Tech

Galileo 05 Limited

Lynemore Wind Farm

Additional Information Volume 2

Chapter 7: Ornithology

663991 (00)

JANUARY 2026

GALILEO EMPOWER

RSK

Table of Contents

7.1 INTRODUCTION 7-1
7.2 POTENTIAL EFFECTS 7-2
7.3 METHODOLOGY 7-4
Scope of Assessment 7-4
Disturbance and Displacement Impacts 7-5
Collision Impacts 7-5
Cumulative Impacts 7-5
Habitats Regulations Appraisal 7-6
7.4 APPLICATION RESPONSES TO THE EIA PROPOSED DEVELOPMENT 7-7
7.5 UPDATED IMPACT ASSESSMENT 7-8
Disturbance and Displacement – Revised Proposed Development Alone 7-8
Collision – Revised Proposed Development Alone 7-10
Disturbance and Displacement – Cumulative Impacts 7-11
Collision – Cumulative Impacts 7-12
7.6 SUMMARY 7-15
7.7 CROSS REFERENCING 7-0
7.8 REFERENCES 7-0

TABLES

Table 7.1: Summary of Ornithological Impact Assessment (EIA Proposed Development) 7-2
Table 7.2: Relevant Consultee Responses to the EIA Report Ornithology Chapter 7-7
Table 7.3: Updated Assessment of Disturbance and Displacement Impacts 7-8
Table 7.4: Updated Collision Risk Estimates 7-10
Table 7.5: Updated Cumulative Impact Assessment (Collision Risk) 7-13
Table 7.6 Summary of Updated Effects 7-0
Table 7.7 Cross Reference to EIA 7-0

FIGURES

AI Figure 7.7 Moorland Breeding Bird Survey Results (Year 1 and Year 2)
AI Figure 7.8 Vantage Point Survey Results (Year 1 and Year 2)

TECHNICAL APPENDICES

AI Technical Appendix 7.1 Updated Collision Risk Modelling Calculations

7 ORNITHOLOGY

7.1 Introduction

7.1.1 This Additional Information (AI) chapter considers the potential for significant effects on ornithological features as a result of the construction, operational and decommissioning phases of the Revised Proposed Development.

7.1.2 A comprehensive impact assessment was previously provided in the Environmental Impact Assessment (EIA) Report for the EIA Proposed Development (14-turbine layout), with the impact assessment of ornithological features provided in the **EIA Report, Chapter 7 Ornithology**. That assessment identified key species and potential impacts upon them, determined the magnitude of those impacts and concluded whether the resulting effects would be significant or non-significant. It was concluded that for all impacts on all ornithological features there would be no significant effects, as a result of the EIA Proposed Development, both on its own and when considered cumulatively alongside other relevant projects within the wider region (based on Natural Heritage Zones (NHZs)).

7.1.3 The purpose of this chapter of the AI, is to update the EIA where the level of impact on ornithological features may now differ from that originally presented, as a result of redesign and the subsequent 12-turbine layout of the Revised Proposed Development. The chapter provides a summary of the findings of the impact assessment for the EIA Proposed Development, sets out relevant changes to impacts as a result of the Revised Layout and updates the assessment for the Revised Proposed Development.

7.1.4 Full details of the amendments made to the submitted layout are provided in **AI Chapter 2: Updated Description of the Proposed Development**.

7.1.5 The core change that affects the impact assessment for ornithological features is the removal of two turbines (T4 and T5), resulting in a 12-turbine layout, rather than the 14-turbine layout of the EIA Proposed Development. There have also been small adjustments to the locations of seven other turbines which have been relocated within 44 to 85m from their location in the EIA layout. The main consequence of the revised project layout for ornithological features is to change the level of predicted collision risk. This is fully investigated within this chapter. Potential changes to disturbance and displacement impacts are also examined, in accordance with the impact assessment for the EIA Proposed Development.

7.1.6 The methodology for assessing potential impacts is the same as that set out in **EIA Report, Chapter 7**. Methods, results and discussion provided in that chapter (and associated Technical Appendices) are not repeated here, other than where required to inform understanding or to provide context to the updated assessment.

7.1.7 Where recommended guidance for assessment has changed since the EIA Report was written, this is acknowledged.

7.1.8 This chapter is accompanied by:

- **AI Figure 7.7** Moorland Breeding Bird Survey Results (Year 1 and Year 2).
- **AI Figure 7.8** Vantage Point Survey Results (Year 1 and Year 2).
- **AI Technical Appendix 7.1** Updated Collision Risk Modelling Calculations.

7.2 Potential Effects

7.2.1 **EIA Report, Chapter 7** identified 'Important Ornithological Features' (IOFs) and potential impacts resulting from the EIA Proposed Development, and these are summarised in **Table 7.1**. The conclusions of the impact assessment (residual impacts) are presented. Impacts from the EIA Proposed Development alone are listed first, followed by cumulative impacts.

Table 7.1: Summary of Ornithological Impact Assessment (EIA Proposed Development)

IOF	Impacts	Impact Magnitude	Significance of Effect
EIA Proposed Development alone			
Curlew	Disturbance and displacement (construction and decommissioning phases)	**Negligible[1] adverse**	**Non-significant**
	Disturbance and displacement (operational phase)	**Negligible adverse**	**Non-significant**
Dunlin	Disturbance and displacement (construction and decommissioning phases)	**Negligible adverse**	**Non-significant**
	Disturbance and displacement (operational phase)	**Negligible adverse**	**Non-significant**
	Collision (operational phase)	**Negligible adverse**	**Non-significant**
Golden eagle	Disturbance and displacement (construction and decommissioning phases)	**Negligible adverse**	**Non-significant**
	Disturbance and displacement (operational phase)	**Negligible adverse**	**Non-significant**
	Collision (operational phase)	**Negligible adverse**	**Non-significant**
Golden plover	Disturbance and displacement (construction and decommissioning phases)	**Negligible adverse**	**Non-significant**
	Disturbance and displacement (operational phase)	**Negligible adverse**	**Non-significant**
	Collision (operational phase)	**Negligible adverse**	**Non-significant**
Red kite	Disturbance and displacement (construction and decommissioning phases)	**Negligible adverse**	**Non-significant**
	Disturbance and displacement (operational phase)	**Negligible adverse**	**Non-significant**
	Collision (operational phase)	**Negligible adverse**	**Non-significant**
Short-eared owl	Disturbance and displacement	**Negligible adverse**	**Non-significant**

[1] Definition of 'negligible' magnitude impacts in the assessment: "*a very slight (indiscernible) reduction in a site and/or species status or productivity and/or no observable impact. For example, affecting <1% of the regional population; short-term impacts to <5% of the regional population*".

IOF	Impacts	Impact Magnitude	Significance of Effect
	(construction and decommissioning phases)		
	Disturbance and displacement (operational phase)	**Negligible adverse**	**Non-significant**
White-tailed eagle	Collision (operational phase)	**Negligible adverse**	**Non-significant**
EIA Proposed Development cumulative impacts			
Curlew	Disturbance and displacement (construction and decommissioning phases)	**Negligible adverse**	**Non-significant**
	Disturbance and displacement (operational phase)	**Negligible adverse**	**Non-significant**
Dunlin	Disturbance and displacement (construction and decommissioning phases)	**Negligible adverse**	**Non-significant**
	Disturbance and displacement (operational phase)	**Negligible adverse**	**Non-significant**
	Collision (operational phase)	**Negligible adverse**	**Non-significant**
Golden eagle	Disturbance (construction and decommissioning phases)	**Negligible adverse**	**Non-significant**
	Displacement (construction and decommissioning phases)	**Small[2] adverse**	**Non-significant**
	Disturbance (operational phase)	**Negligible adverse**	**Non-significant**
	Displacement (operational phase)	**Small adverse**	**Non-significant**
	Collision (operational phase)	**Small adverse**	**Non-significant**
Golden plover	Disturbance and displacement (construction and decommissioning phases)	**Negligible adverse**	**Non-significant**
	Disturbance and displacement (operational phase)	**Negligible adverse**	**Non-significant**
	Collision (operational phase)	**Negligible adverse**	**Non-significant**
Red kite	Disturbance and displacement (construction and decommissioning phases)	**Negligible adverse**	**Non-significant**
	Disturbance and displacement (operational phase)	**Negligible adverse**	**Non-significant**
	Collision (operational phase)	**Small adverse**	**Non-significant**

[2] Definition of 'small' magnitude impacts in the assessment: "*the impact (either on its own or cumulatively with other projects) would not result in a loss of function to the conservation status of a site and/or species, but some adverse impact to species abundance would be observable, although this may only be temporary. For example, affecting 1%-5% of the regional population; short-term impacts to 5-20% of the regional population*".

IOF	Impacts	Impact Magnitude	Significance of Effect
Short-eared owl	Disturbance and displacement (construction and decommissioning phases)	**Negligible adverse**	**Non-significant**
	Disturbance and displacement (operational phase)	**Negligible adverse**	**Non-significant**
White-tailed eagle	Collision (operational phase)	**Small adverse**	**Non-significant**

7.2.2 The IOFs and impacts listed in **Table 7.1** are reassessed within this chapter to determine if there are any changes to the conclusions of the assessments (impact magnitude or significance of effect) as a result of the Revised Proposed Development.

7.3 Methodology

Scope of Assessment

7.3.1 This AI chapter only investigates impacts on IOFs, which are those ornithological features that were scoped in for full assessment within the EIA Report (as listed in **Table 7.1**). As the Revised Proposed Development has a smaller footprint and fewer turbines than that which was originally assessed for the EIA Proposed Development, for the ornithological features scoped out from detailed assessment in the EIA Report (species recorded occasionally and/or in small numbers, or which were otherwise considered not to be sensitive to the impacts associated with the EIA Proposed Development) it can safely be assumed that the previous conclusion of non-significant effects on these features is still applicable.

7.3.2 It is acknowledged that there has been a change in wind farm baseline ornithological survey guidance since completion of the impact assessment for the EIA Proposed Development. During baseline surveys, all gulls were treated as 'secondary species' during the Vantage Point (VP) flight activity surveys, in accordance with guidance which was applicable at that time (SNH, 2017). Secondary species are not recorded in sufficient detail to allow collision risk to be estimated. Survey guidance has now been updated (NatureScot, 2025a) and now recommends that gulls be treated as target species during VP flight activity surveys, due to national population declines. As this change in guidance has occurred since the ornithological assessment for the EIA Proposed Development was written, gulls require consideration as to whether they require the impact assessment they have not received to date. However, on examination of the data it was confirmed that no gulls were recorded during the baseline VP flight activity surveys. The only gull records obtained were flights of black-headed gull and common gull recorded during the baseline Moorland Breeding Bird Survey (MBBS). During the MBBS, gulls were classed as target species and these surveys showed that gulls were not breeding in the vicinity of the Site (as would be expected based on the location and habitats present on Site). Therefore, collision risk for all gulls can be concluded as being nil or negligible and they do not require further assessment. Gull species are not further discussed within this chapter.

Disturbance and Displacement Impacts

7.3.3 For the IOFs for which disturbance and displacement impacts were previously assessed, these impacts have been reassessed based on examining known and suspected nest sites and breeding territories and comparing these to the revised layout to determine whether the magnitude of impact is likely to have changed.

7.3.4 The IOFs reassessed for disturbance and displacement impacts are the same as those included in the impact assessment for the EIA Proposed Development (**Table 7.1**), namely: curlew, dunlin, golden eagle, golden plover, red kite and short-eared owl.

Collision Impacts

7.3.5 The reassessment of collision impacts has been undertaken by updating collision risk modelling (CRM) analyses for relevant IOFs based on the 12-turbine layout of the Revised Proposed Development and comparing the mortality estimates to those of the EIA Proposed Development (as presented in **EIA Report, Chapter 7**).

7.3.6 Full details of the CRM analysis methods are provided in **AI Technical Appendix 7.1**. The CRM analyses for the Revised Proposed Development have been undertaken in accordance with current guidance (Band, 2024), as recommended by NatureScot (2024). This methodology replaces version 1 (Band *et al*., 2007), which was previously the standard approach for assessing potential collision risk from onshore turbines. It should be noted that the CRM analyses for the EIA Proposed Development were carried out using the 2007 methodology, prior to the new guidance being adopted. (The outputs of the two CRM methods are considered by Band (2024) to be equivalent). In reassessing potential collision impacts for the Revised Proposed Development, the opportunity has been taken to update the CRM analysis using current guidance. As the main aim of the updated guidance has been to standardise the approach to CRM used by practitioners, by undertaking the revised CRM analyses for the Revised Proposed Development following this method, this should provide for better cumulative impact assessments (CIAs) which include newly proposed wind farm projects that have also adopted the new guidance.

7.3.7 Following the same approach as was used in the original assessment, five IOFs have undergone CRM analyses to determine potential collision risk during the operational phase of the Revised Proposed Development (**Table 7.1**), namely dunlin, golden eagle, golden plover, red kite and white-tailed eagle.

7.3.8 In the case of white-tailed eagle, extra modelling has been undertaken to provide collision risk estimates that exclude young (non-breeding) birds. The exclusion of impacts on dispersing immature birds allows for a collision mortality estimate that better reflects potential impacts on the breeding population. This information was not provided in the EIA Report.

Cumulative Impacts

7.3.9 Following reassessment for the Revised Proposed Development on its own, an updated cumulative impact assessment is also provided. The approach to CIA is the same as for the EIA Proposed Development and cumulative impacts at a regional population scale are assessed, with projects identified within NHZ 10: Central Highlands (all species) and

NHZ 10 plus NHZ 21: Moray Firth (red kite only; due to the close proximity of NHZ 21 and this being the likely source of red kites recorded on Site).

7.3.10 In order to update the CIA for the Revised Proposed Development, the planning portals for The Highland Council (THC)[3], Moray Council[4] and the Energy Consents Unit (ECU)[5] were searched to specifically look for any additional onshore wind farm projects that have been submitted into planning between the writing of the CIA for the EIA Proposed Development (January 2025) and the time of writing this updated assessment (November 2025). In keeping with the approach used for the EIA Proposed Development, projects in scoping are not included as they do not have sufficient data available to inform the CIA, and are in any case subject to change.

7.3.11 This search has identified four additional proposed projects, which are all located in NHZ 10: Balnespick Wind Farm, Clune Wind Farm, Highland Wind Farm and Kyllachy Wind Farm. Data for these four additional projects have been added to that from the original CIA for the EIA Proposed Development.

Habitats Regulations Appraisal

7.3.12 Information to Inform a Habitats Regulations Appraisal (HRA) was previously provided for the EIA Proposed Development (**EIA Report, Appendix 7.4**).

7.3.13 Loch Ashie Special Protection Area (SPA) and Loch Ruthven SPA and Ramsar site (Wetland of International Importance) were screened out, with no likely significant effect concluded on their sole qualifying feature (Slavonian grebe) due to a lack of connectivity with the Site. The revised layout does not change this conclusion.

7.3.14 Inner Moray Firth SPA and Ramsar site was screened out for all qualifying features (mostly marine and estuarine-dwelling species) with the exception of non-breeding greylag goose. However, further assessment provided in the HRA for the EIA Proposed Development showed that the nearest suitable habitat for greylag goose to the Site is located beyond the distance at which disturbance would take place and so there would be no route to impact for disturbance and displacement on this ornithological feature. Regarding the potential for collision impacts on greylag goose, the location of the Site in hills beyond the core foraging areas associated with the SPA population would result in no, or very low, flight activity across the Site; as evidenced in the survey data which recorded one flight of two birds during two years of survey. CRM was not undertaken for greylag goose for the EIA Proposed Development, and it was concluded that the collision risk posed by the EIA Proposed Development would effectively be zero and would not contribute to in-combination impacts. It was, therefore, stated in the HRA for the EIA Proposed Development that there would be no adverse effect on the integrity of the Inner Moray Firth SPA and Ramsar site as a result of the EIA Proposed Development alone or in-combination, in relation to greylag goose. The revised layout would not change these conclusions and so updated information to inform an HRA is not provided for the Revised Proposed Development.

[3] Available from: https://wam.highland.gov.uk/wam/ (Accessed November 2025)

[4] Available from: https://publicaccess.moray.gov.uk/eplanning/ (Accessed November 2025)

[5] Available from: https://www.energyconsents.scot/ApplicationSearch.aspx (Accessed November 2025)

7.4 Application Responses to the EIA Proposed Development

7.4.1 Following submission of the EIA Report, a number of application responses have been received to date from relevant consultees. There are some comments received where a response or clarification is considered useful to aid consultees when deliberating this updated impact assessment for the Revised Proposed Development. These comments are listed in **Table 7.2**, alongside a response/ clarification. Note that the table only provides a summary of relevant responses, as ongoing consultation with NatureScot on these matters has been taking place separate to the production of this impact assessment.

Table 7.2: Relevant Consultee Responses to the EIA Report Ornithology Chapter

Consultee	Comment	Response/ Clarification
NatureScot	There are limitations in the VP flight activity survey methods that could have resulted in the gathering of unrepresentative survey data. Further baseline surveys are recommended.	Further justification of VP locations has been provided to NatureScot as well as evidence of flight activity being unaffected by surveyor presence. VP1 (and variations thereof) is more distant from proposed turbine locations following the revised layout. Justification has been provided to NatureScot as to why the survey effort completed to date, including two years of baseline surveys, is considered sufficient to inform the impact assessment. Based on extensive experience from undertaking baseline surveys for other wind farm developments, there is high confidence that the relatively low level of flight activity reflected in the survey results is representative of baseline ornithological conditions and not a result of survey limitations.
	White-tailed eagle territories within 3km of operating wind farms have lower occupancy and lower productivity. The proposal could therefore reduce the range of the recovering population (currently one known pair in NHZ 10).	The Revised Proposed Development is located over 13km from the nearest known white-tailed eagle home range in NHZ 10 and so lies beyond the species' maximum foraging range and well beyond their core range of 5km (SNH, 2016). The low flight activity recorded during baseline surveys does not indicate that white-tailed eagles were prospecting a territory in the vicinity of the Site. The impact assessment is based on baseline conditions and not potential conditions in the future. With between 889 and 1,005 territorial pairs modelled to exist by 2040 (Sansom, 2016a) there are very extensive areas of Scotland suitable for wind farm developments that would need to be avoided if areas with potential to support territories needed to be considered.
	There is a growing cumulative collision risk to white-tailed eagles at a national level. The Scotland-wide cumulative collision estimate is currently close to 16 birds per year, which is considered likely to negatively impact the growth rate of the national population and range recovery.	The cumulative mortality estimate is described as slowing the growth rate of the white-tailed eagle population. The growth trend would not be halted or reversed by the current estimate. A reduced growth rate, compared to what it would otherwise be, would result in slower range expansion but conservation objectives would still be met, albeit on a longer timescale.

Consultee	Comment	Response/ Clarification
	The stated annual collision risk estimate of 0.603 (for white-tailed eagle) is considered high. The VP survey results do not indicate if the flights recorded were of adult or juvenile birds.	The annual collision estimate for the Revised Proposed Development is lower than that predicted for the EIA Proposed Development (as set out below). It is considered appropriate to use the mean estimate in the assessment (not the maximum estimate as stated in the response) to account for inter-annual variation, in accordance with NatureScot (2025a) guidance on baseline surveys. Five at-risk flights in Year 1 (on three dates) and eight at-risk in Year 2 (also on three dates) are considered to represent natural variation and not a change in baseline conditions between survey years. Examination of baseline data has been undertaken as to the age of white-tailed eagles recorded and this has been used in the updated CRM analysis to provide a separate mortality estimate involving only adult birds.
RSPB	Confirmation provided that the RSPB would not be commenting on the application.	No response/clarification needed, but it is acknowledged that RSPB do not raise any ornithological issues of concern.

7.5 Updated Impact Assessment

Disturbance and Displacement – Revised Proposed Development Alone

7.5.1 The breeding territories of the IOFs recorded during the MBBS (curlew, dunlin, golden plover and short-eared owl) undertaken during the two years of baseline surveying are illustrated against the proposed turbine locations of the Revised Proposed Development on **AI Figure 7.7**.

7.5.2 For the IOFs originally assessed for disturbance and displacement impacts (curlew, dunlin, golden eagle, golden plover, red kite and short-eared owl), changes to the level of impact are discussed in **Table 7.3** for the Revised Proposed Development.

Table 7.3: Updated Assessment of Disturbance and Displacement Impacts

IOF	Original Impact Assessment: EIA Proposed Development	Change
Curlew	Status: intermittent breeder in very low numbers (one pair in baseline survey Year 1). Construction/ decommissioning phase: possible disturbance within 200-300m of works. Operational phase: no displacement predicted based on existing research. Negligible impacts concluded.	The revised layout has resulted in the Year 1 breeding territory location now being located further from the development than previously and is now over 750m from the nearest proposed turbine. Disturbance and displacement impacts would remain negligible but would be lower for the Revised Proposed Development.
Dunlin	Status: breeder in both survey years in very low numbers (one to two pairs). Construction/ decommissioning phase: possible disturbance within 100-200m of works Operational phase: no displacement	The revised layout has resulted in the breeding territory locations from Year 1 now being located further from the development than previously and the Year 2 breeding territory location now being located outside the development rather than between

IOF	Original Impact Assessment: EIA Proposed Development	Change
	predicted based on existing research. Negligible impacts concluded.	turbines. Disturbance and displacement impacts would remain negligible but would be lower for the Revised Proposed Development.
Golden eagle	Status: occasionally recorded flying over the Site but the Site does not overlap with any currently occupied home ranges. The EIA Proposed Development was considered unlikely to affect the viability of any future home range in the nearby or wider surrounding area. Negligible impacts concluded.	The Revised Proposed Development would result in a smaller footprint and so any displacement impacts would be reduced compared to the larger footprint (greater avoidance area) associated with the EIA Proposed Development. Disturbance and displacement impacts would remain negligible but would be lower for the Revised Proposed Development.
Golden plover	Status: breeder in low numbers in both survey years (five to seven pairs) and sporadic records during the non-breeding season. Construction/ decommissioning phase: possible disturbance within 200-500m of works. Operational phase: little or no displacement predicted, based on existing research. Negligible impacts concluded.	Whilst the revised layout would not change impacts for most of the recorded breeding territory locations, it has resulted in one to two of the breeding territory locations now being located further from the development than previously. The smaller footprint would be expected to result in less displacement in the non-breeding season, when the Site is intermittently used by mobile flocks. Overall, disturbance and displacement impacts would remain negligible but would be lower for the Revised Proposed Development.
Red kite	Status: regularly recorded but no breeding within the Site, with nearest probable nest recorded 4km from the Site boundary. This is well beyond potential disturbance impact (Goodship and Furness, 2022). No disturbance concluded for the construction/ decommissioning phase; and little or no displacement predicted for the operational phase, based on existing research. Negligible impacts concluded.	The revised layout is unlikely to make a noticeable difference to (already minimal) disturbance and displacement impacts upon red kite, but the smaller footprint of the Revised Proposed Development means that overall the level of impact is expected to be reduced compared to the EIA Proposed Development. Disturbance and displacement impacts would remain negligible but would be lower for the Revised Proposed Development.
Short-eared owl	Status: presence during the core breeding season in Year 1 was assumed to represent a breeding territory, with any nest site considered most likely to be on the edge of the Site or in the 2km buffer. Construction/ decommissioning phase: possible disturbance within 300-500m of works. Operational phase: possible displacement within 500m of turbines predicted. Negligible impacts concluded.	The revised layout has resulted in the Year 1 breeding territory location (should it be occupied again in future by this nomadic species) now being located further from the development than previously and is now over 800m from the nearest proposed turbine. Disturbance and displacement impacts would remain negligible but would be lower for the Revised Proposed Development.

7.5.3 The impacts of disturbance and displacement, where they have been predicted, have been reduced for all IOFs for the Revised Proposed Development when compared to the EIA Proposed Development.

7.5.4 The disturbance and displacement effects of the Revised Proposed Development on its own (construction, operational and decommissioning phases) remain unchanged from those concluded for the EIA Proposed Development, with a negligible adverse impact predicted and non-significant effects concluded for all IOFs.

Collision – Revised Proposed Development Alone

7.5.5 Flightlines of the five IOFs assessed for collision risk (dunlin, golden eagle, golden plover, red kite and white-tailed eagle) recorded during VP flight activity surveys across the two years of baseline surveying have been mapped against the turbine locations of the Revised Proposed Development and are illustrated on **AI Figure 7.8**.

7.5.6 **Table 7.4** provides the collision mortality estimates for the Revised Proposed Development (during the operational phase) for relevant species. The values presented are mean "turbine weighted" estimates ("effort weighted" in the case of dunlin) using NatureScot's recommended avoidance rates (NatureScot, 2025b). The presented values were the most precautionary estimates calculated for the three scenarios modelled (unweighted, turbine-weighted and effort-weighted). For full details of how the estimates were calculated and for the outputs from other modelled scenarios see **AI Technical Appendix 7.1**. The mortality estimates are presented alongside those calculated for the EIA Proposed Development to allow comparison.

Table 7.4: Updated Collision Risk Estimates

IOF	Collision Mortality Estimate (Birds per Year)						Change
	EIA Proposed Development			Revised Proposed Development			
	Yr 1	Yr 2	Mean	Yr 1	Yr 2	Mean	
Dunlin	0.205	0.000	**0.103**	0.005	0.000	**0.002**	The collision estimate for the Revised Proposed Development is lower than that estimated for the EIA Proposed Development.
Golden eagle	0.045	<0.001	**0.023**	0.008	0.013	**0.010**	The collision estimate for the Revised Proposed Development is lower than that estimated for the EIA Proposed Development.
Golden plover	0.998	0.430	**0.714**	0.349	0.022	**0.182**	The collision estimate for the Revised Proposed Development is lower than that estimated for the EIA Proposed Development.
Red kite	0.333	0.443	**0.388**	0.170	0.215	**0.194**	The collision estimate for the Revised Proposed Development is lower than that estimated for the EIA Proposed Development.
White-tailed eagle	0.166	0.603	**0.385**	0.233	0.458	**0.346**	The collision estimate for the Revised Proposed Development is lower than that estimated for the EIA Proposed Development.

7.5.7 For white-tailed eagle, collision estimates have also been calculated following omission of juvenile and immature birds. This has only resulted in the removal of one flight, but this

does reduce the mortality risk for Year 2 to 0.367. The mean estimate for white-tailed eagle (adults only) is therefore reduced to **0.329** birds per year.

7.5.8 The collision mortality estimates have been reduced for the Revised Proposed Development, when compared to the EIA Proposed Development, for all IOFs.

7.5.9 In terms of the impact assessment, the effect of collision from the Revised Proposed Development on its own (operational phase) remain unchanged from those concluded for the EIA Proposed Development, with a negligible adverse impact predicted and non-significant effects concluded for all IOFs.

Disturbance and Displacement – Cumulative Impacts

7.5.10 The cumulative assessment of disturbance impacts for the EIA Proposed Development concluded a negligible impact and a non-significant effect for all IOFs. The inclusion of the four additionally proposed projects in the CIA (Balnespick Wind Farm, Clune Wind Farm, Highland Wind Farm and Kyllachy Wind Farm) would not substantially change the original conclusions. These four projects are located between approximately 7km and 12.5km from the Revised Proposed Development at their nearest points. Disturbance during construction/ decommissioning would only be expected to occur within a short species-specific distance of works (less than 500m for all IOFs), resulting in very localised impacts. Even if all new proposed projects were to be constructed/ decommissioned at the same time the small-scale and temporary nature of the associated disturbance, which would impact different home ranges across the region, would not raise the disturbance impact above negligible magnitude, and so a non-significant effect can still be concluded for the regional population of the IOFs assessed in regard to the construction phase of the Revised Proposed Development.

7.5.11 The cumulative assessment of displacement impacts (operational phase) for the EIA Proposed Development stated that existing evidence (as referenced in the assessment) suggests that for curlew, dunlin, golden plover and red kite that these species continue to use wind farm sites post-construction. On this basis, cumulative displacement impacts would not be an issue and a cumulative displacement impact has been concluded for these ornithological features as being of negligible magnitude and as having a non-significant effect. This remains the case for the Revised Proposed Development.

7.5.12 Potential cumulative displacement impacts were also assessed for the EIA Proposed Development for short-eared owl. Two of the four newly proposed projects recorded this species in one survey year (Clune Wind Farm and Highland Wind Farm) but in both cases the distance of the suspected breeding territory from these developments meant that a negligible impact was predicted. As discussed in the original assessment, short-eared owls are highly nomadic and breeding sites and numbers vary greatly year to year so displacement from particular areas would not have a substantive impact on this species, especially in a region with few birds and extensive suitable habitat. The cumulative displacement impact for short-eared owl remains unchanged for the Revised Proposed Development and a negligible impact, and non-significant effect, is concluded.

7.5.13 For golden eagle, although the EIA Proposed Development was shown not to be in an existing home range, the cumulative displacement impact on this ornithological feature was considered to be small adverse in magnitude. This was due to some of the proposed and operational wind farm projects within the wider NHZ 10 overlapping with known home ranges, although in all cases non-significant displacement effects were concluded.

7.5.14 The four newly proposed wind farm projects, identified for inclusion in the updated CIA, assessed golden eagle as follows:

- Balnespick Wind Farm was identified as being within foraging range of a nest site, although flight activity suggested the proposed development area was of relatively minor importance and a low negative magnitude displacement impact was concluded.
- Clune Wind Farm considered the development area to be in an eagle home range but considered the area lost through displacement to be small compared to the size of the home range (not quantified) and concluded a non-significant effect.
- Highland Wind Farm stated that the development area is on the outer edge of two home ranges which would have very small proportional losses from displacement and a negligible impact and non-significant effect was concluded.
- Kyllachy Wind Farm considered that the development area is located beyond core foraging range of the nearest territory and there would be no significant losses as a result of displacement.

7.5.15 The cumulative displacement impact on golden eagle is considered to be unchanged from the original CIA, with some small losses to specific home ranges but none considered sufficient to result in a loss of viability for any of the relevant home ranges. A small adverse impact and non-significant effect remains the conclusion for the Revised Proposed Development.

Collision – Cumulative Impacts

7.5.16 An updated CIA has been undertaken for collision impacts. Updates to the cumulative collision mortality estimates for relevant IOFs are summarised in **Table 7.5**, followed by a discussion as to whether these new estimates change the magnitude of the predicted impact or significance of effect compared to the EIA Proposed Development. The data used in **Table 7.5** includes the Revised Proposed Development (updated mortality estimates), the original projects in NHZ 10 (and NHZ 21 for red kite) included in the assessment for the EIA Proposed Development, as well as the additional four wind farms proposed for NHZ 10. None of the wind farm projects included in the original CIA have been removed from the updated assessment.

7.5.17 The four new projects identified have been included for an IOF where that species was recorded sufficiently to have undergone CRM. The IOFs with collision risk estimates were as follows:

- Balnespick Wind Farm: golden eagle, golden plover and red kite.
- Clune Wind Farm: golden eagle, golden plover, red kite and white-tailed eagle.
- Highland Wind Farm: golden eagle, red kite and white-tailed eagle.
- Kyllachy Wind Farm: red kite only (note golden eagle mortality was also calculated but estimated at 0.0).

7.5.18 None of these four additional projects have been consented at the time of writing and it is highly likely that at least some of these projects will undergo layout changes before there is confirmation that consent has either been granted or refused. Therefore, the inclusion of the mortality estimates as presented in the relevant EIA Report for those projects is precautionary.

Table 7.5: Updated Cumulative Impact Assessment (Collision Risk)

IOF	Cumulative Collision Impact: EIA Proposed Development	Change to Collision Estimate: Revised Proposed Development
Dunlin	0.103 collisions per year, the same as for the EIA Proposed Development alone. The cumulative collision mortality impact was considered to be of negligible magnitude.	The only change is the reduced collision mortality estimate for the Revised Proposed Development (0.002). As no other projects undertook CRM for dunlin, 0.002 collisions per year is also the cumulative estimate. The cumulative collision estimate for the Revised Proposed Development is lower than that estimated for the EIA Proposed Development.
Golden eagle	1.172 collisions per year. The EIA Proposed Development contributed <2% of this total. Following consideration of conservation status and the impact of immature birds in the population, the cumulative collision mortality impact was considered to be small adverse.	Taking into account the reduced collision mortality estimate for the Revised Proposed Development (0.010) but adding the estimates for Balnespick Wind Farm (0.09), Clune Wind Farm (0.277) and Highland Wind Farm (0.163), the updated cumulative mortality estimate equals 1.689 birds per year. The cumulative collision estimate for the Revised Proposed Development is greater than that estimated for the EIA Proposed Development.
Golden plover	7.814 collisions per year. Assessed against the NHZ breeding population and Scottish wintering population the cumulative collision mortality impact was considered to be of negligible magnitude.	Taking into account the reduced collision mortality estimate for the Revised Proposed Development (0.182) but adding the estimates for Balnespick Wind Farm (0.01) and Clune Wind Farm (0.028), the updated cumulative mortality estimate equals 7.32 birds per year. The cumulative collision estimate for the Revised Proposed Development is lower than that estimated for the EIA Proposed Development.
Red kite	2.760 collisions per year. Based on available literature this was considered insufficient to limit population growth and the cumulative collision mortality impact was considered to be small adverse.	Taking into account the reduced collision mortality estimate for the Revised Proposed Development (0.194) but adding the estimates for Balnespick Wind Farm (0.20), Clune Wind Farm (0.681), Highland Wind Farm (0.015) and Kyllachy Wind Farm (0.10), the updated cumulative mortality estimate equals 3.545 birds per year. The cumulative collision estimate for the Revised Proposed Development is greater than that estimated for the EIA Proposed Development.
White-tailed eagle	0.906 collisions per year. This was considered insufficient to limit population growth and the cumulative collision mortality impact was considered to be small adverse.	Taking into account the reduced collision mortality estimate for the Revised Proposed Development (0.346) but adding the estimate for Clune Wind Farm (0.97) and Highland Wind Farm (0.005), the updated cumulative mortality estimate equals 1.842 birds per year. Although not consistent with other projects, inclusion of the 'adult only' estimate for the Revised Proposed Development results in an estimate of 1.825. The cumulative collision estimate for the Revised Proposed Development is greater than that estimated for the EIA Proposed Development.

7.5.19 For dunlin and golden plover the cumulative collision estimate is lower for the Revised Proposed Development than that calculated for the EIA Proposed Development. For these IOFs, a negligible impact and non-significant effect remains the conclusion of the assessment.

7.5.20 For golden eagle the cumulative collision estimate has increased from 1.172 to 1.689 birds per year, as a result of inclusion of the additionally proposed projects. The Revised Proposed Development contributes to less than 1% of this total. A collision rate of 1.689 is equal to 3.13% of the regional population of 27 pairs (54 adult birds) (up from 2.17% for the cumulative estimate for the EIA Proposed Development). As stated in the impact assessment for the EIA Proposed Development, the collision estimates are based on a high proportion of immature birds recorded on project sites and these birds are not reflected in the NHZ population totals. It is immature birds that are most susceptible to collision. Adult birds exhibit very high avoidance of turbines, as has been shown by e.g. Whitfield (2009). Immature golden eagles have a high level of background annual mortality (85%)[6], but this is sufficient to support a population with a favourable status (increasing trend in the Central Highlands and in Scotland as a whole). The small increase in cumulative collision risk for the Revised Proposed Development is not considered sufficient to change the previous assessment and a small adverse impact and non-significant effect remains the conclusion. Irrespective, it is important to note that the contribution of the Revised Proposed Development to cumulative collision impacts on the regional golden eagle population would be indiscernible.

7.5.21 For red kite the cumulative collision estimate has increased from 2.760 to 3.545 birds per year, as a result of inclusion of the additionally proposed projects. The increase can be attributed to the proposed Clune Wind Farm (0.681), which contributes to *c*.20% of the overall total. The Revised Proposed Development contributes to less than 5% of the total. The cumulative assessment for the EIA Proposed Development referred to the research undertaken by Sansom *et al*. (2016b) which found that more than five collisions per year would be needed to limit population growth in the north Scotland red kite population (the core part of this population being found in NHZ 21, which is included in the CIA for this species). The original conclusion of a small adverse cumulative collision impact is considered to still be applicable, and a non-significant effect is concluded.

7.5.22 Although collision risk for the Revised Proposed Development has decreased for white-tailed eagle, the cumulative collision estimate has increased from 0.906 to 1.842 birds per year, as a result of inclusion of the additionally proposed projects. Over 50% of this total is a result of inclusion of the proposed Clune Wind Farm. The Revised Proposed Development contributes to 17% of the total. However, when considering the apparent proportional risk of new projects, it should be acknowledged that this is a reflection of changing baseline conditions within the region, which has seen the white-tailed eagle population increase since some of the projects included in the CIA were constructed.

7.5.23 The cumulative assessment for the EIA Proposed Development concluded that the cumulative collision risk for white-tailed eagle would be insufficient to cause a decline in the population of this species and concluded a small adverse impact and a non-significant effect.

[6] Available from: https://www.bto.org/understanding-birds/welcome-birdfacts (Accessed November 2025)

7.5.24 Cumulative collision risk at a national scale is now considered by NatureScot to be a key issue for white-tailed eagle (NatureScot, *per comms*. (see **Table 7.2**)) such that regional impacts cannot be looked at in isolation. It is outwith the scope of this assessment to determine country-wide collision risk, although NatureScot in their EIA response (August 2025) suggest, based on their own data, that this is currently close to 16 birds per year. It is not known if this estimate has since changed with further planning submissions. The Scottish population of white-tailed eagle is currently estimated at around 200 breeding pairs[7]. At a national scale, 16 deaths per year is equivalent to 4% of the breeding population. However, this is precautionary as immature birds (which do not typically breed until five years old) are not included in this population estimate and young, inexperienced birds are considered more likely than adults to be at risk of collision.

7.5.25 NatureScot has stated in their EIA response that this level of cumulative collision mortality would have a negative impact on the rate of population growth. However, the original aims of the white-tailed eagle reintroduction project to achieve a viable and self-sustaining population across its historic range would still be met; whilst acknowledging that recolonisation of all available habitat may take place over a longer timescale than without this level of additional mortality. The cumulative mortality would have to result in a population decline for it to be considered a significant adverse effect.

7.5.26 There remains uncertainty as to the current and future cumulative collision risk to white-tailed eagle, given the number of proposed wind farm projects in planning (both regionally and nationally) that are yet to be determined, and which may be subject to layout changes and which may or may not be consented. Within NHZ 10 this includes Clune Wind Farm, which currently contributes over half of the cumulative risk at a regional level. In the absence of that proposal, the cumulative collision risk for the Revised Proposed Development would be lower than that of the EIA Proposed Development.

7.5.27 Within the context of impacts at a national scale, the Revised Proposed Development, with a collision estimate of 0.346 birds per year (0.329 adults per year), is considered to represent a site of relatively low value for white-tailed eagle.

7.6 Summary

7.6.1 Based on the assessments set out above, the impact assessment for the Revised Proposed Development is summarised in Error! Reference source not found.. The table presents an update to the findings of the assessment for the EIA Proposed Development and presents a summary of likely significant effects (residual effects) for the Revised Proposed Development.

7.6.2 For most ornithological features, there would be a reduction in predicted impacts for the Revised Proposed Development alone, when compared to the EIA Proposed Development. Where a reduction cannot be concluded, the impact would be the same as for the EIA Proposed Development, with no greater impacts predicted. However, the magnitude classifications used ('negligible' being the lowest category) mean that the negligible impacts predicted for all IOFs remain the same as in the original submission,

[7] Available from: https://www.nature.scot/scotlands-sea-eagles-balancing-conservation-and-farming (Accessed November 2025)

despite any actual reductions in magnitude. All impacts are predicted to have non-significant effects.

7.6.3 The assessment for the Revised Proposed Development cumulatively with other projects also remains unchanged for most IOFs and assessed impacts. For golden eagle and red kite cumulative collision risk has increased as a result of including additional projects in the assessment, even though the impacts of the Revised Proposed Development itself have fallen and contribute a very small proportion of the risk. The classification of impact magnitude (small adverse), and conclusion of a non-significant effect, remains the same as in the original assessment.

7.6.4 For white-tailed eagle, there is uncertainty in the cumulative collision risk. The collision impact of the Revised Proposed Development has reduced compared to the EIA Proposed Development, but the inclusion of four newly proposed wind farm projects increases the cumulative regional collision risk overall. The cumulative mortality risk is highly precautionary as at least some of the additional wind farm projects now included in the CIA are likely to be subject to layout changes before being consented (where granted). As with the EIA Proposed Development, this is still considered to represent a small adverse and non-significant effect at a national population scale, as the additional level of mortality would not be sufficient to cause population decline.

7.6.5 Mitigation and enhancement measures are unchanged from the EIA Proposed Development.

Table 7.6 Summary of Updated Effects

Ornithological Feature	EIA Proposed Development Impact/ Effect	Change	Revised Proposed Development Impact/ Effect
EIA/Revised Proposed Development alone Construction and Decommissioning Phases: disturbance and displacement			
Curlew	**Negligible/ Non-significant**	Reduction in impact but no overall change	**Negligible/ Non-significant**
Dunlin	**Negligible/ Non-significant**	Reduction in impact but no overall change	**Negligible/ Non-significant**
Golden eagle	**Negligible/ Non-significant**	Reduction in impact but no overall change	**Negligible/ Non-significant**
Golden plover	**Negligible/ Non-significant**	Reduction in impact but no overall change	**Negligible/ Non-significant**
Red kite	**Negligible/ Non-significant**	Reduction in impact but no overall change	**Negligible/ Non-significant**
Short-eared owl	**Negligible/ Non-significant**	Reduction in impact but no overall change	**Negligible/ Non-significant**
EIA/Revised Proposed Development alone Operational Phase: disturbance and displacement			
Curlew	**Negligible/ Non-significant**	Same or reduction but no overall change	**Negligible/ Non-significant**
Dunlin	**Negligible/ Non-significant**	Same or reduction but no overall change	**Negligible/ Non-significant**
Golden eagle	**Negligible/ Non-significant**	Reduction in impact but no overall change	**Negligible/ Non-significant**
Golden plover	**Negligible/ Non-significant**	Same or reduction but no overall change	**Negligible/ Non-significant**
Red kite	**Negligible/Non-significant**	Same or reduction but no overall change	**Negligible/ Non-significant**

Ornithological Feature	EIA Proposed Development Impact/ Effect	Change	Revised Proposed Development Impact/ Effect
Short-eared owl	**Negligible/ Non-significant**	Reduction in impact but no overall change	**Negligible/ Non-significant**
EIA/Revised Proposed Development alone Operational Phase: collision			
Dunlin	**Negligible/ Non-significant**	Reduction in impact but no overall change	**Negligible/ Non-significant**
Golden eagle	**Negligible/ Non-significant**	Reduction in impact but no overall change	**Negligible/ Non-significant**
Golden plover	**Negligible/ Non-significant**	Reduction in impact but no overall change	**Negligible/ Non-significant**
Red kite	**Negligible/ Non-significant**	Reduction in impact but no overall change	**Negligible/ Non-significant**
White-tailed eagle	**Negligible/ Non-significant**	Reduction in impact but no overall change	**Negligible/ Non-significant**
EIA/Revised Proposed Development cumulative Construction and Decommissioning Phases: disturbance and displacement			
Curlew	**Negligible/ Non-significant**	No change	**Negligible/ Non-significant**
Dunlin	**Negligible/ Non-significant**	No change	**Negligible/ Non-significant**
Golden eagle	Disturbance: **Negligible/ Non-significant** Displacement: **Small adverse/ Non-significant**	No change	Disturbance: **Negligible/ Non-significant** Displacement: **Small adverse/ Non-significant**
Golden plover	**Negligible/ Non-significant**	No change	**Negligible/ Non-significant**
Red kite	**Negligible/ Non-significant**	No change	**Negligible/ Non-significant**
Short-eared owl	**Negligible/ Non-significant**	No change	**Negligible/ Non-significant**
EIA/Revised Proposed Development cumulative Operational Phase: disturbance and displacement			
Curlew	**Negligible/ Non-significant**	No change	**Negligible/ Non-significant**
Dunlin	**Negligible/ Non-significant**	No change	**Negligible/ Non-significant**

Ornithological Feature	EIA Proposed Development Impact/ Effect	Change	Revised Proposed Development Impact/ Effect
Golden eagle	Disturbance: **Negligible/ Non-significant** Displacement: **Small adverse/ Non-significant**	No change	Disturbance: **Negligible/ Non-significant** Displacement: **Small adverse/ Non-significant**
Golden plover	**Negligible/ Non-significant**	No change	**Negligible/ Non-significant**
Red kite	**Negligible/ Non-significant**	No change	**Negligible/ Non-significant**
Short-eared owl	**Negligible/ Non-significant**	No change	**Negligible/ Non-significant**
EIA/Revised Proposed Development cumulative Operational Phase: collision			
Dunlin	**Negligible/ Non-significant**	Reduction in impact but no overall change	**Negligible/ Non-significant**
Golden eagle	**Small adverse/ Non-significant**	Increase in impact* but no overall change	**Small adverse/ Non-significant**
Golden plover	**Negligible/ Non-significant**	Reduction in impact but no overall change	**Negligible/ Non-significant**
Red kite	**Small adverse/ Non-significant**	Increase in impact* but no overall change	**Small adverse/ Non-significant**
White-tailed eagle	**Small adverse/ Non-significant**	Increase in impact* but no overall change	**Small adverse/ Non-significant****

* Increase due to inclusion of additional proposed developments.

** However, there is some uncertainty due to the number of wind farm applications yet to reach determination.

7.7 Cross Referencing

Table 7.7 Cross Reference to EIA

Figure	Associated Figure in EIA Report
AI Figure 7.7	Figures 7.5a - 7.5b
AI Figure 7.8	Figures 7.4a – 7.4d

7.8 References

Band, W. (2024). *Using a collision risk model to assess bird collision risks for onshore wind farms.* NatureScot Research Report 909.

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

Goodship, N.M. and Furness, R.W. (MacArthur Green) (2022). *Disturbance Distances Review: An updated literature review of disturbance distances of selected bird species.* NatureScot Research Report 1283.

NatureScot (2025a). *Recommended bird survey methods to inform impact assessment of onshore windfarms*. NatureScot, Inverness.

NatureScot (2025b). *Wind farm impacts on birds – use of avoidance rates in the NatureScot Wind Farm Collision Risk Model. September 2025 v4*. NatureScot, Inverness.

NatureScot. (2024). *Guidance on using an updated collision risk model to assess collision risk at onshore wind* farms. NatureScot, Inverness.

Sansom, A., Evans, R. & Roos, S. (2016a). *Population and future range modelling of reintroduced Scottish white-tailed eagles (Haliaeetus albicilla).* Scottish Natural Heritage (now NatureScot) Commissioned Report No. 898.

Sansom, A., Etheridge, B., Smart, J. and Roos, S. (2016b). *Population modelling of North Scotland red kites in relation to the cumulative impacts of wildlife crime and wind farm mortality.* Scottish Natural Heritage (now NatureScot) Commissioned Report No. 904.

SNH (2017). *Recommended bird survey methods to inform impact assessment of onshore wind farms. Scottish Natural Heritage Guidance: Version 2 - March 2017*. Scottish Natural Heritage, now NatureScot, Inverness.

SNH (2016). *Assessing connectivity with Special Protection Area (SPAs)*. Scottish Natural Heritage, now NatureScot, Inverness.

Whitfield, D.P. (2009). *Collision avoidance of golden eagles at wind farms under the 'Band' collision risk model.* Natural Research Ltd. Report to Scottish Natural Heritage (now NatureScot).