

Chapter 9: Ornithology

Chapter 9

Ornithology

Introduction

9.1 This chapter assesses the potential for significant effects upon ornithological features associated with the construction and operation of the proposed An Càrr Dubh Wind Farm (hereafter referred to as the Proposed Development).

9.2 The specific objectives of the chapter are to:

- Describe baseline ornithological conditions;
- Describe the assessment methodology and significance criteria used in completing the assessment of effects;
- Describe the potential effects, including cumulative effects;
- Describe mitigation measures proposed to address any potentially significant effects (if required); and
- Assess the residual effects remaining following the implementation of mitigation (if required).

9.3 The assessment presented within this chapter has been undertaken by Avian Ecology Ltd. as detailed in **Appendix 1.1: Statement of Expertise**.

9.4 This chapter is supported by the following Figures and Appendices which are referenced throughout the text:

- Figures:
 - **Figure 9.1a: Natural Heritage Zone (NHZ) 14**
 - **Figure 9.1b: Ornithological Statutory Designated Sites**
 - **Figure 9.3: Vantage Point (VP) Survey Plan**
 - **Figure 9.4: Breeding Bird Survey Plan**
 - **Figure 9.5a: VP Flight Activity Target Species Results (Raptors) – Year 1**
 - **Figure 9.5b: VP Flight Activity Target Species Results (Raptors) – Year 2**
 - **Figure 9.5c: VP Flight Activity Target Species Breeding Season Results (Raptors) – Year 3**
 - **Figure 9.5d: VP Flight Activity Target Species Results (Non-Raptors) – Year 1**
 - **Figure 9.5e: VP Flight Activity Target Species Results (Non-Raptors) – Year 2**
 - **Figure 9.5f: VP Flight Activity Target Species Breeding Season Results (Non-Raptors) – Year 3**
 - **Figure 9.6a: “At Collision Risk” Flight Activity (All Species) – Year 1**
 - **Figure 9.6b: “At Collision Risk” Flight Activity (All Species) – Year 2**
 - **Figure 9.6c: “At Collision Risk” Flight Activity (All Species) – Year 3**
 - **Figure 9.7a: Moorland Breeding Bird Survey Results – Year 1**
 - **Figure 9.7b: Moorland Breeding Bird Survey Results – Year 2**
 - **Figure 9.7c: Moorland Breeding Bird Survey Results – Access Track 2022**
- Appendices:
 - **Appendix 9.1: Technical Ornithological Appendix**
 - **Appendix 9.2: Collision Mortality Risks**

■ Confidential Documents:

- **Figure 9.2a: Existing Ornithological Records RSPB [Sensitive]**
- **Figure 9.2b: Existing Ornithological Records ARSG [Sensitive]**
- **Figure 9.5g: VP Flight Activity Target Species Results (White-tailed Eagle and Red-throated Diver) – Year 1 [Sensitive]**
- **Figure 9.5h: VP Flight Activity Target Species Results (White-tailed Eagle and Red-throated Diver) – Year 2 [Sensitive]**
- **Figure 9.5i: VP Flight Activity Target Species Results (White-tailed Eagle and Red-throated Diver) – Year 3 [Sensitive]**
- **Figure 9.6d: “At Collision Risk” Flight Activity (White-tailed Eagle and Red-throated Diver) – Year 1 [Sensitive]**
- **Figure 9.6e: “At Collision Risk” Flight Activity (White-tailed Eagle and Red-throated Diver) – Year 2 [Sensitive]**
- **Figure 9.6f: “At Collision Risk” Flight Activity (White-tailed Eagle and Red-throated Diver) – Year 3 [Sensitive]**
- **Figure 9.8: Breeding Annex 1/Schedule 1 Raptor and Owl Searches 2019, 2020 and 2021 [Sensitive]**
- **Figure 9.9: Breeding Black Grouse Survey Results 2019 [Sensitive]**
- **Figure 9.10: Breeding Diver Survey Results 2020 [Sensitive]**
- **Appendix 9.3: Confidential Ornithology Appendix**
- **Appendix 9.4: Confidential Golden Eagle Topographical (GET) Model Assessment**

9.5 Confidential documents will not be made publicly available but will be provided to the Scottish Government Energy Consents Unit (ECU), Argyll and Bute Council (ABC), NatureScot and RSPB Scotland to inform their own appraisal of the Proposed Development.

9.6 Planning policies of relevance are set out in **Chapter 5: Statutory and Policy Framework**.

Scope of the Assessment

9.7 Onshore wind farm developments have the potential to significantly effect ornithological features in three main ways:

- Direct habitat loss through wind farm construction;
- Mortality through collision with operational turbines; and
- Indirect displacement/habitat loss through the avoidance of operational wind farms infrastructure.

9.8 Only effects upon ornithological features which are considered important from a conservation perspective, as identified in a review of baseline ornithological information, and which are potentially sensitive to effects associated with the Proposed Development in accordance with Annex 1 of NatureScot guidance (SNH, 2018a¹), are considered within the assessment.

Effects Assessed in Full

9.9 At the outset of the ornithology surveys, a number of target species were identified for survey and recording through desk studies and consultation with NatureScot. These include species listed on/as:

- Annex 1 of NatureScot guidance (SNH, 2018a);
- Annex 1 of the ‘Birds Directive’ (Directive 2009/147/EC);

¹ SNH (2018a) Assessing Significance of Impacts from Onshore Windfarms on Birds Outwith Designated Areas

- Schedule 1 of the Wildlife and Countryside Act 1981 (as amended);
- Qualifying interests of designated sites (see **Table 9.5** and **Figure 9.1b**); and
- Wetland birds, including migratory geese, swans ducks (excluding Mallard, waders and waterfowl).

9.10 Informed by the results of the surveys, only effects upon the following ornithological features are scoped into a detailed assessment presented within this chapter:

- Golden eagle; and
- White-tailed eagle.

9.11 The assessment considers the potential for the following adverse effects on these species associated with the operation of the Proposed Development:

- Collision mortality risks as a result of collision or interaction with turbine blades; and
- Displacement/disturbance (indirect habitat loss) as a result of disturbance during operation (golden eagle only).

9.12 Where species population information is available, the potential for significant adverse effects on these species is assessed at the regional Natural Heritage Zone (NHZ) 14 'Argyll West and Islands' scale, within which the Proposed Development is located (**Figure 9.1b**) and in accordance with NatureScot guidance (2018a).

9.13 The potential for significant collision risk and displacement effects is considered both for the Proposed Development and cumulatively, in-combination with other wind farms located within NHZ 14, in accordance with NatureScot guidance (2018b²).

9.14 The reasoning for Scoping out potential effects on all other target species is set out in the section on Existing Conditions below.

Effects Scoped Out

9.15 The following potential effects upon all ornithological features are scoped out of assessment:

- Habitat loss during construction; and
- Decommissioning effects.

9.16 As stipulated in NatureScot guidance (SNH, 2017³) it is generally considered that passerine species are not significantly impacted by wind farm developments. The potential for significant adverse effects upon such species in relation to the construction or operation of the Proposed Development is therefore also scoped out of assessment. Embedded good practice measures are included as part of the Proposed Development to enable legislative compliance with regards to the protection of all breeding bird species under the provisions of the Wildlife and Countryside Act 1981 (as amended), during construction works, and where required during operational maintenance works.

Habitat Loss During Construction (All Features)

9.17 The Proposed Development will result in the direct and permanent loss of approximately 24.4 hectares (ha) of moorland, heath and grassland from within the Site.

9.18 During the construction phase additional habitat losses and disturbance will also occur within construction working areas. These habitats will however, be reinstated following the completion of construction works (expected to be approximately 18 months) and as such construction phase losses are considered temporary and reversible. Full details of habitat loss calculations are detailed in **Chapter 8: Ecology. Appendix 8.5: Outline Restoration and Enhancement Plan (OREP)** sets out the proposed habitat and peatland restoration measures.

9.19 The Proposed Development will include for a CEMP, to be finalised on the basis of the OCEMP presented as **Appendix 4.2** in consultation with ABC, NatureScot and other stakeholders. The OREP included as **Appendix 8.5** also includes for outline habitat enhancement measures which will enhance foraging and nesting opportunities for bird species, including black grouse, breeding

waders and foraging raptors away from proposed infrastructure. The OREP will be finalised consultation with ABC, NatureScot and other stakeholders.

9.20 Overall direct and permanent habitat losses as a result of the construction of the Proposed Development will result in an adverse effect upon ornithological features at no more than a Local level only, resulting in small permanent and temporary losses in potentially suitable nesting, foraging opportunities. Suitable habitats and therefore nesting, foraging and roosting opportunities will remain abundant within the Site, the immediate and wider surrounding area.

9.21 Direct habitat losses as a result of the construction of the Proposed Development, are therefore scoped out of any further detailed assessment, as such losses are not likely to be not significant for any species.

Decommissioning

9.22 As noted in **Chapter 2: Approach to the EIA**, potential effects associated with the decommissioning phase of the Proposed Development are not considered in detail. Potential effects on ornithological features can be reasonably concluded as being of equal or lesser significance to construction phase disturbance/displacement effects, over a reduced timeframe.

Assessment Methodology

Legislation and Guidance

Legislation

9.23 This assessment has referred to the following key pieces of legislation:

- The 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');
- The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (as amended) (hereafter referred to as the 'EIA Regulations');
- The Nature Conservation (Scotland) Act 2004;
- The Wildlife and Countryside Act 1981 (as amended); and
- The Wildlife and Natural Environment (Scotland) Act 2011.

Guidance

9.24 The interpretation of baseline ornithological information and this assessment has made reference to the following key pieces of guidance:

- Wind Farm Impacts on Birds – Calculating a Theoretical Collision Risk Assuming No Avoiding Action (SNH, 2000⁴);
- Developing Field and Analytical Methods to Assess Avian Collision Risk at Wind Farms (Band et al., 2007⁵);
- Natural Heritage Zone Bird Population Estimates (Wilson et al., 2015⁶);
- Assessing Connectivity with Special Protection Areas (SNH, 2016a⁷);
- Environmental Statements and Annexes of Environmentally Sensitive Bird Information: Guidance (SNH, 2016b⁸);
- Guidelines for Ecological Impact Assessment in the UK and Ireland. Terrestrial, Freshwater, Coastal and Marine (CIEEM, 2018⁹);
- Recommended Bird Survey Methods to Inform Impact Assessment of Onshore Wind Farms (SNH, 2017³);

² SNH (2018b) Assessing the Cumulative Impacts of Onshore Wind Farms on Birds

³ SNH (2017) Recommended Bird Survey Methods to Inform Impact Assessment of Onshore Wind Farms

⁴ SNH (2000) Windfarms and Birds – Calculating a Theoretical Collision Risk Assuming No Avoiding Action

⁵ Band, W., Madders, M. and Whitfield, D. P. (2007) Developing field and analytical methods to assess avian collision risk at wind farms. In: de Lucas, M., Janss, G. F. E. and Ferrer, M. (Eds.) Birds and Wind Farms: Risk Assessment and Mitigation (p.259-275)

⁶ Wilson, M. W., Austin, G. E., Gillings, S. and Wernham, C. V. (2015) Natural Heritage Zone Bird Population Estimates (A Scottish Windfarm Bird Steering Group (SWBSG) Commissioned Report Number SWBSG_1504)

⁷ SNH (2016a) Assessing Connectivity with Special Protection Areas (SPAs) (Version 3)

⁸ SNH (2016b) Environmental Statements and Annexes of Environmentally Sensitive Bird Information: Guidance for Developers, Consultants and Consultees

⁹ CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine (Version 1.2)

- Assessing the Significance of Impacts from Onshore Wind Farms Outwith Designated Areas (SNH, 2018a);
- Assessing the Cumulative Impacts of Onshore Wind Farms on Birds (SNH, 2018b²);
- Avoidance Rates for the Onshore SNH Wind Farm Collision Risk Model (SNH, 2018c¹⁰);
- Birds of Conservation Concern 5 (BoCC) (Stanbury et al., 2021¹¹);
- The Effect of Aviation Obstruction Lighting on Birds at Wind Turbines, Communication Towers and Other Structures (NatureScot, 2020¹²); and

- Disturbance Distances in Selected Scottish Bird Species (NatureScot, 2022¹³).

9.25 Additional sources of guidance and peer-reviewed literature have also been referred to during the interpretation of baseline ornithological information and for the purposes of this assessment, and is referenced to where appropriate.

Consultation

9.26 In undertaking the assessment, consideration has been given to the Scoping Responses and other consultation which has taken place as detailed in **Table 9.1**.

Table 9.1: Consultation responses

Consultee and Date	Scoping/Other Consultation	Issue Raised	Response/Action Taken
Argyll and Bute Council (ABC) 20 th January 2022	Response to EIA Scoping Opinion.	Agreed that the range of desk study and ornithological surveys is sufficient and proportionate to inform the design and assessment of the Proposed Development.	Noted.
		Agreed that the range of effects to be assessed with regards to ornithology was acceptable.	Noted.
		Advised the Argyll Bird Club should be additionally contacted for baseline ornithology information.	The Argyll Bird Club was contacted by email in May 2022 however no response was received.
		Agreed with the assessment and evaluation methodology proposed.	Noted.
		Advised that the Scoping out of potential effects upon ornithological designated sites with the exception of the Glen Etive and Glen Fyne SPA, should be done following the completion of survey works and cumulative effects from other wind farms considered.	The potential for effects upon designated sites for nature conservation with ornithological effects has been considered on the basis of likely pathways for effects and in review of baseline ornithological information. The potential for effects upon any such site is scoped out of assessment, with further justification provided within this chapter. A summary of information to inform a Habitats Regulations Appraisal (HRA) of the Proposed Development in relation to the Glen Etive and Glen Fyne SPA is provided at the end of this chapter.
		Advised on the drafting of a CEMP to include ornithological mitigation and employment of an Ecological Clerk of Works (ECoW) to oversee such measures.	A CEMP will be prepared for the Proposed Development on the basis of the Outline CEMP submitted as Appendix 4.3 and which includes for the provision of a Breeding and Roosting Bird Protection Plan (BRBPP). The BRBPP will include those mitigation measures required to enable the protection of breeding bird species during the construction and operation of the Proposed Development. Such measures contained within the CEMP once agreed in consultation with ABC, NatureScot and other stakeholders will be overseen by an ECoW (or similar).
NatureScot 11 th July 2019	Response to request on baseline ornithological studies.	Advised on the availability of satellite telemetry data for golden eagle territory G/LAE1B which overlaps the Site. Advised on the preference for a meeting to discuss ornithological and other natural heritage issues.	Satellite telemetry data for tagged adult birds associated with the G/LAE1 and G/LAE1B golden eagle ranges was obtained in consultation with the data provider for the period 1 st March 2017 to August 2022 and which has been used to inform the assessment presented within this chapter. Follow up meeting undertaken on 2 nd April 2020 (see below) with regards to ornithological issues.
NatureScot 2 nd April 2020	Informal virtual meeting on the approach to baseline ornithological studies.	Advised on the potential for ornithological constraints associated with wind farm investigations within the Site.	Noted.
		Advised on likely changes to guidance on the assessment of effects on golden eagles but that empirical data still required to inform assessments.	Noted.
		Advised that NatureScot will consider the potential for connectivity between golden eagle ranges and the Glen Etive and Glen Fyne Special Protection Area (SPA), should satellite telemetry show tagged birds to enter the SPA.	Satellite telemetry data has been obtained from tagged birds associated with the G/LAE1B and G/LAE1 golden eagle ranges. The data has been reviewed to establish range boundaries (see Appendix 9.4) and the potential for connectivity with the Glen Etive to Glen Fyne SPA. In review and analysis of the data, it is concluded that the G/LAE1B golden eagle range which encompasses the Site has a discrete range boundary which does not overlap with the SPA (see Appendix 9.4). The potential for likely significant effects upon the SPA is therefore screened out. A summary of information to inform a HRA of the Proposed Development in relation to the Glen Etive and Glen Fyne SPA is provided at the end of this chapter.

¹⁰ SNH (2018c) Avoidance Rates for the Onshore SNH Wind Farm Collision Risk Model (Version 2)

¹¹ Stanbury, A., Eaton, M., Aebischer, N., Balmer, D., Brown, A., Douse, A., Lindley, P., McCulloch, N., Noble, D. and Win, I. (2021) The Status of Our Bird Populations: The Fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and Second IUCN Red List assessment of Extinction Risk for Great Britain (British Birds, 114, p.723-747)

¹² NatureScot (2020) The Effect of Avian Obstruction Lighting on Birds at Wind Turbines, Communication Towers and Other Structures

¹³ NatureScot (2022) Disturbance Distances in Selected Scottish Bird Species

Consultee and Date	Scoping/Other Consultation	Issue Raised	Response/Action Taken
		Advised that the cumulative picture has changed substantially since previous investigations into wind farm developments were undertaken and that this should be considered.	Noted. The assessment considers the potential for significant cumulative effects in-combination with other wind farm developments in NHZ 14 and which is in accordance with NatureScot guidance (SNH, 2018b ²).
NatureScot 2 nd July 2021	Response to EIA Scoping.	Advised that white-tailed eagle, golden eagle, other Schedule 1 listed raptors, divers and black grouse are likely to be the main species of interest for the Site.	Noted. These species have been included as target species for survey and recording during baseline ornithological studies.
		Advised effects should be assessed cumulative at the NHZ level.	The assessment presented within this chapter considers the potential for significant effects upon ornithological interests at the regional NHZ 14 scale, both from the Proposed Development and cumulatively with other wind farm developments.
		Agreed that the range of desk study and ornithological surveys is sufficient and proportionate to inform the design and assessment of the Proposed Development.	Noted.
		Agreed that the range of effects to be assessed with regards to ornithology was acceptable.	Noted.
		Advised no other consultees are relevant to the ornithology assessment of scope of baseline information.	Noted.
		Agreed with the assessment and evaluation methodology proposed, providing a cumulative assessment is presented at the NHZ 14 scale.	Noted (as above).
		Agreed with the exception of the Glen Etive and Glen Fyne SPA, the potential for effects upon all other designated sites with ornithological features could be scoped out. Advised that the assessment of potential effects upon the Glen Etive and Glen Fyne SPA would need to be robust.	The potential for likely significant effects upon the Glen Etive to Glen Fyne SPA is screened out (see above). A summary of information to inform a HRA of the Proposed Development in relation to the Glen Etive and Glen Fyne SPA is provided at the end of this chapter.
		Advised on the potential for surveys and other wind farm investigations in the area to skew golden eagle flight activity.	Baseline information regarding the activity of golden eagles in proximity to the Proposed Development and which has been gathered through desk study sources and field survey to inform this assessment is considered extensive and robust.
		Advised on the availability of the Golden Eagle Topographical (GET) model to inform an assessment of potential effects upon golden eagles. Commented that they would welcome further discussion on its use for the Proposed Development.	Baseline information includes satellite telemetry data over a c. four-year period and which provides an accurate reflection of golden eagle movements, both in the absence and in the presence of potential environmental factors influencing activity. This information together with the GET model has been used to inform a robust assessment of potential effects upon golden eagle for the Proposed Development. No limitation to subsequent assessment is therefore considered. The GET model has been used to inform an assessment of potential operational habitat loss (displacement) effects to golden eagle and revise the Proposed Development layout. Full details of the assessments are presented in Appendix 9.4 .
NatureScot 22 nd November 2021	Response to Scoping – follow up virtual meeting.	Agreed that scheme design with regards golden eagle should be influenced by GET 6+ habitat and satellite telemetry data.	Scheme design has been informed through an assessment using the GET model and satellite telemetry data, to avoid the potential for significant effects upon golden eagles. Full details are presented in Appendix 9.4 , with further discussion provided in below.
		Advised that the local golden eagle territory EA 816 (i.e. the G/LAE1B range) should be mapped using Kernel analysis of the tagging data to inform the assessment of potential habitat loss through displacement.	Boundaries for the G/LAE1B and G/LAE1 golden eagle ranges have been defined using Kernel analysis to inform the assessment. Details are presented in Appendix 9.4 .
		Advised that previous assumptions of a 5% significance threshold when determining the potential for significant habitat loss effects to golden eagles may no longer be meaningful and that a qualitative approach may likely be necessary.	Noted.
		Noted that a loss of five pairs (1% of the National population) could be nationally significant, but that the NHZ population could potentially remain favourable with the loss of a golden eagle pair.	Noted. Scheme design has however sought to avoid the potential for significant effects upon golden eagle and loss of breeding ranges.
		Advised there has been a rapid regional expansion of white-tailed eagle and there may be additional unknown pairs.	Noted. White-tailed eagle has been included as a target species for survey and recording.

Consultee and Date	Scoping/Other Consultation	Issue Raised	Response/Action Taken
		Commented that red-throated diver is a sporadic breeding in the area, with little site fidelity.	Noted. Red-throated diver has been included as a target species for survey and recording.
RSPB 23 rd April 2019	Response to request for ornithological information.	Provided existing ornithological records from within 6 kilometres (km) of the approximate Site centre.	This information has been used to inform the approach baseline ornithology surveys and subsequent assessment.
RSPB 11 th June 2021	Response to Scoping.	Advised on bird species of conservation concern which may occur within or close to the Proposed Development including: golden eagle, white-tailed eagle, hen harrier, red-throated diver and black grouse and which impacts should be assessed.	Noted. These species have been included as target species for survey and recording.
		Advised surveys should follow current NatureScot guidance (SNH, 2017 ³).	Baseline ornithological surveys have been undertaken in accordance with current NatureScot guidance (SNH, 2017 ³).
		Surveys should be followed up by collision risk assessment and the potential impacts of habitat loss and displacement assessed including for raptors, divers and breeding waders.	The assessment considers the potential for collision risks, habitat loss and displacement to bird species, with focus on those species listed on Annex 1 of NatureScot guidance (SNH, 2018a ¹) and which are a priority for assessment.
		Advised that the assessment should consider the entire development and that options for grid connections should be considered by the EIAR.	The assessment considers all components of the Proposed Development as described in Chapter 4: Project Description . The grid connection route will be subject to a separate application under the and is therefore not considered within the EIAR.
		Advised that any anemometer masts should be fitted with bird divertors.	Permanent masts proposed will be of a tower design and which are of lower collision risk to bird species.
		Advised a cumulative assessment of impacts to golden eagles should be undertaken.	The assessment considers the potential for significant effects to golden eagle as a result of the Proposed Development and cumulatively, in-combination with other wind farms.
		Advised golden eagle range reports should be obtained from NatureScot and used to inform the assessment.	Range reports have not been requested from NatureScot. Recent satellite telemetry data has been used to identify golden eagle range boundaries applicable to the Site and which is considered appropriate for the purposes of a contemporary assessment.
		Advised the GET model should be used to assess the impacts on golden eagle territories.	The GET model has been used to inform an assessment of potential operational habitat loss (displacement) effects to golden eagle and revise the Proposed Development layout. Full details of the assessments are presented in Appendix 9.4 .
		Advised a HRA will be required.	A summary of information to inform a HRA of the Proposed Development in relation to the Glen Etive and Glen Fyne SPA is provided below.
		Advised white-tailed eagle populations are expanded and advised on the requirement for construction and operational monitoring.	The potential for future changes in the distribution of breeding Annex 1/Schedule 1 raptors, including white-tailed eagles is considered within this assessment. Measures to enable their protection during construction works will be included within a Breeding Bird Protection Plan (BBPP) contained within the CEMP. Measures to reduce potential collision risks to white-tailed eagle, over the operational lifetime of the Proposed Development, are also included.
Advised information from the Argyll Raptor Study Group (ARSG) should be sought.	Consultation with the ARSG has been undertaken to obtain existing records of scarce breeding raptors and owls and which has been used to inform this assessment (see below).		
Advised impacts upon black grouse should be fully assessed and that consideration to mitigation works for the species within the Site or surrounding area should be given.	The chapter does not consider the potential for significant effects upon black grouse in detail, as significant effects are not likely to occur. Measures to enable the avoidance of disturbance to lekking birds during construction works will be included within a BRBPP contained within the CEMP (see Outline CEMP in Appendix 4.3). Habitat management measures which will provide habitat improvement for black grouse away from Proposed Development infrastructure is also detailed within the OHLRMP (Appendix 8.5). The Outline HMP and Outline CEMP will be finalised in consultation with ABC and NatureScot.		
Advised turbines should be set back from any lochans used by red-throated divers and the assessment should consider the potential for cumulative impacts on the species.	No turbine locations are located within 1km of any lochan on which breeding red-throated divers were recorded. The potential for significant effects upon the species is scoped out of detailed assessment.		

Consultee and Date	Scoping/Other Consultation	Issue Raised	Response/Action Taken
Argyll Raptor Study Group (ARSG) 26 th September 2019, 26 th January 2021 and 18 th May 2022	Response to request for ornithological information.	Provided existing information relating to breeding raptors and owls within proximity to the Site.	This information has been used to inform the approach to baseline surveys and impact assessment.

Study Area

9.27 The assessment of effects upon ornithological interests has been undertaken at the NHZ 14 geographic scale (**Figure 9.1a**), and which is in accordance with NatureScot guidance (2018a¹).

9.28 In accordance with NatureScot guidance (SNH, 2017³) the main study areas within which baseline information relating to the presence and distribution of breeding and wintering birds has been collated has extended to at least 500m beyond the Site boundary.

9.29 In accordance with NatureScot guidance (SNH, 2017³) survey areas for the identification of nest and display sites of the following species and/or species groups have also been extended out to the following distances beyond the Site boundary, as illustrated on **Figure 9.4**:

- 1km for breeding red-throated and black-throated diver;
- 1.5km for lekking black grouse;
- 2km for breeding and roosting Annex 1/Schedule 1 raptors and owls; and
- 6km for golden eagle and white-tailed eagle.

9.30 The study area has also included the Site boundary and out to 10km for statutory designated sites for nature conservation with ornithological qualifying interests, extended to 20km for sites with migratory goose qualifying interests (see **Figure 9.1a**)¹⁴.

9.31 The survey area of flight activity surveys within which to quantify the level of flight activity for input into collision mortality risk estimates has comprised the proposed turbine locations of the Proposed Development and a 500m buffer, in accordance with NatureScot guidance (SNH, 2017³).

9.32 Full details of ornithological desk study and field survey areas are presented in **Appendix 9.1** and illustrated on **Figures 9.1b**, **9.2a-b**, **9.3** and **9.4**.

Desk Based Research and Data Sources

9.33 A desk study has been undertaken to determine the proximity of the Proposed Development to designated sites for nature conservation with ornithological interests and obtain existing ornithological records within the Site and surrounding areas.

9.34 The following key sources have been consulted to obtain existing ornithological information:

- NatureScot Sitelink;
- Royal Society for the Protection of Birds (RSPB);
- Argyll Raptor Study Group (ARSG);
- Natural Research Projects (NRP); and
- EIA documentation for the:
 - Blarghour Wind Farm (2018); and
 - Ardchonnell Wind Farm (2012)¹⁵.

¹⁴ As no statutory designated sites with migratory goose qualifying interest are located within 20km, **Figure 9.1a** only extends to 10km from the Site boundary.

9.35 EIA documentation for the Blarghour Wind Farm S36C Variation Application (ECU Reference: ECU00004754) has also been reviewed however, the detailed ornithological assessment is not in the public domain.

9.36 Reference has also been made to additional pieces of guidance and peer reviewed literature as referenced in Legislation and Guidance, and additionally as relevant herein.

9.37 Further details of desk studies undertaken and results obtained are presented in **Appendices 9.1** and **9.3**.

Field Survey

9.38 The following ornithological field surveys have been undertaken:

- Vantage Point (VP) Flight Activity Surveys (February 2019 – August 2021);
- Moorland Breeding Bird Surveys (MBBSs) (April 2019, 2020 and 2022);
- Breeding Annex 1/Schedule 1 Raptor and Owl Searches (2019, 2020 and 2021);
- Breeding Black Grouse Surveys (2019, 2020 and 2022); and
- Breeding Diver Surveys (2019 and 2020).

9.39 All surveys have been undertaken in accordance with NatureScot guidance (SNH, 2017³) and species-specific guidance referenced therein, and have been completed by experienced and professional ornithologists.

9.40 Detailed survey methodologies, target species for survey and recording and survey areas are presented within **Appendix 9.1** and illustrated in **Figures 9.3** and **9.4**.

9.41 Target species for survey and recording have included species listed on/as:

- Annex 1 of NatureScot guidance (SNH, 2018a¹);
- Annex 1 of the 'Birds Directive' (Directive 2009/147/EC);
- Qualifying interests of designated sites (see **Table 9.5** and **Figure 9.1b**); and
- Wetland birds, including migratory geese, swans, ducks (excl. mallard), waders and waterfowl.

9.42 No limitations to ornithological field surveys in establishing an accurate reflection of the distribution and level of baseline activity of ornithological features were identified.

Assessing Significance

9.43 The assessment presented within this chapter follows the principles set out in the Chartered Institute of Ecology and Environmental Management (CIEEM) Guidelines for Ecological Impact Assessment in the UK and Ireland (CIEEM, 2018⁹), with impact significance determined on the basis of the sensitivity of ornithological features and the magnitude of change.

¹⁵ The Site of the Proposed Development has been subject to a previous application for a wind farm by RWE Innogy UK in 2012 known as the Ardchonnell Wind Farm which was subsequently refused.

Sensitivity

9.44 The sensitivity (or importance) of ornithological features has been determined with reference to Annex 1 'Priority bird species for assessment when considering the development of onshore wind farms in Scotland' of NatureScot guidance (SNH, 2018a¹) and according to criteria based on the conservation status of individual bird species presented in **Table 9.2**.

9.45 Potential connectivity of a statutory designated site for nature conservation with the Proposed Development has been assessed with reference to NatureScot guidance (2016a⁷), and on the basis of responses received from consultees detailed in **Table 9.1** and baseline information.

Table 9.2: Sensitivity (importance) of ornithological features

Sensitivity (Importance)	Description
High (International/National)	Species listed on Annex 1 of the Birds Directive (2009/147/EC) and which comprise a qualifying interest of a potentially connected internationally statutory designated site for nature conservation i.e. SPA and/or Ramsar site. Nationally or internationally important numbers of a species, including regularly occurring migratory species listed on Annex II of the Birds Directive i.e. >1% of the relevant national or international biogeographical population). Species not listed on Annex 1 of the Birds Directive, but listed in Schedule 1 of the Wildlife and Countryside Act 1981 (as amended), and which comprise a qualifying interest of a potentially connected nationally designated site for nature conservation i.e. Site of Special Scientific Interest (SSSI).
Medium (Regional)	Species listed on Annex 1 of the Birds Directive and/or on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) and which do not comprise a qualifying interest of a statutory designated site for nature conservation i.e. SPA, Ramsar site or SSSI. Regionally important numbers of a species i.e. >1% of the relevant regional Natural Heritage Zone (NHZ) population or appropriate alternative and listed on Annex 1 of NatureScot guidance (SNH, 2018a ¹).
Low (Local)	All other species that are widespread and common and/or which are not present in regionally or nationally important numbers, but which form part of the breeding/wintering bird assemblage within the Site.

Magnitude

9.46 Potential effects upon ornithological features are described with reference to their magnitude and their direction (adverse or beneficial), duration and reversibility where this is relevant to understanding the nature of an effect and determining its significance. The criteria used to determine the magnitude of change is presented in **Table 9.3**.

Table 9.3: Magnitude of change

Magnitude	Description
Very High	Total loss or near total loss that either alone or in-combination with effects from other relevant proposals will irreversibly adversely or positively 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 a habitat, complex of habitats and/or the population levels of species of interest. e.g. affecting >80% of an NHZ population/habitat.
High	Major change/loss that either alone or in-combination with effects from other relevant proposals is likely to adversely or positively affect the conservation status of a site/population in the short-long term and affects its long-term viability, in terms of the coherence of its ecological structure and function (integrity), across its whole area, that enables it to sustain a habitat, complex of habitats and/or the population levels of species of interest. e.g. affecting >21-80% of an NHZ population/habitat.
Medium	Change/loss that either alone or in-combination with effects from other relevant proposals is detectable and which may adversely or positively affect the conservation of a site/population in the short-medium term but which would not affect its long-term viability.

Magnitude	Description
	e.g. affecting >6-20% of an NHZ population/habitat.
Low	Neither of the above applies, but some minor adverse or beneficial effect is evident in the short-term basis or affects extent of habitat/species abundance in the local area. e.g. affecting >1-5% of an NHZ population/habitat.
Negligible	Very slight or no observable change in baseline conditions. e.g. affecting ≤1% of the relevant NHZ population/habitat.

Significance

9.47 The predicted significance of the effect has been determined through a standard method of assessment based on the exercise of professional judgement, a combination of sensitivity and magnitude of change as detailed in **Table 9.4** below and has been further informed by relevant information on bird species ecology, population trends and evidence from the studies of bird and wind farm interactions, as referenced herein. Unless otherwise stated, all effects are assumed to be adverse.

9.48 Major and Moderate effects are considered significant in the context of the EIA Regulations.

Table 9.4: Significance criteria

Sensitivity	Magnitude of Change				
	Very High	High	Medium	Low	Negligible
High	Major	Major/Moderate	Moderate/Minor	Minor	Negligible
Medium	Major/Moderate	Moderate	Minor	Minor/Negligible	Negligible
Low	Moderate/Minor	Minor	Minor	Minor/Negligible	Negligible

Assessment of Cumulative Effects

9.49 The assessment of potentially significant cumulative effects has been undertaken with reference to NatureScot guidance (SNH, 2018b²) for important ornithological features subject to a detailed assessment.

9.50 The cumulative assessment includes consideration of:

- Existing wind farm developments, either operational or under construction;
- Consented wind farm developments, awaiting implementation; and
- Wind farm applications awaiting determination within the planning process with design information in the public domain.

9.51 Those developments which have been withdrawn and/or refused are not considered, unless an appeal is currently in progress and information is available.

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

9.53 With regards to the spatial extent of the cumulative assessment, NatureScot guidance (2018b²) recommends that cumulative effects should typically be assessed at the relevant regional NHZ scale. The potential for significant cumulative effects is therefore assessed at the NHZ 14 geographical scale, where sufficient information is available for those relevant developments to allow for a meaningful assessment.

9.54 The scale at which potentially significant cumulative effects is assessed is also revised where justified, to allow for the inclusion of biologically reasonable constraints, also for the purposes of a meaningful and precautionary assessment.

9.55 The significance of cumulative effects has been assessed following the criteria detailed in **Table 9.3** and **9.4**.

Assessment Limitations

9.56 No limitations to the availability of baseline ornithological information have been identified that would prevent an informed decision to be taken in relation to the identification and assessment of likely the potential for significant environmental effects on ornithological features. Further discussion is provided in **Appendix 9.1**.

9.57 In relation to the assessment of potentially significant cumulative effects, where information regarding other wind farms within NHZ 14 is not readily available or allows for a quantitative assessment, precautionary assumptions have been adopted.

Existing Conditions

Designated Sites for Nature Conservation

9.58 The Site does not form part of any statutory designated site for nature conservation with ornithological qualifying interests and is not located immediately adjacent to any such site.

9.59 The nearest such site, and only such site within 10km of the Site comprises the Glen Etive and Glen Fyne Special Protection Area (SPA), designated for its breeding golden eagle interests and located approximately 4.9km to the north-east of the Site boundary at its nearest point (**Figure 9.1b** and **Table 9.5**).

9.60 There are no internationally designated sites for migratory waterfowl located within 20km of the Site, and the Proposed Development is not located within or close to any known goose feeding area associated with such sites (Mitchell, 2012¹⁶).

9.61 In accordance with NatureScot guidance (SNH, 2016a⁷), the Site is located within the maximum core foraging range connectivity distances for golden eagle as the qualifying interest of the Glen Etive and Glen Fyne SPA i.e. 6km for breeding golden eagle.

9.62 The SPA breeding golden eagle population is assigned a value of **High** importance, in accordance with the criteria presented in **Table 9.2**.

9.63 Satellite telemetry data from two tagged golden eagles associated with two separate golden eagle ranges encompassing the Site and occurring to the north of the Site (the G/LAE1B and G/LAE1 golden eagle ranges respectively) has however been reviewed to establish local golden eagle range boundaries (see **Appendix 9.4**) and the potential for connectivity between the Site with the Glen Etive to Glen Fyne SPA. In review and analysis of the data, it is concluded that the G/LAE1B golden eagle range which encompasses the Site in its entirety has a discrete range boundary which does not overlap with the SPA (see **Appendix 9.4**). The G/LAE1B and G/LAE1 golden eagle ranges are therefore considered to form part of the wider countryside breeding golden eagle population.

9.64 The potential for likely significant effects upon the Glen Etive and Glen Fyne SPA and any other statutory designated site for nature conservation with qualifying ornithological interests, is therefore not considered further and scoped out of any further detailed assessment.

9.65 A summary of information to inform a HRA of the Proposed Development in relation to the Glen Etive and Glen Fyne SPA is provided at the end of this chapter.

Table 9.5: Designated sites for nature conservation with ornithological interests (10km)

Designated Site	Distance/Direction	Qualifying Interests
Glen Etive and Glen Fyne Special Protection Area (SPA)	4.9km, north-east	Golden eagle (breeding)

VP Flight Activity Surveys

9.66 Flight activity of target species recorded during the during the entire VP survey effort between February 2019 and August 2021 from all VP locations combined is summarised and detailed in **Appendix 9.1** and illustrated in in **Figures 9.5a** to **9.5f** and **Confidential Figures 9.1g** to **9.1i**.

9.67 Flight activity of the following target species was recorded over the course of surveys:

- Greylag goose
- Whooper swan
- Goosander
- Lapwing
- Golden plover
- Merlin
- Peregrine
- Greenshank
- Red-throated diver
- Grey heron
- Osprey
- Golden eagle
- Hen harrier
- Red kite
- Curlew
- Dunlin
- Woodcock
- Snipe
- Redshank
- White-tailed eagle

Collision Mortality Risks

9.68 Collision mortality risks for the Proposed Development have been estimated using the NatureScot collision risk model (CRM) (SNH, 2000⁴ and Band et al., 2007⁵) for those target species where sufficient “at collision risk” flight activity was identified (>3 “at collision risk” flights in any survey year). For species with ≤3 “at collision risk” flights, collision mortality risks can reasonably be precluded as Negligible and not significant at any population level and therefore are not considered further within this assessment. Full details are presented in **Appendix 9.2** and summarised in **Table 9.6**.

Table 9.6: Collision mortality risks (species with >3 “at collision risk” flights)

Species	Avoidance Rate (SNH, 2018b ¹⁰)	No. of “at Collision Risk” Flights	Annual Collision Mortality Risk
Red-throated diver	99.5%	Year 1 = 0 Year 2 = 6 Year 3 = 0	Year 1 = 0.000 Year 2 = 0.020 Year 3 = 0.000 (breeding)
Golden eagle	99%	Year 1 = 5 Year 2 = 4 Year 3 = 6	Year 1 = 0.063 Year 2 = 0.026 Year 3 = 0.058 (breeding)
Hen harrier	99%	Year 1 = 0 Year 2 = 4 Year 3 = 0	Year 1 = 0.000 Year 2 = 0.025 Year 3 = 0.000 (breeding)
White-tailed eagle	95%	Year 1 = 8 Year 2 = 20 Year 3 = 13	Year 1 = 1.228 Year 2 = 1.140 Year 3 = 0.604 (breeding)

9.69 Estimated collision mortality risks to red-throated diver for the Proposed Development represents 0.01% of the most recently published NHZ 14 breeding population (83 breeding pairs, 166 breeding bird as per Wilson et al., 2015⁶) and which would be a **Negligible** effect in accordance with the criteria presented in **Table 9.3**. Red-throated divers are understood to be a sporadic breeding species in the area, and which was confirmed during baseline studies (see **Appendix 9.1** and **9.3**). Very low levels of red-throated diver “at collision risk” flight activity was recorded over three consecutive breeding seasons of survey, with only sufficient activity to merit further detailed analysis in 2020/21 (Year 2, see **Table 9.6** and **Appendix 9.2**). The turbine layout of the Proposed Development is not considered to interrupt any regularly used flight path by adult birds during the breeding season, including to foraging areas at Loch Awe to the west and coastal areas to the east. There has been little reported evidence of red-throated divers colliding with wind turbines, with no known published or reported collision at Scottish onshore wind farms. A collision mortality event for the species over the operational period of the Proposed Development is therefore considered to be highly unlikely, with the

¹⁶ Wildfowl & Wetlands Trust and Scottish Natural Heritage (Mitchell, C.) (2012) Mapping the Distribution of Feeding Pink-footed and Iceland Greylag Geese in Scotland

species known to demonstrate high levels of macro-avoidance (Furness, 2015¹⁷). The potential for significant collision risks to red-throated diver as a result of the Proposed Development alone or in-combination with any other wind farm development at the NHZ 14 scale, is therefore scoped out of further assessment.

9.70 Estimated collision mortality risks to hen harrier for the Proposed Development represents 0.01% of the most recently published NHZ 14 breeding population (125, pairs, assuming 250 breeding birds as per Wilson et al., 2015⁶), and which would be a **Negligible** effect in accordance with the criteria presented in **Table 9.3**. Whilst collision fatalities of hen harriers at onshore wind farms in Scotland have been reported, such events are very rare due to the species typically low flight heights, and which reduces their sensitivity to collisions with modern turbine specifications. This is reflected in the high recommended avoidance rate for use in the NatureScot CRM (Whitfield and Madders, 2006¹⁸; SNH, 2018c¹⁰). The very small estimated collision mortality risks for the Proposed Development would be very unlikely to contribute materially to potentially significant cumulative effects upon the species at any population level. The potential for significant collision risks to hen harrier, assigned a value of **Medium** importance in accordance with the criteria presented in **Table 9.2** (see subsequent section), as a result of the Proposed Development alone or in-combination with any other wind farm development at the NHZ 14 scale, is therefore scoped out of further assessment.

9.71 Detailed assessment has been undertaken for collision mortality risks for golden eagle and white-tailed eagle below.

Moorland Breeding Birds

9.72 Baseline surveys in 2019 and 2020 recorded a very narrow assemblage of moorland breeding birds within the survey area, including small numbers of the following breeding target species: curlew, snipe, golden plover, teal and common sandpiper. Additionally in 2022, habitats within proximity to the proposed access route were found to support small numbers of the following breeding target species: golden plover and snipe.

9.73 Estimated breeding target species territory numbers recorded in 2019, 2020 and 2022 within proximity to the Proposed Development are provided in **Appendix 9.1** and illustrated in **Figures 9.7a-c**.

9.74 **Table 9.7** summarises the number of breeding territories for those target species identified for survey and recording that are included on Annex 1 of NatureScot guidance (SNH, 2018a¹) and which are considered potentially sensitive to onshore wind turbine developments, recorded within upper species-specific disturbance buffer zones in accordance with NatureScot guidance (2022¹³). A summary of species importance (sensitivity) in accordance with the criteria presented in **Table 9.2** and professional judgement is also presented.

9.75 This includes a very small number of golden plover, curlew and lapwing territories and which represents a very small proportion of currently stated regional breeding population estimates, with the overall moorland breeding bird assemblage for the Site assessed as being of **Low** importance (sensitivity) in accordance with the criteria presented in **Table 9.2**.

9.76 Potentially significant disturbance/displacement effects upon the breeding moorland bird assemblage of the Site are therefore scoped out of detailed assessment, on the basis of a relatively small number of breeding territories that may potentially be affected by the Proposed Development. The Proposed Development will also include for the implementation of standard good practice measures within a CEMP for the proposed development, including a Breeding and Roosting Bird Protection Plan (BRBPP), to enable the protection of breeding bird species over the course of construction works.

9.77 Habitat management principles contained within the OREP (see **Appendix 8.5**), will also seek to expand and maintain breeding and foraging habitats for the breeding moorland bird assemblage within the Site over the lifetime of the Proposed Development, away from operational infrastructure.

9.78 Potentially significant construction or operational phase effects upon the moorland breeding bird assemblage recorded within the Site and within proximity to proposed infrastructure can therefore reasonably be concluded as non-significant and are scoped out of further assessment.

Table 9.7: Moorland breeding bird territories within disturbance buffer zones

Species	No. of Breeding Territories			Upper Disturbance Buffer Zone	Regional NHZ 14 Population	Importance (Sensitivity)
	2019	2020	2022			
Lapwing	0	1	0	300 metres (m) ¹⁹	N/A	Low (listed on Annex 1 of NatureScot guidance (SNH, 2018a ¹) but present in very small numbers)
Golden plover	1	2	4	500m	1,429 breeding pairs	Low (listed on Annex 1 of the Birds Directive and Annex 1 of NatureScot guidance (SNH, 2018a ¹) but present in numbers of <1% of the regional NHZ population)
Curlew	0	2	0	300m	207 breeding pairs	Low (listed on Annex 1 of NatureScot guidance (SNH, 2018a ¹) but present in number of <1% of the regional NHZ population)

Annex 1/Schedule 1 Breeding Raptors and Owls

9.79 Desk study sources and baseline surveys in 2019, 2020 and 2021 did not identify the breeding sites of any Annex 1/Schedule 1 breeding raptor or owl within the Site, but identified breeding sites of the following such species within the wider survey area, and which are included on Annex 1 of NatureScot guidance (SNH, 2018a¹) and therefore potential sensitivity to onshore wind turbine developments:

- Osprey;
- Golden eagle;
- Hen harrier;
- White-tailed eagle; and
- Merlin.

9.80 Further details are provided in **Appendix 9.1** and **Appendix 9.3**, and **Figures 9.2a, 9.2b** and **9.8**.

Osprey

9.81 Two osprey territories were recorded within 2km of the Site during field surveys between 2019-2021, both to the west of the Site. A further osprey breeding site was also identified just beyond 2km to the south-west of the Site from information obtained in consultation with the ARSG. No breeding site was identified within 750m of the Site (or any Proposed Development Infrastructure). The two osprey territories recorded within 2km of the Site represents 12.5% of the most recently published NHZ 14 breeding population (16 breeding pairs in 2013 as per Wilson et al., 2015⁶). Relatively low levels of osprey flight activity were recorded over the course of VP flight activity surveys, suggesting waterbodies within the Site are of lesser importance for foraging birds than those in the wider area, including in closer proximity to nesting locations. The breeding osprey population within proximity to the Site is assigned a value of **Medium** importance in accordance with the criteria presented in **Table 9.2**.

Golden Eagle

9.82 From consultation with NatureScot (see **Table 9.1**) and the ARSG (see **Appendix 9.3**) a number of golden eagle territories are known to occur within proximity to the Site, and regional occupancy of breeding ranges is understood to be high and the population in a favourable conservation status (Whitfield et al., 2008²⁰). No golden eagle eyries were identified within 1km of the Site. In review of

¹⁷ Scottish Natural Heritage (Furness, R. W.) (2015) A review of red-throated diver and great skua avoidance rates at onshore wind farms in Scotland (Scottish Natural Heritage (SNH) Commissioned Report No. 885)

¹⁸ Whitfield, D. P. and Madders, M. (2006) A review of the impacts of wind farms on hen harrier *Circus cyaneus* and an estimation of collision avoidance rates (Natural Research Information Note 1 (revised))

¹⁹ Disturbance buffers not presented within NatureScot guidance. For the purposes of this assessment, a precautionary disturbance buffer zone is adopted in line with that presented for curlew.

²⁰ Whitfield, D. P., Fielding, A. H., McLeod, D. R. A. and Haworth, P. F. (2008) A conservation framework for golden eagles: implications for their conservation and management in Scotland (Scottish Natural Heritage (SNH) Commissioned Report No.193)

Satellite telemetry for two tagged range holding golden eagles, the Site is identified as being located entirely within a single golden eagle range (G/LAE1B), with a further breeding range occupying the area to the north (G/LAE1).

9.83 The 2015 national survey of golden eagle, reported a total of 508 breeding pairs in Scotland (Hayhow et al., 2015²¹), exceeding the national target for favourable conservation status as set out in Whitfield et al. (2008²⁰). The most recently published NHZ 14 golden eagle population is 44 occupied breeding territories (Wilson et al., 2015⁶), based on 2003 monitoring data, but which is considered outdated on account of recent population growth.

9.84 In 2020 the Scottish Raptor Monitoring Scheme (SRMS), reported 51 golden eagle ranges occupied by pairs (Challis et al., 2022²²) in Argyll (including the Argyll Islands, Mainland and Bute), and which suggests the regional population has increased, in line with national trends.

9.85 On the basis of the most recent assessment, the NHZ 14 golden eagle population is considered to be in a favourable conservation status (Whitfield et al., 2008²⁰).

9.86 There are a number of known golden eagle ranges located within 20km of the Proposed Development (see **Appendix 9.4**), with the Site encompassed in its entirety by the occupied G/LAE1B range and which is considered to form part of the wider regional NHZ 14 population. The range represents c.2% of the most recently published Argyll and Bute population.

9.87 For the purposes of assessment golden eagle is assigned a value of **Medium** importance in accordance with the criteria presented in **Table 9.2**.

Hen Harrier

9.88 No evidence of breeding hen harrier was recorded within the survey area during field surveys over three consecutive breeding seasons (2019-2021). Three hen harrier breeding territories, were identified to the west of Loch Awe (>2km from the Site), from information obtained in consultation with the ARSG. Adult birds associated with one of these identified territories are known to forage on the east side of Loch Awe and which is likely to attribute to flight activity recorded during baseline VP flight activity surveys. This single territory represents <1% of the most recently published NHZ 14 breeding hen harrier population (125 breeding pairs in 2011 as per Wilson et al., 2015⁶) however, national breeding populations of hen harriers are known to have declined in recent years, with the current NHZ breeding population estimate possibly outdated. The breeding hen harrier population occurring within proximity to the Site is therefore assigned a more precautionary value of **Medium** importance in accordance with the criteria presented in **Table 9.2**.

White-tailed Eagle

9.89 An establishing white-tailed eagle territory was recorded over the course of baseline studies, to the south-west of the Site. A roost site was recorded in 2020 and a nest site was built by the pair in 2021 but no successful breeding attempt recorded. The roost and nest site recorded, are located >500m from any Proposed Development infrastructure. The Scottish population of white-tailed eagle remains in its expansion phase following reintroduction, with regional population estimates, particularly on the west coast increasing rapidly and the establishment of new territories not uncommon. For the purposes of assessment white-tailed eagle is assigned a value of **Medium** importance in accordance with the criteria presented in **Table 9.2** and professional judgment. Further details of the species evaluation is provided within the subsequent assessment section.

9.90 The most recently published NHZ 14 white-tailed eagle population is eight territorial pairs (Wilson et al., 2015⁶), based on 2013 Scottish Raptor Monitoring Scheme (SRMS) data, and which is considered outdated on account of recent population growth.

9.91 In 2020, a total of 123 occupied white-tailed eagle ranges in Scotland were reported to the SRMS (Challis et al., 2022²²), with 34 occupied ranges reported from Argyll (including the Argyll Islands and Mainland). The white-tailed eagle population in Argyll and throughout the wider west coast of Scotland is still (rapidly) expanding with high productivity rates, and a number of breeding sites are likely to be unknown.

9.92 Records of known white-tailed eagle territories within proximity to the Site were not identified in consultation with RSPB or the ARSG (see **Appendix 9.3**). A single establishing territory was however identified within 2km of the Site over the course of baseline

ornithology surveys in 2020 and 2021, but no successful breeding attempt was made (see **Appendix 9.3**). This information was shared with the ARSG.

9.93 This single territory represents c.3% of the most recently published Argyll population. The 2020 Argyll breeding population (34 occupied ranges), is however considered likely to be precautionary. It is unknown whether this identified pair is included in the most recently published estimate, or if they will continue to establish.

9.94 For the purposes of this assessment, it is however considered that the pair will continue to establish, with white-tailed eagle assigned a value of medium importance (sensitivity), in accordance with the criteria presented in **Table 9.2**.

Merlin

9.95 No evidence of breeding merlin was recorded within the survey area during field surveys over three consecutive breeding seasons (2019-2021). Three merlin territories were identified in proximity to the Site from information obtained in consultation with the ARSG, this included one territory within approximately 2km of the Site, but >500m from the Site and any Proposed Development infrastructure. This single territory represents 7% of the most recently published NHZ 14 breeding merlin population (13 pairs in 2008 as per Wilson et al., 2015⁶). The breeding merlin population within proximity to the Site is therefore assigned a value of **Medium** importance in accordance with the criteria presented in **Table 9.2**.

9.96 All construction works associated with the Proposed Development will occur beyond maximum disturbance/displacement buffers for identified breeding sites or roost sites of osprey (750m), golden eagle (1km), hen harrier (750m), white-tailed eagle (500m), and merlin (500m), as recommended in NatureScot guidance (2022¹³). However it is acknowledged that new breeding sites or roosting sites may be established prior to the commencement of construction works.

9.97 The Proposed Development will include for the implementation of standard good practice measures within a CEMP for the Proposed Development, including a Breeding and Roosting Bird Protection Plan (BRBPP), to enable the protection of breeding bird species including species listed on Schedule 1, 1A and A1 of the Wildlife and Countryside Act over the course of construction works, and where required during operational maintenance works for the Proposed Development.

9.98 Based on the information presented above, the potential for significant effects upon Annex 1/Schedule 1 breeding raptors as a result of disturbance from construction or operational maintenance works is therefore scoped out of further detailed assessment.

9.99 With the exception of potential effects upon golden eagle, and for which evidence of strong behavioural displacement from operational wind farms is evidenced (Fielding et al., 2019²³, 2021²⁴ and 2022²⁵), the potential for significant effects upon Annex 1/Schedule 1 breeding raptors as a result of displacement/habitat loss during the operational phase of the Proposed Development is also scoped out of further consideration. There is no or a very limited current evidence base to suggest foraging or nesting white-tailed eagle, osprey, hen harrier or merlin are significantly displaced from operational wind farm infrastructure. Should there be some level of localised displacement, this would be considered Negligible in the context of alternative and available habitats for these species at the regional NHZ 14 scale and therefore not significant.

9.100 Habitat management principles contained within the OHLRMP (see **Appendix 8.5**), will also seek to expand and maintain foraging habitats for the breeding raptors within the Site over the lifetime of the Proposed Development, away from operational infrastructure.

Breeding Black Grouse

9.101 Black grouse is listed on Annex 1 of NatureScot guidance (SNH, 2018a¹) and considered potential sensitive to onshore wind turbine developments.

9.102 Two black grouse leks were recorded within the survey area in 2019. No black grouse leks were recorded within the survey area during surveys in 2020, or within the survey area for the access track component of the Site in 2022. Lek sites recorded in 2019 were located outside the Site boundary and >750m from any proposed infrastructure (including the access track route).

²¹ Hayhow, D. B., Benn, S., Stevenson, A., Stirling-Aird, P. K. and Eaton, M. A. (2017) Status of Golden Eagle *Aquila chrysaetos* in Britain in 2015 (Bird Study, 64(3), p.281-294)

²² Challis, A., Wilson, M. W., Eaton, M. A., Stevenson, A., Stirling-Aird, P., Thornton, M. and Wilkinson, N. I. (2022) Scottish Raptor Monitoring Scheme Report 2020

²³ Fielding, A. H., Haworth, P. F., Anderson, D., Benn, S., Dennis, R., Weston, E. and Whitfield, D. P. (2019) A simple topographical model to predict Golden Eagle *Aquila chrysaetos* space use during dispersal (International Journal of Avian Science, 162(2), p.400-415)

²⁴ Fielding, A. H., Anderson, D., Benn, S., Dennis, R., Geary, M., Weston, E. and Whitfield, P. (2021) Non-territorial GPS-tagged golden eagles *Aquila chrysaetos* at two Scottish wind farms: Avoidance influenced by preferred habitat distribution, wind speed and blade motion status (PLoS ONE, 16(8): e0254159). Available at: <https://doi.org/10.1371/journal.pone.0254159>

²⁵ Fielding, A. H., Anderson, D., Benn, S., Dennis, R., Geary, M., Weston, E. and Whitfield, D. P. (2022) Responses of dispersing GPS-tagged Golden Eagles (*Aquila chrysaetos*) to multiple wind farms across Scotland (Ibis, 164(1), p.102-117)

9.103 No additional known lek sites obtained in consultation with RSPB were identified within the Site, or within 750m of any Proposed Development infrastructure (including the access track route).

9.104 Further details are provided in **Appendix 9.1** and **Appendix 9.3**, and **Figure 9.9**.

9.105 Published research suggests that wind farm construction has no detectable effects on the abundance of lekking black grouse at wind farm sites (Zwart et al., 2015²⁶), but that some evidence has been found to suggest that black grouse leks within 500m of planned turbine locations move locally after construction. The same research also clarifies that this does not equate to the complete displacement of black grouse from wind farm sites, with evidence from some sites identifying the use of areas by black grouse within 500m of operational turbine locations and occasional use of areas beneath turbines (Zwart et al., 2015²⁶).

9.106 Black grouse require a range of habitats throughout the year including heathland, woodland and grasslands, which are abundant within the Site and surrounding local area. The abundance of suitable lekking, foraging and nesting habitat are not considered a limitation for black grouse populations locally, and the Argyll black grouse population is historically localised and limited.

9.107 Notably the number and locations of black grouse lek sites recorded over the course of field surveys varied with two leks recorded in 2019 and none in 2020. The leks recorded in 2019, supported a small number of males (peak of five across two leks), but which is typical for Argyll, and are considered to comprise 'main lek sites' in this location, albeit they may not be used in some years. The peak lekking male population recorded (five males) represents c.7% of the most recently published NHZ 14 lekking population (67 males in 2005 as per Wilson et al., 2015⁶). The lekking male population recorded within proximity to the Site is therefore assigned a value of **Medium** importance in accordance with the criteria presented in **Table 9.2**.

9.108 The potential for significant construction or operational effects upon black grouse are scoped out of assessment due to the absence of lekking sites recorded within proximity to proposed infrastructure. Standard good practice measures to avoid the potential for disturbance to lekking black grouse, should in some years lek sites be present closer to construction work areas, are also included within the BRBPP and which will form part of the Proposed Developments CEMP.

Breeding Divers

9.109 Red-throated and black-throated divers are listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended), Annex 1 of the Birds Directive and Annex 1 of NatureScot guidance (SNH, 2018a¹) and therefore considered potential sensitive to onshore wind turbine developments.

9.110 Desk study sources and consultation with RSPB Scotland and NatureScot (see **Table 9.1**) identified that red-throated and black-throated diver breed sporadically at suitable waterbodies within proximity to the Site.

9.111 During baseline surveys in 2020, a single pair of breeding red-throated divers were recorded at a waterbody within the survey area, located to the south of the Site. In 2019, activity of red-throated diver was recorded within the survey area, but there was no evidence a pair made a successful nesting attempt. In 2019, a single black-throated diver was also recorded over-flying the Site, but there was no evidence a pair made any attempt to breed in the survey area.

9.112 Further details are provided in **Appendix 9.1** and **Appendix 9.3**, and **Figure 9.10**.

9.113 The single breeding pair recorded in 2020 represents c.1% of the most recently published NHZ 14 breeding red-throated diver population (83 breeding pairs, as per Wilson et al., 2015⁶). The breeding diver population recorded within proximity to the Site is therefore assigned a value of **Medium** importance in accordance with the criteria presented in **Table 9.2**.

9.114 The breeding lochan recorded in 2020 is located >1km from any Proposed Development infrastructure, and as such beyond the upper recommended disturbance buffers for the species during the breeding season in accordance with NatureScot guidance (2022¹³). The potential for significant constriction or operational disturbance/displacement effects upon red-throated diver are therefore not predicted to occur and are therefore scoped out of further detailed assessment.

9.115 Standard good practice measures to avoid the potential for disturbance to breeding red-throated diver as species listed on Schedule 1 of the Wildlife and Countryside Act Schedule 1981 (as amended), should in some years breeding lochans be identified closer to construction work or operational maintenance work areas, are also included within the BRBPP and which will form part of the Proposed Developments CEMP.

Summary of Ornithological Features and Effects Scoped Out

9.116 A summary of target species identified during baseline studies, together with their valuations based on the criteria presented in **Table 9.2** and the exercise of professional judgement is provided in **Table 9.8**.

9.117 The potential for significant effects upon those features with a value of low (local) importance (sensitivity) is not considered in detail within this assessment on the basis of good practice measures included as part of the Proposed Development. These features include species which whilst recorded as target species during baseline studies are or had:

- Considered widespread;
- Not established to be breeding locally;
- Present in breeding numbers of regional importance;
- Very low levels of flight activity; and/or
- Not considered sensitive to onshore wind farm developments in accordance with NatureScot guidance (SNH, 2018a¹).

9.118 Further details of baseline ornithological information are presented within **Appendix 9.1** and **9.3**, with further justification provided in **Table 9.2**.

Table 9.8: Summary of important ornithological features and effects scoped out

Importance/ Sensitivity	Feature	Summary and Justification
High (International/ National)	Glen Etive and Glen Fyne SPA breeding golden eagle population	Effects scoped out due to absence of connectivity of the golden eagle range which encompasses the Site and the SPA.
Medium (Regional)	Black grouse	Included as a target species for survey and recording in accordance with NatureScot guidance (SNH, 2017). Listed on Annex 1 of NatureScot guidance (SNH, 2018a ¹) and potentially sensitive to onshore wind turbine developments. No lek sites identified or recorded within 750m of Proposed Development infrastructure, with number of lekking males recorded representing c.7% of the most recently published regional NHZ 14 population (Wilson et al., 2015 ⁶). No flight activity recorded, and species typically flying below collision risk height of modern turbine specifications. Potential for significant effects scoped out in absence of likely of potential for loss or disturbance to males at identified lek sites and good practice measures to be included within the Proposed Development's CEMP to protect breeding birds.
	Red-throated diver	Listed on Annex 1 of the Birds Directive and Schedule 1 of the Wildlife and Countryside Act 1981 (as amended). Included as a target species for survey and recording in accordance with NatureScot guidance (SNH, 2017 ³). Listed on Annex 1 of NatureScot guidance (SNH, 2018a ¹) and potentially sensitive to onshore wind turbine developments. Single pair recorded in proximity to the Site represents c.1% of the most recently published regional NHZ 14 breeding red-throated diver population (Wilson et al., 2015 ⁶). No breeding lochans recorded within 1km of Proposed Development infrastructure and Negligible collision mortality risks.

²⁶ Zwart, M. C., Robson, P., Rankin, S., Whittingham, M. J. and McGowan, P. J. K. (2015) Using Environmental Impact Assessment and Post-construction Monitoring Data to Inform Wind Energy Developments (Ecosphere, 6(2), p.26)

Importance/ Sensitivity	Feature	Summary and Justification
		Potential for significant effects scoped out in absence of likely of potential for loss or disturbance to breeding pairs or collisions, with good practice measures to be included within the Proposed Development's CEMP to protect breeding birds.
	Osprey	<p>Listed on Annex 1 of the Birds Directive and Schedule 1 of the Wildlife and Countryside Act 1981 (as amended).</p> <p>Included as a target species for survey and recording in accordance with NatureScot guidance (SNH, 2017³).</p> <p>Listed on Annex 1 of NatureScot guidance (SNH, 2018a¹) and potentially sensitive to onshore wind turbine developments.</p> <p>Two breeding territories recorded in proximity to the Site represents 12.5% of the most recently published regional NHZ 14 breeding osprey population (Wilson et al., 2015⁶).</p> <p>No breeding sites recorded within 250m of Proposed Development infrastructure. Very low levels of flight activity recorded, with Negligible collision risks reasonably concluded.</p> <p>Potential for significant effects scoped out in absence of likely of potential for loss or disturbance to breeding pairs or collisions, with good practice measures to be included within the Proposed Development's CEMP to protect all breeding birds.</p>
	Golden eagle	<p>Listed on Annex 1 of the Birds Directive and Schedule 1 of the Wildlife and Countryside Act 1981 (as amended).</p> <p>Included as a target species for survey and recording in accordance with NatureScot guidance (SNH, 2017³).</p> <p>Listed on Annex 1 of NatureScot guidance (SNH, 2018a¹) and potentially sensitive to onshore wind turbine developments.</p> <p>Breeding range which encompasses the Site represents 2% of the likely Argyll and Bute breeding population, but no breeding sites recorded within 1km of any Proposed Development infrastructure.</p> <p>Potential for significant construction phase and operational maintenance phase disturbance effects scoped out, with good practice measures to be included within the Proposed Development's CEMP to protect all breeding birds.</p> <p>In the absence of additional mitigation, the potential for significant operational displacement effects and collision mortality risks is scoped-into further detailed assessment.</p>
	Hen harrier	<p>Listed on Annex 1 of the Birds Directive and Schedule 1 of the Wildlife and Countryside Act 1981 (as amended).</p> <p>Included as a target species for survey and recording in accordance with NatureScot guidance (SNH, 2017³).</p> <p>Listed on Annex 1 of NatureScot guidance (SNH, 2018a¹) and potentially sensitive to onshore wind turbine developments.</p> <p>No breeding sites recorded within 2km of the Site, but foraging range of a single territory within the wider area representing <1% of the most recently published regional NHZ 14 population (Wilson et al., 2015⁶), known to overlap with the Site. Species has undergone significant recent population decline, so precautionary value assigned.</p> <p>Potential for significant construction phase and operational maintenance phase disturbance effects scoped out, with good practice measures to be included within the Proposed Development's CEMP to protect all breeding birds. Species considered to be of low sensitivity to collision mortality, with significant effects as a result of the Proposed Development alone or cumulatively with other development highly unlikely and scoped out of further assessment.</p>

Importance/ Sensitivity	Feature	Summary and Justification
	White-tailed eagle	<p>Listed on Annex 1 of the Birds Directive and Schedule 1 of the Wildlife and Countryside Act 1981 (as amended).</p> <p>Included as a target species for survey and recording in accordance with NatureScot guidance (SNH, 2017³).</p> <p>Listed on Annex 1 of NatureScot guidance (SNH, 2018a¹) and potentially sensitive to onshore wind turbine developments.</p> <p>Roost and nest sites associated with a single locally establishing pair recorded >500m from Proposed Development infrastructure. Potential for significant construction phase and operational maintenance phase disturbance effects scoped out, with good practice measures to be included within the Proposed Development's CEMP to protect all breeding birds.</p> <p>No current evidence to suggest the species is displaced by onshore wind turbines, with potential for significant operational habitat loss effects therefore scoped out of further assessment.</p> <p>In the absence of mitigation, the potential for significant collision mortality risks effects is scoped-into further detailed assessment.</p>
	Merlin	<p>Listed on Annex 1 of the Birds Directive and Schedule 1 of the Wildlife and Countryside Act 1981 (as amended).</p> <p>Included as a target species for survey and recording in accordance with NatureScot guidance (SNH, 2017³).</p> <p>Listed on Annex 1 of NatureScot guidance (SNH, 2018a¹) and potentially sensitive to onshore wind turbine developments.</p> <p>No breeding sites recorded within the survey area, but three territories known to be present within the wider area, representing 7% of the most recently published regional NHZ 14 population (Wilson et al., 2015⁶).</p> <p>Potential for significant construction phase and operational maintenance phase disturbance effects scoped out, with good practice measures to be included within the Proposed Development's CEMP to protect all breeding birds. Very low levels of flight activity recorded, with Negligible collision risks reasonably concluded and scoped out of further detailed assessment.</p>
Low (Local)	Greylag goose	<p>Listed on Annex 1 of NatureScot guidance (SNH, 2018a¹) and potentially sensitive to onshore wind turbine developments.</p> <p>Included as a target species for survey and recording in accordance with NatureScot guidance (SNH, 2017³).</p> <p>Site not located within 20km of any designated site for migratory populations of the species and habitats within the Site unsuitable for foraging wintering flocks.</p> <p>Potential for significant construction phase and operational maintenance phase disturbance effects scoped out. Very low levels of flight activity recorded, with Negligible collision risks reasonably concluded and scoped out of further detailed assessment.</p>
	Whooper swan	<p>Listed on Annex 1 of the Birds Directive.</p> <p>Listed on Annex 1 of NatureScot guidance (SNH, 2018a¹) and potentially sensitive to onshore wind turbine developments.</p> <p>Included as a target species for survey and recording in accordance with NatureScot guidance (SNH, 2017³).</p> <p>Site not located within 20km of any designated site for migratory populations of the species and habitats within the Site unsuitable for foraging wintering flocks.</p>

Importance/ Sensitivity	Feature	Summary and Justification
		Potential for significant construction phase and operational maintenance phase disturbance effects scoped out. Very low levels of flight activity recorded, with Negligible collision risks reasonably concluded and scoped out of further detailed assessment.
	Goosander	Listed on Annex 1 of NatureScot guidance (SNH, 2018a ¹) and potentially sensitive to onshore wind turbine developments. Included as a target species for survey and recording in accordance with NatureScot guidance (SNH, 2017 ³). Not recorded to breed within proximity to the Site. Potential for significant construction phase and operational maintenance phase disturbance effects scoped out. Very low levels of flight activity recorded, with Negligible collision risks reasonably concluded and scoped out of further detailed assessment.
	Lapwing	Listed on Annex 1 of NatureScot guidance (SNH, 2018a ¹) and potentially sensitive to onshore wind turbine developments. Included as a target species for survey and recording in accordance with NatureScot guidance (SNH, 2017 ³). Recorded to breed in very small numbers within the Site. Potential for significant construction phase and operational maintenance phase disturbance effects scoped out, with good practice measures to be included within the Proposed Development's CEMP to protect all breeding birds. Very low levels of flight activity recorded, with Negligible collision risks reasonably concluded and scoped out of further detailed assessment.
	Golden plover	Listed on Annex 1 of the Birds Directive. Listed on Annex 1 of NatureScot guidance (SNH, 2018a ¹) and potentially sensitive to onshore wind turbine developments. Included as a target species for survey and recording in accordance with NatureScot guidance (SNH, 2017 ³). Recorded to breed in very small numbers within the Site, <1 most recently published NHZ 14 population (Wilson et al., 2015 ⁶). Potential for significant construction phase and operational maintenance phase disturbance effects scoped out, with good practice measures to be included within the Proposed Development's CEMP to protect all breeding birds. Very low levels of flight activity recorded, with Negligible collision risks reasonably concluded and scoped out of further detailed assessment.
	Curlew	Listed on Annex 1 of NatureScot guidance (SNH, 2018a ¹) and potentially sensitive to onshore wind turbine developments. Included as a target species for survey and recording in accordance with NatureScot guidance (SNH, 2017 ³). Recorded to breed in very small numbers within the Site, <1 most recently published NHZ 14 population (Wilson et al., 2015 ⁶). Potential for significant construction phase and operational maintenance phase disturbance effects scoped out, with good practice measures to be included within the Proposed Development's CEMP to protect all breeding birds. Very low levels of flight activity recorded, with Negligible collision risks reasonably concluded and scoped out of further detailed assessment.
	Dunlin	Listed on Annex 1 of NatureScot guidance (SNH, 2018a ¹) and potentially sensitive to onshore wind turbine developments. Included as a target species for survey and recording in accordance with NatureScot guidance (SNH, 2017 ³). Recorded to breed in very small numbers within the Site, <1 most recently published NHZ 14 population (Wilson et al., 2015 ⁶). Potential for significant construction phase and operational maintenance phase disturbance effects scoped out, with good practice

Importance/ Sensitivity	Feature	Summary and Justification
		measures to be included within the Proposed Development's CEMP to protect all breeding birds. Very low levels of flight activity recorded, with Negligible collision risks reasonably concluded and scoped out of further detailed assessment.
	Greenshank	Listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended). Included as a target species for survey and recording in accordance with NatureScot guidance (SNH, 2017 ³). Listed on Annex 1 of NatureScot guidance (SNH, 2018a ¹) and potentially sensitive to onshore wind turbine developments. Not recorded to breed within the Site. Potential for significant construction phase and operational maintenance phase disturbance effects scoped out, with good practice measures to be included within the Proposed Development's CEMP to protect all breeding birds. Very low levels of flight activity recorded, with Negligible collision risks reasonably concluded and scoped out of further detailed assessment.
	Black-throated diver	Listed on Annex 1 of the Birds Directive and Schedule 1 of the Wildlife and Countryside Act 1981 (as amended). Included as a target species for survey and recording in accordance with NatureScot guidance (SNH, 2017 ³). Listed on Annex 1 of NatureScot guidance (SNH, 2018a ¹) and potentially sensitive to onshore wind turbine developments. Note recorded to breed within the survey area, and considered a sporadic breeder locally. Very low levels of flight activity recorded. Potential for significant effects scoped out in absence of likely of potential for loss or disturbance to breeding pairs or collisions, with good practice measures to be included within the Proposed Development's CEMP to protect breeding birds.
	Red kite	Listed on Annex 1 of the Birds Directive and Schedule 1 of the Wildlife and Countryside Act 1981 (as amended). Included as a target species for survey and recording in accordance with NatureScot guidance (SNH, 2017 ³). Listed on Annex 1 of NatureScot guidance (SNH, 2018a ¹) and potentially sensitive to onshore wind turbine developments. No breeding sites identified within 2km of the Site. Potential for construction phase and operational maintenance phase disturbance effects scoped out, with good practice measures to be included within the Proposed Development's CEMP to protect all breeding birds. Very low levels of flight activity recorded, with Negligible collision risks reasonably concluded and scoped out of further detailed assessment.
	Peregrine	Listed on Annex 1 of the Birds Directive and Schedule 1 of the Wildlife and Countryside Act 1981 (as amended). Included as a target species for survey and recording in accordance with NatureScot guidance (SNH, 2017 ³). Listed on Annex 1 of NatureScot guidance (SNH, 2018a ¹) and potentially sensitive to onshore wind turbine developments. No breeding sites identified within 2km of the Site. Potential for construction phase and operational maintenance phase disturbance effects scoped out, with good practice measures to be included within the Proposed Development's CEMP to protect all breeding birds.

Importance/ Sensitivity	Feature	Summary and Justification
		Very low levels of flight activity recorded, with Negligible collision risks reasonably concluded and scoped out of further detailed assessment.
	All other commoner raptors, gulls, herons, all passerines and additional species forming part of the moorland breeding bird assemblage within the Site.	Included as a target species for survey and recording in accordance with NatureScot guidance (SNH, 2017 ³) and/or incidentally recorded during surveys or desk study records for local area identified. Species considered to be of low sensitivity to onshore wind farm development. Potential for significant effects scoped out in absence of likely of potential for loss or disturbance to breeding pairs or collisions, with good practice measures to be included within the Proposed Development's CEMP to protect breeding birds.

Implications of Climate Change

9.119 The UKCP18 climate change projections show a general trend towards warmer, wetter winters and hotter, drier summers. These factors are likely to result in an extended breeding bird season with earlier in the year (and likely more) nesting attempts (which has potential to increase breeding productivity, although this will be dependent on prey availability), but contrary to this the increased rainfall is likely to result in higher rates of fledgling mortality.

9.120 The opposing potential effects of climatic change on ornithology receptors makes predicting future likely outcomes difficult. There is no reason to consider that the breeding bird assemblage using the Site will change substantially over the lifespan of the Proposed Development due to climate change. However, breeding productivity for some species, given the predicted substantially higher rates of average precipitation across the lifespan of the Proposed Development (according to the UKCP18 climate change projections) may reduce, and this may have notable effects for ground-nesting species recorded, such as breeding waders.

9.121 Potential effects on ornithology receptors detailed in this chapter are not predicted to substantively change in relation to climate change over the lifespan of the Proposed Development.

Future Baseline in the Absence of the Proposed Development

9.122 In the absence of the Proposed Development, or assuming a gap between baseline surveys and the commencement of the construction, changes in baseline ornithology conditions (i.e. distributions and populations) are unlikely, given the current land use of the Site and surrounding area. Sheep grazing is anticipated to continue within the Site and commercial forestry activity is anticipated to continue in the surrounding area with forested areas harvested and clear-fell areas created on rotation in accordance with current forest plans.

9.123 Local levels of breeding raptor activity on and within proximity to the Site would be expected to continue at comparable levels with those recorded during field surveys and highlighted by desk study records. Numbers of lekking black grouse, the number and distribution of lek sites would reasonably be anticipated to be maintained at the low number which is characteristic of Argyll.

9.124 It is anticipated that red-throated divers will continue to breed and/or attempt to breed at suitable waterbodies within proximity to the Site.

9.125 Numbers of breeding wader territories may reasonably fluctuate within the Site in response to any localised changes in habitat suitability (e.g. from sheep grazing), but would reasonably be expected to be similar over time.

Design Considerations

9.126 With regards to ornithological interests, scheme design constraints have considered the avoidance or minimisation of potential effects upon black grouse, golden eagle and red-throated diver.

Black Grouse

9.127 Over the course of surveys a 500-750m infrastructure buffer around identified black grouse lek sites was incorporated into design constraint planning to avoid construction and operational disturbance/displacement effects upon potentially regionally

important numbers of black grouse. No identified lek sites are subsequently located within 750m of any Proposed Development infrastructure.

Golden Eagle

9.128 The layout of the Proposed Development has been optimised to avoid areas of 'good' golden eagle habitat, informed through the use of the GET model and satellite telemetry data from tagged range holding birds.

9.129 In the latter stage of scheme design, the layout was reduced from a 17-turbine layout, to the final 13-turbine layout, specifically to avoid the potential for significant operational habitat loss (displacement) effects to golden eagle range G/LAE1B which encompasses the Site, as determined through analysis of satellite tagging data. Further details are provided in **Chapter 3: Site Selection and Design Strategy**.

9.130 Full details of the GET model are presented within **Appendix 9.4**.

Red-throated Diver

9.131 A 500m infrastructure buffer around waterbodies was incorporated into design constraint planning and was maintained in so far as possible, whilst baseline studies were ongoing to determine the distribution of breeding red-throated divers in proximity to the Site.

9.132 Following the completion of baseline studies and final scheme design, no turbines are subsequently located within 1km of any red-throated diver breeding lochan identified over the course of baseline studies.

Micrositing

9.133 The requirement for micrositing of any infrastructure, within the 50m applied for limit, would be determined on the basis of pre-construction site investigations.

9.134 The potential for micrositing of any infrastructure to result in a change in the significance of effects upon any ornithological features scoped out of or scoped-into detailed assessment is considered very low. Baseline studies identify the Site supports a limited breeding bird assemblage, with breeding, lekking and roosting sites of species considered potentially sensitive to disturbance including species listed on Schedule 1 of the Wildlife and Countryside Act 1981, and black grouse, identified during baseline studies located sufficiently distant from the Proposed Development, including a buffer for micrositing, to preclude a change in the potential for significant disturbance effects.

9.135 Good practice measures including a BBPP and which will form part of the Proposed Developments CEMP, will also ensure that any change in baseline conditions and therefore the potential for the breeding, lekking and roosting sites of sensitive species to be established closer to the Proposed Development are identified and appropriate measures implemented to avoid the risk of disturbance and enable legislative compliance.

9.136 The identification of "at collision risk" flight activity for the purposes of collision mortality risk estimates has also adopted a precautionary approach, through the identification of such activity within 200m of proposed turbine locations, relative to the 77.5m blade length of the candidate turbine specification i.e. 122.5m beyond the rotor sweep. The potential for collision mortality risks have therefore inherently considered the requirement for a micrositing allowance.

9.137 The potential for change in the significance of operational displacement effects to golden eagle (subsequently assessed in detail) as a result of the micrositing allowance applied for is also considered inconsequential. The accuracy of satellite telemetry and GET model pixels, are unlikely to be of sufficient resolution to detect any substantial measurable change in the number of satellite fixes or 'good' golden eagle habitats within 300m of turbine locations, relative to figures presented for the Proposed Development.

Good Practice Measures

Construction Environmental Management Plan (CEMP)

9.138 A Construction Environmental Management Plan (CEMP) will be prepared for the Proposed Development in consultation with ABC, NatureScot, Argyll and other relevant stakeholders, on the basis of the Outline CEMP presented as **Appendix 4.3**.

9.139 The Outline CEMP includes for standard measures to ensure the Proposed Development is constructed in accordance with industry good practice. With specific reference to the protection of ornithological interests during the construction and operation of the Proposed Development, the CEMP will include for a Breeding and Roosting Bird Protection Plan (BRBPP).

9.140 All wild birds in the UK are protected under the provisions 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. In addition, 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 are using or near a nest containing eggs or young; or to disturb their dependent young.

9.141 Species listed on Schedule A1 of the Act receive further protection for their habitually used nest sites, with species listed on Schedule 1A of the Act protected from harassment at any time of year.

9.142 Prior to the commencement of construction activities, a BRBPP will be prepared and submitted for agreement in consultation with ABC and NatureScot and which once finalised will form part of the CEMP.

9.143 The BRBPP will include details of pre-commencement survey methods and protocols, including consultation with relevant consultees, to enable the prevention and/or minimisation of disturbance to breeding and roosting Schedule 1A birds and will be overseen by a suitable competent ECoW.

9.144 The BRBPP will detail those measures required on account of findings from the pre-commencement breeding bird survey, to ensure the protection of breeding and Schedule 1A roosting birds over the course of construction works, and where required during operational maintenance works, in accordance with NatureScot guidance (2022b¹³) or best available species guidance applicable at the time, as agreed in consultation with ABC and NatureScot.

9.145 The BRBPP will also include details of pre-commencement survey methods and protocols, to enable the prevention and/or minimisation of disturbance to lekking black grouse. This will include for the restriction on construction works, including the movement of vehicles along access track routes, within 750m of any identified lek sites prior to 9am in the months of April and May.

Site Clearance Activities

9.146 Habitat clearance activities, where these coincide with the breeding bird season (1st March to 31st August, inclusive) will be subject to a pre-clearance survey by a competent ornithologist to identify any active wild bird nests. Should any active nests be found, works will only proceed under the advice of the appointed ornithologist and following a disturbance risk assessment. This will include all works within the Site (i.e. both the Site and along the Site access route).

9.147 Work exclusion buffers around identified nest sites will be implemented where necessary in accordance with the BRBPP.

Restoration and Enhancement Plan

9.148 The Proposed Development will also include for a Restoration and Enhancement Plan. An Outline Restoration and Enhancement Plan (OREP) is presented as **Appendix 8.5** of the EIA Report and will be finalised in consultation with ABC, NatureScot and other stakeholders.

9.149 The OREP includes for peat restoration, tree planting, grazing management and species specific habitat management measures. Such measures, once finalised, will serve to enhance habitats within the Site, away from Proposed Development infrastructure for moorland breeding birds, black grouse and foraging and nesting raptors. Such measures are considered to sufficiently offset direct habitat losses as a result of the Proposed Development and enhance the quality, functioning and connectivity of moorland habitats for breeding birds over its operational lifetime.

9.150 Further details are provided in **Appendix 8.5**.

Assessment of Effects

9.151 This section assesses in further detail the potential for significant effects upon golden eagle and white-tailed eagle in relation to the operation of the Proposed Development and as a result of:

- Disturbance/displacement – golden eagle only; and
- Collision mortality risk – golden eagle and white tailed eagle.

Golden Eagle

Disturbance/Displacement (Operation)

9.152 Previous studies have extensively evidenced the displacement of golden eagles from operational wind farms in Scotland. 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 500m of operational turbines (Haworth Conservation, 2015²⁷). 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 farm 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., 2005²⁸).

9.153 More recent analyses in Fielding et al. (2021²⁴ and 2022²⁵), including comprehensive research from analysed movements of 59 Scottish GPS tagged golden eagles, demonstrates that there remains clear evidence that golden eagles are displaced from suitable habitat by operational wind farm developments, but suggests that 500m is too conservative to quantify potential habitat losses and that displacement distances are not the same for all turbines. Turbine diameter has also not been demonstrated as a prediction of how close satellite tracked birds approach operational turbines (Fielding et al., 2022²⁵).

9.154 On the basis of best and currently available evidence at Scottish wind farm developments, a fixed (precautionary) displacement distance of 300m around proposed turbine locations has been adopted for the purposes of assessing potential operational displacement effects upon both range holding and dispersing golden eagles as a result of the Proposed Development. This is considered to be a conservative approach, as actual displacement may be less for some turbines, particularly those in or surrounded by good eagle habitat.

9.155 The GET model has subsequently been used to quantify losses of available 'good' golden eagle habitat within the G/LAE1b range as a result of the Proposed Development, defined as Open GET 6+ habitat i.e. that with GET model score of ≥ 6 and which is not assumed lost to forestry and/or other wind farm developments. This has been supplemented through the use of satellite telemetry for the tagged female bird associated with the G/LAE1b and which provides extensive, actual empirical data on use of habitats by the pair within the range. Full details of the assessment undertaken for a preliminary 17 turbine layout, and subsequent 13 turbine layout for the Proposed Development are presented in confidential **Appendix 9.4**.

9.156 Adopting a 300m fixed displacement distance around the proposed 13 turbine locations, this captures approximately 5.2% of satellite tag records obtained for the tagged female bird associated with the G/LAE1b range, and estimated a 7.0% loss of Open GET 6+ habitat from within the G/LAE1b range. It should be noted that the layout was amended from a 17 turbine layout to remove turbines identified during preliminary analysis (in **Appendix 9.4**) and which were considered to have the potential to block significant golden eagle movement patterns around the Proposed Development. Subsequently, avoidance of high-usage areas of the Site was a primary design constraint.

9.157 For the purposes of this assessment the percentage of satellite tag records (5.2%) is adopted as a proxy for the percentage estimate of current range loss for G/LAE1B, following construction of the Proposed Development, as the tag records indicate that some of the GET 6+ habitat within the 300m displacement buffer, is not/or very seldom used by the golden eagles occupying the range.

9.158 A 5.2% range loss would represent an effect of **Medium** magnitude, on an ornithological feature of **Medium** importance, and which would be of **Minor** significance and which is **Not Significant** in the context of the EIA Regulations.

9.159 The range loss would not be expected to result in the abandonment of the G/LAE1B range, and the estimate is considered precautionary, as eagles may not be displaced from all turbines equally, and collisions with operational wind turbines for the species are known to occur. As such, the Proposed Development will not result in an adverse impact upon the current favourable conservation status of the NHZ 14 breeding population.

9.160 As young dispersing golden eagles typically stay outside occupied breeding ranges and disperse over vast areas of Scotland, operational habitat losses to dispersing golden eagles would be very small, if occurring at all. For context and adopting a conservative dispersing range of 10km around the Proposed Development, would result in a <2.4% loss of available Open GET 6+ habitat for dispersing juvenile birds. This would represent an effect of **Low** magnitude, on an ornithological feature of **Medium** importance, and

²⁷ Haworth Conservation (2015) Edinbane Windfarm: Ornithological Monitoring 2007-2014: A review of the spatial use of the area by birds of prey

²⁸ Walker, D., McGrady, M., McCluskie, A., Madders, M. and McLeod, D. R. A. (2005) Resident Golden Eagle ranging behaviour before and after construction of a windfarm in Argyll (Scottish Birds, 25, p.24-40)

which would be of **Minor** significance and which is **Not significant** in the context of the EIA Regulations. The percentage loss is considered a substantial overestimate on account of the currently occupied G/LAE1B range, and with the 2.4% loss figure based on a 17 turbine layout²⁹ (see **Appendix 9.4**).

9.161 The Proposed Development will include for grazing management within the Site as detailed in the OREP (**Appendix 8.5**). The measures in the OREP will be finalised in consultation with ABC, NatureScot and other relevant stakeholders. This will include for a grazing management strategy within the site, aimed at the improvement of moorland habitat quality as a result overgrazing by sheep and deer, and which is recognised as the main constraint impacting on golden eagles in NHZ 14 (Whitfield et al., 2008²⁰). The grazing management strategy will seek to improve and monitor habitat quality, and prey availability for golden eagles, in areas away from operational infrastructure, over the lifetime of the Proposed Development.

9.162 Operational disturbance/displacement effects on golden eagles, whilst permanent, in summary, are therefore considered to be of no more than a **Low-Medium** magnitude on a receptor of **Medium** importance species, resulting in an effect that is of **Minor** significance which is **Not Significant** in the context of the EIA Regulations.

Collision Mortality Risk (Operation)

9.163 Evidence from current research identifies the main impact of wind farms in Scotland to golden eagles as habitat loss through operational disturbance/displacement, with the probability of collision mortality considered to be very low, although not precluded. It is understood that there have been five reported golden eagle fatalities at operational wind farms in Scotland between 2018 and 2021³⁰.

9.164 Annual collision mortality risks for golden eagle using the NatureScot CRM and flight activity data for the period February 2019 to August 2021 have been estimated as 0.026-0.063. Full details are provided in **Appendix 9.2**.

9.165 Annual collision mortality risks of up to 0.063 birds, represents 0.06% of the most recently published Argyll and Bute breeding population (51 pairs, 102 breeding birds; Challis et al., 2022²²). The low levels of collision risk mortality are considered to be on account of scheme design to avoid areas of 'good' golden eagle habitat, known to be used by birds associated with the G/LAE1B range.

9.166 On the basis of evidence for the displacement of golden eagles from onshore wind farms collision mortality risks to golden eagle from the Proposed Development are considered very unlikely and of no more than of **Negligible** magnitude on an ornithological feature of **Medium** importance, giving an effect of **Negligible** significance which is **Not Significant** in the context of the EIA Regulations.

White-tailed Eagle

Collision Mortality Risk (Operation)

9.167 Annual collision mortality risks for white-tailed eagle using the NatureScot CRM and flight activity data for the period February 2019 to August 2021 have been estimated as 1.140-1.228 birds, and which represents c.1.8% of the most recently published Argyll breeding population, assuming all collision would be of adult breeding birds. This is considered a precautionary assessment, in the absence of the known number of non-breeding, non-territorial dispersing birds, which are also likely to form part of the Argyll (and NHZ 14) population.

9.168 Collision mortality risks to white-tailed eagle from the Proposed Development are therefore assessed as being of no more than of **Low** magnitude on an ornithological feature of **Medium** importance, giving an effect of **Minor** significance which is **Not Significant** in the context of the EIA Regulations.

9.169 White-tailed eagles are known to be susceptible to collision mortality risks from operational wind farms, as recognised by the relatively low avoidance rate recommended for use in the NatureScot CRM (95% in SNH, 2018c¹⁰). It is understood there have been seven reported white-tailed eagle fatalities at operational wind farms in Scotland between 2018 and 2021 however, this does not appear to have curtailed regional or national population growths reported in recent monitoring reports (Challis et al., 2022²²).

9.170 Additional mitigation is therefore proposed to reduce potential collision mortality risks to white-tailed eagle.

Additional Mitigation

9.171 No potentially significant effects upon any ornithological feature as a result of the Proposed Development are predicted.

9.172 Additional mitigation is however, proposed to reduce the potential for collision mortality risks to white-tailed eagle.

9.173 The OREP (**Appendix 8.5**) includes for a sensitive grazing regime and which will reduce the presence of livestock and deer. This will have the effect of reducing the incidence of carrion prey for white-tailed eagle and therefore foraging opportunities within the Site, close to operational turbines.

9.174 An Operational Carcass Monitoring and Recovery Strategy (OCMRS) will also be agreed and implemented for the Proposed Development in consultation with ABC and NatureScot by way of planning condition.

9.175 The OCMRS would include protocols and the frequency for the search and removal of livestock and deer carcasses from within proximity to operational turbine locations. The OCMRS will be agreed prior to the commissioning of the Proposed Development, and its requirement reviewed periodically on the basis of the presence and proximity of occupied white-tailed eagle breeding ranges and the conservation status of the regional NHZ 14 population.

Residual Effects

7.1.1 On the basis of additional mitigation measures proposed, residual effects upon ornithological features are concluded as **Not Significant** as a result of the construction and operation of the Proposed Development.

7.1.2 The OREP (**Appendix 8.5**), once finalised will provide peatland restoration measures over an extensive continuous area, and which will provide enhanced opportunities for breeding moorland birds and foraging raptors.

7.1.3 Restoration will seek to improve nesting habitats for ground-nesting moorland waders, hen harrier and black grouse away from operational infrastructure and positively effect foraging opportunities for such, including local live prey resources for golden eagle and white-tailed eagle.

7.1.4 Such measures are considered to sufficiently offset direct habitat losses as a result of the Proposed Development and enhance the quality, functioning and connectivity of moorland habitats for breeding birds over its operational lifetime.

In-Combination Effects with the Blade Transfer Area

9.176 The potential for significant in-combination effects with the blade transfer area upon any ornithological feature is not considered likely to occur. Potential effects would be restricted to potential disturbance/displacement effects during the construction phase and which would be localised and temporary. Works and activities would be subject to measures contained within a CEMP for proposed works and which would include for a BRBPP in line with that to be implemented for the Proposed Development to protect breeding bird species over the duration of construction works.

Cumulative Effects

9.177 This section considers the potential for significant effects upon golden eagle and white-tailed eagle in-combination with other wind farm developments at the Regional NHZ 14 scale, in accordance with NatureScot guidance (2018b²).

9.178 Potentially effects on all other ornithological features as a result of the Proposed Development have been scoped out of detailed assessment, with no potential to contribute to potentially significant cumulative effects in-combination with other wind farm developments in NHZ 14.

Cumulative Effects During Operation

Disturbance/Displacement (Golden Eagle)

9.179 Cumulative operational disturbance/displacement effects to golden eagle are inherently considered in the quantification of the loss of 'Open' GET 6+ habitat for both range holding and young dispersing birds i.e. that already lost to existing wind farms or forestry (see **Appendix 9.4**).

²⁹ During scheme design the potential for significant effects upon dispersing golden eagles was assessed in **Appendix 9.4** on the basis of a 17 turbine layout, as such for a Proposed Development (13 turbine layout), the percentage loss of habitats would be <2.4%.

³⁰ NatureScot response to information request (July 2022), in relation to the Glendye Wind Farm Public Local Inquiry (PLI).

9.180 The use of the percentage of satellite tag records as a proxy of range loss also considers the potential for cumulative effects to the G/LAE1B range, on the assumption that range use has adapted to avoid existing wind farms and forestry and which is evident from the satellite tag data i.e. avoidance of the operational An Suidhe Wind Farm and afforested areas by birds within the range boundary (see **Appendix 9.4**).

9.181 The potential for further turbines within the range boundary calculated for G/LAE1B are identified from the consented Blarghour Wind Farm, of which a small number of the developments consented 17-turbines intrude into the very northern extent of the G/LAE1B boundary, together with a small number of proposed turbines for the Eredine Wind Farm intruding to the southern extent of the range boundary (see **Appendix 9.4**).

9.182 The consented Blarghour Wind Farm is also now subject to a S36C variation (ECU Reference: ECU00004754) for a reduced turbine layout and larger tip heights (removal of three north-western turbines) and increase in tip height of remaining 14 turbines to 180m). Whilst, the ornithological assessment is restricted from the public domain, the turbines which have been removed from the consented scheme are not located within the G/LAE1B range boundary (on the basis of information analysed for the purposes of this assessment and presented in **Appendix 9.4**). As such, the cumulative turbine layout within the G/LAE1B boundary can be assumed unchanged. The location of the consented Blarghour Wind Farm turbines and those remaining as part of the S36C variation application, are also located within the very northern limits of the G/LAE1B range, and which had a relatively low incidence of tagging records at the interface of the two territories.

9.183 The consideration of the Eredine scheme is not provided, as it is as yet unknown whether this proposal will progress to a formal planning application. At which stage the proposal will include an appraisal of the potential for significant effects on the G/LAE1B range in-combination with the Proposed Development.

9.184 The consented Blarghour Wind Farm scheme included for mitigation to offset the potential for operational habitat losses to golden eagle, through habitat creation from woodland clearance. Detailed information regarding the consented Blarghour mitigation proposals and any associated with the revised application, are not publicly available, however, it would be expected that such proposals would be tailored to offset potential effects to the golden eagle ranges affected, including the G/LAE1 and G/LAE1B ranges. Providing mitigation proposals included as part of the consented scheme remain committed to within the S36C, the absence of potentially significant cumulative effects can reasonably be concluded.

9.185 On the basis of mitigation proposed for the consented Blarghour Wind Farm and habitats within proximity to the Blarghour turbines of relatively lower importance for the G/LAE1B range, potential cumulative operational disturbance/displacement effects to golden eagle therefore remain of **Low adverse** magnitude on a **Medium** importance species, resulting in an effect that is of **Minor** significance which is **Not Significant** in the context of the EIA Regulations.

Collision Mortality Risks

9.186 On the basis of the species evidenced avoidance of operational wind farms, the rarity of reported collisions and the very low levels of collision mortality risk estimated for the Proposed Development, the potential for the Proposed Development to contribute to significant cumulative collision mortality risks to golden eagle is considered highly unlikely and is not considered in further detail within this assessment.

9.187 In accordance with NatureScot guidance (2018b²), cumulative collision risks for white-tailed eagle predicted for wind farm developments located within NHZ 14 which are either operational, under-construction, consented or at the planning application stage are summarised in **Table 9.9**. Cumulative risks from developments which are at Scoping stage and/or have been refused and for which no appeal proceedings have been formally submitted, are not included given the lack of available data or as it is reasonably unknown whether these developments will proceed further.

9.188 Figures presented for other wind farm developments have not been checked or amended to reflect avoidance rates used within the assessment (where relevant). Where it is stated N/A i.e. "Not Assessed", the wind farm development was not supported by an assessment of collision mortality risks to white-tailed using the NatureScot CRM and as such, no (or negligible) collision mortality risks have been assumed.

9.189 The cumulative annual collision mortality risk to white-tailed eagle within NHZ 14, using available information from all wind farms considered, is estimated as 1.547 birds and which represents c.2% of the most recently available Argyll breeding population (assuming 34 pairs, 68 breeding adults). As previously detailed, the most recently published Argyll breeding population does not include the unknown number of non-breeding, or unpaired non-territorial birds, which are also likely to form part of the Argyll (and NHZ 14) species' population. This number is very likely to be high, given the species high productivity rates (1.2 young fledged per successful pair, as per Challis et al., 2022²²).

9.190 Cumulative collision mortality risks to white-tailed eagle at the regional Argyll population level are therefore concluded to be of no more than of **Low** magnitude on a species of **Medium** importance, giving an effect of **Minor** significance, which is **Not Significant** in the context of the EIA Regulations.

Table 9.9: Other Wind Farm Schemes in NHZ14

Wind Farm	Status	ABC/ECU Planning Ref.	Annual Collision Mortality
Beinn Ghlas	Operational	97/00719/DET	N/A
Carraig Gheal	Operational	05/00016/ELSE36	N/A
An Suidhe	Operational	05/01711/VARCON	N/A
Clachan Flats	Operational	02/00953/DET	N/A
A'Chruach	Operational	11/02520/PP	N/A
A'Chruach Windfarm Phase 2	Consented	14/02829/PP	N/A
Site 18, Kilmory Industrial Estate, Lochgilphead	Operational	07/00022/DET	N/A
Cruach Mhor	Operational	01/01553/DET	N/A
Srondoire	Operational	14/00489/PP	N/A
Allt Dearg	Operational	10/02151/PP	N/A
Freasdail	Operational	16/02791/PP	N/A
Cour	Operational	10/00909/PP	N/A
Deucheran Hill	Operational	99/00925/DET	N/A
Auchadaduie	Operational	11/02525/PP	N/A
Beinn an Tuirc, by Carradale	Operational	98/00597/DET	N/A
Beinn an Tuirc 2, by Carradale	Operational	05/01397/DET	N/A
Beinn an Tuirc 3, by Carradale	Under Construction	15/03057/PP	N/A
Tangy, Kilkenzie	Operational	94/00739/DET	N/A
Tangy Extension, Kilkenzie	Operational	04/01291/DET	N/A
Blary Hill	Under Construction	14/01978/PP	N/A
Blarghour	Approved <i>S36C variation ornithological assessment is restricted, but it has been reasonably assumed that fewer turbines would likely result in lower or similar collision mortality estimates.</i>		0.106 (worst case)
Tangy IV	Approved	18/02014/S36	N/A
Airigh	Approved	16/02196/SCOPE	N/A
Creag Dhubh	Approved	19/02544/PP	N/A

Wind Farm	Status	ABC/ECU Planning Ref.	Annual Collision Mortality
Earraghail	In-planning	20/00949/S36	N/A
Clachaig Glen	In-planning	20/01325/S36	N/A
Rowan	In planning	15/00025/SCOPE	N/A
Narachan	In planning (appeal)	19/01402/SCOPE	0.2 ³¹
High Constellation	Consented Scoping Request for tip height increase to consented scheme (ECU00001857)	18/01564/SCOPE ECU00001857	0.013 (mean annual)
Sheirdrim	In-planning (appeal)	19/00816/SCOPE	N/A
Existing Cumulative		0.319	
Proposed Development		1.228	
Total Cumulative		1.547	

Proposed Mitigation

9.191 Potentially significant cumulative effects as a result of operational displacement to golden eagle or collision risks to white-tailed eagle are not considered likely to occur and no additional mitigation is proposed.

Residual Cumulative Effects During Operation

9.192 Residual effects upon ornithological features are concluded as **Not Significant** as a result of the construction and operation of the Proposed Development in-combination with other relevant developments.

Interrelationship Between Effects

9.193 This chapter complements **Chapter 8** and which is referred to where relevant in relation to habitat loss.

Further Survey Requirements and Monitoring

9.194 Ornithological monitoring is proposed in the OREP, to be finalised in consultation with relevant stakeholders, with outline details as presented in **Appendix 8.5**. Monitoring will include for updated baseline (Year 0) and subsequent monitoring surveys, for moorland breeding birds, hen harrier, black grouse and golden eagle prey species to inform the efficacy and review of habitat restoration and enhancement measures, with consultation undertaken with specialist recording groups (e.g. ARSG) as appropriate.

Summary of Significant Effects

9.195 There will be no significant effects on ornithology as a result of construction or operation of the Proposed Development.

Information to Inform a Habitats Regulations Appraisal

9.196 In accordance with NatureScot guidance (SNH, 2016a⁷), the Site is located within the maximum core foraging range connectivity distances for golden eagle as the qualifying interest of the Glen Etive and Glen Fyne SPA i.e. 6km for breeding golden eagle. In consultation with NatureScot, the availability of satellite telemetry data for a tag fitted in March 2017 to the female bird associated with range G/LAE1B was identified and for which the range boundary was considered to encompass the Site.

9.197 The tag fitted in 2017 was still providing data at the end of 2021 (303,143 records over 1,029 days), and which provides a very robust picture of range use for G/LAE1B. Unpublished data (Whitfield & Fielding, see **Appendix 9.4**) has also shown that males and females in a pair have similar range use.

9.198 Kernel analysis was used to identify a range boundary for G/LAE1B, and also for range G/LAE1 derived from satellite tracking data for a tagged bird associated with that range, spanning April to July 2022 (approximately 15 months). The analysis identified (using a 95% PVC) discrete boundaries for both ranges, with only G/LAE1B encompassing the Site and G/LAE1 occurring to the north of the Site. As golden eagle ranges are generally exclusive, the potential for effects upon golden eagle range G/LAE1 (or any other range) as a result of the Proposed Development is not considered further within this assessment.

9.199 The analysis identified that the range boundary for G/LAE1B (95% PVC) does not intrude into the Glen Etive and Glen Fyne SPA, with only a very small number of satellite tag registrations from the tagged female occurring within the SPA boundary (c.0.1% of the tag records obtained). On the basis of the extensive and current empirical dataset from the satellite tag, it can be concluded beyond reasonable doubt that the SPA does not form an integral or regularly used part of the G/LAE1B range. The potential for connectivity between the golden eagle range encompassing the Site and the Glen Etive and Glen Fyne SPA boundary is therefore discounted.

9.200 Similarly on the assumption that golden eagle ranges are typically exclusive and defended against other non-breeding, unpaired or adjacent range holding birds, the use and importance of the Site by bird forming part of the SPA breeding population will be inconsequential.

9.201 The potential for likely significant effects upon the Glen Etive and Glen Fyne SPA as a result of the Proposed Development is therefore screened out.

9.202 The assessment of potential for effects upon golden eagles presented within **Chapter 9** of the EIAR, can therefore be restricted to effects upon the G/LAE1B range and dispersing juvenile golden eagles, which form part of the wider countryside population.

³¹ ECU00001884 – EIA Further Environmental Information 2: Ornithology (May 2022)