

## 9 ORNITHOLOGY

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### 9.1 Introduction

- 9.1.1 This chapter provides an assessment of the potential effects upon important ornithological features in relation to the construction and operation of the Proposed Development. The 'site' comprises the 'turbine area' and the 'access area'.
- 9.1.2 The chapter is supported by **Figures 9.1 to 9.6** presented in **Volume 3** and the following technical appendices presented in **Volume 2**:
- **Appendix 9.1:** Ornithology;
  - **Appendix 9.2:** Confidential Ornithology;
  - **Appendix 9.3:** Collision Risk Model (CRM) Analysis; and
  - **Appendix 9.4:** Golden Eagle Topographical (GET) Model.
- 9.1.3 **Appendix 9.2** contains detailed information pertaining to the locations of sensitive breeding bird species and which is considered confidential. Such information will not be made publicly available, but will be provided to the Scottish Government, the Highland Council (THC) and NatureScot (as required).
- 9.1.4 This chapter should also be read with reference to **Chapter 8: Ecology**.
- 9.1.5 Only common bird names are referred to within this chapter. A summary of species referred to including common names, species names and relevant conservation status is provided in **Appendix 9.1**.

### 9.2 Legislation, Policy and Guidance

- 9.2.1 In preparation of this chapter, reference has been made to the following key pieces of legislation, planning policy and guidance:

#### European

- Conservation of Habitats and Species Regulations 2017, as amended in Scotland by the Conservation (Natural Habitats, &c.) (EU Exit) (Scotland) (Amendment) Regulations 2019 (collectively 'the Habitats Regulations').

#### National

- The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017;
- The Wildlife and Countryside Act 1981 (as amended);
- The Wildlife and Natural Environment (Scotland) Act 2011;
- The Nature Conservation (Scotland) Act 2004;
- The National Planning Policy Framework 3 (2014);
- Scottish Planning Policy (2014);
- General pre-application and scoping advice for onshore wind farms (NatureScot, 2020);

- Guidelines for Ecological Impact Assessment in the UK and Ireland. Terrestrial, Freshwater, Coastal and Marine (CIEEM, 2018);
- Recommended bird survey methods to inform impact assessment of onshore wind farms (SNH, 2017a);
- Assessing Connectivity with Special Protection Areas (SPAs) (SNH, 2016);
- Assessing Significance of Impact From Onshore Windfarms on Birds Outwith Designated Areas (SNH, 2018a);
- Assessing the Cumulative Impact of Onshore Wind Energy Developments (NatureScot, 2021);
- Assessing the Cumulative Impact of Onshore Wind Farms on Birds (SNH, 2018b);
- Windfarms and Birds – Calculating a Theoretical Collision Risk Assuming No Avoiding Action (SNH, 2000);
- Avoidance Rates for the onshore SNH Wind Farm Collision Risk Model (SNH, 2017b);
- Natural Heritage Zones Bird Population Estimates (Wilson *et al.*, 2015);
- ‘Fifth Birds of Conservation Concern’ (Stanbury *et al.*, 2021); and
- Scottish Biodiversity List (SBL) 2020.

#### Local

- Sutherland Local Biodiversity Action Plan (LBAP); and
- Highland Biodiversity Action Plan.

9.2.2 Local planning policies of relevance to this assessment are provided in **Chapter 5: Planning Policy Context**.

### 9.3 Scope of Assessment

9.3.1 Assessment has been undertaken in accordance with CIEEM guidelines (2018), and considers the following three main potential impacts upon ornithological features associated with wind farm developments:

- Direct habitat loss – as a result of the construction of wind farm infrastructure;
- Disturbance/displacement – the displacement of birds from the wind farm and surrounding areas as a result of the construction and operation of the wind farm; and,
- Collision mortality – mortality resulting from collision or interaction with turbines or other wind farm infrastructure.

9.3.2 The potential for effects is considered as a result of the Proposed Development alone and cumulatively, in-combination with other wind farm developments.

9.3.3 CIEEM guidelines (2018) and NatureScot guidelines (NatureScot, 2020) stipulate that it is not necessary to carry out a detailed assessment of impacts upon ecological (and ornithological) features that are sufficiently widespread, unthreatened and resilient to impacts of a development proposal.

9.3.4 As such, the assessment considers effects upon designated sites and ornithological features which are considered important on the basis of relevant guidance and professional judgement.

- 9.3.5 Where ornithological features are not considered so important as to warrant a detailed assessment, or where they will not be significantly affected on the basis of baseline information, these are 'scoped out' of the assessment. Mitigation measures for such features may however, still be outlined as appropriate to reduce and/or avoid any potentially adverse effects or to ensure legislative compliance.

### **Decommissioning Phase Effects**

- 9.3.6 Decommissioning phase effects are considered to result in no greater scope and magnitude of effects upon ornithological features than would occur during the construction phase of the Proposed Development, albeit occurring over a shorter timescale.
- 9.3.7 As such, decommissioning phase effects upon ornithological features are not considered explicitly within this assessment.

### **Direct Habitat Loss**

- 9.3.8 The Proposed Development will result in the direct and permanent loss of open moorland habitats as detailed within **Chapter 8: Ecology**.
- 9.3.9 Habitat losses have the potential to result in the loss, or otherwise lowered quality, of nesting and foraging opportunities for ornithological features which are known to use or inhabit the site (or the wider area), primarily including black grouse and open moorland species.
- 9.3.10 Overall direct and permanent habitat losses, on the basis of the nature and scale of the Proposed Development, are considered to be small, resulting in an adverse impact upon ornithological features at no more than a "Local" level only. However, habitat loss is considered in the assessment specific to those ornithological features that are scoped into the assessment.
- 9.3.11 All wild birds, their nests, eggs and dependent young are protected under the provisions of the Wildlife and Countryside Act 1981 (as amended). Site clearance activities during the construction phase of the Proposed Development, where undertaken during the breeding bird season (broadly March to August inclusive), may therefore result in an offence under the act should activities result in the loss or damage to in use nests, eggs or dependent young of any wild bird species. Mitigation measures are therefore outlined to ensure legislative compliance during the construction phase and further consideration is scoped out of this assessment.
- 9.3.12 The potential for indirect habitat loss to ornithological features as a result of disturbance and displacement is however, assessed for both the construction and operational phase of the Proposed Development.

## **9.4 Assessment Methodology**

- 9.4.1 Assessment has been undertaken in accordance with CIEEM guidelines (2018) and includes the following stages:
- determination and evaluation of important ecological features;
  - identification and characterisation of impacts;
  - outline of mitigating measures to avoid and reduce significant impacts;

- assessment of the significance of any residual effects after such measures; and
- identification of appropriate compensation measures to offset significant residual effects.

9.4.2 The assessment has also been undertaken with reference to NatureScot guidance (SNH, 2016 and 2018a) on the assessment of wind farm developments in relation to designated sites and those located within the wider countryside.

9.4.3 In accordance with current NatureScot guidance (SNH, 2018a) the assessment of impacts has been undertaken at a **Regional** scale with regards species populations, unless an alternative geographical scale is considered appropriate on the basis of best available information.

9.4.4 The Natural Heritage Zone (NHZ) is considered to be the most appropriate default Regional scale, with the Proposed Development located entirely within the Peatlands of Caithness and Sutherland NHZ (NHZ 5).

### Determining Importance

9.4.5 Relevant European, national and local guidance has been referred to in order to determine the importance of ornithological features. Reference has also been made to NatureScot guidance on “Priority” bird species for assessment, when considering the development of onshore wind farms in Scotland (SNH, 2018a).

9.4.6 In addition, importance has also been determined using professional judgement and taking account of the results of baseline surveys, desk study and the importance of features within the context of the Regional geographic area.

9.4.7 For the purposes of this assessment the importance of ornithological features is considered within a defined geographical context, from Local to International, as outlined in **Table 9.1**.

9.4.8 It should be noted that importance does not necessarily relate to the level of legal protection that a feature receives and ornithological features may be important for a variety of reasons, such as their connectivity to a designated site, rarity or the geographical location of species relative to their known range.

9.4.9 Similarly, whilst a particular feature may be associated with a nearby internationally designated site, the feature is not automatically assigned a value of “International” importance.

**Table 9.1: Geographic Scale of Ornithological Feature Importance**

Importance	Definition
International	An internationally designated site e.g., a Special Protection Area (SPA) and/or Ramsar site or candidate site (e.g., cSPA). A regularly occurring species present in internationally important numbers (>1 % of its biogeographic population) listed under Annex I of the Birds Directive, or regularly occurring migratory species listed under Annex II of the Birds Directive connected to an internationally designated site for this species.
National	A nationally designated site e.g., a Site of Special Scientific Interest (SSSI).

Importance	Definition
	A regularly occurring species present in nationally important numbers (>1 % of its Scottish population) and listed as a UK Biodiversity Action Plan (BAP), SBL priority species Red-listed bird of Conservation Concern (Stanbury <i>et al.</i> , 2021) and listed under Schedule 1 of the Wildlife & Countryside Act or Annex I of the Birds Directive.
Regional	A regularly occurring species present in regionally important numbers i.e., >1 % of its relevant Natural Heritage Zone (NHZ) population (Wilson <i>et al.</i> , 2015) or appropriate alternative and listed as a UK BAP, SBL priority species Red-listed birds of Conservation Concern (Stanbury <i>et al.</i> , 2021) or listed on Schedule 1 of the Wildlife & Countryside Act or Annex I of the Birds Directive.
Local	All other species that are widespread and common and which are not present in regionally or nationally important numbers, but which do contribute to the local breeding/wintering bird assemblage.

### Characterising Impacts

- 9.4.10 Once identified, potential effects are described with reference to the following characteristics as appropriate:
- positive or negative;
  - extent;
  - magnitude;
  - duration;
  - timing;
  - frequency; and
  - reversibility.
- 9.4.11 The assessment only makes reference to those characteristics relevant to understanding the nature of an effect and determining its significance. For the purposes of this assessment the temporal nature of potential effects is described as follows:
- negligible: of inconsequential duration;
  - short-term: for 1 to 5 years;
  - medium-term: for 5 to 10 years;
  - long-term: >10 to 30 years; and
  - permanent: >30 years.
- 9.4.12 The likelihood or probability that an effect will occur is also described as far as possible based on best available information and is referred to using the following terms: certain, likely, unlikely or highly unlikely where appropriate.
- 9.4.13 The criteria used to determine the magnitude of impact are set out in **Table 9.2**.
- 9.4.14 It is important to note that where reference is made to population level effects to assess magnitude (e.g. at the Regional NHZ population level), population estimates used are considered to be guides.
- 9.4.15 In addition, it will often be impossible to equate an impact to an actual population loss. For example, where birds may be displaced from a wind farm site as a result of construction or operational activities, such a loss may be temporary or may reasonably

result in the relocation of birds to suitable habitats elsewhere within the wind farm site, immediate or wider area. Where uncertainty arises a precautionary approach has been adopted.

- 9.4.16 As such, professional judgement, on the basis of best available evidence, has been used to inform the assessment of impacts presented within.

**Table 9.2: Impact Magnitude**

Magnitude	Definition
Very High	The impact (either on its own or in-combination with other proposals) may result in the permanent total or almost complete loss of a site and/or species status or productivity.
High	The impact (either on its own or in-combination with other proposals) may adversely affect the conservation status of a site/population, in terms of the coherence of its ecological structure and function (integrity), across its whole area, that enables it to sustain the habitat, complex of habitats and/or the population levels of species of interest. E.g., Affecting >5 % of the relevant Regional NHZ population.
Medium	Biodiversity conservation status of a site or population would not be adversely affected, but some element of the functioning might be affected, and impacts could potentially affect its ability to sustain some part of itself in the long term. E.g., Affecting >1-5 % of the relevant Regional NHZ population.
Low	None of the above applies, but some minor adverse effect is evident on a temporary basis or affects extent of habitat/species abundance in the local area. E.g., Affecting >1 % of the relevant Regional NHZ population.
Negligible	No observable adverse effect.
Beneficial	The impact is considered to be beneficial to a species or sites nature conservation status.

### Determining Significance

- 9.4.17 For the purposes of assessment a 'significant effect' is an effect that either supports or undermines biodiversity conservation objectives for 'important features' or for biodiversity in general.
- 9.4.18 Significant effects encompass impacts on structure and function of defined sites, habitats or ecosystems and the conservation status of habitats and species (including extent, abundance and distribution) and are identified on the basis of magnitude, professional judgment and best available evidence.
- 9.4.19 CIEEM guidelines (2018) note that "A significant effect does not necessarily equate to an effect so severe that consent for the project should be refused planning permission. For example, many projects with significant negative ecological effects can be lawfully permitted following EIA procedures."
- 9.4.20 For the purposes of this assessment, significant effects are primarily expressed with reference to the Regional population scale, in line with NatureScot's interests of a species

status at wider spatial levels (SNH, 2018a). The significance of effects at other geographical scales (such as Local or National) is also expressed where appropriate and where sufficient information allows a meaningful assessment.

- 9.4.21 In cases of reasonable doubt, where it is not possible to robustly justify a conclusion of no significant effect, a significant effect has been assumed as a precautionary approach. Where uncertainty exists, this is acknowledged.
- 9.4.22 Where the ornithological assessment proposes measures to mitigate adverse effects on ornithological features, a further assessment of residual ornithological effects, taking into account any mitigation recommended, has been undertaken.
- 9.4.23 CIEEM guidelines (2018) do not recommend the sole use of a matrix table as commonly set out in EIA Report Chapters to determine 'significant' and 'not significant' effects. For the purposes of this assessment presented herein, **Table 9.3** sets out adapted CIEEM terminology and equivalent EIA terms.

**Table 9.3: Effect Significance**

Effect (EIA Significance)		
Not significant	Negligible or Low Adverse/ Beneficial	A negligible or low adverse or beneficial effect upon the integrity of an ornithological feature, typically at a site level or below.
Not significant	Minor Adverse / Beneficial	A low or medium, short-term or long-term adverse or beneficial effect upon the integrity of an ornithological feature below regional level (i.e. Local level).
Significant	Moderate Adverse / Beneficial	A high or very high, long-term or permanent adverse or beneficial effect upon the integrity of an ornithological feature at a regional level or above.
Significant	Major Adverse / Beneficial	A medium or high, medium-term or long-term adverse or beneficial effect upon the integrity of an ornithological feature at a national (Scottish) or international level.

### Assessment of Cumulative Effects

- 9.4.24 Potentially significant cumulative effects can result from individually not significant but collectively significant actions taking place over a period of time or concentrated in a location.
- 9.4.25 Cumulative impacts have therefore been assessed with reference to guidance (SNH, 2018b) for important ornithological features subject to a detailed assessment. Furthermore, criteria for the Golden Eagle Topographical (GET) model (details provided in **Appendix 9.4**) are also considered in determining parameters for cumulative assessment.
- 9.4.26 The cumulative assessment therefore includes consideration of:
  - existing wind farm developments, either built or under construction; and

- approved wind farm developments, awaiting implementation.
- 9.4.27 With regard to the spatial extent of the cumulative assessment, guidance (SNH, 2018b) recommends that cumulative effects should typically be assessed at the relevant Regional NHZ scale, unless there is a reasonable alternative.
- 9.4.28 In this case, the undertaking of an in-combination assessment of potential impacts at the NHZ scale would entail the consideration of a very large number of other wind farm developments. NatureScot guidance (SNH, 2018b) does therefore recognise that access to relevant data for other developments may be limited and therefore a meaningful assessment of cumulative effects is not always possible. Given that relevant data for many of the wind farm developments located within the relevant NHZs is unlikely to be readily available, the results of any cumulative assessment at the NHZ scale would therefore not allow any meaningful conclusions to be drawn.
- 9.4.29 An alternative approach has therefore been adopted for the purposes of this assessment and in accordance with the criteria for GET model, with a search area out to 20 km, used to determine the spatial extent over which the cumulative assessment is undertaken.

## 9.5 Consultation Undertaken

- 9.5.1 Consultation with statutory and non-statutory advisors, together with species specialist groups has been undertaken to inform the approach to and undertaking of assessment.
- 9.5.2 A summary of consultations undertaken, responses received and how they have been considered is provided in **Table 9.4**.

**Table 9.4: Summary of Consultations**

Consultee	Response Received	Action Taken
NatureScot, 7th November 2019, Pre-Scoping	Overall satisfied with the scope of ornithological assessment. Stated that cumulative impacts on birds, effects upon NHZ populations of bird species and a collision risk assessment should be undertaken for Annex 1 and Schedule 1 species recorded as regularly using the airspace of the Proposed Development. In particular, this is likely to include golden eagle, red- and black-throated diver, and possibly hen harrier.	Cumulative impacts on birds have been considered, in the context of NHZ populations (NHZ 5) where relevant (see <b>Section 9.12</b> ), and collision risk modelling has been undertaken for those species which were recorded in sufficient number (see <b>Section 9.10</b> ).
NatureScot, 9th April 2020, Scoping	Overall satisfied with the scope of ornithological assessment. Regional impact of Proposed Development on golden eagle in NHZ 5 should be assessed. Potential connectivity between the site and the designated sites Caithness and Sutherland Peatlands Ramsar (breeding greylag goose) and Dornoch Firth and Loch Fleet SPA and Ramsar (wintering greylag goose), and Lairg and Strath Brora Lochs SPA (breeding black-throated diver) should be considered in the assessment. Appreciated that the Proposed Development is	Cumulative effects on birds have been considered, in the context of NHZ populations (NHZ 5) where relevant (see <b>Section 9.12</b> ). Potential connectivity with relevant designated sites is considered in the assessment (see <b>Sections 9.10 and 9.15</b> ).

Consultee	Response Received	Action Taken
	<p>not within a known foraging site for greylag geese so the potential for connectivity is considered unlikely. Consider it unlikely that black-throated divers will pass through the site as birds likely to approach the lochs of Lairg and Strath Brora Lochs SPA along Strath Fleet and Strath Brora to the east and up the Kyle and along Loch Shin from the south.</p>	
<p>RSPB, 9th April 2020, Scoping</p>	<p>Overall agree with content of scoping report, including species and sites scoped into assessment.</p> <p>Confirmed that target species that may use site, and/or adjacent habitats include black-throated diver (qualifying feature of Lairg and Strath Brora Lochs SPA and SSSI), golden eagle, hen harrier, merlin, short-eared owl, greenshank, wood sandpiper, curlew, lapwing, golden plover, black grouse and twite.</p> <p>The assessment should provide sufficient information to an Appropriate Assessment to assess potential impacts on the Lairg and Strath Brora Lochs SPA.</p> <p>Stated that a known golden eagle territory is within 6 km of the Proposed Development and eagle surveys should be undertaken out to 6 km, and records from the Highland Raptor Study Group (HRSG) should be sought.</p> <p>Recommend requesting black grouse records from Forestry and Land Scotland (FLS).</p> <p>The EIA Report should include full information on VP work undertaken, maps showing VP locations and viewsheds, maps showing diver and raptor flights (and foraging areas), worked example(s) of collision risk model (CRM) calculations and provision of raw data in order for independent verification of CRM calculations.</p> <p>EIA assessment should include all elements of the Proposed Development, including roads and other infrastructure.</p> <p>Disturbance, displacement, loss of suitable habitat and collision risk mortality should be assessed for all species and should include potential impacts of all elements of the Proposed Development (and not just wind turbines).</p> <p>Cumulative impacts on species and their populations should be assessed across both NHZ and SPA populations. As well as wind farms, cumulative impacts of the Lairg to Loch Buidhe overhead line and the Creag Rhiabhach grid connection should also be considered.</p> <p>Disturbance, displacement and collision risk should be assessed cumulatively for all species.</p>	<p>Those target species listed were regarded in the assessment (see <b>Section 9.10</b>).</p> <p>Potential connectivity with relevant designated sites is considered in the assessment (see <b>Sections 9.10 and 9.15</b>).</p> <p>Records were obtained from HRSG and FLS (see <b>Appendices 9.1 and 9.2</b>).</p> <p>All relevant survey information is provided in <b>Appendix 9.1</b>, with CRM information provided in <b>Appendix 9.3</b>.</p> <p>Cumulative effects on birds have been considered, in the context of NHZ and the SPA populations where relevant (see <b>Section 9.12</b>).</p> <p>Disturbance, displacement, habitat loss and collision risk has been considered in the assessment (see <b>Section 9.10</b>).</p> <p>An outline HMP has been provided as <b>Appendix 8.5</b>.</p>

Consultee	Response Received	Action Taken
	A detailed HMP should be prepared for mitigation/enhancement in relation to important species. The measures should align with landscape-scale peatland restoration taking place on adjacent FLS forest estate.	
NatureScot, 27th April 2020, Pre-Scoping	Acknowledged that bird surveys during part of the early bird breeding season in Year 1 were not possible due to restrictions on travel as a consequence of the Covid-19 pandemic. Stated that completing a full bird breeding season in Year 2 will ensure that any underestimating of the activity of key bird species in Year 1 can be accounted for.	A complete bird breeding season of surveys were undertaken in Year 2, and the deficit in survey months (April and May 2020) in Year 1 due to unforeseen and unprecedented circumstances (Covid-19) is addressed in <b>Section 9.6</b> and <b>Appendix 9.1</b> .
The Highland Council, 27th April 2020, Scoping	<p>Presence of Schedule 1 (and other notable bird species) must be included and considered as part of the assessment. Advised that NatureScot and RSPB would advise further.</p> <p>Assessment on impact of collision, disturbance and displacement from foraging, breeding and roosting areas needs considered, as well as cumulatively.</p> <p>Clear methods to be provided and justify any deviation from them.</p>	<p>Effects on notable species, including Schedule 1 species, through collision (if relevant), disturbance and displacement from foraging, breeding and roosting areas is considered in the assessment, as well as cumulative effects (see <b>Sections 9.10</b> and <b>9.12</b>).</p> <p>NatureScot and RSPB have been consulted for advice, as detailed in this table.</p> <p>Clear survey methodologies provided in <b>Appendix 9.1</b>, with methodology for collision risk modelling (CRM) provided in <b>Appendix 9.3</b>.</p>
NatureScot, 16th September 2021, GateCheck	<p>Reiterated the requirement for a completed 2021 breeding season (Year 2), to account for the reduced survey effort during the early bird breeding season in 2020 (Year 1) due to Covid-19 travel restrictions.</p> <p>Stated that any limitations of the reduced survey effort in Year 1 and measures to deal with the deficit are addressed.</p>	A complete bird breeding season of surveys were undertaken in Year 2, and the deficit in survey months (April and May 2020) in Year 1 due to unforeseen and unprecedented circumstances is addressed in <b>Section 9.6</b> and <b>Appendix 9.1</b> .
NatureScot, 11th November 2021, Post-Scoping	<p>Stated that the only golden eagle population figures that they have are the 2003 framework figures, and updated figures are only in confidential annexes from EIA reports that cannot be shared.</p> <p>Recommended contacting the HRSG for most recent estimates for the required NHZ golden eagle population.</p>	HRSG contacted for the most recent golden eagle NHZ estimates (see below).

Consultee	Response Received	Action Taken
HRSG, 26th November 2021, Informal consultation for population estimates	Provided the latest NHZ population estimates for NHZ 5 and NHZ 7 for golden eagles.	Population estimates used in assessment (see <b>Section 9.10</b> ).

## 9.6 Baseline Methodology

### Study Area

- 9.6.1 The main study area within which baseline information in relation to ornithological features has been obtained has comprised the turbine area and buffer areas out to at least 500 m, extended up to 6 km for field surveys of specific species as per current guidance (SNH, 2017a) and up to 20 km searches for internationally important designated sites (SPAs).
- 9.6.2 Full details of study areas adopted for desk study and field surveys are provided in **Appendix 9.1** and illustrated on **Figures 9.1, 9.3 and 9.4**.

### Desk Study

- 9.6.3 As per current guidance (SNH, 2017a) an initial review of existing ornithological information and consultation with NatureScot was undertaken prior to the commencement of field surveys. This enabled a preliminary overview of likely bird species and populations in proximity to the proposed scheme to be formed, identify possible target species for survey and define field survey requirements, which were subsequently agreed in consultation with NatureScot.
- 9.6.4 Further desk study has also been undertaken over the course of the field surveys to provide additional context for field survey observations.
- 9.6.5 The desk study has included a review of designated sites within proximity to the project area and consultation with specialist recording groups for existing ornithological records including the RSPB, Highland Biological Recording Group (HBRG), FLS and the HRSG.
- 9.6.6 A review of publicly available EIA documentation for the withdrawn Dalnessie Wind Farm application<sup>93</sup> and the in planning Strath Tirry Wind Farm<sup>94</sup> (given this wind farm is located adjacent to the access area) has also been undertaken.
- 9.6.7 Full details and results of the desk study undertaken are provided in **Appendices 9.1 and 9.2**.

<sup>93</sup> ECU Reference: EC00003171.

<sup>94</sup> THC Reference Number: 20/05067/FUL.

## Target Species

- 9.6.8 Target species for survey and recording have been drawn from the following lists adopting a precautionary approach and with reference to current guidance (SNH, 2017 and 2018):
- Annex I of the EC Birds Directive;
  - Schedule 1 of the Wildlife & Countryside Act 1981; and
  - ‘Red-listed’ Birds of Conservation Concern (Stanbury *et al.*, 2021).
- 9.6.9 The broad selection of target species for survey and recording included qualifying interests for identified designated sites for nature conservation (**Table 9.5**) and for which core foraging ranges in accordance with current guidance (SNH, 2016), overlap with the turbine area. This has included black-throated diver as a qualifying interest of the Lairg and Strath Brora Lochs SPA and SSSI.
- 9.6.10 Passerine species were not identified as target species for survey and recording and are not considered sensitive to wind farm developments (SNH, 2017a and 2018a). Observations of notable species e.g. those listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) and Red-listed BoCC species (i.e. Stanbury *et al.*, 2021) during Moorland Breeding Bird Surveys were however recorded.
- 9.6.11 Gulls and commoner raptor species including buzzard, kestrel and sparrowhawk, were also not identified as target species given their general widespread number and abundance, but were recorded as secondary species during Vantage Point (VP) Flight Activity Surveys (detailed below).

## Field Surveys

- 9.6.12 The following field surveys were carried out between 2019 and 2021 to inform the design and assessment of the Proposed Development:
- Vantage Point (VP) flight activity surveys;
  - Moorland breeding bird surveys (MBBS);
  - Annex I/Schedule 1 Breeding raptor and owl searches;
  - Breeding black grouse searches; and
  - Breeding diver searches.
- 9.6.13 Surveys have been undertaken in accordance with guidance (SNH, 2017a) and full details are provided in **Appendix 7.1**.
- 9.6.14 Current guidance (SNH, 2017a) recommends that a minimum of two years of ornithological surveys are carried out to inform the assessment of wind farm developments, unless it can be demonstrated that a shorter period of survey is sufficient. The collated dataset therefore provides two years of ornithological survey data, collected within the most recently available five-year window of survey opportunity, prior to the undertaking of assessment.

### *Field survey personnel*

- 9.6.15 All field surveys were completed by experienced, reputable and professional ornithologists fully conversant in established bird survey methodologies for proposed wind turbine developments.
- 9.6.16 Details of field surveyors used are provided in **Appendix 9.1**.

## Assessment Limitations

- 9.6.17 Restrictions on travel in April and May 2020, due to the Covid-19 pandemic, meant that ornithology surveys could not be undertaken during these two months. However, surveys were undertaken in April and May 2021, resulting in surveys over a full breeding season (Year 2) and surveys over a partial breeding season (Year 1). Additional hours were not undertaken in the latter part of the breeding season in Year 1, as NatureScot in their consultation (see **Table 9.1**) stated that this would have a risk of underestimating flight activity (given flight activity tends to be high earlier in the breeding season, such as in April). Instead, it was agreed through consultation with NatureScot that surveys over a full breeding season in Year 2 would be carried out, which would act to compensate for (and would provide a comparison to) the surveys covering a partial breeding season in Year 1.
- 9.6.18 All habitats within the boundary of the turbine area were accessible. The wider study areas used for the MBBS (500 m), Annex I/ Schedule 1 Breeding Raptor and Owl Searches (2 km and 6 km), Breeding Diver Searches (2 km) and Breeding Black Grouse Searches (1.5 km) were surveyed from suitable locations within the turbine area boundary or public rights of way (PRoWs), scanning the study areas with the use of optics (telescope and binoculars). Given the good visibility across the study area from the PRoWs this is not considered a limitation to the results obtained.
- 9.6.19 Plantation woodland habitats within the study areas was surveyed by traversing tracks and clearings rather than walking directly through dense plantation habitat, due to logistical and health and safety considerations. The study area was appropriately covered from the accessible tracks and clearings and this is not therefore considered a limitation to the results obtained.
- 9.6.20 No substantive limitations to the assessment are therefore considered.

## 9.7 Existing Environment

- 9.7.1 This section provides a summary of baseline ornithology conditions in relation to:
- Statutory designated sites nature conservation with ornithological interests;
  - Target species flight activity; and
  - Distributions and abundances of breeding bird species as recorded during baseline ornithology surveys and established from desk study.
- 9.7.2 Detailed information regarding desk study records and field survey results is presented in **Appendix 9.1** and **9.2** and also as relevant within the “Predicted Impacts” (see **Section 9.10**) with regards important ornithological features.

### Designated Sites for Nature Conservation

- 9.7.3 This section should be read with reference to **Figure 9.1**.
- 9.7.4 **Table 9.5** provides a summary of statutory designated sites with cited ornithological interests located within 10 km of the turbine area, extended to 20 km for internationally designated sites with migratory waterfowl interest.
- 9.7.5 Sites designated for other ecological features are addressed separately in **Chapter 8: Ecology**.

9.7.6 The distances specified within **Table 9.5** are measured from the turbine area to the designation boundary at its nearest point.

9.7.7 There is one internationally designated site with migratory waterfowl interests located within 20 km of the turbine area (Dornoch Firth and Loch Fleet SPA and Ramsar).

**Table 9.5: Designated Sites for Nature Conservation**

Site	Distance and Direction	Qualifying Interests
Lairg and Strath Brora Lochs SPA and SSSI	3.1 km, south-west	Breeding black-throated diver.
Strath Carnaig and Strath Fleet Moors SPA and SSSI	6 km, south	Breeding hen harrier.
Caithness and Sutherland Peatlands SPA and Ramsar	8.3 km, east	<p>Breeding populations of:</p> <ul style="list-style-type: none"> <li>• Red-throated diver;</li> <li>• Black-throated diver;</li> <li>• Hen harrier;</li> <li>• Golden eagle;</li> <li>• Merlin;</li> <li>• Golden plover;</li> <li>• Wood sandpiper;</li> <li>• Short-eared owl;</li> <li>• Dunlin; and</li> <li>• North Scottish Greylag goose (qualifying feature of the Ramsar)</li> </ul> <p>Migratory populations of:</p> <ul style="list-style-type: none"> <li>• Common scoter;</li> <li>• Greenshank; and</li> <li>• Wigeon.</li> </ul>
Skinsdale Peatlands SSSI	8.3 km, east	<p>Breeding populations of:</p> <ul style="list-style-type: none"> <li>• Dunlin;</li> <li>• Golden plover; and</li> <li>• Greenshank.</li> </ul> <p>Breeding bird assemblage, including golden eagle and merlin.</p>
Cnoc an Alaskie SSSI	8.6 km, west	<p>Breeding population of:</p> <ul style="list-style-type: none"> <li>• Greenshank.</li> </ul> <p>Breeding bird assemblage, including golden eagle, merlin and wood sandpiper</p>
Grudie Peatlands SSSI	10 km, south-west	<p>Breeding populations of:</p> <ul style="list-style-type: none"> <li>• Dunlin;</li> <li>• Golden plover; and</li> <li>• Greenshank.</li> </ul>
Dornoch Firth and Loch Fleet SPA and Ramsar	19.3 km, south-east	<p>Breeding populations of:</p> <ul style="list-style-type: none"> <li>• Osprey.</li> </ul>

Site	Distance and Direction	Qualifying Interests
		Migratory/wintering populations of: <ul style="list-style-type: none"> <li>• Bar-tailed godwit;</li> <li>• Greylag goose; and</li> <li>• Wigeon.</li> </ul> Waterbird assemblage, including curlew, teal, redshank, dunlin and oystercatcher.

### VP Flight Activity Surveys

- 9.7.8 Target species “at collision risk” flight activity recorded during the entire VP survey effort (September 2019 – August 2021) is summarised in **Table 9.6**. The total number of flights, total number of birds recorded and the total time (seconds) spent at “collision risk height”<sup>95</sup> are presented.
- 9.7.9 Detailed flight records are presented in **Appendix 9.1**, with flight lines illustrated in **Figures 9.5a-c**.

**Table 9.6: Target Species Flight Activity Summary**

Species	Total No. of Flights	Total No. of Birds	Total Time Spent “At Collision Risk Height” (seconds)
Whooper swan	2	7	768
Greylag goose	6	45	7,402
Black-throated diver	1	2	364
Grey heron	1	1	58
Red kite	3	4	726
Hen harrier	9	10	2,847
Golden eagle	31	35	15,881
White-tailed eagle	3	3	962
Short-toed eagle	1	1	1,200
Lapwing	10	12	1,437

<sup>95</sup> “At collision risk” – at rotor sweep height (17 - 200 m) and within 290 m of proposed turbine locations for all species. It is based on a worst case scenario of 200 m tip height, 163 m maximum rotor diameter and 98.5 m hub height, thus considering the upper limit of the larger turbines (200 m tip height) and lower limit of the smaller turbines (180 m tip height).

Species	Total No. of Flights	Total No. of Birds	Total Time Spent "At Collision Risk Height" (seconds)
Curlew	1	1	54
Wood sandpiper	1	1	192
Snipe	14	16	3,478

### Moorland Breeding Bird Surveys

- 9.7.10 In summary, the study area was found to support a moorland breeding bird assemblage with a relatively limited range of territory number, with most breeding territories in open habitats (and clear-felled areas) on the periphery of the turbine area.
- 9.7.11 Estimated breeding wader territory numbers recorded in 2020 (Year 1) and 2021 (Year 2), within 500 m of the turbine area are provided in **Table 9.7** and illustrated in **Figures 9.6a** and **9.6b**, respectively.
- 9.7.12 Further details of moorland breeding bird assemblages recorded are provided in **Appendix 9.1**.

**Table 9.7: Breeding Wader Territories – Within 500 m of Turbine Area**

Species	No. of Territories	
	2020	2021
Teal	1	2
Golden plover	4	11
Lapwing	1	6
Curlew	1	2
Dunlin	1	3
Wood sandpiper	0	1
Common sandpiper	1	3
Greenshank	1	0
Oystercatcher	0	1
Snipe	6	15

### Annex II/ Schedule 1 Breeding Raptor and Owl Searches

- 9.7.13 The desk study revealed a golden eagle breeding territory in the wider area in 2002-2019 (>6 km; with up to three territories identified during the surveys which supported the now withdrawn Dalnessie Wind Farm application made in 2010), up to four merlin territories

and a barn owl territory (in 2009-2010), and non-breeding records of hen harrier, red kite, goshawk, osprey, honey buzzard, peregrine and white-tailed eagle.

- 9.7.14 Breeding raptor and owl searches recorded breeding evidence for two Annex I/ Schedule 1 raptor species within the study area; golden eagle and merlin.
- 9.7.15 No raptors or owl species were confirmed as breeding within the turbine area.
- 9.7.16 Merlin was recorded as breeding in 2021 with an active nest identified approximately 500 m from the nearest proposed turbine location. No definitive evidence of merlin breeding was recorded in 2020.
- 9.7.17 A pair of golden eagles was recorded displaying in open habitat in the wider area to the east of the turbine area in 2020, and on Sròn Leathad Chleansaid immediately north-east of the turbine area in 2021. Given the activity, habitat to the east of the turbine area and associated with Sròn Leathad Chleansaid are considered to form part of a breeding golden eagle pair's territory in 2021, and possibly 2020, although no nest site was located within the 6km study area.
- 9.7.18 Individual flights of male and female hen harrier in the study area were recorded in 2021, with individual flights of red kite, peregrine *Falco peregrinus*, white-tailed eagle (principally immature birds) and short-eared owl *Asio flammeus* also recorded in 2021. No evidence of breeding was recorded for any of these species.
- 9.7.19 Further details relating to the locations of sensitive breeding raptors are provided in **Appendix 9.2**.

#### **Breeding Black Grouse Searches**

- 9.7.20 The desk study from FLS revealed 27 records of black grouse, including 24 lek records from 2015-2021, with the closest lek comprising one male adjacent to the access area.
- 9.7.21 Searches for black grouse lek sites were undertaken in 2020 and 2021 and identified no lek sites within the study area.
- 9.7.22 A male black grouse was recorded incidentally when a surveyor was leaving the site on completion of a VP flight activity survey, in November 2020, within a clear-fell section of the forestry compartment to the south-west of the turbine area. Given the grouse was recorded in November; the record signifies a non-lekking individual. Furthermore, a single female black grouse was recorded in clear-fell habitat incidentally when surveyors were carrying out a breeding raptor and owl search in June 2021, approximately 4 km north-west of the turbine area. No evidence of a black grouse lek site was identified, and this was assumed to be a roaming female bird.

#### **Breeding Diver Searches**

- 9.7.23 The desk study from RSPB revealed six breeding records of black-throated diver, comprising two breeding lochans. Furthermore, six red-throated diver flights were recorded during the surveys which supported the now withdrawn Dalnessie Wind Farm application in 2009-2011 (but no breeding evidence was disclosed).
- 9.7.24 Searches of lochs for breeding divers were undertaken in 2020 and 2021 and identified no breeding divers.

- 9.7.25 In 2021, a pair of red-throated divers was recorded on Loch Gaineamhach in June, but outside the breeding diver study area, 5.5 km to the north-west of the turbine area and with no evidence of breeding observed.
- 9.7.26 Breeding diver focal breeding loch watches were therefore not undertaken in 2020 or 2021.

## 9.8 Future Baseline

- 9.8.1 In the absence of the Proposed Development, or assuming a gap between baseline surveys and the commencement of the Proposed Development construction, changes in baseline ornithology conditions (i.e. distributions and populations) are most likely to result from habitat modifications within or surrounding the site due to land management practices.
- 9.8.2 In the absence of the Proposed Development, the habitats within the site are considered to largely remain under the existing management regime. This comprises grazing by small numbers of livestock and deer.
- 9.8.3 Commercial forestry operations within adjacent plantation forestry, such as felling, may also alter the distribution of ornithological species recorded during baseline surveys; however, it is highly unlikely this would be in such a way as to substantially alter the baseline reported here.
- 9.8.4 The site is not subject to any other development pressures or management which would affect the habitats or ornithological species in such a way that the present baseline conditions presented here would become substantively different.
- 9.8.5 Breeding bird densities would therefore reasonably be expected to remain at comparable levels with those recorded during field surveys and identified through desk study i.e. at relatively low levels, albeit central territory locations may shift.
- 9.8.6 The establishment of breeding raptor territories within the turbine area is considered unlikely, given the general absence of suitable nesting habitat features such as deep heather swards, crags, steep scree and mature woodland.
- 9.8.7 Whilst short-term and small-scale variability in ornithological populations and distributions may occur, and revisions to conservation statuses and designations are possible, such changes would be unlikely to qualitatively alter the conclusion of the assessment presented within and have been accounted for through application of a precautionary approach and appropriate mitigation.

## 9.9 Design Considerations

- 9.9.1 The following design considerations have been incorporated to specifically reduce and/or otherwise avoid adverse impacts upon ornithological features.
- 9.9.2 Full details of the scheme design evolution and embedded mitigation measures are detailed in **Chapter 2: Proposed Development**.
- 9.9.3 The design of the Proposed Development considered golden eagle activity and the presence of an active merlin nest site. The highest level of golden eagle activity within the turbine area was associated with Sròn Leathad Chleansaid along the northern boundary. Proposed turbine locations were off-set from the mountain summit by >500 m.

The active merlin nest site in 2021 was approximately 500 m from the nearest proposed turbine. Although the exact same nest site is not likely to be re-used, merlin often nest in the same general area and it can reasonably be assumed that the Proposed Development will include a suitable separation distance from merlin nest sites. Pre-construction nesting birds checks described below will ensure that active merlin nest sites are identified and considered during works for the Proposed Development.

### **Construction Environmental Management Plan**

- 9.9.4 A Construction Environmental Management Plan (CEMP) will be in place during the construction phase of the Proposed Development. The CEMP will include all good practice construction measures, pollution prevention controls and monitoring to be implemented over the course of the Proposed Development in line with current industry and mandatory statutory guidance and as detailed within **Chapter 2: Proposed Development**.
- 9.9.5 The CEMP will also include Bird Protection Plans (BPPs) detailing good practice measures for protecting nesting birds, including pre-construction nesting bird checks during the breeding bird season (March-August, inclusive), and the establishment of appropriate buffers to protect active nests.
- 9.9.6 The CEMP will be submitted to NatureScot for approval prior to the commencement of construction works, in consultation with The Highland Council (THC).

### **Habitat Management Plan**

- 9.9.7 In addition to the CEMP which will be produced to protect environmental receptors during the construction phase of the Proposed Development, an outline Habitat Management Plan (HMP) has been produced (see **Appendix 8.5**). The outline HMP includes restoration measures of the most sensitive habitats within the turbine area, and subsequent monitoring which will measure the effectiveness of restoration works, with restoration works adaptable in response to monitoring outcomes. Restoration works will benefit the breeding bird assemblage present on, and close to, the site, including breeding waders.

## **9.10 Predicted impacts**

- 9.10.1 This section presents an assessment of effects upon important ornithological features, in the absence of non-embedded design mitigation both as a result of the Proposed Development alone and cumulatively in-combination with other wind farm developments.
- 9.10.2 The Proposed Development has been assessed for an operational life of 35 years.
- 9.10.3 The following potential impacts have been assessed:
- Inadvertent destruction of in-use nests during construction;
  - Habitat loss due to construction;
  - Disturbance to birds during construction due to vehicular traffic, operating plant and the presence of construction workers;
  - Disturbance to birds during the operation of the turbines, vehicular traffic and the presence of people during operations; and,
  - Collision mortality of birds with turbine blades and other infrastructure.

### Important Ornithological Features

- 9.10.4 A summary of identified important ornithological features is provided in **Table 9.8**. The level of importance assigned to each species is based upon baseline survey results and professional judgement.
- 9.10.5 Features which are unlikely to be affected or which are considered sufficiently widespread, unthreatened or resilient to impacts from the Proposed Development, and hence will remain viable and sustainable, have not been subject to a detailed assessment and have been "scoped-out".
- 9.10.6 Mitigation measures are however outlined as appropriate to ensure legislative compliance.

**Table 9.8: Summary of Important Ornithological Features.**

Ornithological feature	Importance	Justification
Designated Sites	International/National	<p>The Proposed Development does not form part of any statutory designated site for nature conservation with qualifying ornithological features</p> <p>The Lairg and Strath Brora Lochs SPA and SSSI and the Caithness and Sutherland Peatlands SPA and Ramsar are within the core foraging range of the qualifying black-throated diver, and the Dornoch Firth and Loch Fleet SPA and Ramsar is in the core foraging range of the qualifying greylag goose (in accordance with SNH, 2016). The Caithness and Sutherland Peatlands Ramsar has also breeding greylag goose from the 'North-west' population as a qualifying feature.</p> <p>As agreed through consultation with NatureScot, potential effects on all other designated sites are discounted based on spatial segregation and such sites being sufficiently distanced from the site, greater than the core range of the qualifying feature (as per SNH, 2016).</p> <p>Information to inform a HRA in relation to the Lairg and Strath Brora Lochs SPA (and SSSI), the Caithness and Sutherland Peatlands SPA and Ramsar and the Dornoch Firth and Loch Fleet SPA and Ramsar are provided in <b>Section 9.15</b>.</p> <p><b>Scoped out of detailed assessment.</b></p>
Golden eagle	Regional	<p>Thirty-one 'at-risk' flights were recorded during the survey period (2019-21).</p> <p>Open habitat to the east and the northern boundary of the turbine area is considered to be part of a breeding pair's territory.</p>

Ornithological feature	Importance	Justification
		<p>This single breeding territory represents 3.6 % of the current (2021) NHZ population estimate (provided by the HRSG).</p> <p><b>Scoped in to detailed assessment.</b></p>
Hen harrier	Local	<p>Nine 'at-risk' flights were recorded during the survey period (2019-21), in the breeding and non-breeding seasons.</p> <p>No evidence of breeding was identified in Year 1 or Year 2.</p> <p><b>Scoped in to detailed assessment.</b></p>
Wood sandpiper	Regional	<p>One 'at-risk' flight and one breeding territory within 500 m of the turbine area in Year 2. The species is a nationally rare breeding bird.</p> <p><b>Scoped in to detailed assessment.</b></p>
Lapwing	Local	<p>Ten 'at-risk' flights were recorded during the survey period (2019-21).</p> <p>Lapwing bred within the MBBS study area in Year 1 and 2, with a peak of six territories. Most of the territories were outside the turbine area, within the 500 m buffer. The species is not a qualifying feature of any designated site considered in the assessment.</p> <p>Embedded mitigation, including the implementation of good practice construction measures and pre-construction surveys (as detailed in <b>Section 9.9</b>) are considered adequate to avoid any potentially significant adverse effects upon lapwing.</p> <p><b>Scoped out of detailed assessment.</b></p>
Snipe	Local	<p>Fourteen 'at-risk' flights were recorded during the survey period (2019-21).</p> <p>Snipe bred within the MBBS study area in Year 1 and 2, with a peak of 15 territories. Most of the territories were outside the turbine area, within the 500 m buffer. The species is not a qualifying feature of any designated site considered in the assessment.</p> <p>Embedded mitigation, including the implementation of good practice construction measures and pre-construction surveys (as detailed in <b>Section 9.9</b>) are considered adequate to avoid any potentially significant adverse effects upon lapwing.</p> <p><b>Scoped out of detailed assessment.</b></p>

Ornithological feature	Importance	Justification
Merlin	Local	<p>An active nest was identified in Year 2, but not in Year 1. The nest was approximately 500 m from the nearest proposed wind turbine.</p> <p>No 'at-risk' flights were recorded across the survey period (2019-21).</p> <p>Embedded mitigation, including the implementation of good practice construction measures and pre-construction surveys (as detailed in <b>Section 9.9</b>) are considered adequate to avoid any potentially significant adverse effects upon merlin.</p> <p><b>Scoped out of detailed assessment.</b></p>
Red kite	Local	<p>No evidence of breeding was identified in Year 1 or Year 2 and only a modest number of flights (three 'at-risk' flights) during the survey period (2019-21).</p> <p><b>Scoped out of detailed assessment.</b></p>
White-tailed eagle	Local	<p>No evidence of breeding was identified in Year 1 or Year 2 and only a modest number of flights (two 'at-risk' adult flights) during the survey period (2019-21).</p> <p><b>Scoped out of detailed assessment.</b></p>
Divers	Local	<p>No evidence of breeding divers during the survey period (2019-21).</p> <p>Only one 'at-risk' black-throated diver flight was recorded and no red-throated diver flights.</p> <p>Embedded mitigation, including the implementation of good practice construction measures and pre-construction surveys (as detailed in <b>Section 9.9</b>) are considered adequate to avoid any potentially significant adverse effects upon divers.</p> <p><b>Scoped out of detailed assessment.</b></p>
Black grouse	Local	<p>No evidence of black grouse leks during the survey period (2019-21), despite desk study records from FLS revealing leks in the wider area.</p> <p>No 'at-risk' black grouse flights were recorded. Two non-lekking black grouse recorded incidentally, outside the turbine area (with one recorded in November 2020).</p> <p>Embedded mitigation, including the implementation of good practice construction measures and pre-construction surveys (as detailed in <b>Section 9.9</b>) are considered</p>

Ornithological feature	Importance	Justification
		<p>adequate to avoid any potentially significant adverse effects upon black grouse.</p> <p><b>Scoped out of detailed assessment.</b></p>
All other wading species	Local	<p>One 'at-risk' curlew flight was recorded during the survey period (2019-21).</p> <p>Relatively modest numbers of breeding territories of curlew (peak of two), dunlin (peak of three), common sandpiper (peak of three), greenshank (peak of one), oystercatcher (peak of one) and golden plover (peak of 11) were recorded in the MBBS study area. Most of the territories were outside the turbine area, but within the 500 m buffer.</p> <p>Embedded mitigation, including the implementation of good practice construction measures and pre-construction surveys (as detailed in <b>Section 9.9</b>) are considered adequate to avoid any potentially significant adverse effects upon all other wading species.</p> <p><b>Scoped out of detailed assessment.</b></p>
All other raptor and owl species	Local	<p>No further breeding evidence of Annex I/Schedule 1 raptors or owls during the survey period (2019/21).</p> <p>One 'at-risk' short-toed eagle flight was recorded, with individual flights of peregrine and short-eared owl recorded during breeding raptor and owl searches in Year 2 (but no flights during the VP Flight Activity Surveys).</p> <p>Short-toed eagle is a European continental species which is an extremely rare vagrant to the UK, and thus transient and therefore not considered to be of conservation importance regardless of rarity in the UK.</p> <p>Embedded mitigation, including the implementation of good practice construction measures and pre-construction surveys (as detailed in <b>Section 9.9</b>) are considered adequate to avoid any potentially significant adverse effects upon all other raptor and owl species.</p> <p><b>Scoped out of detailed assessment.</b></p>
Greylag goose	Local	<p>A total of six 'at-risk' greylag goose flights were recorded during the survey period (2019-21), with four of the flights during the breeding season and two during the non-breeding season. The geese recorded are not considered to be connected to any</p>

Ornithological feature	Importance	Justification
		designated site (see above in this table), and instead are likely to constitute resident/feral birds. <b>Scoped out of detailed assessment.</b>
All other wetland species	Local	Very low flight activity recorded for all other wetland species and comprised of two whooper swan flights and one grey heron flight. Teal was recorded breeding in the MBBS study area, comprising a peak of two territories in Year 2. Although only one territory was within the turbine area. Embedded mitigation, including the implementation of good practice construction measures and pre-construction surveys (as detailed in <b>Section 9.9</b> ) are considered adequate to avoid any potentially significant adverse effects upon all other wetland species. <b>Scoped out of detailed assessment.</b>

### Collision Risk Modelling (CRM) Analysis

9.10.7 CRM analysis has been undertaken for golden eagle and hen harrier on the basis of the high incidence of “at collision risk” flight activity recorded ( $\geq 4$  flights). Full details are provided in **Appendix 9.3**.

#### *Golden Eagle*

9.10.8 The species is listed on Annex I of the Birds Directive (considered post-Brexit by the Habitat Regulations) and Schedule 1, 1A and A1 of the Wildlife and Countryside Act 1981 (as amended), is an SBL species and is listed for action in the Highland Nature Local Biodiversity Action Plan (LBAP).

9.10.9 Consultation with the HRSG (see **Table 9.1**) revealed that the present (as of 2021) golden eagle population for NHZ 5 ‘Peatlands of Caithness and Sutherland’ is 28 pairs. A national golden eagle survey took place in 2015, which overall identified the national population had increased by 15 %, rising from 442 breeding pairs recorded during the previous national survey in 2003, to 503 territorial pairs in 2015 (Challis *et al.*, 2016), and it is understood that golden eagle populations in Scotland have continued to grow since 2015.

9.10.10 Golden eagle flight activity recorded during baseline surveys has comprised a total of 58 flights recorded during VP flight activity surveys completed between September 2019 and August 2021 including those of adult and immature birds.

9.10.11 Consultation with the HRSG and RSPB identified a golden eagle breeding territory > 6 km from the turbine area (with most recent data from 2020). The HRSG reported that the pair had only successfully reared young twice in 18 years (2002-2019), with evidence suggesting interference by people is the cause of the high failure rate.

- 9.10.12 The eagle pair observed during surveys may be a newly establishing unknown pair, or is the pair identified from the desk study (HSRG) who has a nest site >6 km from the turbine area.
- 9.10.13 For the purposes of this assessment golden eagle is assigned a value of Regional importance, with the presence of the identified breeding pair representing 3.6 % of the current NHZ 5 population estimate. It should however be noted that this is a highly precautionary valuation given population estimates presented exclude sub-adult and juvenile birds also associated with regional populations and which is unknown.

#### Displacement (Construction)

- 9.10.14 Construction works associated with the Proposed Development would occur at a sufficient distance from any identified golden eagle eyrie to preclude the likelihood of disturbance to nesting pairs (750-1000 m based on expert opinion; Ruddock and Whitfield, 2007). As such, no disturbance to breeding golden eagles at their nests sites would occur.
- 9.10.15 In line with current research, which suggests some evidence for construction phase displacement of golden eagles from wind farm sites (Haworth Conservation, 2015), there may be some level of disturbance to individual birds which choose to utilise habitats in the vicinity of working areas over the course of construction works (anticipated to be approximately 18 months).
- 9.10.16 Such impacts would however be temporary, and would constitute an effect of **Low adverse** magnitude, of **Minor adverse** significance, and which is **Not Significant** in the context of the EIA Regulations.

#### Habitat loss (Construction)

- 9.10.17 The site is open moorland habitat, and only the higher altitude areas associated with Sròn Leathad Chleansaid to the north/ north-east of the turbine area are appraised as 'good' golden eagle habitat ('GET 6+' habitat; see **Appendix 9.4**).
- 9.10.18 Golden eagle activity was predominantly associated with Sròn Leathad Chleansaid with few flights through the turbine area, particularly in Year 2, which supports the GET model results (see **Figure 9.5b**).
- 9.10.19 There will be no direct loss of known or potentially suitable undisturbed nesting habitat for golden eagle. Potential direct moorland foraging habitat losses as a result of the Proposed Development are also considered negligible in the context of remaining habitats immediate to the site and in the wider surrounding area and that likely within the range of the golden eagle territory. The GET model (see **Appendix 9.4** for details) predicts an insignificant loss of suitable golden eagle habitat during the construction stage of the proposed Development; given such a small proportion (<3.4 %) of suitable habitat (GET 6+ habitat) within the golden eagle's estimated range will be lost.
- 9.10.20 Overall direct habitat losses would not be considered to affect the perceived quality of the potential foraging range of the single identified breeding pair of golden eagles or result in reduced breeding success or subsequent abandonment by the pair. Similarly, use of the site by birds not associated with the identified occupied territory, is unlikely to be by a substantial number of different birds, with baseline surveys suggesting golden eagles recorded were those of the resident breeding pair.

- 9.10.21 Such impacts of habitat loss for both breeding and non-breeding birds would be no more than a **Low/Medium adverse** magnitude, of **Minor adverse** significance, and which is **Not Significant** in the context of the EIA Regulations.

Displacement (Operation)

- 9.10.22 No active golden eagle eyries were identified in 2020 or 2021, but the desk study revealed one breeding territory >6 km east of the turbine area. There were 58 golden eagle flights during the VP Flight Activity Surveys across the survey period, mainly associated with Sròn Leathad Chleansaigh along the north/north-eastern boundary of the turbine area. It is not known whether the golden eagle activity is from the known breeding pair given the site is located outside the core foraging range (6 km) of golden eagles in accordance with NatureScot guidance (SNH, 2016), or whether the activity represents a newly establishing pair in the area.
- 9.10.23 Previous studies have found evidence of displacement of golden eagles from operational wind farms. A single long-term study of potential displacement effects upon the species at the Edinbane and Ben Aketil Wind Farms on the Isle of Skye, did suggest the occurrence of displacement on the basis of the decrease in the spatial use of habitats within 500 m of operational turbines (Haworth Conservation, 2015). However, overall eagle flight activity was found to be highly variable between monitoring years, with potential confounding influences of differences in habitat features between onshore wind sites (e.g. topography). A second study carried out at Beinn an Tuirc Wind Farm, did also identify a decrease in spatial use of the onshore wind site by golden eagle during initial years of operational monitoring, although some limited activity through turbine clusters was recorded, with only one flight through the cluster, and three flights over the wind farm (Walker *et al.*, 2005).
- 9.10.24 More recent and comprehensive research from analysed movements of 59 Scottish GPS-tagged golden eagles demonstrated that there is now clear evidence that golden eagles are displaced from suitable habitat as a result of operational wind developments, with eagles displaced out to 300 m from the outermost turbines (Fielding *et al.* 2021a and b). This displacement effect also includes golden eagles being deterred from using habitat in between turbines.
- 9.10.25 On the basis of best and currently available evidence at Scottish wind developments, displacement and loss of habitats for foraging golden eagles is calculated for areas encompassing the turbine layout and buffer out to a maximum distance of 300 m of the outermost turbine locations including the area between turbines (total of 530 ha for this Proposed Development), of which (only) 85 ha is open GET 6+ habitat, referred to as 'good' eagle habitat (see **Appendix 9.4**).
- 9.10.26 The output from the GET model is detailed in **Appendix 9.4** and has assumed a precautionary 2,500 ha range of adult golden eagles in the region, and thus a total of only 3.4 % of the range would be lost to the Proposed Development.
- 9.10.27 The GET model similarly reports insignificant levels of habitat loss for dispersing golden eagles by assessing the effect out to 20 km from the Proposed Development and regarding the availability of suitable eagle habitat (GET 6+), with only 0.2 % of GET 6+ habitat lost at that scale as a result of the Proposed Development.

- 9.10.28 The GET model concludes that there will be an in-significant loss of golden eagle habitat arising from the operation of the Proposed Development and it is unlikely that the loss would create a significant impact on the extent of habitat used by the golden eagle pair. It is extremely unlikely that the Proposed Development would have a significant impact on dispersing young eagles.
- 9.10.29 It is also unlikely that there will be a significant reduction of habitat use outside of the 300 m exclusion zone from the proposed Development.
- 9.10.30 Operational displacement, whilst permanent is therefore considered to be of no more than a **Medium adverse** magnitude, of **Minor adverse** significance, and which is **Not Significant** in the context of the EIA Regulations.

#### Collision Risk Mortality

- 9.10.31 CRM Analysis for golden eagle has been completed using flight activity data for the period September 2019 to August 2020 (Year 1) and September 2020 to August 2021 (Year 2), which predicts an annual mortality of 0.03 and 0.83 birds, respectively (see **Appendix 9.3**). This represents a respective 0.05 % (for Year 1) and 1.48 % (for Year 2) of the most recent NHZ 5 population estimate (28 pairs, thus 56 territorial adult birds, so not accounting for unpaired and immature birds).
- 9.10.32 Estimated adult survival rates for golden eagle are stated as 95 % (Watson, 1997<sup>96</sup>), which gives a baseline mortality of 5 % for adult birds. Assuming a Regional NHZ population estimate of 28 pairs (56 birds); the baseline mortality rate in the absence of the proposed Development would be 3 adult birds per year. The estimated annual mortality (0.03 and 0.83 birds, in Years 1 and 2 respectively) resulting from the Proposed Development represents a potential 1 – 27.7 % increase in annual baseline Regional NHZ mortality.
- 9.10.33 It is understood that there have been three confirmed golden eagle collision fatalities at operational wind farms in Scotland at the time of writing and therefore the potential for collisions to occur for the species over the lifetime of the Proposed Development cannot be entirely precluded, but such events are considered to be extremely rare. There is no evidence to indicate that golden eagle collisions occur to such an extent that they could affect regional population levels. Recent research (Fielding *et al.*, 2021a and b) documents that golden eagles are displaced from wind farms, with 300 m considered modest for the displacement effect. It is therefore reasonable to predict that collision risk mortality from the Proposed Development will be considerably lower than those estimated from CRM Analysis, given the recent advancements in our understanding of the effects of wind farms on golden eagles.
- 9.10.34 Overall collision mortality risks to golden eagle are therefore considered to represent no more than a **Low/Medium adverse** magnitude, of **Minor adverse** significance and which would be **Not Significant** at the Regional NHZ population level.

#### *Wood Sandpiper*

- 9.10.35 Wood sandpiper is an Annex I species on the Birds Directive (considered post-Brexit by the Habitat Regulations), Schedule 1 species on the Wildlife and Countryside Act 1981

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<sup>96</sup> Watson, J. (1997). The Golden Eagle. (London, Poyser).

(as amended), an Amber-listed BoCC and a SBL species. The species is listed for action in the Highland Nature Local Biodiversity Action Plan (LBAP). The species is a summer visitor to Scotland.

- 9.10.36 There are no documented NHZ 5 'Peatlands of Caithness and Sutherland' population estimates for the species, but it is considered a nationally rare breeding species in Scotland.
- 9.10.37 Observations of wood sandpiper during baseline surveys comprised one flight during VP flight activity surveys, of single bird.
- 9.10.38 A wood sandpiper breeding territory was recorded within a coniferous plantation clearing south-west of the turbine area in Year 2.
- 9.10.39 Given the species is a nationally rare breeding in Scotland, for the purposes of this assessment wood sandpiper is assigned a value of Regional importance.

#### Displacement (Construction)

- 9.10.40 The wood sandpiper breeding territory is approximately 350 m from the turbine area boundary, and >600 m from the nearest proposed turbine (with infrastructure similarly >600 m from the breeding territory). The territory is also buffered from the turbine area by coniferous plantation. Although the species will not use the same nest site, it is considered likely that the same area could be used in subsequent breeding seasons.
- 9.10.41 Published literature on disturbance distances to breeding wood sandpiper is limited, but Ruddock and Whitfield (2007) suggest a 150-300 m, with an upper range of 200-600 m where disturbance is unlikely.
- 9.10.42 It is considered that potential displacement impacts upon the species will therefore unlikely occur as a result of construction works.
- 9.10.43 Effects are therefore **Low adverse** magnitude, of **Minor adverse** significance and **Not Significant** in the context of the EIA Regulations.

#### Habitat loss (Construction)

- 9.10.44 The site is open moorland habitat which is considered suboptimal for wood sandpiper, which will typically forage in forest habitat such as that to the south-west of the turbine area.
- 9.10.45 There will be no direct loss of known or potentially suitable undisturbed nesting habitat for wood sandpiper.
- 9.10.46 Overall direct habitat losses would not be considered to affect the perceived quality of the potential foraging range of any breeding wood sandpipers in the wider area or result in reduced breeding success or subsequent abandonment by any breeding pairs.
- 9.10.47 Such impacts of habitat loss for wood sandpiper would be **Negligible** and **Not Significant** in the context of the EIA Regulations.

#### Displacement (Operational)

- 9.10.48 The turbine area does not constitute optimal foraging habitat for wood sandpiper, so overall direct habitat losses would not affect the perceived quality of the potential foraging range of breeding wood sandpiper or result in reduced breeding success or subsequent

abandonment of any pair. Breeding wood sandpiper is considered more likely to forage in forested habitats to the south-west and west of the turbine area, where the species was recorded as breeding in small numbers (one territory).

- 9.10.49 Potential operational phase displacement effects are therefore assessed **Negligible** and **Not Significant** in the context of the EIA Regulations.

#### Collision Risk Mortality

- 9.10.50 Only one 'at-risk' wood sandpiper flight was recorded across the entire VP flight activity survey period (September 2019-August 2020). No CRM was therefore undertaken and the collision risk for the species as a consequence of the Proposed Development is considered inconsequential. Such impacts are therefore considered **Negligible** and **Not Significant** in the context of the EIA Regulations.

#### *Hen Harrier*

- 9.10.51 Hen harrier is an Annex I species on the Birds Directive (considered post-Brexit by the Habitat Regulations), Schedule 1 and Schedule 1A species on the Wildlife and Countryside Act 1981 (as amended), a Red-listed BoCC and a SBL species. The species is listed for action in the Highland Nature Local Biodiversity Action Plan (LBAP).
- 9.10.52 The NHZ 5 'Peatlands of Caithness and Sutherland' population estimate is 38 pairs (Wilson *et al.*, 2015), based on data from the 2010 national survey, although this is now substantially dated.
- 9.10.53 The most recent UK hen harrier survey undertaken in 2016 estimates that the Scottish population comprising 431 pairs (862 breeding birds) (Challis *et al.*, 2018). This is a notable decline since the last survey in 2010, where the national Scottish population was estimated as 505 pairs. In 2016, the number of breeding pairs in Highland was reported to be 63 pairs (126 birds), 13 of which were in Sutherland and fledged a minimum of four chicks (Challis *et al.*, 2018). The Highland population (63 pairs) constitutes 14.6 % of the Scottish population, and of the 11 regions, has the third highest population after Argyll and Orkney (Challis *et al.*, 2018).
- 9.10.54 Observations of hen harrier during baseline surveys comprised a total of 24 flights during VP flight activity surveys, all (with the exception of one flight) of single birds.
- 9.10.55 Observations of hen harrier were also recorded during breeding raptor and owl searches, although there was no evidence of breeding. Habitats within the site provide foraging opportunities for the species, but they are not considered suitable for nesting, due to the lack of suitable dense heather. Habitat in the wider area is likely to provide more suitable nesting habitat for the species. No breeding evidence was recorded within the turbine area or within 2 km during baseline surveys or has been identified in consultation with the HRSG, RSPB or HBRG.
- 9.10.56 It is noted that population estimates presented do not include juvenile or sub-adult birds, which also comprise part of the Scottish and NHZ populations however, given the estimates presented are likely to provide a reasonably accurate indication of the population locally and regionally.

9.10.57 Given there was no evidence of breeding, and the relatively modest flight activity of hen harriers recorded, for the purposes of this assessment hen harrier is assigned a value of Local importance.

#### Displacement (Construction)

9.10.58 The site is not located in proximity to any known nesting or roosting site for the species, no potential displacement impacts upon the species will therefore occur as a result of construction works.

9.10.59 Construction works may result in some disturbance to foraging or transient birds using the site over the course construction works however, this would affect only a very small number of birds and infrequent activity.

9.10.60 Effects are therefore **Negligible** and **Not Significant** at the Regional NHZ population level.

#### Habitat Loss (Construction)

9.10.61 The site is open moorland habitat which is considered suitable for hen harrier.

9.10.62 There will be no direct loss of known or potentially suitable undisturbed nesting habitat for hen harrier. Potential direct moorland foraging habitat losses as a result of the Proposed Development are also considered small in the context of remaining habitats immediate to the site and in the wider surrounding area and that likely within the range any potential hen harrier territory.

9.10.63 Overall direct habitat losses would not be considered to affect the perceived quality of the potential foraging range of any breeding hen harriers in the wider area or result in reduced breeding success or subsequent abandonment by any breeding pairs.

9.10.64 Such impacts of habitat loss for both breeding and non-breeding birds would be **Negligible**, and **Not Significant** at the Regional NHZ population level.

#### Displacement (Operational)

9.10.65 Foraging hen harriers are established as having low sensitivity to disturbance at operational wind farms, likely limited to within 100 m of operational wind turbines should it occur at all (Whitfield and Madders, 2006). Losses of potential foraging habitat would not affect the perceived quality of the potential foraging range of any identified breeding pair of hen harrier or result in reduced breeding success or subsequent abandonment by any pair. Similarly potential use of the site by non-breeding birds is unlikely to be by a substantial number of different birds.

9.10.66 Potential operational phase displacement effects are therefore assessed **Low adverse**, of **Minor significance**, and **Not Significant** at the Regional NHZ population level.

#### Collision Risk Mortality

9.10.67 CRM Analysis for hen harrier has been completed using flight activity data for the period September 2019 to August 2020 (Year 1) and September 2020 to August 2021 (Year 2), which predicts an annual mortality of 0.08 and 0.10 birds, respectively (see **Appendix 9.3**). This represents a respective 0.11 % (for Year 1) and 0.13 % (for Year 2) of the most

recent NHZ 5 population estimate (38 pairs, thus 76 territorial adult birds, so not accounting for unpaired and immature birds).

- 9.10.68 Estimated adult survival rates for hen harrier are stated as 81 % (Picozzi, 1984), which gives a baseline mortality of 19 % for adult birds. Assuming a Regional NHZ population estimate of 38 pairs (76 adult birds), the baseline mortality rate in the absence of the Proposed Development would be 14 adult birds. The estimated annual mortality (0.08 and 0.10 birds, in Year 1 and 2 respectively) resulting from the Proposed Development represents a potential <1 % (0.57 – 0.71 %) increase in annual baseline Regional NHZ mortality.
- 9.10.69 Overall collision mortality risks to hen harrier are therefore considered to represent no more than a **Low adverse** magnitude, of **Minor adverse** significance and which would be **Not Significant** at the Regional NHZ population level.

## 9.11 Mitigation

- 9.11.1 No significant effects upon ornithological features are predicted to occur as a result of the Proposed Development and, as such, project-specific mitigation measures above and beyond those integrated into the design (see **Section 9.9**) are not required.
- 9.11.2 Mitigation measures are however, outlined to ensure legislative compliance with regards bird species during the course of construction and decommissioning works.

### Environmental Clerk of Works

- 9.11.3 A suitably qualified and experienced Environmental Clerk of Works (ECoW) will be appointed prior to the commencement of construction and decommissioning activities and through whom appropriate ornithological advice will be provided throughout.
- 9.11.4 The ECoW will be responsible for undertaking and/or co-ordinating checks for ornithological species before construction and decommissioning activities commence. The ECoW (or appointed 'clerks' on behalf of the ECoW) will also maintain a watching brief as necessary throughout the construction and decommissioning phase to ensure compliance with relevant legislation.
- 9.11.5 All wild birds in the UK are protected under Section 1 of the Wildlife and Countryside Act 1981 (as amended), which makes it an offence to intentionally or recklessly kill, injure or take any wild bird or take, damage or destroy the nest (whilst being built or in use) or its eggs. All wild birds listed on Schedule 1 of the Act receive additional legal protection which makes it an offence to intentionally or recklessly disturb these species while building a nest or in, on or near a nest containing eggs or young; or to disturb their dependent young.
- 9.11.6 Site clearance activities, where commenced during the core breeding bird season (1<sup>st</sup> March to 31<sup>st</sup> August inclusive), will therefore be subject to a pre-clearance survey by the ECoW (or appointed clerks) to identify any active wild bird nests. Should any active nests be found, works will only proceed under the advice of the ECoW or appointed clerk. Work exclusion buffers around identified nest sites would be implemented where necessary in accordance with best available species guidance applicable at the time and/or as agreed in consultation with NatureScot. Updated ornithological information obtained from the pre-construction/pre-decommissioning surveys will be used to inform

and guide the implementation of BPPs, identifying any mitigation (including micro-siting) if required.

- 9.11.7 BPPs will be designed to provide the contractor and ECoW with approved methodologies and mitigation measures for carrying out certain activities and will be agreed in consultation with NatureScot, as will the detailed scope of the role and responsibilities of the ECoW.

## 9.12 Cumulative Effects

- 9.12.1 This section considers the potential effects of the Proposed Development upon important ornithological features in combination with other wind farm developments in accordance with NatureScot guidance (2018b). The assessment follows the criteria used in the GET model and considers operational, consented and under construction wind farms. The only exception is the inclusion of Strath Tirry Wind Farm which is currently under consideration in planning, given it is within 10 km of the turbine area and adjacent to the access area.
- 9.12.2 Cumulative collision risks for golden eagle and hen harrier have been considered as being potentially significant for the purposes of this assessment.
- 9.12.3 The geographic scale at which cumulative assessment of collision risks to golden eagle and hen harrier has been undertaken is based upon that used in the GET model (see **Appendix 9.4**); search area of 20 km.
- 9.12.4 Wind farm developments considered in the assessment are listed in **Table 9.9** together with a summary of collision risk mortality estimates predicted.
- 9.12.5 At the request of RSPB (see **Table 9.1**) potential cumulative effects of the Creag Riabhach Wind Farm grid connection and the Lairg to Loch Buidhe overhead line are also considered. CRM Analysis was not undertaken for golden eagle or hen harrier for either of these non-wind farm schemes. Both schemes considered negligible collision risk (and overall effects) on hen harriers, with the adoption of mitigation measures (such as bird diverters and pre-construction nest checks). For golden eagle, no eagle flights were recorded during surveys for the Creag Riabhach Wind Farm grid connection. Seventeen flights were recorded (of which nine were at-risk, and five passed through the proposed overhead line) during surveys for the Lairg to Loch Buidhe overhead line. Although not quantified in the assessment, golden eagles were considered to be at low collision risk from the overhead line, as a consequence of the low number of at-risk flights, golden eagles having good eyesight (and thus likely to see and avoid the overhead lines) and the flights considered not to be part of a breeding territory. Furthermore, mitigation measures, such as bird diverters, are considered appropriate to minimise the eagle collision risk further. Collision risk mortality of golden eagle and hen harrier as a result of these non-wind farm schemes are therefore considered to be inconsequential for the purpose of this assessment.
- 9.12.6 Figures presented for other wind farm developments have not been checked or amended to reflect avoidance rates used within this assessment. Where it is stated N/A i.e. "Not assessed", the wind farm development was not supported by an assessment of collision risks to golden eagle and/or hen harrier and as such, no collision risks have been assumed.

**Table 9.9: Cumulative Collision Risk Estimates – Golden Eagle and Hen Harrier**

Wind Farm	Annual Collision Risk Estimate	
	Golden eagle	Hen harrier
Creag Riabhach (under construction)	0.04	N/A
Achany (operational)	N/A	N/A
Rosehall (operational)	Not publicly available.	Not publicly available.
Braemore (consented)	N/A	0.33 – 0.50 (1 bird every 2-3 years, with 95 % avoidance rate)
Lairg (operational)	Not publicly available.	Not publicly available.
Lairg II (consented)	0.00326 – 0.02525 (99 % avoidance rate)	Not publicly available, but chapter states 'no likely significant effects' (including cumulatively) on species, so considered negligible for this assessment.
Kilbraur (operational)	Not publicly available.	Not publicly available.
Kilbraur Extension (operational)	Not publicly available.	Not publicly available.
Strath Tirry (in planning)	N/A	N/A
Chleansaid	0.03 – 0.83	0.08 – 0.10
<b>Total</b>	<b>0.073 – 0.895</b>	<b>0.41 – 0.60</b>

9.12.7 Cumulative collision risk estimates for golden eagle are calculated at 0.073 – 0.895 birds per year, which represents 0.13 – 1.6 % of the most recent Regional NHZ population estimate (28 pairs, thus 56 adult birds, in 2021) and a 2.4 – 29.8 % increase in annual baseline Regional NHZ mortality.

9.12.8 Cumulative collision risk estimates for hen harrier are calculated at 0.41 – 0.60 birds per year, which represents 0.54 – 0.79 % of the most recent Regional NHZ population estimate (38 pairs, thus 76 adult birds) and a 2.93 – 4.29 % increase in annual baseline Regional NHZ mortality.

- 9.12.9 As detailed, there have been three known incidents of golden eagle collision fatalities at operational wind farms in Scotland at the time of writing, but the instances are considered to be extremely rare. Furthermore, recent studies (Fielding *et al.*, 2021 a and b) have documented that golden eagles are displaced from operational wind farms by up to 300 m. It is therefore considered that predicted collision risk mortality of golden eagles will be considerably lower than the cumulative annual mortality of up to 0.895 birds, given the advancements in our understanding of the effects of wind farms on golden eagles.
- 9.12.10 Overall cumulative collision mortality risks to hen harrier is considered to represent no more than a **Low/Medium adverse** magnitude, of **Minor adverse** significance and which would be **Not significant** at the Regional NHZ population level.
- 9.12.11 Given, the likely over-estimation of golden eagle annual mortality due to stronger displacement effects, as recently established (see Fielding *et al.*, 2021a and b), overall cumulative collision mortality risks to golden eagle are considered to represent no more than a **Low/Medium magnitude**, of **Minor adverse** significance and which would be **Not significant** at the Regional NHZ population level.

### 9.13 Enhancement Measures

- 9.13.1 Enhancement measures, provided as part of the HMP would remain in place throughout the operational phase, subject to periodic review in accordance with any emerging best practice management advice. Measures are to include peat restoration in the north of the turbine area and native riparian planting along the Allt nan Con-uisge which flows through the turbine area. Peat restoration works will benefit ornithological species, including wading species, and riparian planting will provide potential habitat for black grouse and nesting and foraging passerines. The outline HMP is presented in **Appendix 8.5**.

### 9.14 Summary of Effects

- 9.14.1 A summary of significant ornithological effects is provided in **Table 9.10**.

**Table 9.10: Summary Table of Impacts Upon the Recorded Ornithological Features**

Feature	Proposed Activity	Characterisation of unmitigated impact upon feature	Significance without mitigation and confidence level	Mitigation and Enhancement	Residual significance and confidence level (following mitigation)
Golden Eagle	Displacement (construction)	Low magnitude, temporary	Minor adverse, not significant	Not required	Not significant
	Habitat Loss (construction)	Low/Medium magnitude	Minor adverse, not significant	Not required	Not significant
	Displacement (operational)	Medium magnitude	Minor adverse, not significant	Not required	Not significant
	Collision Mortality (operational)	Low/Medium magnitude	Minor adverse, not significant	Not required	Not significant
	Collision Mortality (cumulative, operational)	Low/Medium magnitude	Minor adverse, not significant	Not required	Not significant
Wood sandpiper	Displacement (construction)	Low magnitude, temporary	Minor adverse, not significant	Not required	Not significant
	Habitat Loss (construction)	Negligible	Negligible, not significant	Not required	Not significant
	Displacement (operational)	Negligible	Negligible, not significant	Not required	Not significant
	Collision Mortality (operational)	Negligible	Negligible, not significant	Not required	Not significant
Hen harrier	Displacement (construction)	Negligible, temporary	Negligible, not significant	Not required	Not significant
	Habitat Loss (construction)	Negligible	Negligible, not significant	Not required	Not significant



Feature	Proposed Activity	Characterisation of unmitigated impact upon feature	Significance without mitigation and confidence level	Mitigation and Enhancement	Residual significance and confidence level (following mitigation)
	Displacement (operational)	Low magnitude	Negligible, not significant	Not required	Not significant
	Collision Mortality (operational)	Low magnitude	Minor adverse, not significant	Not required	Not significant
	Collision Mortality (cumulative, operational)	Low/Medium magnitude	Minor adverse, not significant	Not required	Not significant

## 9.15 Information to Inform a Habitats Regulations Appraisal

- 9.15.1 This section summarises information relating to the potential for Likely Significant Effects upon ornithological qualifying features of Lairg and Strath Brora Lochs SPA (and SSSI), Caithness and Sutherland Peatlands SPA and Ramsar, and Dornoch Firth and Loch Fleet SPA and Ramsar as a result of the Proposed Development.
- 9.15.2 In accordance with documented core foraging ranges (SNH, 2016) and in consultation with NatureScot (see **Table 9.1**) qualifying features considered are black-throated diver (Lairg and Strath Brora Lochs SPA and SSSI, and Caithness and Sutherland Peatlands SPA and Ramsar) and greylag goose (Dornoch Firth and Loch Fleet SPA and Ramsar, and Caithness and Sutherland Peatlands Ramsar)
- 9.15.3 The potential for Likely Significant Effects upon any other European sites and Ramsar sites and other qualifying features (as presented in **Table 9.5**) are screened out on the basis of spatial separation of the turbine area from additional designations in accordance with guidance (SNH, 2016), and following consultation with NatureScot (see **Table 9.1**).
- 9.15.4 The Lairg and Strath Brora Lochs SPA (and SSSI), and Caithness and Sutherland Peatlands SPA and Ramsar are respectively 3.1 km and 8.3 km from the turbine area which is within the core foraging range of the qualifying species black-throated diver (up to 10 km; SNH, 2016).
- 9.15.5 Desk study established the location of two lochs that have previously been used by suspected breeding black-throated divers (the most recent in 2017) in the wider area, but no suitable breeding diver lochs within the turbine area.
- 9.15.6 Only one black-throated diver flight (two birds) was recorded during the two year survey period (in April 2021). Furthermore, no evidence of breeding black-throated divers was recorded during breeding diver searches in Year 1 or Year 2.
- 9.15.7 Given the very low levels of black-throated diver activity during surveys the potential for Likely Significant Effects on the Lairg and Strath Brora Lochs SPA (and SSSI), and Caithness and Sutherland Peatlands SPA and Ramsar can be precluded on the basis of negligible activity by black-throated diver through the turbine area (and thus inconsequential collision risk), and with no evidence of breeding activity.
- 9.15.8 The Dornoch Firth and Loch Fleet SPA and Ramsar is 19.3 km from the turbine area which is on the upper limit but within the core foraging range of the qualifying species over-wintering greylag goose (15 - 20 km; SNH, 2016).
- 9.15.9 During the entire two survey period, only two greylag goose flights (total of 26 birds) were recorded during the winter/passage period (September - March), with the two goose flights recorded on 22nd October 2020. No further evidence of greylag geese was recorded during the winter/passage period. Given the very limited activity of greylag geese during the winter/passage period, and subsequent inconsequential collision risk, the potential for Likely Significant Effects on the Dornoch Firth and Loch Fleet SPA and Ramsar can be precluded.
- 9.15.10 The Caithness and Sutherland Peatlands Ramsar is 8.3 km from the turbine area. Following consultation with NatureScot (see **Table 9.1**), the potential for the Proposed Development to effect breeding greylag geese (of the North/West Scotland population), which is a qualifying feature of the designated site was considered. Across both survey

years, a total of four greylag goose flights were recorded during the breeding season (between April – June 2021). The flights consisted of multiple birds (2 – 6), and thus considered likely to be flocks of non-breeding birds. Furthermore, given the Caithness and Sutherland Peatlands Ramsar is 8.3 km, it is considered unlikely that breeding geese using the designated site will forage >8 km from nest sites particularly when they have dependent young. Greylag geese are highly territorial and are likely to be active locally to the nest sites and the Ramsar. Those four flights are therefore considered to be resident/feral greylag geese rather than birds of the North/West Scotland population which breeding within the Ramsar.

- 9.15.11 Given that none of the greylag goose flights during the breeding season is considered to be from geese associated with the Caithness and Sutherland Peatlands Ramsar Likely Significant Effects on the Ramsar can be precluded.

## 9.16 References

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