.24 Bird surveys are based on sampling techniques and results give an indication of numbers and activities of birds at the particular times that surveys were carried out. The surveys for the Proposed Development were distributed by time of day and by date throughout the year to give a representation of the range of activity, but were limited occasionally by inclement weather, though this did not compromise overall survey effort. No gaps were identified in the baseline data that would prevent assessments being undertaken for the purposes of determining likely significant effects as is required by the EIA Regulations.

6.4 Baseline Conditions

Designated Sites

- 6.4.1 Four statutory sites with international designations for ornithological features were identified within 20 km of the Proposed Development:
- West Inverness-shire Lochs SPA;
 - Loch Knockie and nearby Lochs SPA;
 - North Inverness Lochs SPA; and
 - Glen Affric to Strathconon SPA.
- 6.4.2 A summary of their citations is provided in **Table 6-5** below and their locations shown in **Figure 6.3**.

⁹ SNH (2016) Assessment and mitigation of impacts of power lines and guyed meteorological masts on birds. (Version 1). SNH

Table 6-5: Summary of Internationally Designated Sites

Site Name	Distance from Application Site and Direction	Designation Interest
West Inverness-Shire Lochs SPA/SSSI	7.2 km south-west	Breeding: <ul style="list-style-type: none"> Black-throated diver (<i>Gavia arctica</i>) and Common scoter (<i>Melanitta nigra</i>). The SPA contains of eight lochs, of which five are within 20 km of the Proposed Development. The closest is Loch Lundie, lying to the southwest of the Proposed Development
Loch Knockie and nearby lochs SPA/SSSI	7.5 km east	Breeding: <ul style="list-style-type: none"> Slavonian grebe (<i>Podiceps auritus</i>). The SPA contains two lochan complexes which support breeding populations of Slavonian grebe, of which two are within 20 km of the Proposed Development. The closest are the lochan complex on Glendoe forest, lying to the southeast of the Proposed Development.
North Inverness Lochs SPA	9.7 km north-east	Breeding: <ul style="list-style-type: none"> Slavonian grebe (<i>Podiceps auritus</i>). The SPA contains five lochs which support breeding populations of Slavonian grebe, of which five are within 20 km of the Proposed Development. The closest is Loch Dubh, lying to the north-east of the Proposed Development.
Glen Affric to Strathconon SPA	10.3km north-west	The Glen Affric to Strathconon SPA is a large predominantly upland site encompassing the foothills and mountains of Glen Affric, Glen Cannich, Glen Strathfarrar and Strathconon, designated for regularly supporting a population of European importance of golden eagle.

6.4.8 No statutory sites with national designations for ornithological features were identified within 5 km of the Proposed Development.

Species

6.4.9 A total of 15 species of conservation concern (Schedule 1 / Annex I species, Red and Amber listed in BoCC) were recorded as probable breeders within the Study Area; full details are contained in **Appendix 6.2**, with territory locations displayed in **Figure 6.4**. Territory locations of Schedule 1 species are displayed in confidential **Figure 6.7**

6.4.10 Flight activity surveys recorded a total of 12 flights of 4 target species overflying the Study Area, full details on each flight are contained in **Appendix 6.2**, with all flights displayed in **Figure 6.5**.

6.4.11 Two target species (merlin and tawny owl) were recorded during the breeding raptor and owl surveys, details are provided in Confidential **Appendix 6.5** and **Figure 6.7**.

6.4.12 Black grouse surveys identified two lek locations within the Study Area, full details are contained in **Appendix 6.2**. Locations are displayed in **Figure 6.6**.

6.4.13 A number of Valued Ornithological Receptors (VORs) have been identified from the results of desk study and baseline surveys. These VORs and their assessment values are shown in **Table 6-6** below.

Table 6-6: Summary of Valued Ornithological Receptors (VORs) within the Survey Area.

Value	VORs	Justification
International	None	No designated feature of an SPA and Ramsar site within 20 km of the Proposed Development were recorded within the Study Area.
Regional	Black grouse, golden plover, greenshank, merlin, osprey, white-tailed eagle.	Not a designated feature of an SPA or Ramsar site within 20 km of the Proposed Development, however considered to be of high conservation concern (Annex 1, Schedule 1 or part of a population of regional importance)
Local	Cuckoo, passerine species of medium / high conservation concern (dunnock, bullfinch, skylark, meadow pipit, song thrush, mistle thrush, willow warbler, spotted flycatcher, tree pipit, grey wagtail, wren).	Target species of high conservation concern (SBL / LBAP / UK BoCC Red and Amber list species) that are present in locally important numbers but are not a qualifying feature of any statutory sites within 10 km of the Proposed Development.
Negligible	Secondary raptor species (buzzard, sparrowhawk, kestrel); gulls (common); corvids (raven, hooded crow); passerine species of low conservation concern (chaffinch, coal tit, goldcrest, pied wagtail, robin, siskin, stonechat, swallow).	Generally common and widespread non-target species of low conservation concern (i.e. species on the UK BoCC Green List that are not afforded any special protection) that are not a designated feature of any statutory sites within 10 km of the Proposed Development.

6.4.18 Receptors of negligible conservation value are not considered further in this assessment as these receptors are generally common and widespread species and none were recorded within the Study Area in numbers considered to be locally, regionally, nationally or internationally important.

6.4.19 Results from all relevant surveys have been compiled to produce baseline descriptions for each receptor detected. Receptors of regional or higher value are discussed individually; those assessed as being of local value are included in **Appendix 6.3**.

Black grouse

6.4.20 Two flights of Black grouse were recorded during flight activity surveys close to lek sites in Levishie forest. Black grouse surveys identified two lek locations within the Study Area, see **Figure 6.6**. The number of displaying males at each location ranged between six (Lek 2) and eight (Lek 1) birds. Single females were recorded at both lek location. Both leks are located within 100 m of the Proposed Development and 150 m of existing access tracks which will be utilised as an access route for the Proposed Development.

Golden plover

6.4.21 Eight flights were recorded between May 2021 and July 2021 across Levishie forest, see **Figure 6.5**. No flights were recorded crossing the Proposed Development at Potential Collision Height (PCH).

6.4.22 One breeding territory of golden plover was identified within the Study Area, close to Loch an Rughie Dhuibh, see **Figure 6.4**. The nearest territory to the Proposed Development is 100 m.

Greenshank

6.4.23 Details of white-tailed eagle within the Study Area are contained within Confidential **Appendix 6.4**.

Merlin

6.4.24 Details of white-tailed eagle within the Study Area are contained within Confidential **Appendix 6.4**.

Osprey

6.4.25 Details of white-tailed eagle within the Study Area are contained within Confidential **Appendix 6.4**.

White-tailed eagle

6.4.26 Details of white-tailed eagle within the Study Area are contained within Confidential **Appendix 6.4**.

6.5 Issues Scoped Out

6.5.1 Due to the Proposed Development not being within close proximity to any SPA designated for wintering bird species, it was not considered necessary to survey during the winter months, as agreed with NatureScot prior to the commencement of bird survey work.

6.6 Potential Effects

6.6.1 The enabling and construction works, forestry felling, the installation of temporary access routes and the installation and operation of the Proposed Development all have the potential to impact upon ornithological features.

6.6.2 Based on the consultation responses and known environmental sensitivities, this assessment considers the following potential effects:

- the direct loss and fragmentation of bird habitats due to 'land take' by the Proposed Development, which may reduce the quantity and quality of available breeding, roosting and foraging habitat for bird species including raptors, waders and wildfowl. This effect may also include the permanent removal of trees / scrub as part of the wayleave associated with the OHL;
- the modification of bird habitat due to hydrological change should construction activities disrupt hydrological pathways and processes. This may have a potential effect on quality of breeding and foraging habitat for waders and wildfowl;
- impacts on the qualifying features of the nearby SPAs through connectivity between the SPA and the Proposed Development;
- the permanent or temporary displacement of birds during construction and operations phase which may result from noise, lighting and vehicular movements. This effect may include affecting breeding, roosting and foraging behaviour of raptors, waders and wildfowl; and
- the accidental mortality of individual birds due to collision risk resulting from contact with the pole structures and OHL.

Electrocution

6.6.3 Birds can be at risk of electrocution from contact with unprotected wires and associated metal infrastructure. Large birds are generally more vulnerable to electrocution by OHLs because of the greater risk of spanning between two phase conductors or energised and earthed structures with outreached wings or other body parts¹⁰. Many bird species (particularly raptors) are attracted to OHLs and their supports, especially in open un-forested areas, as they provide lookout posts, as well as being used generally for perching, nesting and

¹⁰ Lehman, R., Kennedy, P. and Savidge, J. (2007) The state of the art in raptor electrocution research: A global review. *Biological Conservation* 136 159-174

roosting. Ground nesting species (such as hen harrier) rarely use OHL supports for perching / hunting and are therefore at less risk from electrocution¹¹.

- 6.6.4 Studies carried out to investigate avian electrocution in Europe, associated with wooden poles, concluded that wingspan was the key biometric associated with the possibility of being electrocuted¹². If the distance between conductor phases is small, if only short upright insulators are used or if protective gaps (e.g. arcing horns for lightning strikes) are installed on a wood pole, even small birds can be electrocuted.
- 6.6.5 The configuration of the wires and poles of the Proposed Development means that it is not possible for a bird to be able to touch a conductor while it is perched on an earthed pole, touch a conductor and the earth wire simultaneously or touch two conductor wires simultaneously due to the gaps between the conductors and perch points being greater than any bird wing span found within the Study Area (2.5 m).
- 6.6.6 There should therefore be no risk of electrocution to birds from the Proposed Development.

6.7 Assessment of Effects

- 6.7.1 Potential disturbance / displacement effects and potential collision effects arising from the construction and operational phases of the Proposed Development are considered for each VOR detected.

Designated Sites

- 6.7.2 As the qualifying species of the nearby designations were not recorded during surveys carried out within the Study Area, it is not considered likely that the Proposed Development would have a significant effect on qualifying species for these designations.

Black grouse

- 6.7.1 Black grouse is a Red-Listed species on the BoCC. Inverness-shire holds a regionally important population. Black grouse tend to fly low and keep close to the ground, as a result this species is particularly vulnerable to flying into deer fences, so are probably susceptible to unmarked low lying wires and cables. Research on grouse species in Norway has shown collisions with power lines to be a regular source of mortality for black grouse¹³. The species is sensitive to disturbance at lekking sites, consequently, lekking sites close to areas where construction is planned are vulnerable to disturbance. Disturbance distances where birds take to flight are estimated between 300 – 500 m for lekking males.

Potential Disturbance / Displacement Effects

- 6.7.2 Two lek locations were identified within the Study Area. A total of 14 displaying males were counted between these two leks. Both leks are located within 300 m of the Proposed Development. The lek located on Levishie Forest is located near an existing access track which will be utilised during construction as an access route for the Proposed Development. Disturbance to displaying males may result in reduced breeding success for black grouse. Best practice guidance indicates that disturbance within a zone of 500-750m of a lek site should be avoided. The effects would be temporary and reversible. Due to the potential for affecting more than 1 % of the regional population, the risk of unmitigated displacement due to disturbance during the construction phase is predicted to be of minor (adverse) magnitude and **significant** for this species.

Potential Collision Effects

¹¹ Haas, D., Nipkow, M., Fielder, G., Schneider, R., Haas, W. and Schurenberg, B. (2005) Protecting birds from powerlines. Nature and Environment, 140. Council of Europe Publishing, Strassbourg

¹² Janss, G. and Ferrer, M. (1999) Avian electrocution on power poles: European experiences. Birds and Power Lines: Collision, Electrocution and Breeding. Quercus, Madrid, Spain, pp. 145 – 164.

¹³ Bevanger, K. (1998) Biological and conservation aspects of bird mortality caused by electricity power lines: a review. *Biol. Conserv.* 86: 67-76.

6.7.3 Two flights of black grouse were recorded during the flight activity surveys. Although this species is susceptible to collisions with power lines, no flights were recorded at risk height across the corridor of the Proposed Development. Additionally, the proximity of lek sites to existing overhead line infrastructure indicates that new overhead line infrastructure may not create additional cumulative effects. Therefore, the potential effects as a result of collision risk is considered to be of low magnitude and therefore **not significant** for this species.

Golden plover

6.7.4 Golden plover is listed on Annex I of the Birds Directive and is an SBL priority species. It was recently moved from the UK BoCC Green List to Amber List due to the international importance of non-breeding birds in the UK¹⁴. In Inverness-shire, golden plover is considered a widespread breeder on the moors and upland habitats and in winter is found at coastal sites around the county, occasionally in large flocks.

Potential Disturbance / Displacement Effects

6.7.5 Golden plover were found breeding within the Study Area at low frequency (one territory on Levischie Forest). The territory is approximately 100 m from the Proposed Development alignment. Research at operational wind farms in Scotland has shown that the population density of waders within 500 m of wind farms can be reduced by up to 80 % for golden plover¹⁵, although some wind farms have apparently shown no negative impact on the species¹⁶. On this basis, the Proposed Development has the potential to displace up to one golden plover territory. Although it is possible that small numbers of foraging and breeding birds may be displaced due to construction of the Proposed Development, the effects would be temporary and reversible. There is alternative foraging and breeding habitat available in the surrounding area, therefore it is likely that any displaced birds would relocate to other suitable habitat nearby. As such, displacement due to disturbance is considered to be of low magnitude and therefore **not significant** for golden plover.

Potential Collision Effects

6.7.6 Eight flights of golden plover were recorded within the Study Area, occasionally comprising small flocks of birds in early spring visiting potential foraging areas near the Proposed Development. No flights crossed the Proposed Development at risk height. Due to the infrequency of flights within the Study Area, the impact of collision mortality is considered to be of negligible magnitude and consequently **not significant** for golden plover.

Greenshank

6.7.7 Assessment of effects on greenshank is contained within Confidential **Appendix 6.4**.

Merlin

6.7.8 Assessment of effects on merlin is contained within Confidential **Appendix 6.4**.

Osprey

6.7.9 Assessment of effects on osprey is contained within Confidential **Appendix 6.4**.

White-tailed eagle

¹⁴ Eaton, M., Aebischer, N., Brown, A., Hearn, R., Lock, L., Musgrove, A., Noble, D., Stroud, D. and Gregory, R. (2015) Birds of Conservation Concern 4: The Population Status of Birds in the UK, Channel Islands and Isle of Man. *British Birds* 108, 708-746

¹⁵ Sansom, A., Pearce-Higgins, J.W. & Douglas, D.J.T (2016). Negative impact of wind energy development on a breeding shorebird assessed with a BACI study design. *Ibis* 158 (3), 541 – 555.

¹⁶ Fielding, A. H. and Haworth, P.F. (2013). Farr wind farm: A review of displacement disturbance on golden plover arising from operational turbines – 2013 update. Hawrth Conservation, Mull.

6.7.10 Assessment of effects on white-tailed eagle is contained within Confidential **Appendix 6.4**.

Other Ornithological Receptors

6.7.11 Assessment of ornithological receptors of local value are presented in **Appendix 6.4**.

6.8 Mitigation

6.8.1 Good practice management measures are proposed in order to limit and further minimise potential impacts on ornithological features across the site and ensure legal compliance during the construction phase.

Mitigation by Design

6.8.2 SSEN Transmission's approach to the EA process has been to prioritise and implement mitigation in a hierarchical way. This approach focuses on developing a design through the consideration of alternative routes to avoid likely significant adverse effects as far as possible, as discussed in Chapter 2 of this EA Report.

General mitigation measures

6.8.3 SSEN Transmission has developed GEMPs and SPPs for construction works that may negatively impact upon VORs. The SPPs outline the procedures that must be followed where there is a potential for breeding birds to be present. Each SPP outlines the responsibilities of SSEN Transmission and their Contractors, legislative protection for the protected species, best practice measures to follow and an approved methodology for carrying out certain mitigation activities. This suite of SPPs has been approved by NatureScot and would be adopted where relevant to the project.

6.8.4 A Construction Environmental Management Plan (CEMP) will be developed by the Principal Contractor detailing measures to manage, control and monitor the potential effects of noise, dust, litter, pollution and personnel / vehicular movements. Best practice pollution control measures, with reference to the Scottish Environment Protection Agency (SEPA) and Control of Substances Hazardous to Health (COSHH) guidelines, will be included in the CEMP. Particular reference will be made to managing handling, storage and use of hazardous chemicals and fuels used during the construction process. A detailed spill response plan will be developed and fully-briefed to all site operatives and forms part of the CEMP.

6.8.5 Construction (including enabling works and felling) should avoid being undertaken in the breeding bird season (later March to end of July inclusive) to minimise disturbance to nesting birds where possible. The construction of the Proposed Development is anticipated to take approximately 22 months to complete, and it would not be possible for all works to be undertaken outwith the breeding bird season.

6.8.6 Where it is not possible to schedule all works out with the breeding bird season, the appointed Environmental Clerk of Works (ECoW), or suitably qualified ornithologist, would undertake pre-construction surveys to identify the presence of protected bird species and nests. Should a nest of any bird be located during pre-construction surveys, the ECoW would: recommend suitable mitigation measures (including appropriate buffer zones depending on the species); implement any requirements of the SPP and provide toolbox talks to contractors to ensure accidental / reckless disturbance of the nesting bird is avoided. The ECoW / suitably qualified ornithologist would undertake regular monitoring of birds present within proximity to works to ensure any nests are promptly located, identified and suitably protected from damage or disturbance.

Measures Specific to Black Grouse

6.8.7 Prior to the commencement of construction, black grouse lek surveys would be carried out at the appropriate time of year by a suitably qualified ornithologist in accordance with standard survey methodologies¹⁷. Black grouse are considered to have moderate behavioural sensitivity to disturbance, but they are most at risk from disturbance whilst displaying at lek sites. Lek 1 is located within 100 m of the Proposed Development. Both leks are located within 150 m of an existing access track which will be utilised during construction as an access route for the Proposed Development.

6.8.8 The construction programme should consider the timing of works within 500 m of the lek locations, to completely avoid the use of this section of track during the peak lekking period of late March to the end of May. If this section of access track requires upgrading as part of enabling works for the Proposed Development, this shall be undertaken outwith March to May. If it is not considered possible to completely avoid the use of this section of access track between March and May to facilitate access to construct the Proposed Development, access should be limited to avoid disturbance to lekking birds (i.e. no vehicle access will be permitted along the access track within 500 m of lek sites for two hours after sunrise). These measures will be included in the Birds SPP (see **Appendix 3.2**), adopting measures specific to black grouse, which the ECoW will implement and monitor compliance with.

6.9 Monitoring

6.9.1 Construction phase monitoring would be carried out by the appointed ECoW, to ensure compliance with environmental legislation and effective delivery of mitigation measures.

6.10 Residual Effects

6.10.1 A summary of potential effects on valued ornithological receptors (VORs) is provided in **Table 6-7**. An assessment of the residual effects, those remaining following the implementation of the proposed mitigation measures as detailed in Section 6.8 above has been undertaken.

6.10.2 The implementation of mitigation measures to protect black grouse and greenshank during construction and operation of the Proposed Development would reduce the potential effects on these VORs from minor to negligible.

6.10.3 No other significant effects (pre-mitigation) were identified. Nevertheless, good practice management measures have been identified, as detailed in Section 6.8 above, to further avoid and reduce effects. The residual effects on ornithological receptors are not significant.

¹⁷ Gilbert, G., Gibbons, D.W. and Evans, J. (2011) Bird Monitoring Methods. RSPB/BTO

Table 6-7: Summary of Effects

VOR	Potential Effects	Significance of Effect	Specific Mitigation	Residual Significance
Designated sites	Displacement / disturbance to qualifying species during the construction phase (including enabling works and felling). Mortality of SPA qualifying species through collision.	Negligible	No specific mitigation is required in addition to the implementation of best practice measures detailed in the GEMPs and SPPs.	Negligible, Not significant
Black grouse	Disturbance to breeding black grouse during the construction phase (including enabling works and felling).	Minor adverse, Significant	In addition to the implementation of best practice measures detailed in the GEMPs and SPP, mitigation as described in Section 6.8.7 and 6.8.8 will include consideration during the scheduling of works to avoid using the existing access tracks within 500 m of identified lek sites to avoid disturbance / displacement of lekking birds where possible.	Negligible, Not significant
	Mortality through collision.	Negligible, Not significant	No specific mitigation is required.	Negligible, Not significant
Golden plover	Disturbance to breeding pairs during the construction phase (including enabling works and felling).	Negligible, Not significant	No specific mitigation is required in addition to the implementation of best practice measures detailed in the GEMPs and SPPs.	Negligible, Not significant
	Mortality through collision.	Negligible, Not significant	No specific mitigation is required.	Negligible, Not significant
Greenshank	Disturbance to breeding pairs during the construction phase (including enabling works and felling).	Negligible, Not significant	For details, see Confidential Appendix 6.4 .	Negligible, Not significant
	Mortality through collision.	Negligible, Not significant	No specific mitigation is required.	Negligible, Not significant
Merlin	Disturbance to breeding pairs during the construction phase (including enabling works and felling).	Negligible, Not significant	No specific mitigation is required.	Negligible, Not significant

VOR	Potential Effects	Significance of Effect	Specific Mitigation	Residual Significance
	Mortality through collision.	Negligible, Not significant	No specific mitigation is required.	Negligible, Not significant
Osprey	Disturbance to breeding pairs during the construction phase (including enabling works and felling).	Negligible, Not significant	No specific mitigation is required.	Negligible, Not significant
	Mortality through collision.	Negligible, Not significant	No specific mitigation is required.	Negligible, Not significant
White-tailed eagle	Disturbance to breeding pairs or roosting birds during the construction phase (including enabling works and felling).	Negligible, Not significant	No specific mitigation is required.	Negligible, Not significant
	Mortality through collision.	Negligible, Not significant	No specific mitigation is required.	Negligible, Not significant

6.11 Summary

- 6.11.1 An assessment has been made of the predicted significance of effects of the Proposed Development on ornithological interests. This assessment identified no significant effects, following mitigation, of the Proposed Development on ornithological interests.
- 6.11.2 Specific mitigation measures are proposed to minimise the potential effects of displacement and disturbance and to ensure compliance with the Wildlife and Countryside Act (1981) as amended by the Nature Conservation (Scotland) Act (2004). Best practice guidance regarding breeding birds would be followed and an ECoW would be employed as appropriate during construction.