Lochluichart Wind Farm Extension II

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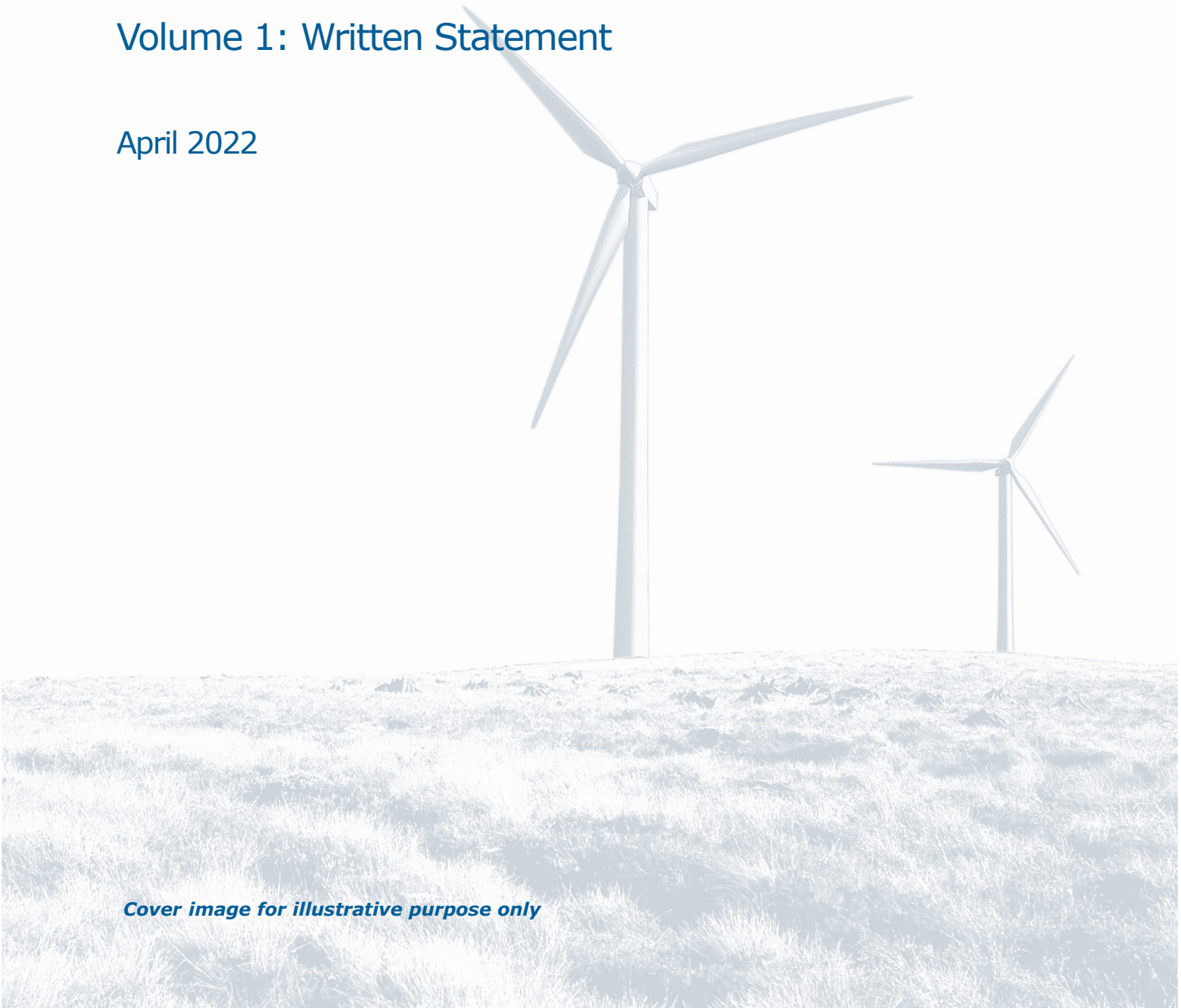
Further Environmental Information

Volume 1: Written Statement

April 2022



Cover image for illustrative purpose only

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1. Introduction

1.1. Background and Site Description

1.1.1 Bluebell Wind Limited (hereafter known as 'the Applicant') received a planning permission for Lochluichart Wind Farm Extension II, a 5-turbine scheme (up to 133m tip height), together with associated infrastructure, on 1st July 2020 from The Highland Council ('THC') (hereafter referred to as the 'Consented Development' (THC Ref: 19/01284/FUL).

1.1.2 Following further discussion amongst the joint-partners, driven largely by the limited availability of turbines within a 133m tip height planning envelope on which the Consented Development was based on (and discussed in more detail in the Design and Access Statement (Section 1.3.9), **Appendix 1.B**), the Applicant submitted a new application for Lochluichart Wind Farm Extension II on 25th June 2021, seeking a planning permission from The Highland Council ('THC') under the Town and Country Planning (Scotland) Act 1997 for a 5-wind turbine scheme (this time, with up to 149.9m tip height) and associated infrastructure (hereafter known as the 'Proposed Development').

1.1.3 The application was accompanied by an Environmental Impact Assessment Report (hereafter known as the 'EIA Report') (Infinergy, June 2021), and associated documents, prepared under the Town & Country Planning Act (Environmental Impact Assessment) (Scotland) Regulations 2017.

1.1.4 Following the submission of the Proposed Development, THC consulted relevant organisations as well as the public. Following receipt of consultation responses (see **Appendix 1.A,** specifically those from NatureScot, RSPB, Forestry Scotland and THC's Forestry Officer), the Applicant considered matters raised in discussion with THC, and has undertaken further work where appropriate; the submission of Further Environmental Information ('FEI') is the outcome.

1.1.5 In response to the feedback from the statutory consultees, no changes have been made to the Proposed Development. Response to the consultees, where applicable, are contained in the following sections:

- Ecology (Section 2);
- Ornithology (Section 3);
- Forestry (Section 4);
- Landscape Visual (Section 5).

1.2 Structure of the Further Environmental Information

1.2.1 The FEI is split into three volumes. **Volume 1** of the FEI contains written statements informing each area of assessment considered throughout the EIA process. The FEI needs to be read in conjunction with the EIA Report.

1.2.2 **Volume 2** contains the Figures that inform the FEI.

1.2.3 **Volume 3** contains supporting information and Appendices for each of these technical chapters, and additional studies that have been prepared to inform the relevant assessments as reported in the FEI.

1.2.4 The assessment was undertaken by the following technical consultancies and in-house by Infinergy shown in Table 1.0.

Table 1.0: Further Environmental Information – Chapter Structure/Consultant responsibility

Section Number	Title	Project Role
1	Introduction	Infinergy
2	Ecology	Avian Ecology
3	Ornithology	Avian Ecology
4	Forestry	Neil McKay Forestry Consultant
5	LVIA	Optimised Environments

1.3 Availability of the Further Environmental Information

1.3.1 In accordance with current Covid-19 guidance, the FEI and the supporting documentation are also available online; please visit the dedicated website at www.lxxwindfarm.co.uk, under News/Downloads. A copy of the FEI on CD or flash drive is available free of charge (while stocks last), by contacting Infinergy Limited at info@lxxwindfarm.co.uk or in writing to Freepost Infinergy Limited (no stamp or further address detail necessary). If required, a hard copy of the entire FEI can be provided at a cost of £150 plus VAT.

1.4 Representations to the Applicant

Any representations to the application should be made directly to the Highland Council.

2. Ecology

Non-Technical Summary

This Further Environmental Information ('FEI') to **Chapter 10: Ecology** of the Environmental Impact Assessment (EIA) Report for the Proposed Development has been prepared by Avian Ecology Ltd., and informs an assessment of potential impacts of the Proposed Development upon non-avian ecological features in accordance with the Chartered Institute for Ecology and Environmental Management (CIEEM) guidelines (2018). The assessment has been informed through desk study, field surveys and consultation with relevant stakeholders. Where relevant, information from the operational Lochluichart Wind Farm, Lochluichart Wind Farm Extension and Corriemoillie Wind Farm has been referred to.

The Proposed Development is for an alternative design to the consented Lochluichart Wind Farm Extension II (2020) (the 'Consented Development'). The variation of design is detailed in **Chapter 3: Description of the Proposed Development** of the EIA Report, and largely comprises an increase in tip height of the consented turbines from 133m to 149.9m and minor increases in foundation and laydown areas.

The FEI presents the methods and results of ecological survey work conducted in the period May to August 2021 (inclusive), and where relevant updates the impact assessment presented in **Chapter 10: Ecology** of the EIA Report on the basis of these results.

Surveys undertaken in 2021 recorded no significant changes to baseline ecological conditions at the Proposed Development. Subsequently there is no change to the assessment that the Proposed Development is not anticipated to lead to significant adverse effects for any protected or notable species and habitats.

Introduction

2.1. This Further Environmental Information (FEI) to the Environmental Impact Assessment Report (EIA Report) has been prepared by Avian Ecology Ltd. and provides an updated assessment of potential effects on non-avian ecological features in relation to the construction, operation and decommissioning of the proposed Lochluichart Wind Farm Extension II (hereafter referred to as the 'Proposed Development').

2.2. The Proposed Development is for an alternative design to the consented Lochluichart Wind Farm Extension II (2020) (the 'Consented Development'). The variation of design is detailed in **Chapter 3** of the EIA Report, and largely comprises a 17m increase in tip height of the consented turbines from 133m to 149.9m and minor increases in foundation and laydown areas.

2.3. Additional ecological surveys were carried out in 2021 in accordance with Scoping responses and subsequent correspondence (see **Chapter 10: Ecology**, **Table 10.1**).

2.4. Where required to inform or provide context to this FEI, information from the EIA Report for the Proposed Development is summarised herein when it is critical to understanding. The EIA Report documentation included for the

Consented Development is also referred to throughout this assessment, where appropriate. Otherwise, in order to avoid repetition, a reference to the relevant chapter and/or section location is provided. Methods, results and assumptions provided in **Chapter 10** of the Proposed Development EIA Report are not repeated here, and only changes to the previously reported results in these chapters are presented, along with an updated impact assessment based on these results where relevant. Where results of the 2021 surveys will not lead to any changes in assessed effects to those previously presented in the EIA Report, this is stated and the need for updated assessment 'scoped out' at that stage, in line with the principles of proportionate EIA.

2.5. The assessment is based upon baseline data, comprising specifically targeted field surveys of important and legally protected receptors identified during desk study and consultation feedback. It draws on pre-existing information, where appropriate, from other studies, survey data sources and is based on the Guidelines for Ecological Impact Assessment (EcIA) in the United Kingdom (CIEEM, 2018) and NatureScot's Environmental Impact Assessment Handbook.

2.6. The specific objectives of this FEI are to:

- Identify any changes to the baseline conditions since previous survey work was conducted;
- identify any potentially significant effects upon key ecological features; and
- identify and describe any mitigation measures required to address any potentially significant effects.

2.7. The FEI is supported by the following figures and technical appendices presented in Volumes 2 and 3:

- **Figure 2.0**: Bat Survey Plan 2021
- **Figure 2.1**: Extended Habitat Survey Results 2021
- **Appendix 2.A**: Ecology

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

2.9. Only common species names are referred to within this FEI (with the exception of habitat community names, or lower plant species for which there is no common name). A summary of species referred to including species names and relevant conservation status is provided in **Appendix 10.A** and **Chapter 10: Ecology** of the EIA Report.

Project Description

2.10. A detailed description of the Proposed Development is provided in **Chapter 3: Description of the Proposed Development** within the EIA Report, and the Site boundary (herein referred to as the 'Site') is shown on **Figures 2.0** and **2.1** (herein referred to as the 'Site').

2.11. Lochluichart Wind Farm and Lochluichart Wind Farm Extension (hereafter referred to as the 'Operational Schemes') are located directly to the south of the Proposed Development, and the Corriemoillie Wind Farm (hereafter referred to as 'Corriemoillie') is located directly to the east (see **Figure 2.0**).

2.12. The Site predominantly comprises open moorland habitats including mire, heath, still and running water and mixed forestry plantation.

Scope of the Assessment

2.13. The assessment presented in **Chapter 10: Ecology** of the EIA Report has been undertaken with reference to CIEEM guidance (2018), and focuses on those activities that could impact and potentially generate significant effects on ecological features. This information in this FEI supplements this and identifies whether there have been any changes in baseline conditions at the Proposed Development which may affect the conclusions of the impact assessment presented in the EIA Report

2.14. The scope of field surveys undertaken in 2021 has been guided by consultation and existing relevant survey information gathered for the Consented Development and Operational Schemes, and also from the Corriemoillie submission, which provide an extensive existing baseline dataset for the Proposed Development and immediate surrounding area.

2.15. The assessment presented within this FEI considers the following three main potential effects upon ecological features associated with wind farm developments, which comprise:

- Habitat Loss / Deterioration – direct and indirect loss and deterioration of habitats;
- Mortality / loss of life – loss of life or injury through construction activities to species, or collision mortality resulting from collision or interaction with the operational turbines; and,
- Disturbance / Displacement of Species –disturbance and displacement of faunal species; loss, damage or disturbance to their breeding and/or resting places.

2.16. In line with the Consented Development, the potential for effects is considered as a result of the Proposed Development alone and cumulatively (where relevant) in-combination with the Operational Schemes, Corriemoillie and Kirkan Wind Farm.

Consultation

2.17. A summary of responses from consultees to the submitted EIA Report for the Proposed Development is provided in **Table 2.0** below, along with how these have been addressed. Only aspects of the application responses with relevance to ecology are included here. Full Consultation Responses are included in **Appendix 1.A** of this FEI.

2.18. Full copies of consultation documentation related to the Proposed Development and Consented Development are provided in **Appendix 10.C** of the EIA Report.

Table 2.0 Consultation summary.

Consultee	Date	Stage	Summary of Response	How Response has been addressed

Consultee	Date	Stage	Summary of Response	How Response has been addressed
NatureScot	30/04/2021	Further Scoping liaison	Advice remains unchanged from that previously provided The data collected to inform the Consented Scheme is now too old and new survey work is required as previously advised. It will not be possible to assess the environmental effects of this application until this information has been gathered. Recommended bat surveys comprise a spring, summer and autumn period, in accordance with NatureScot guidance (SNH, 2019).	Updated ecology surveys relevant to the Proposed Development have been undertaken in 2021, in accordance with guidance, and the results used to inform the requirement for an updated impact assessment.
RSPB	15/07/2021	EIA Application April 2021	Details of the location of compensatory planting must be agreed prior to determination and a suitable pre-commencement condition attached to any consent requiring a detailed compensatory planting plan. We note that the approved Long-Term Forest Plan on the site has not identified removing forestry on deep peat as a management option. We strongly recommend this is considered within the HMP, taking account of any woodland species such as black grouse on the site. If the turbine and infrastructure layout cannot be amended to avoid deep peat over 50cm, bog restoration must be maximised on	It should be noted that compensatory planting is a Scottish Forestry requirement under the 'Control of Woodland Removal' policy, and is unrelated to planting for mitigation, compensation or enhancement which may be included in an HMP for a development. A commitment to develop an HMP post-consent, appropriate to site-specific impacts and opportunities, is included in **Section 2.49**. It is proposed that an appropriate HMP will be delivered post consent through a suitably worded planning condition.

Consultee	Date	Stage	Summary of Response	How Response has been addressed
			site and elsewhere (with commitments secured within the Habitat Management Plan). For example, removing forestry on deep peat and undertaking bog restoration on this site could be included. The EIAR does not seem to recognise the fact that indirect drainage effects may extend out from infrastructure and therefore the amount habitat lost or altered would be greater than indicated. The direct (10.3ha) and temporary (21.88 ha) loss of habitat should be compensated for by undertaking suitable peatland restoration actions over an area of more than 32.18ha. HMP should include measures related to overgrazing and burning 3.7ha of Scots pine plantation in the northern extent of the Site will be lost to the development and the Applicant is committed to providing the equivalent area as compensatory planting. As it will likely be sited on the same estate, it would be appropriate to consider native scrub creation as this would benefit black grouse if designed well. New woodland should avoid being planted on and	**Section 10.144** of **Chapter 10: Ecology** of the EIA Report recognises and addresses the possibility of "indirect physical effects arising from the development (such as alterations to drainage patterns)" It is proposed that an appropriate HMP will be delivered post consent through a suitably worded planning condition. It should be noted that compensatory planting is a Scottish Forestry requirement under the 'Control of Woodland Removal' policy, and is unrelated to planting for mitigation, compensation or enhancement which may be included in an HMP for a development. A commitment to develop an HMP post-consent, appropriate to site-specific impacts and opportunities, is included in **Section 2.49**.

Consultee	Date	Stage	Summary of Response	How Response has been addressed
			encircling deep peat (>0.5m), avoid wader hotspots and avoid areas of mature heather to ensure suitable raptor nesting habitat is not affected.	

Baseline Methodology

2.19. A summary of field surveys undertaken for the Consented Development, along with surveys undertaken for the Operational Schemes and Corriemoillie which are relevant to the Proposed Development application, are included in **Chapter 10: Ecology** of the EIA Report. The following updated ecological field surveys were completed between May and August 2021:

- Bat Activity Surveys (May to August 2021 inclusive); and,
- Habitat and Protected Mammal Walkover Survey (August 2021).

2.20. Surveys were undertaken in accordance with current NatureScot guidance 'Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation' (SNH, 2019), and by experienced and professional ecologists. Any deviations from recommended guidance are discussed in Section 2.33 to 2.41 below.

2.21. Detailed survey methodologies are provided in **Appendix 2.A**.

Bats

2.22. Automated static detectors were deployed within the Site in May, June and August 2021, sampling the spring, summer and autumn periods (Spring: April-May, Summer: June-July, Autumn: August-October) in accordance with NatureScot guidance (SNH, 2019).

2.23. A total of five static detector locations were used to survey areas within proximity of the five proposed turbine locations. These are illustrated in **Figure 2.1** and detailed in Table 2.2 of **Appendix 2.A**.

2.24. Automated detectors were deployed for a minimum of consecutive 10 nights during each monitoring period (spring: 15 nights, summer: 12 nights and autumn: 14 nights) at the onset of an appropriate weather window for bat activity i.e., forecast temperatures of >8°C (at dusk), maximum ground level wind speeds of 5m/s and no, or only very light, rainfall.

2.25. Full details for 2021 surveys are provided within **Appendix 2.A**.

Habitats

2.26. Given the existence of habitat data for the Proposed Development from survey work undertaken in 2010, 2015 and 2017, and the low likelihood of significant changes to the recorded baseline habitats having occurred in the intervening period, surveys in 2021, completed on 23 August, comprised an updated habitat walkover survey to identify any material changes in baseline

habitats recorded within the Site since previous results were collected. Habitat survey methods were extended to include the additional recording of specific features indicating the presence, or likely presence, of protected or notable species, and potential roost sites for bats.

Assessment Methodology and Significance Criteria

2.27. Impact assessment has been undertaken using the assessment methodology and significance criteria in accordance with CIEEM guidelines (2018), and described in **Chapter 10: Ecology** of the EIA Report. In line with the principles of proportionate EIA the assessment concentrates on the potential for significant effects rather than all effects. A 'significant effect' is defined as an effect that either supports or undermines biodiversity conservation objectives for 'important ecological features' or for biodiversity in general at an appropriate geographic scale.

Limitations

2.28. Due to health and safety considerations relating to shooting activities undertaken within the study area by the estate, there were some time periods when survey access was not possible. This included periods during the recommended spring and summer bat detector deployment periods in April to July and so the spring deployment continued into June, and the spring and summer deployments were relatively close together. However, given the shorter survey window for these species this far north, and the previously evidenced low importance of the Proposed Development for bats, this is not considered to represent a constraint to the results obtained or subsequent FEI assessment.

2.29. Occasional detector failures occurred. These are common events and are not considered to affect the overall validity of the data set, given the low number of bats recorded overall. For further details see **Appendix 2.A**.

2.30. Data have been analysed using the online Ecobat tool in line with guidance (SNH 2019). When data are entered into Ecobat for analysis, there is no allowance for entering recording nights where no bat passes were recorded, and so the analysis is carried out only on presence data. For example, the detector may have recorded 200 bat passes over a seven-day period; all of these passes were recorded on two nights but the Ecobat Medians and Means only consider those two nights in their analysis, not the full seven days. This can act to skew the results and elevate the risk levels of percentile ranks calculated.

2.31. The online tool remains limited by the amount of data in the database on a locational basis; and therefore, Ecobat output is regarded as indicative and to be considered alongside desk study information and professional judgement, rather than conclusive evidence of the importance of a site for bats.

2.32. Two of the species recorded within the Site had a reference range below the Ecobat recommended number of <200 (noctule; 158 and brown long-eared; 41). The data within the reference range used to compare activity levels between Site data and other records within 200km^2 is likely to have been obtained from surveys undertaken at proposed or operational wind farm

sites. Thus, most of the records are likely to be from low value habitats (upland, exposed commercial forestry) compared to habitats of greater value (such as those detailed in Table 3a of NatureScot guidance (SNH, 2019)**Error! Bookmark not defined.** and listed under 'High'); hence a reference range below 200.

2.33. Four nights of sampling during the spring and six nights during the summer monitoring periods were excluded from the analysis as they did not meet the criteria for appropriate weather conditions (SNH, 2019) and no bats were recorded. Nights which did not meet the criteria, but where bat activity was recorded, are included within the analysis. Although it is recognised that poor weather can affect bat activity, excluding these data from the analysis skews the dataset and would remove some high collision risk species (noctule) from the dataset. Subsequently inclusion of these nights represents a precautionary approach.

2.34. Due to the weather station failing during the summer recording period weather data for this deployment has been taken from online resources; see **Appendix 2.A**.

2.35. Analysing bat sonograms using Kaleidoscope can clearly identify certain species. However, some genus groups (such as *Myotis* spp.) can be difficult to determine the specific species due to their similar styles of calls. In addition, it can be difficult to determine species or even genus in some circumstances, due to partial calls being heard or due to distortion from, for example passing cars, rain or wind. In cases when it is not possible to identify a bat call to genus, it is labelled as an unknown bat. If the genus can be identified but not the species, the call is labelled by the genus group only.

2.36. The detectability of some bat species, such as brown long-eared, is lower than that of, for example, noctule and *Pipistrellus* spp. The echolocation calls of brown long-eared are comparatively more difficult to detect with bat detectors, and their particular hunting strategies take them into less open habitats. Careful interpretation has therefore been applied when comparing survey results across species.

Baseline Conditions

2.37. Detailed field survey results are presented in **Appendix 2.A**.

Protected and Notable Species

Bats

2.38. Habitat structure within the Site continues to be generally poor for bats, with the open nature lacking suitable foraging and commuting features. No change to the status of potential for the Site to support bat roosts was noted during surveys in 2021 and no activity was recorded within species-specific emergence times; overall the Site is considered to be of negligible bat roosting potential in accordance with BCT guidance (Collins, 2016).

2.39. Bat activity surveys undertaken within the Site in 2021 recorded very low levels of activity attributed to common and soprano pipistrelle, noctule, Myotis species and brown long-eared bats, with a total of 611 bat passes recorded during the spring, summer and autumn deployments. The majority

was attributed to common and soprano pipistrelle and highest activity levels were recorded in August (autumn). Full results of the bat activity surveys are included in **Appendix 2.A**.

2.40. Based on the updated bats and wind farms guidance (SNH, 2019) for Stage 1 (potential risk of a site based on habitats and development-related receptors) the Proposed Development is assessed as being of 'Low Site Risk'.

2.41. Stage 2 of the NatureScot (SNH, 2019) guidance requires an overall risk assessment, based on activity levels of high collision risk bat species (in this case common and soprano pipistrelle, and noctule). A total of 561 bat registrations were recorded across five monitoring stations for these species in spring, summer and autumn 2021, representing 0.08 mean bat passes per night for common pipistrelle, 0.17 mean passes per night for soprano pipistrelle and 0.3 mean passes per night for noctule. These activity levels are considered to be very low, and representative of the exposed habitats within the Site.

2.42. The output from Ecobat shows that in summary, the Overall Risk Assessment for noctule is considered to fall under "Low Site Risk" and under for common pipistrelle and soprano pipistrelle "Low Site Risk" with the exception of LOC 3 which falls under "Moderate Site Risk" for common pipistrelle and LOC 2 which falls under "Moderate Site Risk" for soprano pipistrelle. Overall, this equates to Low Site Risk across the five survey locations.

2.43. As such, and as stated in **Chapter 10: Ecology** of the EIA Report, on the basis of very low bat activity levels recorded, sub-optimal habitat, the geographical location and the availability of high value foraging habitat beyond the Proposed Development, the mortality risk to bats arising from the Proposed Development is considered to be low. Over the long-term, operational effects are unlikely to adversely affect the conservation status of any bat species, and as such are not considered to be significant at any population level.

2.44. Furthermore, embedded into the design of the Proposed Development is a 50m (from blade tip) buffer between turbines and bat habitat features and the avoidance of turbines within areas of higher bat activity. On consideration of the embedded mitigation, low activity levels recorded and low site risk, bats are not considered likely subject to significant effects.

Terrestrial Mammals

2.45. No signs of protected mammals were recorded during 2021 baseline surveys, and baseline conditions these species within the Site are considered unchanged from those assessed for the Consented Development. As such, terrestrial mammals are not considered further in this FEI.

Habitats and Vegetation

2.46. Habitat validation surveys undertaken in 2021 identified the same habitats present as recorded in previous years (see **Appendix 2.A**), with the habitats in the Site predominantly a mix of M17 bog and M15 wet heath. However, the survey in 2021 found the distribution of these communities in the northern section of the Site to differ from the 2017 mapping, with the M17 bog community being much more extensive in the northern half of the site,

and the M15 being less extensive, than previously recorded (see **Figure 2.1**). These habitats are vegetatively very similar, with the M17 occurring on deeper peat (generally over 50cm deep) and the M15 on shallow peat (less than 50cm deep). This area was not mapped in detail during the 2017 survey as there is no new infrastructure planned for this location. In light of this, calculations for loss for each separate habitat type are unchanged by the updated survey results, though the relative proportion of M17 bog within the Site which will be lost to infrastructure is reduced as its overall extent has increased (and vice versa for M15 wet heath). Detailed survey results are presented in **Appendix 2.A** and illustrated on **Figure 2.0**.

2.47. The majority of habitats within the Site comprise large areas of blanket bog and wet heath communities, developing on peat of variable depth. The habitat types correspond to European wet heath and Active raised bog and blanket bog listed on Annex I of the Habitats Directive and also represent priority habitat types for the Ross and Cromarty (East) LBAP.

Embedded Mitigation and Scheme Design Evolution

2.48. Full details of the scheme design evolution and embedded mitigation measures are detailed in Chapter 3: Description of the Proposed Development of the EIA Report, with a contextual summary provided in **Chapter 10: Ecology**.

Habitat Management Plan (HMP)

2.49. It is proposed that a HMP will be produced post-consent, subject to appropriate planning condition, which will include proposals for restoration of the most sensitive habitats and subsequent monitoring will measure the effectiveness of restoration works, with restoration works adaptable in response to monitoring outcomes. The HMP will also include the management of habitats across the Site to provide an overall net gain.

Summary

2.50. Updated ecology surveys in 2021 have found no material change to baseline conditions for non-avian ecological receptors, and so the conclusions of the impact assessment contained in **Chapter 10: Ecology** of the EIA Report remain unchanged. As such, all non-avian ecological features are scoped out of further assessment in this FEI.

References

CIEEM (2018, updated 2019) Guidelines for Ecological Impact Assessment in the UK and Ireland. Terrestrial, Freshwater, Coastal and Marine. Chartered Institute of Ecology and Environmental Management, Winchester

Scottish Natural Heritage (2014, updated 2018) Environmental Impact Assessment Handbook. V5.

SNH (2019) Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation: https://www.nature.scot/doc/bats-and-onshore-wind-turbines-survey-assessment-and-mitigation#6.1%C2%A0+Assessing+bat+activity+levels [Accessed September 2021

Collins, J. (ed) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines 3rd edition. Bat Conservation Trust, London

Chapter 3: Ornithology

Non-Technical Summary

This Addendum to Chapter 11: Ornithology of the Environmental Impact Assessment Report for the Proposed Development has been prepared by Avian Ecology Ltd. It provides Further Environmental Information ('FEI') to inform, where necessary, an updated assessment of potential impacts of the Proposed Development upon ornithological features in accordance with the Chartered Institute for Ecology and Environmental Management (CIEEM) guidelines (2018)[i].

The assessment has been informed through desk study, ornithological field surveys and consultation with relevant stakeholders. Where relevant, information from the operational Lochluichart Wind Farm, Lochluichart Wind Farm Extension and Corriemoillie Wind Farm has been referred to.

The Proposed Development is for an alternative design to the consented Lochluichart Wind Farm Extension II (2020) . The variation of design is detailed in Chapter 3: Description of the Proposed Development of the EIA Report, and of relevance to impacts upon ornithological features comprises an increase in tip height of the consented turbines from 133m to 149.9m and minor increases in foundation and laydown areas.

The FEI presents the methods and results of ornithological survey work conducted in the period February 2021 to March 2022 (inclusive), along with up-to-date contextual results from nearby developments, and updates the impact assessment presented in Chapter 11: Ornithology on the basis of these results.

As described in the EIA Reports for the Proposed Development and for the Consented Development, adverse effects on black grouse and breeding divers have been avoided and/or sufficiently mitigated through project design, i.e., the turbines and associated infrastructure have been located so as to minimise any potentially significant effects.

Habitat losses as a result of the Proposed Development, in the context of their remaining availability within the Site and surrounding wider area, are not considered to be significant for birds. Given the temporary and restricted nature of works associated with the construction and decommission phases of the development, no significant effects upon ornithological features are predicted.

An assessment of collision mortality risk has been carried out for golden eagle on the basis of flight activity data collected during the period March 2021 to February 2022, and which predicts an estimated annual collision mortality of 0.069. The mortality rate for golden eagle is considered to be an over-estimation based on recently published research on displacement effects of windfarms on golden eagles. Such effects are assessed within the Chapter using the Golden Eagle Topographical (GET) Modelling.

Collision mortality for this species is not predicted to lead to significant effects, and no significant effects of displacement due to the Proposed Development are predicted for any important ornithological feature.

Mitigation is proposed in relation to the potential for offences to occur under the provision of the Wildlife and Countryside Act 1981 (as amended) during the construction and decommissioning phases. A Breeding Bird Protection Plan (BBPP) will be included in the Construction Environmental Management Plan (CEMP) to ensure breeding birds and their nest sites are protected from disturbance.

The assessment has also considered the potential effects of the Proposed Development upon important ornithological features in combination with other operational, consented and proposed wind farm developments.

No potentially significant cumulative effects are identified.

Introduction

3.1. This Further Environmental Information ('FEI') to the Lochluichart Wind Farm Extension II Environmental Impact Assessment Report ('EIA Report') has been prepared by Avian Ecology Ltd.

3.2. It provides an updated assessment of potential effects on ornithological features in relation to the construction, operation and decommissioning of the proposed Lochluichart Wind Farm Extension II (hereafter referred to as the 'Proposed Development'), in response to advice received by NatureScot and RSPB, and following the completion of updated baseline surveys and desk study. The assessment is based on the Guidelines for Ecological Impact Assessment (EcIA) in the United Kingdom (CIEEM, 2018)[i] and NatureScot's Environmental Impact Assessment Handbook[ii].

3.3. The Proposed Development comprises a variation in design to the consented Lochluichart Wind Farm Extension II (2020) (hereafter the 'Consented Development'). The variation of design is detailed in Chapter 3 of the EIA Report for the Proposed Development and, of relevance to the assessment of impacts upon ornithological features, comprises a 16.9m increase in tip height of the consented turbines from 133m to 149.9m and minor increases in foundation and laydown areas.

3.4. In response to advice provided by NatureScot and RSPB (see **Chapter 11: Ornithology, Table 11.1**, EIA Report (Infinergy, 2021) and **Table 3.0** herein), updated ornithological surveys and desk study were carried out between February 2021 and March 2022. The assessment presented within Chapter 11 of the EIA Report has therefore been updated, as necessary, to reflect these survey and desk study findings and advice received by NatureScot and RSPB.

3.5. Additional detailed analysis on the significance of habitat loss for golden eagles, similarly in response to advice provided by NatureScot and RSPB (see **Table 3.0**), has also been undertaken.

3.6. Where required to inform or provide context to this FEI, information from the EIA Report for the Proposed Development is summarised herein. EIA Report documentation included for the Consented Development is also referred to where appropriate.

3.7. Detailed methods, results and assumptions provided in the EIA Reports are not repeated here, but reference is made, as appropriate, to the relevant section of the EIA Reports where this information is provided.

3.8. Where the results of the updated ornithological field surveys and desk studies will not lead to any changes in the magnitude and significance of effects previously presented in the EIA Report, this is stated and the need for updated assessment 'scoped out'. This is in line with the principles of proportionate EIA.

3.9. In summary, the assessment within this FEI is undertaken based on information derived through ornithology field surveys undertaken between 2015 and 2017, and in 2021/2022 to inform the Proposed and Consented Developments, together with a review of extensive desk study information, including operational ornithological monitoring reports prepared for the Lochluichart Wind Farm and Lochluichart Wind Farm Extension (hereafter referred to as the 'Operational Schemes') and Corriemoillie Wind Farm (hereafter referred to as 'Corriemoillie') and baseline studies for the Lochluichart Wind Farm Extension II Section 37 Application ('s37 Application') for the grid connection route.

3.10. The specific objectives of this FEI are to:

- identify any changes to the baseline ornithology conditions presented in the EIA Report;
- identify any potentially significant effects upon important ornithological features; and,
- identify and describe any mitigation measures required to address any potentially significant effects.

3.11. The FEI is supported by the following figures and technical appendices presented in Volumes 2 and 3:

- **Figure 3.0**: Site Context; Operational Wind Farms
- **Figure 3.1**: Raptor Survey Coverage
- **Figure 3.2**: Diver Survey Coverage
- **Figure 3.3**: Raptor Survey Area
- **Figure 3.4**: Red-throated Diver Lochs and Flight Corridor (Confidential)
- **Figure 3.5**: Highland Raptor Study Group (HRSG) Results (Confidential)
- **Figure 3.6a**: Vantage Point Survey Results Feb 2021 to Aug 2021 (inclusive)
- **Figure 3.6b**: Vantage Point Survey Results Sep 2021 to Feb 2022 (inclusive)
- **Figure 3.7**: Moorland Breeding Bird Survey Results 2015 and 2021
- **Figure 3.8**: Black Grouse Survey and Results
- **Figure 3.9**: Breeding Raptor Results (Confidential)
- **Figure 3.10:** Moorland Breeding Bird Survey Results 2015 and 2021 (Confidential)
- **Figure 3.11:** Incidental Red-throated Diver Records (Confidential)

- **Figure 3.12:** Nevis Environmental Vantage Point Flight Data (Confidential)
- **Figure 3.13**: Nevis Environmental Vantage Point Non-flight Data (Confidential)
- **Figure 3.14**: Nevis Environmental Walkover Survey Data (Confidential)
- **Figure 3.15**: Nevis Environmental Black Grouse Survey Data (Confidential)
- **Appendix 3.A**: Ornithology
- **Appendix 3.B**: Confidential Ornithology
- **Appendix 3.C**: An Analysis of Potential Golden Eagle Habitat Loss Using the Golden Eagle Topography (GET) Model (Confidential)
- **Appendix 3.D**: Third Party Reports (Confidential)
- **Appendix 1.A**: Consultation

3.12. **Figures 3.4, 3.5, 3.9, 3.10 and 3.11** and **Appendices 3.B** and **3.C** contain information pertaining to the locations of sensitive breeding bird species and which is considered confidential. As such, these documents will not be made publicly available but will be provided to The Highland Council (THC), NatureScot and RSPB.

3.13. Only common species names are referred to within this FEI. A summary of species referred to including species names and relevant conservation status is provided in **Appendix 11.A** of the EIA Report.

Project and Site Description

3.14. A detailed description of the Proposed Development is provided in **Chapter 3: Description of the Proposed Development** within the EIA Report, and the Site boundary (herein referred to as the 'Site') and infrastructure locations shown on **Figures 3.0** to **3.11**.

3.15. The Operational Schemes are located directly to the south of the Proposed Development, with Corriemoillie located directly to the east of the Proposed Development (see **Figure 3.0**).

3.16. The Site predominantly comprises an expanse of open moorland habitats including mire, heath, still and running water and mixed forestry plantation. Further detailed information on extant habitats within the Site is provided in **Chapter 10: Ecology** of the EIA Report.

Scope of the Assessment

3.17. The assessment presented in **Chapter 11: Ornithology** of the EIA Report and within this FEI has been undertaken with reference to CIEEM guidance (2018)[i], and focuses on impacts of the Proposed Development that may potentially generate significant effects upon important ornithological features.

3.18. The purpose of this FEI is therefore to identify any substantive changes to baseline ornithological conditions presented within the EIA Report, which may affect the conclusions of the impact assessment presented in the EIA Report, and where necessary, provide an updated assessment of effects in accordance with advice provided by NatureScot and RSPB (see **Table 3.0**).

3.19. The scope of field surveys undertaken between February 2021 and March 2022 has been guided by consultation with NatureScot and RSPB and informed by baseline survey information gathered for the Consented Development, as well as baseline and operational monitoring data for the Operational Schemes.

3.20. The scope and approach to updated ornithology surveys undertaken has also taken into account the completion of operational monitoring for the Operational Schemes, Corriemoillie and baseline surveys for the s37 Application; see **Section 3.30.**

3.21. Existing information relating to the distribution and activity of bird species at the Site and immediate surrounding area upon which to support an impact assessment of the Proposed Development, is extensive. Ornithological studies have been undertaken within the Site and surrounding area since 2009 to inform the Consented Development, the Operational Schemes and Corriemoillie. As such, the occurrence and general distribution of bird species at the Site, and how likely they are to be adversely impacted by the Proposed Development, is well established.

3.22. Substantial effort has been made to obtain existing relevant information, which may be used to inform the design and assessment of the Proposed Development. Due to the sensitivity and confidential nature of some species records, this information is not publicly available. It should also be noted that third parties are under no obligation to supply this information to consultants for the purposes of informing the assessment of developments, but may so in good faith. As such, where confidential data could not be obtained, reasonable assumptions are made to support a precautionary assessment on the basis of best available evidence. It is however, understood that such information is likely to have been provided to NatureScot as part of confidential EIA submissions and under planning obligations. Such information is therefore understood to be available to NatureScot to review in the context of reasonable assumptions made within this FEI.

3.23. Where the absence of third-party data being made available is considered to have resulted in considerable limitation to the assessment conclusions, this is stated. No responsibility is accepted for factual inaccuracies reported within third-party data.

3.24. The assessment presented within this FEI considers the following three main potential effects upon ornithological features associated with wind farm developments, which includes:

- Habitat Loss – the loss of nesting, foraging or roosting areas by birds resulting from the construction of the Proposed Development;
- Disturbance/Displacement - the displacement of birds from the wind farm and surrounding area as a result of the construction, operation and decommissioning of the Proposed Development; and,
- Collision – mortality resulting from collision or interaction with the turbines.

3.25. A GET model has been conducted to assess the impacts of habitat loss for golden eagle as a result of the Proposed Development and also cumulatively with all other operational and consented turbines within a 20km radius of the Proposed Development (see **Appendix 3.C**). The cumulative assessment for the GET model is incorporated into the model conclusions and so into the assessment of the effects of the Proposed Development alone, which is considered to be a precautionary approach.

3.26. The potential for effects is then further considered as a result of the Proposed Development alone and cumulatively in-combination with the immediately adjacent Operational Schemes, Corriemoillie, and Kirkan Wind Farm (in planning), and also with other operational and consented wind farms of at least three turbines within NHZ7. Cumulative impacts are only assessed for features and routes to impact with above negligible magnitude residual effects following the application of any required mitigation.

Consultation

3.27. A summary of responses from consultees to the submitted EIA Report for the Proposed Development, and also received in response to a draft submission of the FEI in November 2021, are provided in **Table 3.0** below, together with clarification as to how advice received has been addressed.

3.28. Only aspects of the application responses with relevance to ornithology are included within **Table 3.0**. Relevant Consultation Responses are included in **Appendix 1.A** of this FEI.

3.29. Full copies of previous consultation documentation related to the Proposed Development and Consented Development are provided in **Appendix 10.C** of the EIA Report.

Table 3.0 Consultation summary.

Consultee	Date	Stage	Summary of Response	How Response has been addressed
NatureScot	30/04/2021	Further Scoping liaison	NatureScot advised that their advice remains unchanged from that previously provided. They considered the data collected to inform the Consented Scheme is now too old and new survey work is required. NatureScot considered that it will not be possible to assess the environmental effects of this application until this information has been gathered.	Updated survey work has been conducted in 2021/2022 to inform assessment, and the results are provided within this FEI, in **Technical Appendix 3.A** and in **Figures 3.6-3.11.**
			NatureScot stated they cannot confirm a single breeding season will be sufficient but would be happy to review the new ornithology data and consider this at the end of the breeding season.	A year of survey has been carried out, including the breeding season. Rationale and justification for the appropriateness of the survey programme conducted is included in **Section 3.85** to **3.92**
RSPB	15/07/2021	EIA Application April 2021	RSPB stated there was currently insufficient information to allow full assessment of ornithological impacts and they await results of the 2021 ornithological surveys and updated assessment.	Results of 2021/2022 surveys are provided within this FEI, in **Figures 3.6-3.11,** and in **Technical Appendix 3.A**.
			RSPB recommended that the updated assessment should compare impacts between the consented scheme and the proposed development, by presenting the new data collected in 2021 alongside the old data collected in 2015/16, stating whether impacts would be more, less or the same as the consented scheme.	An updated assessment stating whether impacts would be more, less or the same as the Consented Development is provided in this FEI
			RSPB requested that figures presenting the results of the 2015/2016 breeding bird surveys are provided. Breeding bird territories from 2015, 2016 and 2021 should be mapped to assist in determining potential impacts.	Breeding bird results from 2015 and 2021 are shown on **Figures 3.7** and **3.10.**
			RSPB noted that the turbines were designed to avoid significant impacts on red-throated diver. There are no figures showing the	Locations of breeding lochs are given in **Confidential Appendix 3.C** and on

Consultee	Date	Stage	Summary of Response	How Response has been addressed
			location of breeding lochs and flight routes in relation to the proposed development and the other surrounding operational wind farms. They requested consideration of divers' flight routes to and from their breeding lochs and potential barrier effects (in-isolation and cumulatively), or clear justification as to why this was not included within the assessment.	**Confidential Figure 3.4** of this FEI, and in **Confidential Appendix 11.B** of the EIA Report which this FEI supplements. No flight routes were mapped for the baseline as no flights of this species were recorded during VP surveys for the Proposed Development undertaken in 2015-2016, or in 2021. This is primarily due to the fact that the main diver flight corridor is to the west of the Proposed Development, >2km from the VP location (see **Confidential Figure 3.4**). Only occasional flights have been recorded across the Proposed Development and though they have been considered in Site design, this is not considered sufficient activity to constitute a regular flight corridor and so potential barrier effects to this species are not considered to be relevant in the context of the Proposed Development. **Confidential Figure 3.4**, based on Confidential Figure 10 of the Section 37 grid route application, shows red-throated diver breeding lochs, and flight lines recorded for Corriemoillie monitoring 2016-2019. Impacts to breeding red-throated diver are discussed further in **Confidential Appendix 3.B**.

Consultee	Date	Stage	Summary of Response	How Response has been addressed
			RSPB stated that the rationale for assessment of potential disturbance to greenshank must be justified, and measures to prevent construction and operational-phase disturbance and displacement described.	An updated assessment of potential disturbance impacts to greenshank is provided in **Section 3.252** to **3.259.** Measures to prevent disturbance to this Schedule 1 species during the construction and operational phases will be included in the Construction Environment Management Plan (CEMP) and Breeding Bird Protection Plan (BBPP), to be produced post-consent in consultation with and for agreement by NatureScot.
			RSPB noted that the cumulative assessment only considers other wind developments in the vicinity of the proposed development and requested inclusion of other wind farms in NHZ7.	Other wind farms within NHZ7 are included as appropriate. Rationale for the approach to cumulative assessment is presented in **Section 3.75** to **3.78**.
			RSPB requested details of the location of compensatory planting should be agreed prior to determination and a suitable pre-commencement condition attached to any consent requiring a detailed compensatory planting plan.	It should be noted that compensatory planting is a Scottish Forestry requirement under the 'Control of Woodland Removal' policy, and is unrelated to planting for mitigation, compensation or enhancement which may be included in a Habitat Management Plan (HMP) for a development.
			RSPB suggest that measures within the HMP include habitat enhancement for black grouse within the surrounding area.	A commitment to develop a HMP post-consent, appropriate to site-specific impacts and opportunities, is included in **Section 3.161**.
NatureScot	25/01/2022	Comments re Draft	NatureScot stated that they did not consider that the draft FEI makes an adequate assessment of the effects on golden eagle to	Where data gaps exist, a precautionary approach was adopted and assessment

Consultee	Date	Stage	Summary of Response	How Response has been addressed
		FEI	conclude what the effects of development would be.	undertaken on the basis of a worst-case scenario of the complete loss of a golden eagle territory. This has now been updated based on information collated since submission of the draft FEI.
			NatureScot noted that eagle activity has clearly increased in the 7 years since previous surveys were undertaken, demonstrating the need for up-to-date surveys to inform assessment.	It should be noted that this increase in eagle activity locally has coincided with an increase in the number of turbines locally, supporting an assessment that this species is not significantly affected by the presence of turbines. Up-to-date surveys have been carried out to support the assessment. See **Section 3.59** to **3.65, Figure 3.3** and **Appendix 3.A.**
			NatureScot requested clarification of the survey buffer applied for eagle nest searches, and whether eagle nest searches were undertaken with a 6km radius round the wind farm, as Appendix 3.B Section 2.8.1 suggests only a 2km search area was considered. In addition to areas covered by search, they requested confirmation of the dates of the visits.	Search effort was undertaken outwith 2km as access allowed, this is now clarified in **Appendix 3.A**, which also provides survey dates and survey areas are shown on **Figure 3.3**. Surveys were also conducted in 2021 for the Section 37 Grid Route Application, and for Corriemoillie Wind Farm, and a data sharing agreement reached; **Figure 3.1** shows the area covered by these surveys. As is not uncommon, survey of the full 6km buffer was constrained by access permissions, and so survey data was augmented via data requests to the Highland Raptor Study Group (HRSG). This is discussed further in

Consultee	Date	Stage	Summary of Response	How Response has been addressed
				Section 3.63.
			NatureScot agreed with the conclusion in the draft FEI that there may be a golden eagle pair breeding in reasonable proximity to the Site and reiterated the requirement for nest searches to locate this and determine the territory centre for the eagles using the site.	Nest searches were undertaken in 2021 as access permissions allowed, and a known eyrie location was checked. Further early searches have been undertaken in Feb and March 2022 to further try to identify the nest location. However, the territory centre is an outdated concept based on the no-longer supported PAT model assumptions, and use of GET modelling and precautionary principles mean that it is not essential to know where a nest is in order to be able to assess likely impacts to a territory.
			NatureScot noted that the FEI also suggests in Section 3.71 that there is a pair of golden eagles with an alternative nest site within 6km of the wind farm and that these are birds associated with the Glen Affric and Strathconnon SPA.	The wind farm referred to in **Section 3.71** (now **3.106**) is the Operational Scheme, not the Proposed Development. The Operational Scheme sits between the proposed development and the SPA, and considerably closer to the SPA (*c.* 3km distant as opposed to the 6.5km that the Proposed Development would be located). Surveys carried out in February and March 2022 have identified breeding by golden eagle and a further data request to the HRSG has identified the likely location for the eyrie (though this has not been approached, to prevent disturbance at this critical time in the

Consultee	Date	Stage	Summary of Response	How Response has been addressed
				breeding cycle), both outwith the SPA, and so based on activity observed and on distance from the SPA and the location of the golden eagle nests within it (see **Confidential Figure 3.5** and **3.9**) there is no evidence that the activity recorded is an SPA pair. Reference to the SPA has therefore been removed.
			NatureScot stated that golden eagles are known to use their territory differently throughout the year and it will be important to understand how these birds are using the part of their territory through the non-breeding season, and queried whether surveys have continued through the non-breeding season.	Surveys have continued throughout the non-breeding season, and an updated assessment based on a full year of survey work is provided. Due to the extremely precautionary approach adopted in the Draft FEI, predicted impacts are of the same or lower magnitude than the previous highly precautionary assessment.
			NatureScot stated that the FEI needs to provide an assessment on the effects on the golden eagle territory that these birds are associated with. To do that it needs to determine, where that territory centre is exactly through survey and how this wind farm application may affect that including loss of territory through displacement. Modelling is likely to be necessary to do this, such as GET modelling.	An assessment of the effects on the golden eagle territory was provided. The 'territory centre' referred to by NatureScot is an outdated concept associated with defunct PAT modelling. Location of a nest is unrelated to where in the eagles' territory that nest sits, how large the territory is, or how they use the different habitats within their territory, and so this information cannot be determined through survey. The only way to gain this information is via satellite tagging, which is not routinely feasible.

Consultee	Date	Stage	Summary of Response	How Response has been addressed
				GET modelling has been carried out and the results are provided in **Appendix 3.C**, and discussed in **Section 3.216**.
			NatureScot stated that without nest location information it will not be possible to assess the effects on eagles or the effects on the Glen Affric to Strathconon SPA.	Updated information provided. There is no evidence that the pair recorded at the Proposed Development are from the Glen Affric to Strathconon SPA.
			NatureScot stated that the FEI should present the commonly used flight corridors of the divers to demonstrate there is no effect along with their breeding locations in the couple of years.	Diver flights recorded in 2021 are displayed on **Confidential Figure 3.12** and the flight corridor and breeding lochs are shown on **Confidential Figure 3.4**. Breeding locations are discussed in **Appendix 3.B**.
			NatureScot stated that the cumulative assessment should assess effects on NHZ7 as well as cumulative effects of the immediate wind farm cluster on the eagle territory.	Other wind farms within NHZ7 are included as appropriate. Rationale for the approach to cumulative assessment is presented in **Section 3.75** to **3.78**.
RSPB	14/12/2021	Comments re Draft FEI	RSPB queried that no outline Habitat Management Plan document has been produced as part of the FEI, and few details have been provided in the FEI chapters. They advised that a draft HMP with maps of proposed restoration areas should be produced as part of the FEI submission to allow the proposed HMP to be considered more fully.	Given the lack in the EIA Report of any predicted significant effects to be mitigated for any ornithological features, and so the fact that the HMP is not required to mitigate these, it is considered appropriate and proportionate that the details of measures to be proposed should be developed post-consent, in order that any requirements included in planning conditions can be incorporated. Where significant effects are predicted based on updated information

Consultee	Date	Stage	Summary of Response	How Response has been addressed
				contained within this FEI, then specific measures to be included in the HMP to mitigate these are discussed further herein.
			RSPB noted that previous advice was that one full year of surveys would likely be required.	A year of surveys has been carried out; see **Technical Appendix 3.A**.
			RSPB expressed concern about the potential impacts of the proposal due to the increase in golden eagle activity in the area.	It is considered that the increase in golden eagle activity coincident with the construction and subsequent operation of the Operational Schemes and Corriemoillie supports the position that the presence of wind farms is not necessarily a limiting factor to golden eagle home range and territory establishment. See **Section 3.212** to **3.215** for further discussion.
			RSPB further expressed concern that the location of the golden eagle territory is unknown, despite the site being within a home range (gathered from flight activity surveys). Therefore, the scale of impact from the development remains unclear. If it is the case that an eyrie is located within the core territory area, this could have more detrimental impacts than if the territory is further away. With the information that has been provided, it is not possible to fully assess the effects on eagles.	The extremely precautionary assessment provided in the Draft FEI was based on the unrealistic worst-case scenario of the total loss of a golden eagle territory, and therefore could not have assessed greater detrimental impacts irrespective of where the core of the territory is. Details of further nest search survey and information received from the HRSG are included in **Section3.93, Section 3.143** to **3.149**, and **Figures 3.3** and **3.5**, and the assessment of impacts updated accordingly.
			In addition, actions within the HMP should be considered for this species.	It is proposed that appropriate actions to be included within an HMP will be

Consultee	Date	Stage	Summary of Response	How Response has been addressed
				agreed post-consent.
			RSPB noted that very few red-throated diver flights were recorded despite successful breeding in 2021 and that the Ornithology FEI document states that there was no sufficient activity recorded in 2021 to determine a flight corridor but also that "flight paths in the area are well-known" from surveys undertaken at neighbouring wind farm sites. RSPB requested clarification on whether commonly used flight paths pass through the proposed development or not, and a map of flight paths to allow consideration of barrier effects.	Flight corridors are demonstrated on **Confidential Figure 3.4** and show that diver flights are primarily to the west of the Proposed Development, outwith the viewshed of VP surveys carried out in 2021/2022. There is no evidence of regular flight activity over the Proposed Development at any time of the day.
			RSPB stated that presence of breeding birds indicates that they will be flying in and out of the site, possibly at night and that the EIA should consider this.	Flight corridors are demonstrated on **Confidential Figure 3.4** and shows that diver flights are primarily to the west of the Proposed Development. There is no evidence of significant flight activity over the Proposed Development at any time of the day.
			RSPB recommended that the borrow pit blasting and reopening is undertaken outwith the lekking and breeding season (March to July), and alternative lek habitat provided through the HMP. In addition timing of traffic access should be considered within the mitigation plan.	Measures to prevent breaches of legislation pertaining to breeding birds, including black grouse, are embedded in the Proposed Development and, as stated in the EIA Report and the Draft FEI, will be implemented under a CEMP and a BBPP. This is further discussed in **Section 3.158** to **3.160**.
			RSPB stated that as grouse are also known to collide with turbine bases, this should also be addressed in the FEI and consideration given to recent research that has shown that painting bases back can be effective in reducing this.	While it is known that black grouse may occasionally collide with turbine bases, this is not possible quantify and so to assess in meaningful way. Given that all recent black grouse records are at least *c.* 1km from the proposed

Consultee	Date	Stage	Summary of Response	How Response has been addressed
				turbines, no significant collision impacts to black grouse are likely and so qualitative assessment of this is not considered necessary or appropriate. A BBPP and HMP containing measures to protect species including black grouse and provide habitat enhancements for them are included in the Proposed Development.
			RSPB highlighted that the substation and the turbines and track to the east of the substation should be planned for construction outwith the breeding season to avoid disturbance to breeding greenshank. The HMP should also consider options for this species, away from turbine and infrastructure areas.	Measures to prevent breaches of legislation pertaining to breeding birds, including greenshank, are embedded in the Proposed Development and, as stated in Section 12.266 to 12.269 of the EIA Report and within the Draft FEI, will be implemented under a CEMP and a BBPP. This is also included in **Section 3.158** to **3.160** below. It is proposed that appropriate actions to be included within an HMP will be agreed post-consent.
			RSPB noted that the cumulative assessment only considers other wind developments in the vicinity of the proposed development, and requested consideration of other developments within NHZ7 including Meall Buidhe (in planning), Braelangwell (in planning), Strathrory (at appeal), Beinn Tharsuinn (operational), Fairburn (operational) and Novar (operational). RSPB acknowledged that information to inform cumulative assessment may not always be available.	Other wind farms within NHZ7 are included as appropriate. Rationale for the approach to cumulative assessment is presented in **Section 3.75** to **3.78**.

Baseline Methodology

3.30. Ornithological field surveys have been undertaken within the Site and surrounding local area since 2009, as part of baseline studies and operational monitoring to inform the Consented Development, the Operational Schemes and Corriemoillie.

3.31. This has included surveys carried out within the Site and the wider surrounding area in 2021 in relation to the Operational Schemes, Corriemoillie and the s37 Application. As such, the occurrence and general distribution of bird species at the Site, and how likely they are to be adversely impacted by the Proposed Development, is well established

3.32. Key study areas covered by these surveys are shown in **Figures 3.1** and **3.2**.

3.33. Given the extent of survey effort and coverage undertaken in 2021, and to minimise the potential for disturbance to sensitive breeding species in accordance with good practice guidance[iii], data sharing was agreed between the Applicant, Eneco and EDF Energy. The findings of baseline and operational monitoring studies for the above listed schemes, which is considered extensive, has therefore been made available to inform the assessment of the Proposed Development.

3.34. In view of this, and in response to NatureScot and RSPB advice, an updated year of ornithology surveys in accordance with current NatureScot guidance 'Recommended bird survey methods to inform impact assessment of onshore wind farms' (SNH, 2017[iii]), and review of desk study sources, was completed between February 2021 and March 2022. This was to ensure baseline ornithology conditions represented a contemporary account of the distribution and activity of pertinent species, upon which to base an assessment of impacts of the Proposed Development.

Desk Study

3.35. The HRSG were consulted in September 2021 to obtain records of breeding raptors within 2km of the Site, extended to within 6km for eagles. Following comments received from NatureScot, a further request was made on 14th March 2022, for any data on known golden eagle nests within a 10km buffer of the Site.

3.36. In addition to the documents listed in **Section 11.32 – 11.35** of Chapter 11 of the EIA Report, the following further sources (supplied by EDF Energy, Eneco and by Nevis Environmental Ltd.) have been made available and reviewed to inform this FEI:

- Corriemoillie Wind Farm Breeding Bird Summary (2019)[iv];
- Corriemoillie Wind Farm Breeding Bird Survey Report (2021)[v]
- Lochluichart Wind Farm Extension II Grid Connection Surveys (2021)[vi] [vii].
- Loch Luichart Wind Farm - Comparison of ornithological survey data collected between 2014 and 2018[viii]

- Confidential Report on the Monitoring of Red Throated Divers at Lochluichart Wind Farm in 2019[ix]; and
- Galbraith., C. (2020) Confidential Report on the Monitoring of Red Throated Divers at Lochluichart Wind Farm in 2020[x].

3.37. Information received from third parties is subject to confidentiality agreements and so cannot be made publicly available. Full copies of reports received and reviewed are however presented within **Confidential Appendix 3.D** and which will be provided to THC and NatureScot. Key information is summarised below and in **Confidential Appendix 3.B** and **Confidential Figures 3.4-3.5** and **3.12-3.15**.

3.38. It is understood that the third-party reports referenced herein and within the EIA Report have been made available to NatureScot in the context of the developments to which they apply.

Ornithology Field Surveys 2021

3.39. A summary of field surveys undertaken for the Consented Development is included in **Chapter 11: Ornithology** of the EIA Report.

3.40. The following updated ornithology field surveys were completed between February 2021 and March 2022 in response to advice received from NatureScot and RSPB:

- Flight Activity Surveys (February 2021 to February 2022 inclusive);
- Moorland Breeding Bird Survey (May to August 2021 inclusive);
- Breeding Black Grouse Survey (April 2021); and,
- Breeding Raptor Searches (April to August 2021 inclusive and February and March 2022).

3.41. Surveys were undertaken in accordance with current NatureScot guidance[iii], and by experienced and professional ornithologists.

3.42. Survey effort for breeding bird surveys was curtailed on the basis of coverage by ongoing operational monitoring for the Operational Schemes and Corriemoillie and baseline survey work being carried out for the s37 Application (see **Figures 3.1** and **3.2**). This was to minimise surveyor presence within the study area and avoid the potential for disturbance to sensitive species.

3.43. Any deviations from recommended guidance are discussed in **Section 3.79** to **3.87** below.

3.44. Detailed survey methodologies are provided in **Appendix 3.A**.

Target Species

3.45. Target species identified for survey and recorded comprised those previously denoted for the Proposed and Consented Developments, including Schedule 1 and Annex 1 bird species.

3.46. Further details are provided in **Chapter 11: Ornithology** of the EIA Report.

Flight Activity Surveys

3.47. Full details of the methods used for flight activity surveys are given in **Appendix 3.A**.

3.48. Flight Activity Surveys between February 2021 and February 2022 were undertaken from a single VP location (VP2 used during baseline surveys for the Consented Development). This provided full visual coverage of the required VP study area for the Proposed Development in accordance with NatureScot guidance[iii], defined as a 500m buffer around the proposed turbine locations, as illustrated in **Figure 11.1** of the EIA Report.

3.49. The following height bands used were to assign target species flight activity "at", "below" or "above" collision risk, based on the candidate turbine specification:

- HT1 0-10m;
- HT2 10-25m;
- HT3 25-150m and,
- HT4 >150m.

3.50. A total of 87 hours of observational effort was conducted at VP2 between February 2021 and February 2022, split between a single breeding and non-breeding season. This includes minimum observational effort defined in NatureScot guidance[iii], with additional effort afforded during the golden eagle display periods in 2021 and 2022.

3.51. Survey effort in hours completed at VP2 is summarised in **Table 3.1**.

Table 3.1: VP Survey Effort 2021/2022.

VP	2021											2022		Total
	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	
VP2	6	12	9	6	6	-	12	6	-	12	6	2	10	87

3.52. Survey times were dispersed throughout the day, and completed in a range of weather conditions. Detailed survey timings and conditions are provided in **Appendix 3.A**.

Moorland Breeding Bird Survey

3.53. A moorland breeding bird survey was undertaken in the late-spring and summer of 2021. The methodology employed was based upon an adapted Brown and Shepherd (1993)[xi] methodology in accordance with NatureScot guidance (SNH, 2017)[iii] and comprised three staggered visits between May and August (see Limitations; **Section 3.79** to **3.58**).

3.54. The study area comprised all suitable open moorland areas of the Site, and out to 500m of the Site boundary (see **Figure 11.4** of the EIA Report).

3.55. Direct access to parts of the study area within the Corriemoillie estate and covered by surveys for the s37 Application was curtailed, for reasons detailed above.

Breeding Black Grouse Survey

3.56. A survey for black grouse lek sites was undertaken in April 2021 with reference to species-specific survey methodologies outlined in Gilbert *et al*. (1998)[xii] in accordance with NatureScot guidance[iii].

3.57. The study area included all areas of suitable habitat (e.g., open moorland, woodland edges and tracks) within the Site and within 1.5km (see **Figure 11.5** of the EIA Report).

3.58. Direct access to parts of the study area within the Corriemoillie estate and covered by surveys for the s37 Application was curtailed, for reasons detailed above.

Breeding Raptor and Diver Searches

3.59. Searches for breeding raptors, and additionally extended to record divers, were undertaken between April and August 2021 with reference to species-specific survey methodologies outlined in Hardey *et al*., (2013)[xiii] and Gilbert *et al.* (1998)[xii], in accordance with NatureScot guidance.

3.60. Further searches, specifically for evidence of breeding golden eagle were also undertaken in February and March 2022, in response to advice received from NatureScot (see **Table 3.0**)

3.61. Searches comprised a combination of walkover surveys and scaled-down VP watches over areas of suitable habitat features within a 2km radius of the Site, extended beyond this for golden eagles where access allowed (see **Figure 3.3**). This included checking a known eyrie location within the 6 km buffer of the Site, following distant observation to establish there were no signs of occupancy.

3.62. Direct access to parts of the study area within the Corriemoillie estate and covered by surveys for the s37 Application was curtailed, for reasons detailed above.

3.63. On the basis of a data sharing agreement, the results of breeding raptor and diver searches undertaken in 2021 and 2022 have therefore been supplemented by species-monitoring information from:

- HRSG;
- Ornithology surveys undertaken to inform the Lochluichart Wind Farm Extension II s37 Application in 2021 (see Appendix 3.D);
- Corriemoillie Wind Farm Monitoring 2021; and,
- Lochluichart Wind Farm Monitoring 2021.

3.64. This is considered to provide a comprehensive account of the breeding status and distribution of breeding raptors and divers within study areas for the Proposed Development, in accordance with NatureScot guidance.

3.65. Detailed survey effort is presented in **Appendix 3.A**, with further details of breeding diver surveys provided in **Appendix 3.B**.

Assessment Methodology and Significance Criteria

3.66. Updated impact assessment has been undertaken, where appropriate, using the assessment methodology and significance criteria in accordance with CIEEM guidelines (2018)[i], and described in full in **Chapter 11: Ornithology** of the EIA Report.

3.67. In line with the principles of proportionate EIA the assessment concentrates on the potential for significant effects rather than all effects. A 'significant effect' is defined as an effect that either supports or undermines biodiversity conservation objectives for 'important ornithological features' or for biodiversity in general at an appropriate geographic scale.

3.68. The updated assessment contained herein therefore compares assessment conclusions presented within the EIA Report, and where necessary on the basis of updated baseline survey and desk study data, provides an updated assessment of effects, including stating whether previously predicted effects would be more, less or the same as for the Consented Development.

Collision Risk Analysis

3.69. Where sufficient "at collision risk" flight activity of target species was recorded during updated flight activity surveys (February 2021 and 2022), collision risk analysis following Band *et al*. (2007)[xiv], as recommended by NatureScot[iii], has been undertaken.

3.70. "At collision risk" flight activity, is defined in line with NatureScot guidance (SNH 2005)[xv], as flights which occurred within 200m plus the blade length of proposed turbine locations and at collision risk height.

3.71. In accordance with NatureScot guidance (SNH, 2005) "at collision risk" flight activity for the Proposed Development, would equate to those target species flights which occur within 268m of proposed turbine locations and at 13.9m-149.9m.

3.72. For the purposes of analysis, all target species flights recorded in height bands 2 and 3 (10-150m) and within 275m of proposed turbine locations have been identified as being "at collision risk". As such, collision risk estimates are considered slightly precautionary.

3.73. It is also important to note that collision mortality risks predicted as part of wind farm impact assessments do not represent actual or accurate mortality estimates. Rather they are an assessment tool and provide an index of collision risk associated with a development, upon which a reasonable conclusion on population levels effects can be drawn using professional judgement and evidence from literature and other data sources.

3.74. For further discussion see **Appendix 3.A**.

Assessment of Cumulative Effects

3.75. Cumulative effects have been assessed with reference to NatureScot guidance (2012[xvi] and 2018[xvii]) for ornithological features subject to a detailed assessment. The assessment is based on the consideration of residual effects i.e., assuming that proposed mitigation measures (where relevant) are implemented. Features with predicted negligible magnitude residual effects are not considered in the cumulative assessment.

3.76. In accordance with the approach taken for the Consented Development and the adjacent Proposed Kirkan Wind Farm (in planning), the cumulative assessment includes consideration of:

- existing wind farm developments, either built or under construction;
- approved wind farm developments, awaiting implementation; and,
- wind farm proposals awaiting determination within the planning process with design information in the public domain.

3.77. Where these occur within a 10km Zone of Influence (ZoI) of the Proposed Development (i.e. the maximum core foraging range of important ornithological features, as per NatureScot guidance (2016)[xviii]). With regard to the spatial extent of the cumulative assessment, NatureScot guidance (2012[xvi] and 2018[xvii]) recommends that cumulative effects should typically be assessed at the relevant Regional NHZ scale, unless there is a reasonable alternative. In consideration of NatureScot and RSPB's comments on the EIA Report and Draft FEI, consented and operational wind farms within NHZ7 are also considered where appropriate documentation is available to inform the assessment.

3.78. NatureScot guidance (2012)[xvi] recognises that access to relevant data for other developments may be limited and therefore a meaningful assessment of cumulative effects is not always possible. Relevant data for many of the wind farm developments located within NHZ7 is unlikely to be readily available, and so the results of any cumulative assessment at the NHZ scale, based on incomplete data, may not allow any meaningful conclusions to be drawn and should be treated with caution. Work required to obtain sufficient data for robust cumulative assessment would be disproportionate to any potential increase in effects associated with the Proposed Development, particularly in the context of the future baseline and the scale of the Proposed Development.

Limitations

3.79. Direct access to parts of the study areas within the Loch Luichart Estate, including those within the Site, was restricted periodically throughout the year on account of ongoing estate management activities (including shooting).

3.80. As such, this limited the number of days with appropriate weather conditions that were available for moorland breeding bird survey visits. It was therefore not possible to schedule four visits in appropriate weather conditions within that period as stipulated within current NatureScot guidance. Three visits were however carried out, with the last visit taking place in early August.

3.81. The results obtained from the moorland breeding bird survey are in line with the assemblage and distribution of species that would be expected for the study area, based on the observations and results of other surveys undertaken within this period, and also with those of previous years. The inability to complete a fourth visit is therefore not considered to compromise the results or the validity of the conclusions drawn from them. Particularly as works for the Proposed Development (a tip height extension only) will not cause additional construction or operational phase disturbance over and

above that for the Consented Development, for which it is accepted there will be no significant effects on breeding bird species.

3.82. Similarly, access restriction during periods of suitable survey weather meant that no VP survey hours were carried out in July or in October 2021. Survey effort for these months was caught up in subsequent months; however, months where no VP survey hours were carried out have been excluded from the collision risk model to avoid including daylength for months where no birds could have been seen, and so skewing the dataset.

3.83. As detailed and on the basis of data sharing agreements between the applicant, Eneco and EDF Energy, direct access to parts of the study areas within the Corriemoillie Estate and those covered by operational monitoring for the Operational Schemes and baseline studies for the s37 Application in 2021 was curtailed. This was in order to minimise surveyor presence and potential for unnecessary disturbance to sensitive breeding species in accordance with NatureScot guidance.

3.84. During raptor searches in 2021, no survey access was granted to land on adjacent estate landholdings. Suitable habitat features were however scanned from appropriate vantage points within the Site and on public roads and rights of way to detect activity and likely breeding locations for key species.

Justification for Survey Approach

3.85. It is considered that the updated survey work undertaken in 2021/2022 is sufficient to evidence any change in baseline conditions for key target features at the Site since the previous survey work undertaken in 2015-2016, and further is proportionate to the scale of the Proposed Development when the Consented Development is considered.

3.86. As such the baseline data used for assessment is considered to be robust and in line with NatureScot guidance[iii], which states:

"In recognition of the wind farm industry moving into more sensitive bird areas, including locations potentially impacting on the qualifying interests of designated sites, two years survey will be required unless it can be demonstrated by the developer that a shorter period of survey is sufficient."

3.87. The Proposed Development and surrounding area, containing a complex of wind farms comprising Lochluichart, Lochluichart Extension, Corriemoillie and Kirkan (in planning), has been the subject of regular survey and monitoring work since baseline surveys for Corriemoillie commenced in 2009. The results of this survey work and the baseline surveys conducted for the Consented Development, have identified the following key impacts which require consideration at the Proposed Development:

- Collision risk to golden eagle and red-throated diver during the breeding season;
- Disturbance to/displacement of breeding red-throated diver;
- Disturbance to/displacement of breeding greenshank; and
- Disturbance to/displacement of breeding black grouse.

3.88. The principles of proportionate EIA state that EIA should concentrate on significant effects rather than all effects[i]. As such, survey effort needs only be sufficient to detect the potential for significant effects, not all effects. There is no evidence to suggest that high densities of target species are using the airspace over the Operational Schemes and Corriemoillie at any time throughout the year, and no adverse effects have been predicted or recorded as a result of the construction and operation of any of these wind farms to date.

3.89. Golden eagle are known to breed in the wider area and flights have regularly been recorded during surveys for the Operational Schemes and Corriemoillie, particularly along the ridge that runs north-south to the west of these schemes (see **Appendix 3.D**). Flights in the collision risk zone have previously not been sufficiently numerous to justify undertaking collision risk modelling for this species. It is considered that the principal justification for two years of survey is to increase the chances of detecting activity which may be missed during a single year of surveys due to inter-annual variation in presence or abundance of target bird species, and variation in biotic and abiotic factors which may influence bird distribution such as prey availability or weather conditions. Updated VP surveys in 2021/2022 have been designed to maximise the likelihood of detecting activity by golden eagle; surveys commenced in February to detect display flights, and an increased number of survey hours to that recommended in guidance[iii] was undertaken during periods when golden eagles are known to be most active. The data collected has detected an increase in flight activity in 2021/2022 compared to the baseline surveys for the Consented Development, and this has allowed collision risk modelling for this species to be conducted. As such, given that bird presence in specific locations is highly variable year on year, a second year of survey in addition to the extensive historic data for this location is unlikely to provide substantively differing results, and so is not considered to be proportionate to the likely risks associated with the Proposed Development. For further discussion of collision risk to golden eagle, see **Section 3.224** to **3.228** below.

3.90. Divers follow regular flight paths, and while there may be occasional flights over other areas these are not at high density. These flight paths in the area are well-known (see **Confidential Figure 3.4**), and diver corridors have been incorporated into the design of the Proposed Development, Operational Schemes and Corriemoillie. Very few flights of red-throated diver have historically been recorded in the collision risk zone for the Proposed Development, and so it is considered that a second year of VP surveys overlooking the Proposed Development will not add substantively to the available survey data for this species.

3.91. Breeding locations and densities of species may vary considerably year on year. Regular breeding locations of sensitive species are well known via the survey work undertaken to date, and updated by surveys in 2021 to allow an up-to-date assessment of disturbance impacts to be carried out. Embedded mitigation and good practice, including pre-construction surveys to identify specific breeding locations in use at that time, will be employed during construction and operational maintenance activities to prevent disturbance to

breeding birds, and as such it is not considered that a further year of baseline breeding bird surveys is necessary to assess impacts to sensitive breeding species at the Site.

3.92. Based on known current and historical conditions at the Site, and the knowledge regarding behaviour of the key species present the likelihood that a second year of ornithology survey would detect sufficiently different results to change the likely outcome of the impact assessment to one of significant adverse effects is negligible. As such, given the scale of the Proposed Development (a 16.9 m tip height extension to the Consented Development) and the extensive existing data available on which to base impact assessment conclusions it is considered that one year of ornithology survey of the Proposed Development area is sufficient to capture the data relevant to the potential effects of the Proposed Development and is proportionate to the likely risks associated with the Proposed Development.

Baseline Conditions

Desk Study

3.93. The HRSG provided details of two known golden eagle nest sites within 10km of the Proposed Development, associated with two occupied territories (see **Confidential Figures 3.5** and **3.9**).

3.94. Information relating to a historical peregrine eyrie located >2km from the Site was also returned, with no breeding data reported for the location since at least 2003.

3.95. The HRSG did not hold any records of any additional species within 2km of the Site.

3.96. As part of a data sharing agreement between the Applicant, EDF Energy and Eneco, the most recent monitoring reports for the Operational Schemes and Corriemoillie have been made available and reviewed for the purposes of assessment. Survey reports and data for the s37 Application has also been reviewed.

3.97. Reports and information provided as part of the data sharing agreement are considered confidential, and will not be made publicly available. Full copies of monitoring reports provided are however, presented in **Confidential Appendix 3.D**, which will be made available to THC and NatureScot.

3.98. Relevant information is however summarised where practicable below.

Lochluichart Wind Farm – Ornithological monitoring 2011-2021

3.99. Ornithological surveys as part of pre-construction, construction and operational monitoring for the Lochluichart Wind Farm has been undertaken between 2011 and 2021, with the wind farm becoming operational in 2014.

3.100. Surveys have included those for moorland breeding birds (wader, passerine and grouse species), breeding red-throated divers and raptors.

3.101. In summary surveys have recorded the breeding presence and distribution of the following species between 2014 and 2021:

- red-throated diver;

- golden plover, greenshank, common sandpiper, snipe and dunlin.

3.102. Flight activity of osprey, merlin, red kite and golden eagle were also recorded however, no breeding evidence of these species was found.

3.103. Further details of species accounts are provided below.

Red-throated diver

3.104. Breeding locations of red-throated diver are considered sensitive and confidential. The presence and productivity of red-throated divers within proximity to the Proposed Development, as derived from operational monitoring for the Lochluichart Wind Farm, is therefore detailed within **Appendix 3.B**.

3.105. **Appendix 3.B** will not be made publicly available, but will be provided to THC and NatureScot.

Golden eagle

3.106. Operational monitoring for the Lochluichart Wind Farm between 2014 and 2018 (NRP, 2019)[viii] reports the presence of one occupied golden eagle territory, with an alternative nest site located within 6km of the wind farm site. As identified in consultation with the HRSG, the pair's main nest site is located >7km from the wind farm site and the pair have attempted to breed between 2015-2018, successfully raising a chick in 2018.

3.107. This territory was checked during surveys carried out for the Proposed Development in 2021, and is also one of the two territories the HRSG provided information on within 10km of the Proposed Development during consultation in March 2022.

3.108. During operational monitoring between 2014 and 2018, golden eagles, assumed associated with this territory, appeared to use the area in the vicinity of Operational Schemes infrequently, primarily utilising the ridgeline west of the operational turbines and the Proposed Development.

Greenshank

3.109. Operational monitoring for the Lochluichart Wind Farm (NRP, 2019)[viii] between 2014 and 2018, reports the annual presence of a single greenshank territory within the study area.

3.110. Incidental observations made during monitoring in 2019 and 2020 have also continued to record the presence of greenshank within the wind farm, with three pairs recorded close to lochs on the site in 2019[ix] and 2020[x].

3.111. Earlier surveys[viii] report that birds were similarly recorded feeding at most waterbodies within the study area however, nominal territory centres have been located around the perimeter of the study area, particularly along the eastern edge inside the Corriemoillie estate

3.112. Operational monitoring for the Lochluichart Wind Farm[viii] reports that there has been no observed difference in numbers of greenshank recorded breeding within the wind farm study area used for the operational monitoring compared to the control area located *c*. 3km to the west since commencement of operation.

Golden Plover

3.113. The Operational Scheme's monitoring report[viii] states that there is no significant difference between the number of golden plover territories at the wind farm site and the control site, suggesting that the presence of turbines is not affecting the overall density of breeding golden plover at the operational wind farm over the five-year monitoring period since the commencement of operation.

3.114. Some local redistribution of the nesting birds was seen in the early post-construction period, but since 2016 golden plover have begun to return to areas where they nested prior to the construction of the turbines and to use breeding territories between turbines. Over the years since construction the disturbed habitat has recovered and golden plover appear to have habituated to the presence of turbines. Breeding territories have been recorded closer to turbines and golden plovers appear to be reusing the areas between turbines.

Corriemoillie Wind Farm - Operational Monitoring 2016-2019

Monitoring 2009 to 2021

3.115. **Table 3.4** below provides a summary of the key breeding bird results from previous ornithological surveys at Corriemoillie, summarised from the 2019 and 2021 Operational Breeding Bird Survey Reports[iv] [v]. This includes the Breeding Bird Surveys completed throughout 2016-2018 and in 2021 by Nevis Environmental, pre-construction surveys completed in 2015 by Ecology Consulting and surveys carried out between 2008 and 2010 to inform the Environmental Statement (ES).

Table 3.4: Number of territories recorded for key bird species at Corriemoillie Wind Farm since 2009

Phase	**Baseline**		**Pre-con**	**Operational**				
Species	**2009**	**2010**	**2015**	**2016**	**2017**	**2018**	**2019**	**2021**
Greenshank	3		3	3	4	12	3	2
Golden plover	3		4	2	3	2	2	2
Snipe				2	4	7	5	2
Red throated diver	2		2	1	1	2	1	1
Black grouse	1	1	3	3	3			7

3.116. A substantial increase in wader, particularly greenshank, territories is apparent between 2016 and 2018, a trend attributed to the increased openness and wetness of the site following forestry felling for the wind farm. Greenshank continue to breed within the operational turbine area. In 2021 it was noted that wader numbers have started to decline since the tree cover of the forestry restocking has increased, but that the increase in young sapling has apparently benefitted black grouse for which they are a favoured food source. It is considered likely that populations of waders will remain stable at the current low levels until the plantation has grown considerably

taller, and that black grouse numbers within Corriemoillie are likely to be maintained until the thicket stage is reached, and then decline.

3.117. Information regarding breeding red-throated divers is included in **Confidential Appendices 3.B** and **3.D**.

Lochluichart Wind Farm Extension II s37 Grid Connection Application

3.118. The 2021 survey area for the grid connection route significantly overlaps the ornithology study areas for the Proposed Development. The survey area also overlaps with operational monitoring areas for the Lochluichart and Corriemoillie Wind Farms.

3.119. Data collected by Nevis Environmental in 2021 has comprised:

- VP Survey;
- Breeding Diver Survey;
- Raptor Survey;
- Black Grouse Survey; and,
- MBBS Survey.

3.120. A summary of the key results of these surveys of relevance to the Proposed Development is provided below and in **Figures 3.12 – 3.15**.

3.121. Information regarding breeding red-throated divers is included in **Confidential Appendices 3.B** and **3.D**. These will not be made publicly available, but will be provided to THC and NatureScot.

3.122. The viewshed from VP1 for the grid connection route provided some coverage of the Proposed Development. Flights were recorded across the Proposed Development, including two red-throated diver flights heading north across the Site toward Loch Glascarnoch, and one golden eagle flight; as such, recorded flight activity of target species within the Site was very low.

3.123. Several likely territories were also recorded for greenshank within and between the operational wind farms (see **Confidential Figure 3.14**).

3.124. A total of seven black grouse leks were identified (see **Confidential Figure 3.15**). Four black grouse lek locations were recorded within the Site, corresponding with locations recorded during the 2015 and 2021 baseline surveys for the Proposed Development. The lek recorded in 2021 at Sail Odhar Bheag, within the 1.5km buffer in Corriemoillie was also recorded during the grid surveys, along with an additional lek location in the 1.5km buffer to the east of Corriemoillie Forest.

<u>2021/2022 Field Surveys for the Proposed Development</u>

3.125. Detailed field survey results are presented in **Appendix 3.A**. Results pertaining to red throated diver are presented in **Confidential Appendix 3.B** and on Confidential **Figures 3.4, 3.11 and 3.14**.

Flight Activity VP Surveys

3.126. Flight activity recorded remains overall very low, with a total of only 51 flights recorded during 87 hours of survey effort between February 2021 and February 2022 inclusive.

3.127. The majority of flights recorded (36) were of golden eagle which were present and recorded throughout the survey period. Golden eagle flight activity was predominantly recorded over the ridge to the west of the Proposed Development (see **Figure 3.6a** and **b)**, and included flights of a pair, of a juvenile towards the end of the breeding season, and a territorial encounter during the non-breeding season.

3.128. It is considered likely that activity recorded comprises that of birds associated with the occupied territory to the west of the Proposed Development, (see Figure 3.9).

3.129. Additional target species recorded included golden plover, whooper swan, pink-footed goose, greylag goose, white-tailed eagle, hen harrier, merlin and red kite.

3.130. Full details of species recorded during VP surveys are provided in **Appendix 3.A**.

3.131. A summary of "at collision risk" flight activity recorded between February 2021 and February 2022 is presented in **Table 3.5** below.

Table 3.5: Summary target species flight activity at PCH within the CRW.

Species	Occupancy	No. of Flights	No. of Birds	Time (s)
Golden eagle	Breeding	3	5	2,944
Golden eagle	Non-breeding	2	2	687
Golden plover	Breeding	1	1	25

Collision Risk Analysis

3.132. With the exception of golden eagle, no other target species had >1 "at collision risk" flight, none of which included large groups of birds. As such, in the absence of detailed analysis, it can reasonably be concluded that collision risks to target species is very small and would not result in significant mortality estimates at any species population level.

3.133. On the basis of flight activity recorded between February 2021 and 2022 (five "at collision risk" flights), an analysis of collision risks to golden eagle has however been undertaken.

3.134. Full details of the analysis are presented in **Appendix 3.A**.

3.135. Target flights from April 2015 to March 2016 are presented within **Table 11.8** of **Chapter 11: Ornithology** of the EIA Report. There were insufficient "at collision risk" flights (i.e. <3) within this period to justify carrying out collision risk modelling for any species.

Moorland Breeding Bird Survey

3.136. In 2021, the study area was found to support an assemblage of upland and lowland moorland and woodland passerines considered typical of the locale and habitats present. This included breeding territories of four wader species: greenshank, golden plover, common sandpiper and ringed plover.

3.137. Passerine species are not generally considered to be targets for wind development proposals, and so these species are not considered further in this FEI.

3.138. A summary of target species recorded within a 500m radius of the Site is provided in **Table 3.6** and in **Figures 3.7** and **3.10**.

Table 3.6: Numbers of territories for key breeding bird species recorded in the Study Area during MBBS in 2015 and 2021.

Species	2015	2021
Golden plover	3	3
Greenshank	2	3
Snipe		1
Common sandpiper		1
Ringed plover		1
Black grouse		2 (these locations also noted during black grouse survey)
Little grebe		1
Teal		1
Mallard		2

3.139. Of the 2021 records, only the two black grouse and two of the greenshank records were from within the Site (see **Figures 3.7** and **Confidential 3.10**), with the others all recorded in the 500m buffer. There were also records from outwith the 500m buffer of a greenshank territory, a golden plover territory, a red-throated diver territory (adult with chick sighted in August) and a teal territory.

Breeding Black Grouse Survey

3.140. A minimum of five separate lek locations supporting at least 13 males were recorded within the black grouse search area (Site plus 1.5km buffer) in 2021, a minimum of two of which were within the Site (see **Figure 3.3**).

3.141. This represents a considerable increase in numbers of this species at the Site compared to 2015 when a single black grouse lek location, supporting a maximum count of two lekking males, was recorded within the Site.

3.142. The locations of the records of lekking black grouse are shown in **Figure 3.8** and in **Confidential Figure 3.15**. Note that the records shown relate to

black grouse recorded lekking on different dates, and so for satellite leks may be the same birds lekking in slightly different locations (outwith the main leks, lekking birds may move precise lek locations by several hundred metres day to day).

Breeding Raptor and Diver Searches

3.143. No evidence of breeding Schedule 1 raptors was recorded within the survey area during breeding raptor searches in 2021. Flight activity recorded during flight activity surveys did however suggest that the Site is likely to be within the home range of a pair of golden eagles, breeding within proximity to the Site.

3.144. An immature golden eagle was also recorded hunting during raptor searches in June.

3.145. Observations were made at a known golden eagle nest site *c*. 4km to the north west of the Site boundary (*c*. 6km from the nearest turbine location) but there was no evidence of use in 2021.

3.146. Flight activity of golden eagles, recorded during February 2021 to February 2022, are presented on **Figure 3.6a and b,** and the eyrie location checked is shown on **Confidential Figure 3.9**.

3.147. During raptor surveys undertaken in February and March 2022, activity of golden eagle, including regular sightings of a pair, display flights and mating were observed within the study area. Observations were made over, suitable eyrie habitat within the west of the study area (see **Confidential Figure 3.9**) however, no evidence of breeding occupancy could be identified.

3.148. Subsequent consultation with the HRSG was therefore undertaken and which identified an occupied territory >6km from the Site.

3.149. The breeding behaviour observed in 2022 corresponds to the location of both flight activity recorded during 2021, and a nest location outwith the 6km buffer of the Proposed Development as advised by the HRSG, and so is considered to relate to this territory.

3.150. For further details see **Figure 3.6** and **Confidential Figures 3.5** and **3.9**.

3.151. Information regarding breeding red-throated diver results is provided in **Confidential Appendix 3.B**.

Future Baseline

3.152. The Proposed Development is for an extension of tip height by 16.9 m to an already consented development (Highland Council Planning ref: 19/01284/FUL). Therefore, in the absence of the Proposed Development, the future baseline for the Site is the Consented Development, as described below.

3.153. The Consented Development comprises a five-turbine extension to the existing Operational Schemes, with the five turbines arranged in an east-west line along the northern edge of the Operational Schemes and Corriemoillie, in the same locations as for the Proposed Development (see **Figure 3.0**). The Consented Development also includes ancillary infrastructure including new tracks, substation and control buildings, crane

hard standings and borrow pits, also in the same locations as for the Proposed Development.

3.154. The consented turbines are 133 m high to tip and so will have slightly smaller foundations and laydown areas than those for the Proposed Development.

3.155. In all other respects in terms of habitat loss and land use, the future baseline for the Site over the next 40-year period is the same as that described under the Proposed Development herein and in EIA Report **Chapter 3: Description of the Proposed Development**.

Embedded Mitigation and Scheme Design Evolution

3.156. Full details of the scheme design evolution and embedded mitigation measures are detailed in **Chapter 3: Description of the Proposed Development** of the EIA Report, with a contextual summary provided in **Chapter 11: Ornithology**.

3.157. As this report is provided as FEI to the EIA Report, as stated in **Section 3.7**, information contained in the main body of the EIA Report is not repeated here. However, further information to address consultee comments in relation to the draft submission of this report in November 2021 is included here as appropriate.

Construction Environmental Management Plan (CEMP) and Breeding Bird Protection Plan (BBPP)

3.158. As stated in Paragraphs 12.266 to 12.269 of **Chapter 12: Ornithology** of the EIA Report, measures to prevent a breach of legislation pertaining to breeding birds, are included in the Proposed Development and will be implemented under the CEMP.

3.159. This includes timing of works likely to lead to disturbance such as vegetation clearance and borrow pit blasting, to avoid the core breeding bird season and pre-clearance and pre-construction surveys to identify any breeding locations within a ZoI of works. Commitment is made in **Chapter 3: Description of the Proposed Development** of the EIA report to an Environmental Clerk of Works (ECoW) being present on Site to oversee correct implementation of agreed commitments.

3.160. A BBPP or similar is committed to in **Chapter 3: Description of the Proposed Development** of the EIA Report, and **Chapter 11: Ecology** states that this will be drawn up in consultation with NatureScot. This will include any necessary measures to prevent disturbance to key ornithological species such as black grouse, greenshank and breeding raptors during the construction phase, and will be overseen by the ECoW.

Habitat Management Plan (HMP)

3.161. A commitment to a HMP is included in **Chapter 3: Description of the Proposed Development** of the EIA Report. It is proposed that this will be produced post-consent in consultation with NatureScot and subject to appropriate planning condition, and will include proposals for management of habitats across the Site to benefit key ornithological features, and subsequent monitoring to measure the effectiveness of these works and

allow adaptive management. The focus of enhancement measures to be proposed under the HMP will be black grouse and greenshank, and where possible these will be designed to complement the aims of management and monitoring plans in place for the Operational Schemes.

Important Ornithological Features

3.162. An updated summary of important ornithological features, based on results of the 2021/2022 updated ornithology survey work, is provided in **Table 3.7** below. The level of importance assigned to each species is based upon 2021/2022 baseline survey results and, for the purpose of consistency for wind farm development at this locale with reference to EIA documentation for the Consented Development, Operational Schemes and Corriemoillie.

Table 3.7: Summary of important ornithological features.

Ecological Feature	Importance
International	N/A
National	N/A
Regional	Greenshank Golden eagle Red-throated diver Black grouse
Local	Greylag goose Golden plover Red kite Hen harrier Osprey Merlin All other Red-listed BoCC species. All other commoner raptors, passerines and waders.

Ornithological Features Scoped out of Detailed Assessment

3.163. Ornithological features assigned 'Local' importance have been scoped out of detailed assessment on the basis of their established presence in numbers of very low importance, low levels of activity recorded during baseline surveys (**Appendix 3.A**) and/or as they are not considered a priority for assessment in accordance with NatureScot guidance[ii], given their generally accepted low sensitivity to wind farm developments.

3.164. This includes golden plover for the purposes of this assessment, which operational monitoring for the Operational Schemes and Corriemoillie has demonstrated breeding populations at the locale have not declined as a result of the construction and operation of these developments[viii] [v].

3.165. Black grouse, which were present in only locally important numbers in 2015, are considered Regionally important in the context of this FEI due to increased numbers being recorded at the Proposed Development in 2021.

3.166. Species assigned 'Regional' importance in the EIA Report but which were not recorded at the Site during updated ornithology surveys 2021/22, or for which there will be no change to the outcome of the assessment contained in the EIA Report for the Proposed Development namely hen harrier, osprey, merlin and red kite, are assigned Local value in the context of this updated assessment and are not discussed further in this FEI.

3.167. As all wild birds and their nests are protected under the provisions of the Wildlife and Countryside Act 1981 (as amended) mitigation measures are however, outlined to ensure legislative compliance and protection for the in-use nests, eggs and dependent young of all wild birds.

Potential Effects on Ornithological Features

3.168. The Proposed Development may give rise to potentially significant effects upon ornithological features as a result of:

- Direct habitat loss;
- Disturbance and displacement; and
- Collision mortality.

3.169. An overview of each potential effect is discussed in **Chapter 11: Ornithology** of the EIA Report, with updated relevant context provided below where appropriate.

Direct Habitat Loss

3.170. Overall habitat losses are considered to represent a potentially significant adverse effect upon ornithological features at a Local level only, resulting in small losses in available open moorland habitats, which will remain abundant within the Proposed Development Site, and in the immediate and wider surrounding area. Effects of the availability of potential nesting habitats will be restricted to a small number of breeding waders and passerine species as recorded during baseline surveys, with the exception of greenshank and black grouse, which are discussed further below. While no nesting-suitable habitat for golden eagle will be lost as a result of the Proposed Development, a GET model to assess impacts of habitat loss on territory holding golden eagles is provided in **Appendix 3.C** and summarised below.

3.171. The nest sites of some species listed on Schedule A1 of the Wildlife and Countryside Act 1981 (as amended) are protected at any time. No nest sites of such species (e.g. white-tailed eagle, golden eagle, hen harrier and red kite) were recorded within 2km of the Site during baseline field surveys in 2021, or, are known to be present within a ZoI of the Site in which it could be reasonably expected that there may be potential for an offence to occur.

Disturbance / Displacement

Construction and Decommissioning

3.172. Disturbances to ornithological features are most likely to occur during the construction phase of the Proposed Development, anticipated to last for approximately fourteen months.

3.173. Construction activities are predicted to result in a temporary increase in noise, vibration and human presence within construction areas within the

Site. This has the potential to displace birds from the vicinity of construction areas for the duration of construction works.

3.174. Effects are likely to be greatest during the breeding season (generally between March and August, depending upon the species), but are variable between sites and species.

3.175. Overall construction disturbance is considered temporary and will occur only when construction activities are taking place. Furthermore, construction is not expected to take place over the whole of the Site simultaneously, but within defined working areas, phased over small areas.

3.176. Some species, through their listing on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) (1981 Act), are afforded additional protection, which makes it an offence to intentionally or recklessly disturb the species whilst it is building a nest or is in, on, or near a nest containing eggs or young; and/or disturb its dependent young.

3.177. Should site clearance activities and subsequent construction works be undertaken during the breeding seasons for such species, there is potential for a disturbance offence under the 1981 Countryside Act. Measures to prevent disturbance and so a breach of legislation, such as timing works within published species-specific disturbance distances to avoid active periods, will be included in a BBPP to be agreed in writing with THC prior to the commencement of Site clearance and construction works; see **Section 3.160**.

3.178. Some species as listed on Schedule 1A of the Wildlife and Countryside Act 1981 (as amended) are also afforded further protection from harassment at any time of year. This is relevant to roosting white-tailed eagle, golden eagle, hen harrier and red kite. Roost sites of such species were not recorded during baseline field surveys and are not known to be present within the immediate surrounding area.

3.179. Decommissioning effects are anticipated to be similar to potential disturbance effects identified for the construction phase, being localised and temporary in nature.

Operation

3.180. The operation of turbines and maintenance activities has the potential to cause disturbance and displacement of birds throughout the Proposed Development's operational lifetime.

3.181. In general, most breeding bird populations recover at wind farm sites post-construction, however, there is evidence to suggest that some bird species may be displaced by the presence of operational wind turbines, with the extent of displacement highly variable between species and species-groups (e.g. Pearce-Higgins et al., 2012[xix]).

3.182. Larger birds, often those associated with wide, open spaces with relatively little human activity, are generally more susceptible to displacement effects from operational turbines (e.g. Hötker et al., 2006[xx]). There is little evidence to suggest that passerines (i.e. smaller, perching birds) are displaced by operational wind turbines. Similarly, a review of the effects of wind farms on

upland raptors, primarily involving foraging birds, concluded that in the majority of studies, operational displacement appeared to negligible (Madders & Whitfield 2006[xxi]).

3.183. The extent of displacement from wind turbines on waterbirds and breeding waders are likely to vary, depending on a range of factors including the specification of the development; the topography of the surrounding land; existing sources of disturbance, the habitats affected and the availability of alternative habitats and the species of bird in question (e.g., Drewitt and Langston, 2006[xxii]). Studies have shown that, in general, bird species are not disturbed beyond 500-800m from turbines (e.g., Pearce-Higgins *et al*., 2009[xxiii]) and some species do show a high degree of 'habituation' to operational turbines (Hötker *et al*., 2006[xx]).

3.184. It is therefore not possible to provide a single, standardised 'displacement distance' for all birds or even species groups as evidence is confounding. It is also important to note that a displacement distance, where adopted, should not be interpreted as a 'total sterilisation zone'; rather that it is the distance where no discernible effects can be observed. It is also highly likely that some individual birds will be more tolerant than others and at least some birds will continue to utilise habitats within a closer proximity to operational turbines.

Collision Mortality Risk

3.185. Collision or interaction of a bird with operational turbine rotors is certain to result in the death or long-term impairment of that bird to survive.

3.186. In addition, the significance of a single collision mortality, will be dependent on relevant population densities, whereby species which typically occur at low densities (e.g., raptors) are more likely to suffer adverse population level effects than species which naturally occur at higher density populations.

3.187. "At collision risk" flight activity of species considered sensitive collision impacts[iii], was very low during Flight Activity Surveys undertaken between February 2021 and February 2022. This comprised one flight of golden plover and five of golden eagle; three of which were the same pair of birds recorded three times during a single survey day in August 2021.

3.188. On the basis of survey results obtained, detailed collision risk analysis has been undertaken for golden eagle. This is discussed further below, with details of the collision risk analysis included in **Appendix 3.A**.

Decommissioning

3.189. Impacts associated with the decommissioning phase of the Proposed Development are considered to be broadly the same as construction phase impacts, requiring the temporary creation of construction compounds to house equipment and machinery and temporary increases in noise and visual disturbance through the presence of vehicular traffic and site staff.

3.190. Subsequently, decommissioning effects are considered alongside construction effects and not exclusively.

Potential Effects in the Absence of Mitigation

3.191. This section identifies the potential effects in the absence of mitigation of the construction, operational and decommissioning phases of the Proposed Development on the following important ornithological features (as summarised in **Table 3.6**):

- Red-throated diver
- Golden eagle
- Black grouse
- Greenshank

Red-throated Diver

3.192. Red-throated diver is listed on Annex 1 of the EU Birds Directive, Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) and is an Amber-listed bird of conservation concern (BoCC[xxiv]).

3.193. In 2006, the national species survey estimated a total of 1,268 breeding pairs of red-throated diver across the 21 regional NHZ areas. The estimated population for NHZ 7 'Northern Highlands' was 39 pairs (Wilson *et al.*, 2015[xxv]).

3.194. In 2021, two breeding attempts were made by red-throated divers within the study area, with one attempt successful in fledging a single chick. (see **Confidential Figure 3.11** and **Appendix 3.B**

3.195. Operational monitoring for the Operational Schemes and Corriemoillie demonstrate that at this location, historically used nesting lochs have remained attractive to red-throated divers, despite the presence and proximity of operational wind farms. Diver flights have been recorded in and around the Operational Schemes and Corriemoillie, indicating that divers continue to use the flight corridors left for them within the design of the existing schemes.

3.196. The layout of the Consented Development and as such that of the Proposed Development has been amended, to ensure that turbine free corridors adopted by the Operational Schemes are retained.

3.197. As such, it is considered that the data collected in 2021 supports the conclusions of the EIA Report presented within **Appendix 11.B**, of Negligible magnitude impacts and so No Significant Effects upon red-throated diver as a result of the Proposed Development, and in combination with the Operational Schemes and Corriemoillie.

3.198. Predicted levels of impact are the same as for the Consented Development.

Golden Eagle

3.199. Golden eagle is listed on Annex 1 of the EU Birds Directive and Schedule 1 and 1A of the Wildlife and Countryside Act 1981 (as amended), is an Amber-listed BoCC, an SBL species and a priority species on the Ross and Cromarty (East) LBAP.

3.200. This species is also the sole qualifying interest of the Glen Affric to Strathconon SPA, located 6.2km to the south of the Proposed Development.

3.201. The closest eyrie within the Glen Affric to Strathconon SPA is 10.5km from the Proposed Development (see **Confidential Figure 3.5**), and so the activity recorded at the Proposed Development is not considered to be related to an SPA pair. Given the location of the Operational Schemes and Corriemoillie between the SPA and the Proposed Development (see **Figure 3.0** and **Figure 11.0** of the EIA Report), and the location of recorded flight data relative to the closest known golden eagle eyrie within the SPA (see **Figure 3.5**, and **Figure 3.6a** and **b**) there is no evidence of linkage with this SPA. This is in accordance with opinion provided by NatureScot in their response to consultation on the Consented Development; in which they acknowledged that for a development in this location, any records are unlikely to be associated with the SPA (**Chapter 11: Ornithology** of the EIA Report).

3.202. The latest national golden eagle survey was completed 2015, and suggested an increase of 15% in the national Scottish population since the previous national survey, to 508 territorial pairs (Hayhow *et al*., 2017[xxvi]). Study regions used in 2015 do not correspond perfectly with the NHZs, however, in respect of the regions of Scotland used to summarise 2015 census results[1], NHZ7 overlaps with Regions 'B', 'C' and 'E' used for the 2015 census (Hayhow *et al*., 2017[xxvi]). The Proposed Development is located in the far south-west 'corner' of the northern moors and flows region (Region 'B'), on the border with the northwest Highlands region (Region 'E') to the west, and is close to the border of 'C' (north-central Highlands). In the northern moors and flows region the proportion of occupied home ranges has increased by 38%, in northwest Highlands by 29%, and in the north-central Highlands by 2%; it is therefore clear that golden eagle populations in the most relevant regional areas are increasing. In 2019, 115 home ranges occupied by pairs were reported by the SRMS from the Highlands, including 26 from Ross-shire (Challis *et al*., 2020[xxvii]).

3.203. Golden eagle were observed on 10 dates during flight activity surveys undertaken between February 2021 and February 2022 (see **Appendix 3.A**), with a total of 36 flights recorded. The majority of flight activity recorded was associated with the ridgeline to the west of the Proposed Development (see **Figure 3.6a** and **b**), consistent with patterns of spatial use reported within operational monitoring for the Operational Schemes. Flight observations included those of single adult birds and those of adult pairs. A juvenile was also recorded in August and an immature bird in November.

3.204. It is considered that all observations of adult birds during the breeding season were likely to be of the same birds and that the flight activity recorded all relates to a single golden eagle territory, located to the west of the proposed development. Other adults, including aggressive territorial encounters, were also noted during the non-breeding season. The majority of all golden eagle flight activity was recorded over the ridgeline to the west of the Proposed Development. During 87 hours of observation, only five "at collision risk" flights were recorded. This demonstrates how little used the Site of the Proposed Development is by this species.

[1] After Brown & Watson (1964), reference included in Hayhow *et al.*, 2017

3.205. Eagle flights were also recorded during raptor surveys in April, June and July 2021 and in February and March 2022, and one flight was recorded across the Proposed Development in early June during VP survey for the grid route (see **Figures 3.9** and **3.12**).

3.206. There is limited suitable nesting habitat within the Proposed Development Site. The open moorland habitats within the Site do offer suitable foraging habitats for the species, and overall the flight data recorded during 2021/2022 shows higher levels of flight activity in the vicinity of the Proposed Development relative to previous years, indicating a likely overlap with the home range of a pair. However, the number and frequency of flights over the Proposed Development remains low and suggests that the Site lies at the outer periphery of an occupied territory.

3.207. On the whole, flights were recorded over the higher ground to the west of the Proposed Development formed by the north-south ridgeline encompassing peaks from Beinn Liath Bheag to Meall Mhic Iomhair, with limited extents of them crossing into the airspace over the Proposed Development; see **Figure 3.6a and b**.

3.208. The species is assigned a value of 'Regional' importance for the purposes of this assessment.

Construction and Decommissioning Phase Impacts

3.209. Updated field surveys and desk studies do not identify any golden eagle nest sites within at least 2km of the Proposed Development. As such, the assessment of construction and decommissioning phase disturbance and displacement impacts presented in **Chapter 11: Ornithology** of the EIA Report remains unchanged. Impacts to golden eagles associated with construction and decommissioning activities of the Proposed Development would be temporary, of no more than Low magnitude at the Regional NHZ population level and Not Significant.

3.210. Predicted levels of impact are the same as for the Consented Development.

Operational Phase Impacts

3.211. Golden eagle flight activity recorded during 2021/2022 VP surveys and the breeding behaviour recorded during the 2022 raptor surveys indicates that the Proposed Development lies at the periphery of a golden eagle home range. This represents a change to baseline conditions presented within the EIA Report, as there has previously been no evidence that habitats within and around the Proposed Development fall within an area regularly used by a golden eagle pair. There is an occasional eyrie located *c.* 4km northeast of the Site (as identified during the baseline surveys for Kirkan Wind Farm), however this was checked in 2021 and was not occupied. The location of a further eyrie 6.8km from the Site (and *c.* 6km from the ridge over which the greatest levels of activity were recorded; see **Figures 3.5, 3.6a** and **b** and **3.9**) was advised by the HRSG in March 2022. This indicates that either:

- An unknown pair has taken up residence and bred somewhere within the ZoI of the Proposed Development; or
- A known pair has extended their range.

3.212. Both of these scenarios suggest that the presence of the Operational Schemes and Corriemoillie has not prevented golden eagle from using the wider landscape around the constructed wind farms, and indeed they have apparently increased their use of this area.

3.213. The baseline surveys for Kirkan Wind Farm, to the east of Corriemoillie, also detected use of the wider area by breeding golden eagle[xxviii]. Two golden eagle home ranges were identified within 6km of the Kirkan project area, one of which (at the location checked during baseline surveys for the Proposed Development; see **Confidential Figure 3.9**) was occupied by a successfully breeding pair in 2018. Thirty-two golden eagle flights were recorded during VP flight activity surveys completed between September 2016 and August 2018 for Kirkan Wind Farm, including those of adult, sub-adult and juvenile birds. A preference for foraging to the far north of the project area was noted for the adult birds associated with the identified occupied home range, and the project area was considered to be of low importance to the identified breeding pair. Operational displacement was predicted to be a permanent, of no more than a Low magnitude effect which would be Non-significant at the Regional NHZ population level in the context of extensive and preferred remaining suitable habitats both locally and regionally for the species. Losses of potential foraging habitat were not predicted to result in reduced breeding success or subsequent abandonment of their range by the pair. There were no objections to the Kirkan Wind Farm application on the grounds of impacts on golden eagle. It is considered that flights recorded to the north of the Site during raptor surveys are most likely to relate to this territory.

Habitat loss and Displacement

3.214. Although there is historically little clear evidence for long-term displacement effects upon golden eagles as a result of operational wind farms (as reviewed by Humphreys *et al*., 2017[xxix]), there is evidence from operational monitoring studies undertaken at Edinbane, Ben Aketil and Beinn an Tuirc Wind Farms that suggests decreased spatial use of habitats at the wind farm during initial years of operation, though noting that some activity through turbine clusters was recorded and there were potential confounding factors which prevent clear conclusions from being drawn. Displacement is further investigated in a recently published paper investigating the response of GPS tagged dispersing juvenile golden eagles to wind farms in Scotland (Fielding *et al*., 2021)[xxx] which is discussed further in the Collision Risk Mortality section below. Their findings suggest that dispersing juvenile golden eagles avoid turbines (meso avoidance) but did not demonstrate avoidance of wind farms *per se* (macro avoidance).

3.215. The continued recording of flights of this species during post-construction monitoring for the Operational Schemes shows that there is no evidence for macro avoidance in this location, and so golden eagle are not being displaced from the wider landscape.

3.216. There will be no direct loss of known or potentially suitable undisturbed nesting habitat for golden eagle as a result of construction and operation of the Proposed Development. Potential direct foraging habitat losses as a result of the proposed Development are also considered minimal in the

context of remaining high quality eagle habitats immediate to the Site and in the wider surrounding area and so within the range of the golden eagle territory.

3.217. A GET model assessment (see **Appendix 3.C** for details) calculates that the extent of 'open' GET 6+ habitat that will be lost to the Proposed Development equates to 78 ha. Based on a small theoretical home range size of 4,000 ha of open GET 6+ habitat (considered to be a conservative estimate given the amount of highly suitable golden eagle habitat in the region; see **Appendix 3.C**), this loss would represent less than 2% of the total GET 6+ habitat included within the golden eagle pair's home range. This is considered to be an insignificant loss of golden eagle habitat arising from the construction and operation of the Proposed Development and it is highly unlikely that the loss would create a significant impact on the extent of habitat used by any breeding pairs. The results of the GET model assessment also show that it is extremely unlikely that there will be a significant impact on dispersing young eagles.

3.218. Overall direct habitat losses would not be considered to affect the perceived quality of the potential foraging range of the assumed breeding pair of golden eagles or result in reduced breeding success or subsequent abandonment by the pair.

3.219. The golden eagle conservation framework (Fielding *et al.*, 2006[xxxi]) identifies favourable conservation status for NHZs as 66% territory occupancy. The current NHZ7 population reported by the HRSG is 56 occupied territories out of an available 90, so 62%. This is also a considerable increase on the 43 occupied territories reported in the published NHZ population (based on data from the 2003 golden eagle census, as included in the golden eagle framework[xxxi]) and shows an improving trend in populations of this species within NHZ7. The information received from the HRSG stated that NHZ7 is not well studied and so it is their opinion that 56 pairs is likely to be an underestimate (Brian Etheridge, pers comm.).

3.220. This is supported by the data from the most recent golden eagle census in 2015 (Hayhow *et al.*, 2017[xxvi]) which detected a 38% increase in the proportion of occupied home ranges for the study region in which the Proposed Development is sited (Region B: northern moors and flows) between the two periods. As described above study regions used in 2015 for the census[xxvi] do not correspond perfectly with the NHZs, but NHZ7 overlaps with Regions 'B', 'C' and 'E' used for the 2015 census, and the Proposed Development sits within 'B'. Home range occupancy of these three regions is as given as follows:

- Region B (northern flows and moors) – 29 out of 40 ranges occupied; 73%
- Region C (north-central Highlands) – 49 out of 72 ranges occupied; 68%
- Region E (northwest Highlands) – 58 out of 63 ranges occupied; 92%

3.221. Therefore, all three of the regions of relevance to the Proposed Development are currently at Favourable conservation status, applying the criteria from

the golden eagle framework[xxxi]. Habitats within the Proposed Development are evidently used to a limited extent by golden eagles, with the majority of the activity concentrated over the ridgeline to the west (see **Figure 3.6a and b**), as would be expected. There is no evidence of this species showing macro-avoidance of wind farms in Scotland and it is considered extremely unlikely that there will be a notable reduction of habitat use outside of the 300 m exclusion zone[xxx] applied to the Proposed Development for the GET model.

3.222. As such, the Proposed Development would not affect the conservation status of golden eagle in NHZ7. Therefore, while displacement is considered unlikely, should any displacement occur, it would be highly localized. As such, all effects are predicted to be no greater than Low magnitude at any spatial scale and Not Significant.

3.223. Predicted levels of impact are the same as for the Consented Development.

Collision Risk Mortality

3.224. A collision risk assessment for golden eagle has been completed using flight activity data from March 2021 until February 2022, which predicts an annual mortality of 0.069 birds. This represents 0.06% of the current Regional NHZ population (advised by the HRSG as 56 pairs; assumed 112 birds)[xxv] and 0.13% of the most recently published Ross-shire breeding population (26 pairs; assumed 52 birds)[xxvii].

3.225. Estimated adult survival rates for golden eagle are stated as 95% (Watson, 1997[xxxii]), which gives a baseline mortality of 5% for adult birds. Assuming a Regional NHZ population estimate of 56 pairs (112 birds)[xxv], the baseline mortality rate in the absence of the Proposed Development would be 5-6 adult birds. The additional estimated annual mortality (0.069 birds) resulting from the proposed development represents a 1.15-1.38% increase in annual baseline Regional NHZ mortality. However, this is likely to be an over-estimate.

3.226. If macro and/or meso avoidance (i.e., avoidance of the whole wind farm or the turbines) is demonstrated, the relevant risk is of displacement rather than collision[xxx]. A single long-term study of potential displacement effects upon the species at the adjacent wind farms of Edinbane and Ben Aketil on the Isle of Skye, suggested the occurrence of displacement on the basis of decrease in spatial use of habitats within 500m of operational turbines during initial years of operational monitoring (Haworth Conservation, 2015[xxxiii]). The flight data which has continued to be recorded at the Operational Schemes since they have been constructed and become operational shows that there is no evidence for macro avoidance in this location, as golden eagles are not demonstrating complete avoidance of the wind farm. However, a recently published paper investigating the response of GPS tagged dispersing juvenile golden eagles to wind farms in Scotland (Fielding *et al.,* 2021[xxx]) found that micro-avoidance (i.e., avoidance of the turbine blades) is not relevant to young Scottish birds as they extremely rarely come close enough to the turbines to need to avoid the blades; there are very few records even within a distance of twice a rotor sweep of the largest turbines. The results of this study support meso avoidance of turbines by juvenile golden eagles, with no

habituation, and currently unpublished data relating to adults (Fielding *et al*., a[xxxiv] and b[xxxv], in press) shows the same trends. i.e. there is no evidence to suggest that adult behaviour differs measurably from that of immatures in relation to avoidance.

3.227. Terrestrial wind farm construction in Scotland began in the late 1990s, and by 2019, 3,760 turbines were operating in 234 wind farms, many in habitat potentially suitable for golden eagles (Fielding *et al*., 2006[xxxvi] and 2021[xxx]). Scotland holds over 1,000 territorial Golden Eagles (Hayhow *et al*., 2017[xxvi]) and substantially more nonterritorial individuals (Whitfield *et al*., 2008[xxxvii]). Despite this potentially high exposure to collision risk, over 20 years only four golden eagle collision fatalities are known of in Scotland (see **Appendix 3.C**). While it is accepted that some collisions may not have been detected or reported, it would be expected that proportionately more fatalities would have been located. Further, there has been a 29% increase in the population of this species in Northwest Highlands between the last two censuses, leading to a change in conservation status to 'Favourable' for this species. This has occurred concurrently with the increase in the number of operational turbines, and so there is no evidence for adverse population level impacts due to collision with turbines.

3.228. Overall collision mortality risks to golden eagle are therefore considered to represent no more than a Low magnitude effect and which would be Non-significant at the Regional NHZ population level.

3.229. This is higher than for the Consented Development, for which no 'at-risk flights' were recorded and so collision risk was considered to be Negligible.

Black Grouse

3.230. Black grouse are a Red-listed BoCC, an SBL species and a priority species on the Ross and Cromarty (East) LBAP.

3.231. The most recently published NHZ breeding black grouse population estimate for the Northern Highlands NHZ comprises 473 lekking males (Wilson *et al*., 2015[xxv]), based on the 2005 national survey.

3.232. At least two separate black grouse lek locations were located within the Site during breeding black grouse surveys in 2021, one of which is likely to correspond to a slightly different location for the lek recorded in 2015. Surveys for the grid route also recorded black grouse lekking at the location where they were found in 2015 (see **Confidential Figure 3.15**), but no birds were detected at that location during baseline surveys for the Proposed Development in 2021. However, a lekking male was heard *c.* 600 m north of that location on 16 April. One lek contained at least one male, and the other contained five males during the survey visit on 16 April 2021. Leks were also recorded in the 1.5km buffer both during baseline surveys for the Proposed Development and also surveys for the s37 Application. No flight activity of black grouse was recorded, with flights for this species typically occurring below collision risk height of operational turbines.

3.233. Given the increase in numbers of this species recorded in and around the Proposed Development, black grouse are considered to be of 'Regional' importance in the context of this assessment.

Construction and Decommissioning Phase Impacts

3.234. In the context of remaining suitable moorland and woodland habitat within the immediate and surrounding area, impacts associated with habitat loss for black grouse as a result of the Proposed Development remain Negligible and Not Significant at the Regional NHZ population level. Predicted levels of impact are the same as for the Consented Development.

3.235. A review of disturbance distances for the species suggests that breeding female black grouse would not be passively disturbed at distances greater than 100 - 150 m and leks would not be passively disturbed at over 500 - 750 m (Ruddock & Whitfield, 2007[xxxviii]).

3.236. With the exception of the lekking black grouse recorded by Nevis Environmental in the 2015 location (see **Figure 3.8** and **Confidential Figure 3.15**), all black grouse lek locations recorded during the 2021 surveys are located in the northern extent of the Site, further away from the proposed turbines and new tracks (see **Figure 3.8**). One new lek location, supporting at least five males, is >1km from any proposed infrastructure and is therefore considered to be beyond the maximum disturbance distance for this species. However, one of the lek locations recorded is at the revegetated site of the previous borrow pit, which may be reused for the Proposed Development, and lekking birds have also been heard within *c.* 200m of the existing access track, which will be used by construction vehicles.

3.237. As such there is potential for black grouse to be disturbed at their lek sites during the construction phase where works are undertaken during this species' peak lekking season. Given the low numbers of black grouse recorded at the leks within a ZoI of infrastructure, works are only considered likely to impact on one to two lekking birds and not a main lek. The potential for disturbance to black grouse would, however, be temporary, with effects greatest where works are undertaken within proximity (i.e., within 750m) to known lek sites during the breeding season. As such, assuming works will be undertaken over the course of at least one breeding season, this has the potential to result in the temporary displacement of males at lek sites identified within 750m of Proposed Development footprint.

3.238. For the purposes of a precautionary assessment, assuming the absence of suitable alternative lek sites within the surrounding moorland, disturbance of black grouse during the construction phase is considered to comprise a Low magnitude but temporary effect, non-significant at the Regional NHZ population level. Although the impact assessment for the Consented Development also predicted disturbance to up to two lekking birds during the construction phase, this was assessed as being of Negligible magnitude. The predicted level of impact is considered slightly greater for this assessment in recognition of there being an increased number of birds recorded within the Proposed Development. However, effects are still predicted to be non-Significant.

3.239. Such effects are however considered unlikely on the basis of the known availability of alternative lek sites locally to which males may displace.

3.240. Embedded mitigation measures, including a BBPP, are proposed to reduce the potential disturbance effects to lekking black grouse over the course of

construction works, to prevent a breach of legislation pertaining to this species (see **Section 3.264** to **3.265**). This will include measures such as controls on timing of works in proximity to known black grouse lek locations during the black grouse lekking season, including borrow pit blasting.

Operational Phase Impacts

3.241. Research into the displacement of black grouse from wind farm site remains limited. There have been several studies into the abundance and distribution of lekking birds at operational wind farm sites however, confounding factors such as habitat management and the lack of pre-construction data place limitations on evidence suggesting displacement effects for the species (Zwart *et al.* 2015[xxxix]).

3.242. The same research also outlines evidence of the species occasional use of areas beneath turbines (Zwart et al., 2015[xxxix]) and confounding factors such as habitat management and the lack of pre-construction data do however, place limitations on evidence suggesting displacement and population level effects for the species (Zwart et al., 2015[xxxix]). Operational monitoring on other wind farm sites has shown populations to remain stable following construction and commencement of operation of the turbines.

3.243. The species, particularly within the Proposed Development is subjected to moderate levels of disturbance as they are present within close proximity to an access track which has been used during the construction of Corriemoillie.

3.244. Whilst displacement effects are therefore difficult to predict with any high degree of certainty, adopting a precautionary approach and assuming the displacement of two lekking males from the Proposed Development, this would equate to a Low Adverse impact and Not Significant at the Regional NHZ population level. Although the impact assessment for the Consented Development also predicted displacement of up to two lekking birds from the operational wind farm, this was assessed as being of Negligible magnitude. The predicted level of impact is considered slightly greater for this assessment in recognition of there being an increased number of birds recorded within the Proposed Development. However, effects are still predicted to be non-Significant.

<u>Greenshank</u>

3.245. Greenshank is listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) and is an Amber-listed BoCC.

3.246. Currently published NHZ population estimates for breeding greenshank include 148 pairs (296 birds)[xxv] within NHZ 7 'Northern Highlands', with 1,297 pairs across the 21 NHZs. As a breeding species, greenshank is typically present within low breeding densities, with rarely more than one pair perkm^2 (e.g. Forester *et al*., 2007[xl]).

3.247. No "at collision risk" flight activity of greenshank was recorded in 2021, and so the assessment of Negligible collision risk is unchanged from the impact assessment undertaken for the Consented Development

3.248. During baseline surveys in 2021, two greenshank territories were recorded within the Site, and a further territory was recorded within the Corriemoillie

site in the 500m buffer *c*. 300m from the territory recorded adjacent to Loch a Mheallain Chaeorainn in 2015; it is likely that this is the same territory and demonstrates that specific breeding locations within territories may change year on year (see **Appendix 3.D** and **Confidential Figures 3.10** and **3.14**).

3.249. Operational monitoring surveys undertaken for the Operational Schemes has recorded the presence of the territory adjacent to Loch a Mheallain Chaeorainn in 2014, 2015, 2016 and 2017. Additionally, one greenshank territory has been recorded each year in 2014, 2015, 2016 and 2018 in the distal control area, *c.* 3km to the west of the Operational Schemes.

3.250. The results of breeding bird surveys undertaken in 2010 to inform Lochluichart Wind Farm Extension and in 2009 and 2010 to inform Corriemoillie are summarised in **Chapter 11: Ornithology** of the EIA Report.

3.251. The two greenshank territories (assumed 4 birds) recorded during breeding bird surveys in 2021 equates to >1% of the Regional NHZ population. For the purposes of this assessment the species is therefore assigned a value of 'Regional' importance.

Construction and Decommissioning Phase Impacts

3.252. It should be noted that the locations assigned to territories during territory mapping analysis are approximate and do not relate to the location of nests. Unless actually found, nest locations are unknown and will vary between years. As such, discussion of distances to infrastructure is indicative and should not be treated as absolute.

3.253. The locations logged for the two greenshank territories recorded in 2021 are each >350m from the nearest proposed turbine locations, and one is adjacent to a proposed new track.

3.254. A further greenshank territory was recorded within Corriemoillie and beyond 720m from the Proposed Development. No disturbance impacts upon this territory are anticipated.

3.255. As acknowledged in **Chapter 11: Ornithology** of the EIA Report there is a limited literature base on the effects of disturbance to greenshank. However, Hancock *et al*., (2009[xli]) showed mean core territory for greenshank radius of 800m. It is therefore assumed that the greenshank territories recorded within the Proposed Development in 2021 are within 500 m of the nearest infrastructure. As such in the absence of mitigation, construction may cause disturbance to breeding greenshank at the territories closest to infrastructure were construction works to take place at the closest turbine locations during the species' breeding season (broadly April to July). This represents a potential locally significant adverse effect, though it is unlikely to be of greater than a Low magnitude impact, and Not Significant at a Regional NHZ population level. Predicted levels of impact are the same as for the Consented Development.

3.256. Greenshank are listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) and as such are afforded additional protection against disturbance at their nest sites. Precautionary mitigation to ensure legislative

compliance during the construction phase and also during routine maintenance activities during the operational phase, in the form of preconstruction surveys and (if required) a BBPP, is outlined in 'Mitigation' below.

Operational Phase Impacts

3.257. As specified in **Chapter 11: Ornithology** of the EIA Report, the Proposed Development will result in a small and permanent loss of suitable mire and heath habitats available for nesting opportunities for greenshank. However, the two territories closest to proposed infrastructure are in (or considerably overlap) areas of replanted plantation forestry, and as such will become unsuitable for, and be lost to, this species in future under baseline conditions. Buffers around these turbine locations which are kept unplanted to prevent impacts of the trees on wind yield will result in a future increase in open habitat availability in these locations similar to that present the surrounding area for foraging and nesting greenshank and other species of open ground. As such, on the basis of the species' continued presence in typically low breeding densities, effects associated with habitat loss are considered to be Negligible and Not Significant at the Regional NHZ population level.

3.258. In consultation for the Strathy South Wind Farm development, NatureScot has previously cited anecdotal evidence from unpublished studies on the species which suggests that overall greenshank do not display a high level of behavioural displacement around operational turbines (NatureScot, 2015[xlii]). Breeding greenshank continue to be recorded within Corriemoillie, including within 500m of tracks and operational turbines, and at the Operational Schemes during operational monitoring (NRP 2019[viii]).

3.259. Given the proximity of territories to proposed turbine locations, there is the potential for localised displacement of two greenshank territories. However, as demonstrated by the extensive data available for this and surrounding developments, precise breeding locations and numbers of this species fluctuate between years. Evidence from operational monitoring for the proximal wind farms demonstrates that there is a stable local population and that this species has continued to hold territory in the study areas following construction and operation of the Operational Schemes and Corriemoillie. There is extensive suitable habitat present in the wider area, and as such it is considered that while there may be localised displacement from the immediate vicinity of infrastructure this will not be significant at a greater than 'Local' scale. As such habitat loss as a result of displacement during the operational phase is considered to be a Low Adverse magnitude impact and Not Significant at the Regional NHZ population level.

3.260. Predicted levels of impact are the same as for the Consented Development.

Mitigation

3.261. No potentially significant effects upon ornithological features are predicted to occur as a result of the construction, operation, or decommissioning of the Proposed Development.

3.262. Notwithstanding mitigation through design, and a HMP providing enhancements to benefit key ornithological features, no further specific mitigation measures are therefore proposed.

3.263. Mitigation measures are however, proposed in relation to the potential for offences to occur under the provisions of the Wildlife and Countryside Act 1981 (as amended) and on a precautionary basis in relation to sensitive species.

Breeding Birds

3.264. All wild birds in the UK are protected under Section 1 of the Wildlife and Countryside Act 1981 (as amended), which makes it an offence to intentionally or recklessly kill, injure or take any wild bird or take, damage or destroy the nest (whilst being built or in use) or its eggs. 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 while they are in, on, or near a nest containing eggs or young; or to disturb their dependent young.

3.265. To avoid potential disturbance to breeding red-throated diver, greenshank, black grouse and Schedule 1 raptor species, all areas within 800m of site clearance activities will be surveyed in advance of works being undertaken during the core breeding season (1st March to 31st August, inclusive) to identify any active nesting or lekking locations for such species.

3.266. Where required, a BBPP will be drawn up with the aim of protecting breeding birds from disturbance during the construction and operation of the Proposed Development. The BBPP would be produced to be agreed with THC, where necessary in consultation with NatureScot, and may include working buffers around identified nest sites and/or habitat features in accordance with best available evidence applicable at the time. Protection measures during the construction phase will be overseen by a qualified ECoW, whose duties and responsibilities will be defined in the CEMP.

Summary of Residual Effects

3.267. No significant effects have been identified for any important ornithological feature. As such, the significance of residual effects is also Not Significant. Predicted levels of impact and Residual Significance are the same as for the Consented Development

Cumulative Effects

3.268. This section considers the potential for significant effects upon important ornithological features by the Proposed Development in combination with the Operational Schemes, Corriemoillie and Kirkan Wind Farm (**Table 3.7**).

3.269. The potential for cumulative impacts upon red-throated diver, greenshank and black grouse, and for disturbance and/or displacement impacts to golden eagle, are considered to be unchanged from those assessed in **Chapter 11: Ornithology** and in **Appendix 11.B** of the EIA Report and so are not discussed further in this FEI. Cumulative impacts on golden eagle associated with habitat loss are further considered as part of the GET model assessment, and so are already factored in to the final conclusions of the

GET model assessment (see **Appendix 3.C**). As such, only cumulative collision risks for golden eagle have been considered as being potentially significant for the purposes of this updated assessment.

3.270. The geographic scale at which a cumulative assessment of collision risks to golden eagle has been undertaken is based upon NHZ7, where information for other developments in the NHZ was accessible. In line with NatureScot guidance[xvi], developments of fewer than three turbines are not included. Additionally, developments with no relevant information available in the public domain, e.g. developments which are at the scoping stage and have not yet assessed impacts, or developments which became operational a long time ago, are also not included. This includes the following developments:

- Fairburn Wind Farm;
- Novar Wind Farm;
- Novar Wind Farm Extension;
- Beinn Tharsuinn Wind Farm; and
- Braelangwell.

3.271. No assessment of collision risk to golden eagle was available for the following developments' assessments:

- Lochluichart Wind Farm; and
- Strathrory Wind Farm.

3.272. Wind farm developments located within NHZ7 for which information is available and for which collision risk assessment for eagles was undertaken are listed in **Table 3.8** together with a summary of collision risk mortality estimates predicted. Figures presented for other wind farm developments have not been checked or amended to reflect avoidance rates used within this assessment.

Table 3.8 Developments considered for cumulative effects.

Beinneun Wind Farm	
Planning Ref.	11/04152/S36
Status	Constructed
No. of Turbines	25
Annual Collision Risk Estimate	0.12
Beinneun Extension	
Planning Ref.	14/03983/S36
Status	Constructed
No. of Turbines	7
Annual Collision Risk Estimate	0.09
Bhlaraidh Wind Farm	
Planning Ref.	12/02556/S36
Status	Constructed
No. of Turbines	36
Annual Collision Risk Estimate	0.18

Coire na Cloiche	
Planning Ref.	12/00479/FUL
Status	Constructed
No. of Turbines	13
Annual Collision Risk Estimate	0.0075
Millenium South	
Planning Ref.	19/01861/S36
Status	In planning
No. of Turbines	10
Annual Collision Risk Estimate	0.009
Millennium Wind Farm	
Planning Ref.	03/00505/FULLO
Status	Constructed
No. of Turbines	26
Annual Collision Risk Estimate	0.007
Corriemoillie Wind Farm	
Planning Ref.	13/01082/S42
Status	Constructed
No. of Turbines	17
Annual Collision Risk Estimate	0.005
Lochluichart Wind Farm Extension	
Planning Ref.	13/01082/S42
Status	Constructed
No. of Turbines	6
Annual Collision Risk Estimate	0.0047
Kirkan Wind Farm	
Planning Ref.	19/01861/S36
Status	In planning
No. of Turbines	17
Annual Collision Risk Estimate	0.07
The Proposed Development	
Planning Ref.	N/A
Status	Pre-submission
No. of Turbines	5
Annual Collision Risk Estimate	0.069
Total Collision Risk Mortality	0.56

Collision Risk Mortality

3.273. Cumulative collision risk estimates for golden eagle are calculated at 0.56 birds per year, which represents 0.5% of the most recently published Regional NHZ population (112 birds) and a *c.* 10% increase in annual baseline Regional NHZ mortality which is estimated at five to six birds. This would equate to an extra 20 birds over 40 years. This assumes an improbable scenario of the simultaneous operation of all turbines at all wind farms considered over the operational lifetime of the Proposed Development.

3.274. Assuming a mean fledging rate of 0.37 and a minimum 40% sub-adult survival rate[xxxvii] , it is assumed that 331 birds will survive to breeding age during this period (56 x 0.37 x 40 x 0.4). If additional mortality of 20 birds is applied, this leaves 311 potential adult recruits to the NHZ7 breeding population.

3.275. As detailed, in **Section 3.224** to **3.227** above, there is very little evidence for collision risk for this species at wind farms in Scotland, and so the collision risks presented is considered to be an overestimate.

3.276. Overall cumulative collision mortality risks to golden eagle are therefore considered to represent no more than a 'Low' magnitude effect and which would be unlikely realised at the Regional NHZ population level. No significant effects are therefore anticipated.

Ornithological Enhancement Measures

3.277. A HMP will be produced which will include restoration measures of the most sensitive habitats and also provide enhancement of Annex 1 habitats within the Proposed Development. The HMP will also include measures to enhance the habitats within the Site for species such as black grouse and greenshank.

3.278. The HMP will include a detailed work programme, method statements for habitat enhancement, reporting mechanisms and a monitoring and review strategy.

3.279. The HMP will be prescribed and agreed in consultation with NatureScot, THC and RSPB.

Summary of Effects

3.280. No potentially significant impacts upon ornithological features resulting from the Proposed Development alone or cumulatively are identified.

3.281. Good practice mitigation measures to ensure legislative compliance during the construction and operational phases of the development with regards the protection of nesting birds are outlined. Providing implementation, no breach of the provisions of the relevant legislation will occur.

Table 3.9 Summary table of impacts upon the recorded ecological features.

Feature	Proposed Activity	Characterisation of unmitigated impact upon feature	Significance without mitigation	Mitigation and Enhancement	Residual significance and confidence level (following mitigation)
Red-throated Diver	Habitat Loss	Negligible	Negligible, not significant.	Not required.	Not significant
	Disturbance and Displacement	Negligible	Negligible, not significant.	Not required.	Not significant
	Collision Mortality	Negligible	Negligible, not significant.	Not required.	Not significant
Golden eagle	Habitat Loss	Low magnitude	Minor adverse, not significant.	Not required.	Not significant
	Construction - Disturbance and Displacement	Temporary, Low magnitude.	Minor adverse, not significant.	Not required.	Not significant
	Operational – displacement	Low magnitude	Minor adverse, not significant.	Not required.	Not significant
	Collision Mortality	Low magnitude	Minor adverse, not significant.	Not required.	Not significant
Black grouse	Habitat Loss	Permanent, Low magnitude	Negligible, not significant.	Not required.	Not significant
	Disturbance and Displacement	Temporary, Low magnitude.	Minor adverse, not significant.	Legislation compliance only.	Not significant
	Operational – displacement	Low magnitude	Minor adverse, not significant.	Not required.	Not significant
Greenshank	Habitat Loss	Negligible.	Negligible, not significant.	Not required.	Not significant
	Disturbance and Displacement	Temporary, Low magnitude.	Minor adverse, not significant.	Legislation compliance only.	Not significant

Feature	Proposed Activity	Characterisation of unmitigated impact upon feature	Significance without mitigation	Mitigation and Enhancement	Residual significance and confidence level (following mitigation)
	Operational - Disturbance and Displacement	Low magnitude	Minor adverse, not significant.	Not required.	Not significant

References

(See Page 74)

4. Forestry

4.1 Overview

Following the submission of the Proposed Development application, responses were received from Scottish Forestry ('SF') and The Highland Council's ('THC') Forestry Officer.

4.2 Consultation

In response to the application for the Proposed Development, Aganta Baranska, Scottish Forestry's Regulation and Development Manager (07/07/21), made the following comments (see **Appendix 1.A**):

"..SF welcomes the Applicant's commitment to provide compensatory planting of 3.7ha, however questions the way the area was calculated..(SF) questions if some of the areas claimed by the Applicant as 'failed' are in reality areas of native broadleaves, damaged by deer, but still defined as 'woodland'."

4.3 Applicant's response

4.3.1 Scottish Forestry queried the area of woodland that will be lost due to the proposed development, we are clear that the area of trees to be removed due to the permanent infrastructure is 3.70 hectares as stated within the text of the chapter.

4.3.2 The absence of the native broadleaves component of woodland planted in 1990 is questioned by Scottish Forestry, the aerial imagery shows the ground preparation by ploughing but no trees are visible. Established Scots pine is however readily identifiable from the same imagery.

4.3.3 However as Scottish Forestry suggest the 'failed' areas are still defined as 'woodland'. The area of failed trees to be occupied by permanent infrastructure is calculated as 2.41 hectares with reference to the National Forest Inventory and aerial imagery of ground preparation. The final figure for compensatory planting is therefore increased to 6.11 hectares.

4.4 Consultation

4.1.1 In response to the application for the Proposed Development, THC's Forestry Officer, Nick Richards, (21/09/21, RC/06/F see **Appendix 1.A**) made the following comments:

"..With reference to SF response…This will require an amendment to the area of compensatory planting to be provided, although I am happy this this is agreed between the applicant and SF."

4.5 Applicant's response

4.5.1 The calculation of compensatory planting required for the Proposed Development, including 2.41 hectares of failed trees, is therefore revised to 6.11 hectares. THC states no further information is required in support of this application.

5. Landscape Visual Impact Assessment

5.1 Introduction and Overview

5.1.1 This brief report addresses concerns expressed by The Highland Council ('THC') regarding the number and size of turbines forming the proposed Lochluichart Wind Farm Extension II (hereafter 'the Proposed Development') from the perspective of potential impacts on landscape character and visual amenity. It has been prepared by Optimised Environments (OPEN) who were responsible for preparing the Landscape and Visual Impact Assessment (LVIA) as part of the 2021 Environmental Impact Report (EIA Report).

5.1.2 Post application comments made by representatives of THC, in their email of 8th October 2021, and NatureScot, in their email of 26th October 2021, highlighted concerns regarding the prominence of Turbine 4 (T4) and Turbine 8 (T8) which are two of the five proposed turbines, located at the western and eastern end of the group and set closest to the A835. Suggestions have included reducing the size of these turbines or removing them completely from the layout, which would create a three-turbine layout.

5.2 Assessment of Effects

5.2.1 Computer generated wirelines have been produced from key viewpoints, in order to illustrate the comparison between T4 and T8 at the proposed height of 149.9 m and at the alternative lower height of 125 m. The first set (see **Appendix 5.A**) illustrates a selection of the key viewpoints used in the LVIA, and the second set (see **Appendix 5.B**) illustrates a sequence of viewpoints along the A835. In Viewpoint 1: Aultguish Inn and Viewpoint 2: A835 Black Water Bridge, T4 is the closest turbine to these viewpoints and will appear slightly larger as a result. A reduction in the size of T8, which is already the more distant turbine from these viewpoints, would make it appear noticeably smaller and incongruous with the rest of the group.

5.2.2 In the wirelines from the route analysis, the reduction in the size of T8 can be seen to make only a marginal change in viewpoints 1 to 3 from the north, and then as above make it appear at variance with the rest of the group in the viewpoints 4 to 9, from the east and south-east. While the reduction in the size of T4 is more discernible from the A835, from where it is seen as the closest turbine, the apparent decrease in scale that this causes is discordant with the natural perspective viewers would expect, where T4 is seen in conjunction with the other turbines.

5.2.3 In light of the reduction in height of T4 and T8 proposed by THC, it is important to consider how the Proposed Development compares against the first Lochluichart Wind Farm Extension II application (the 'Consented Development', amended via Supplementary Information in November 2019) in the same locations and, also, to consider the extent and level of significant effects as set out in the LVIA for the Proposed Development.

5.2.4 The Consented Development comprises five turbines each with a blade tip height of 133 m, located in exactly the same locations as the five turbines which form the Proposed Development. The only notable change, therefore, is a change in the size of the turbines, with the blade tip height increasing by 16.9 m to a revised height of 149.9 m (rotor diameter increase from 133m. In

order to explain and assess this incremental change, a revised EIA has been prepared with detailed assessments carried out in respect of all landscape and visual receptors.

5.3 Summary of Assessment of Effects

5.3.1 The findings of the revised LVIA are that the Proposed Development will give rise to a small number of significant landscape and visual effects, albeit all contained within a relatively close-range area and mostly relating to the short-term effects of the construction stage. These effects are the same as assessed for the Consented Development, the only exception being that residents represented by Viewpoint 1: Aultguish Inn would be significantly affected in respect of the Proposed Development but not the Consented Development.

5.3.2 The reason why the Proposed Development will give rise to such few significant effects relates to the fact that the five additional turbines would sit to the immediate north of the 17 operational Lochluichart Wind Farm turbines, six operational Lochluichart Wind Farm Extension turbines and 17 operational Corriemoillie Wind Farm turbines, all of which are 125m in height to blade tip. These 40 operational wind turbines have an existing influence on landscape character and visual amenity within the Study Area and it is in the context of this close-range cluster that the five proposed turbines will form a small additional proportion.

5.3.3 This limited occurrence and extents of significant effects underpins the value of locating additional turbines in close association with existing developments, and the benefits of this 'clustering' approach should be considered against the potential disbenefits of introducing turbines into previously undeveloped landscapes. The LVIA has found that there is capacity to accommodate these five additional turbines in this location without giving rise to anything more than very localised significant effects. While the additional turbines will appear slightly larger in contrast to the existing turbines, this difference is incremental and will not lead to the character of the surrounding landscape or views being redefined.

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