9 Ornithology

9.1 Introduction

9.1.1 This chapter provides a revised assessment of the likely significant effects on ornithology associated with the construction and operation of the revised proposed development. It details the post-submission consultation responses and how these have been addressed, relevant changes in policy, legislation and guidance, and the amendments to the original proposed development detailed and assessed in the EIA Report October 2023 that are relevant to ornithology.

9.1.2 As interrelationships exist between the assessment of effects on ornithology and certain other disciplines, reference should be made to the following chapters and technical appendices of the AEI:

- **AEI Chapter 3: Revised Proposed Development Description**
- **AEI Chapter 8: Terrestrial Ecology**
- **AEI Technical Appendix 8.6: Outline Biodiversity Enhancement and Restoration Plan**

9.1.3 This chapter should be read in conjunction with the existing Chapter 9: Ornithology of the EIA Report October 2023.

9.1.4 The assessment has been carried out by Dr Steve Percival of Ecology Consulting, who also carried out the original assessment within EIA Report October 2023.

9.1.5 This AEI chapter is supported by the following figures and technical appendices, which update and replace those included in the EIA Report October 2023:

- AEI Figures:
  - **AEI Figure 9.1: Special Protection Area and Ramsar Sites within 20 km**;
  - **AEI Figure 9.2: Ornithological Survey Areas and Viewsheds**;
  - **AEI Figure 9.3: Breeding Greylag Goose Locations 2022 and 2023**;
  - **AEI Figure 9.4: Breeding Golden Plover Locations 2022 and 2023**;
  - **AEI Figure 9.5: Breeding Lapwing Locations 2022 and 2023**;
  - **AEI Figure 9.6: Breeding Curlew Locations 2022 and 2023**;
  - **AEI Figure 9.7: Pink-footed Goose Flight Lines**;
  - **AEI Figure 9.8: Greylag Goose Flight Lines**;
  - **AEI Figure 9.9: Red Kite Flight Lines**;
  - **AEI Figure 9.10: Peregrine Flight Lines**;
  - **AEI Figure 9.11: Other Raptor Flight Lines**;
  - **AEI Figure 9.12: Curlew Flight Lines**;
  - **AEI Figure 9.13: Lapwing Flight Lines**;
  - **AEI Figure 9.14: Golden Plover Flight Lines**; and
  - **AEI Figure 9.15: Herring Gull Flight Lines.**
- AEI Technical Appendices
  - **AEI Technical Appendix 9.1: Collision Risk Modelling Calculations;**
  - **AEI Technical Appendix 9.2: Shadow Habitats Regulations Assessment; and**

- **AEI Technical Appendix 9.3: Ornithology Confidential Annex.**

9.1.6 AEI Figures 9.1 – 9.15 and AEI Technical Appendices 9.1, 9.2 and 9.3 are referenced in the text where relevant.

9.1.7 Reference is also made to the following Technical Appendices included in the EIA Report October 2023, which remain applicable to the revised proposed development:

- **EIA Technical Appendix 9.6: Breeding Bird Protection Plan**

9.2 Legislation, Policy and Guidance

9.2.1 Since the submission of the EIA Report October 2023, NatureScot has updated its guidance on bird collision risk modelling (Band 2024)[1]. However, this uses the same core model as used for the EIA Report October 2023 collision risk assessment, so the same overall modelling framework has been used as previously in order to retain comparability between the original and the reduced layouts.

9.3 Consultation

9.3.1 **AEI Table 9.1** provides a summary of the consultation responses received for the EIA Report October 2023 relating to ornithology.

AEI Table 9.1. Consultee comments on EIAR Ornithology and response in AEI

Consultee / Date	Consultee Comment	Applicant Response / Action
NatureScot and RSPB	Current curlew regional population is less than published value in Wilson *et al.* 2015 – estimated reduced from 1,400 pairs to 1,220.	Noted – this assessment has used the updated 1,220 pairs as the baseline regional population.
	Cumulative impact concerns raised, particularly with regard to curlew.	The revised proposed development has reduced impact on curlew. Mitigation measures as detailed in Section 9.8 will ensure that the revised proposed development delivers a net benefit to curlew, so would not contribute to any adverse cumulative impact.
NatureScot	Concerns were raised about the collision risk modelling, but NatureScot concluded that it did not consider the issues to be of sufficient concern to necessitate additional assessment.	Noted.
	Goodship and Furness 2022 disturbance distances should be used.	These have been adopted in this assessment for the revised proposed development.

[1] Band, W. (2024). Using a collision risk model to assess bird collision risks for onshore wind farms. NatureScot Research Report 909. Available at: https://www.nature.scot/doc/naturescot-research-report-909-using-collision-risk-model-assess-bird-collision-risks-onshore-wind

Consultee / Date	Consultee Comment	Applicant Response / Action
	NatureScot agrees with the conclusion of no impacts on Fala Flow and Greenlaw Moor SPAs associated with pink-footed geese. More generally NatureScot are not concerned about impacts on geese from this development given the robust status of pink-footed geese and resident greylags.	Noted – there would be a further reduction in risk to 0.4 per year as a result of the revised proposed development. An updated assessment is presented in **AEI Technical Appendices 9.1** and **9.2.**
	Breeding waders - 'clearly a good site'.	The assessment presented in Section 9.7 identifies that the revised proposed development reduces impact on breeding waders substantially, particularly curlew.
	Merlin – need positive management in BERP.	Proposed management measures will include local benefit for this species. This includes re-wetting of peatland and restoration of dry heath.
	Golden eagle – "*As no attempt at nesting has been made in the vicinity we think the level of assessment for golden eagle is adequate*".	Noted – the assessment presented in Section 9.7 concludes that the impact on golden eagle has been reduced as a result of the revised proposed development.
	Red kite – "*The ES identifies that the species has recently colonised the area but has not considered that impact to a recolonising species at the edge of range is going to be greater than to a bigger population. As a result, we consider that the ES is too dismissive of the impact on red kite but given that no nests were recorded in the vicinity, we do not require additional assessment to be undertaken*".	Noted – further consideration of status on edge of expanding range is presented for this species in this chapter (see Section 9.7).
	Biodiversity Enhancement Restoration Plan – needs more information.	**AEI Technical Appenidx 8.6** includes a range of measures that will benefit the local bird populations, though, as set out in section 9.8 below, the focus of the ornithological mitigation will be off-site.

9.4 Scope of Additional Environmental Information

9.4.1 This chapter considers the likely significant effects of the revised proposed development upon ornithology. It focuses on the key receptors identified in the EIA Report October 2023, i.e. those species listed by NatureScot (SNH 2018)[2] as being at potential risk of impact from wind farms. They include:

- Six species breeding within the potential disturbance zone around the site:
  - greylag goose;
  - golden plover;
  - lapwing;
  - curlew;
  - merlin; and
  - short-eared owl (2022 only).
- Key species recorded using the potential disturbance zone outside the breeding season included red kite, hen harrier, goshawk, golden eagle, golden plover, lapwing, curlew, peregrine and merlin.
- Key species recorded at risk of collision (i.e. flying through the site at rotor height) included whooper swan, pink-footed goose, greylag goose, red kite, marsh harrier, goshawk, golden eagle, curlew, golden plover, lapwing, peregrine and merlin.

9.4.2 As for the EIA Report October 2023, this includes assessment of the construction, operational and decommissioning impacts associated with the revised proposed development. The key potential ornithological impacts remain as detailed in the EIA Report October 2023 (SNH 2018):

- direct loss of bird habitat through construction of the new access track;
- disturbance of birds during construction and operation; and
- collision risk to birds during operation.

9.5 Methodology

9.5.1 There have been no changes to the assessment methodology that was used for the EIA Report October 2023. The revised assessment presented in this chapter for the revised proposed development layout uses the same baseline data and applies the same assessment criteria as detailed in Chapter 9: Ornithology of the EIA Report October 2023.

9.6 Baseline

9.6.1 The baseline conditions are fully described in Chapter 9 of the EIA Report October 2023 and that for the purposes of this assessment, the baseline previously described in Chapter 9 is unchanged.

[2] Scottish Natural Heritage (2018). Assessing Significance of Impacts from Onshore Wind Farms Outwith Designated Areas. Available at: https://www.nature.scot/doc/guidance-note-assessing-significance-impacts-bird-populations-onshore-wind-farms-do-not-affect

9.7 Updated Assessment of Potential Effects

Design Amendments

9.7.1 The key design amendment relevant to ornithology is the reduction in wind turbine numbers from 19 to 12. As a result, the potential disturbance zone around the revised proposed development has reduced (for both the construction and the operational phases) and the collision risk zone has also reduced (and hence the resultant collision risk).

Construction Effects

Summary of Assessment of Original Proposed Development

9.7.2 The EIA Report October 2023 identified a range of likely ornithological effects of the construction of the original proposed development, including:

- habitat loss: construction of infrastructure including wind turbine foundations and access tracks – a permanent loss of 1.2% of the total area within the site, and an additional temporary loss of 1.6%;
- disturbance to Schedule 1 and Annex 1 breeding species – merlin, golden plover and short-eared owl;
- disturbance to other breeding species – notably curlew, lapwing and greylag goose; and
- disturbance to wintering birds – notably lapwing and curlew.

Assessment of Revised Proposed Development

9.7.3 This section updates and replaces Section 9.6 of the EIA Report October 2023.

Direct Effects: Loss of Habitat (Direct loss or degradation of habitat through construction of the revised proposed development)

Nature of Impact

9.7.4 There will be a direct loss of habitat resulting from the construction of the revised proposed development. **AEI Table 8.6** sets out the losses of each habitat that would occur as a result of the revised proposed development.

9.7.5 The permanent land take would be limited to the wind turbine foundations, access tracks, permanent crane hardstands and substation & BESS compounds which account collectively for about 2.5% of the total area within the reduced site. Additional temporary land take during construction would add further temporary habitat loss of about another 2.4% of the total area within the site.

9.7.6 The use of existing tracks and the careful selection of routes for the access tracks and wind turbine locations, alongside the use of proven construction techniques would ensure that such effects on birds would be of low/negligible magnitude (even in a local context). In addition, the applicant has committed to the production and implementation of a Construction Environmental Management Plan (CEMP) to the satisfaction of NatureScot and other relevant stakeholders, before construction

commences, and would follow *Windfarm Good Construction Guidance* by Scottish Renewables *et al.* (2019)[3].

Ornithological Receptor Value

9.7.7 Direct habitat loss will reduce habitat availability to the species breeding and foraging on the site, including golden plover, merlin and short-eared owl (all high value), lapwing and curlew (both medium value) and greylag goose (low value).

9.7.8 Direct habitat loss will also reduce habitat availability to the other species foraging on the site, including six high value species (red kite, golden eagle, hen harrier, marsh harrier, goshawk and peregrine).

Magnitude of Impact

9.7.9 The amount of habitat loss from the revised proposed development will be reduced from the EIA Report October 2023, but the overall assessment is unchanged. Direct habitat loss to breeding and non-breeding birds will be negligible in the context of the availability of the habitats that will be affected (predominantly open moorland), and in the context of the sizes of these birds' home ranges.

Significance of Effects

9.7.10 The very small loss of breeding and foraging habitat of negligible magnitude on high/medium value receptors results in an effect of negligible significance for all of the bird species affected and would not be significant.

Indirect Effects: Construction Disturbance (Noise and Visual)

9.7.11 The indirect effect of disturbance is likely to be highest during construction owing to the increased activity on site. Pearce-Higgins *et al.* (2012) found that red grouse, snipe and curlew densities all declined at wind farm sites during construction, whilst densities of skylark and stonechat increased. Construction also involves the presence of work personnel on site which itself can be an important source of potential disturbance. Pearce-Higgins *et al.* (2012), for example, reported decreases in curlew density during construction of 40% and snipe by 53%. Other species, such as golden plover (Sansom *et al.* 2016), though have been unaffected by construction disturbance. The assessment of construction disturbance has assumed that all breeding birds within 500 m of the revised proposed development could potentially be at risk of displacement, and a slightly wider zone (600 m) for wintering birds (Percival 2005, Drewitt and Langston 2006). It should be noted that only partial displacement within these zones might be expected (Pearce-Higgins *et al.* 2009), but it is assumed for the purposes of this assessment that all birds occurring within the zone are at risk of disturbance. For priority species (SNH 2018) consideration has also been given to the disturbance distances given in Goodship and Furness (2022).

Nature of the Impact

9.7.12 The estimated on-site construction period for the revised proposed development is expected to last approximately 16 months (the same as reported in the EIA Report October 2023). The construction

[3] Scottish Renewables. 2019. Good Practice during Wind Farm Construction. Available at : https://www.scottishrenewables.com/publications/498-guidance-good-practice-during-wind-farm-construction

works will take place throughout the year, including the summer months when the weather is more favourable and ground conditions are drier. The construction disturbance footprint area would be reduced as a result of the reduced layout, and bird numbers potentially affected also reduced.

9.7.13 Noise and visual disturbance associated with construction activities could potentially affect breeding and foraging birds in the locality of the wind turbine positions, access tracks and other infrastructure components. Birds that are disturbed at breeding sites are vulnerable to a variety of potential effects that could lead to a reduction in the productivity or survival of their populations; these include the chilling or predation of exposed eggs and chicks and damage of eggs and chicks due to panicked adults. Birds subject to disturbance outside the breeding season may also feed less efficiently or resort to less favoured roosting areas, either of which may reduce their survival prospects. The potential impact will vary between species according to each species' tolerance of disturbance from human activity and the availability of suitable alternative breeding and foraging habitat.

Ornithological Receptor Value

9.7.14 **AEI Table 9.2** shows the peak breeding bird populations of conservation importance that were found within 500 m of the proposed wind turbine locations and with the other associated infrastructure (including access tracks) during the baseline surveys, where this distance has been used to identify the potential disturbance zone (though also giving consideration to particularly sensitive species in a wider area around that). **AEI Table 9.2** also shows the breeding numbers for the original proposed development for comparison.

AEI Table 9.2. Conservation Importance of Breeding Birds in the Wind Farm Potential Disturbance Zone (AEI and EIA Report layouts)

Species	Peak breeding pairs <500 m from wind turbines		Peak breeding pairs <500 m from all infrastructure		Scale of Importance of Breeding Population Within Potential Disturbance Zone	Conservation Value Within Potential Disturbance Zone
	EIA Report	AEI	EIA Report	AEI		
Greylag Goose	26	18	30	28	Regional	Low
Teal	1	1	1	1	Local	Low
Mallard	11	6	11	7	Local	Low
Red Grouse	120	100	141	138	Local	Medium
Kestrel	2	1	2	1	Local	Low
Merlin	1	1	1	1	Regional	High
Oystercatcher	9	1	11	6	Local	Low

Species	Peak breeding pairs <500 m from wind turbines		Peak breeding pairs <500 m from all infrastructure		Scale of Importance of Breeding Population Within Potential Disturbance Zone	Conservation Value Within Potential Disturbance Zone
Golden Plover	12	6	15	15	Regional	High
Lapwing	10	1	21	18	Local	Medium
Snipe	8	3	11	11	Regional (EIA Report), reduced to Local for turbine buffer	Medium
Curlew	30	11	34	27	Regional (EIA Report), reduced to Local for turbine buffer	Medium
Common Sandpiper	7	2	7	2	Local	Low
Redshank	1	0	1	1	Local	Low
Black-headed Gull	1	0	7	7	Local	Low
Stock Dove	1	0	1	0	Local	Low-Nil
Woodpigeon	70	1	75	13	Local	Low
Cuckoo	1	0	2	1	Local	Medium
Short-eared Owl	1	1	1	1	Regional	High
Skylark	238	148	282	249	Local	Medium
Meadow Pipit	725	517	836	767	Local	Low
Grey Wagtail	6	3	8	5	Local	Low
Dipper	4	1	5	1	Local	Low
Wren	83	38	97	64	Local	Low
Dunnock	14	4	20	11	Local	Medium
Whinchat	13	7	13	9	Local	Low

Species	Peak breeding pairs <500 m from wind turbines		Peak breeding pairs <500 m from all infrastructure		Scale of Importance of Breeding Population Within Potential Disturbance Zone	Conservation Value Within Potential Disturbance Zone
Wheatear	12	7	14	9	Local	Low
Ring Ouzel	12	5	13	8	Local	Medium
Song Thrush	7	2	9	4	Local	Medium
Mistle Thrush	13	5	14	9	Local	Low
Willow Warbler	40	13	48	26	Local	Low
Spotted Flycatcher	1	0	1	1	Local	Medium
Siskin	8	0	8	5	Local	Low
Linnet	11	4	14	11	Local	Medium
Lesser Redpoll	38	16	42	26	Local	Medium
Common Crossbill	2	0	2	1	Local	High
Bullfinch	2	0	3	2	Local	Medium
Reed Bunting	17	7	22	17	Local	Medium

9.7.15 **AEI Table 9.3** shows the peak wintering bird populations of conservation importance found within 600 m of the proposed wind turbine locations and the other associated infrastructure (including access tracks) during the baseline surveys, where this distance has been used to identify the potential disturbance zone (though also giving consideration to particularly sensitive species in a wider area around that).

AEI Table 9.3. Conservation Importance of Wintering Birds in the Wind Farm Potential Disturbance Zone

Species	Peak walkover count <600 m from wind turbines		Peak walkover count <600 m from all infrastructure		Scale of Importance of Breeding Population Within Potential Disturbance Zone	Conservation Value Within Potential Disturbance Zone
	EIA Report	AEI	EIA Report	AEI		

Species	Peak walkover count <600 m from wind turbines		Peak walkover count <600 m from all infrastructure		Scale of Importance of Breeding Population Within Potential Disturbance Zone	Conservation Value Within Potential Disturbance Zone
Pink-footed Goose	80	0	80	80	Local	Very high
Greylag Goose	57	0	84	84	Local	Low
Mallard	14	2	15	9	Local	Low
Red Grouse	206	157	218	216	Local	Medium
Red Kite	3	3	3	3	Local	High
Hen Harrier	1	0	1	1	Local	High
Goshawk	1	0	1	0	Local	High
Sparrowhawk	1	1	1	1	Local	Low
Kestrel	3	1	3	2	Local	Low
Merlin	1	1	1	1	Local	High
Peregrine	1	0	1	1	Local	High
Oystercatcher	4	0	4	4	Local	Low
Golden Plover	37	32	37	37	Local	High
Lapwing	30	0	34	34	Local	Medium
Snipe	9	4	11	11	Local	Low
Woodcock	6	4	6	6	Local	Low
Curlew	15	4	18	18	Local	Medium
Lesser Black-backed Gull	1	0	1	0	Local	Low
Herring Gull	25	0	101	96	Local	Medium
Great Black-backed Gull	4	0	1	0	Local	Low

Effects of Construction Disturbance on NatureScot Key Species

9.7.16 The following section presents a revised assessment of the construction disturbance effects on each of the NatureScot (SNH 2018) key species that were found within the potential disturbance zone within the breeding season (**AEI Table 9.2**) and at other times of year (**AEI Table 9.3**).

Curlew

9.7.17 27 pairs of curlew were found within 500 m of the site (compared with 34 pairs for the EIA Report October 2023), and hence would be at risk of disturbance during construction (**AI Figure 9.6**). This species is a red-listed Scottish BAP species, so has been classed as medium value. The NHZ population is 1,400 pairs (Wilson *et al.* 2015) and NatureScot and RSPB have advised further reduction to 1,220 pairs, so the numbers within the potential disturbance zone would be considered to be of regional importance.

9.7.18 This species has been shown to be affected by disturbance, particularly during construction (Pearce-Higgins *et al.* 2012), so some displacement of breeding birds during the construction phase would be expected. The effect in a worst case, assuming complete displacement from this zone, would be of low magnitude on a medium value receptor, which would be of minor significance and not significant.

Golden Plover

9.7.19 15 pairs of golden plover were found within 500 m of the site (the same as the EIA Report October 2023) and hence would be at risk of disturbance during construction (**Figure 9.4**). This species is an EU Birds Directive Annex 1 species, so it has been classed as high value. The NHZ population is 1,058 pairs (Wilson *et al.* 2015), so the numbers within the potential disturbance zone would be considered to be of regional importance. Some disturbance of these birds is likely during construction, though probably not the complete displacement assumed in this worst-case assessment. Even in that worst case, a complete displacement of 15 pairs would be of low magnitude on a high value receptor, resulting in an effect of minor significance, which would not be significant.

Lapwing

9.7.20 18 pairs of lapwing were found within 500 m of the site (compared to 21 pairs in the EIA Report October 2023), and hence would be at risk of disturbance during construction (**Figure 9.5**). This species is a red-listed Scottish BAP species, so it has been classed as medium value. No NHZ population estimate is available (Wilson *et al.* 2015), but the numbers within the potential disturbance zone would be considered to be of local importance. Some disturbance of these birds is likely during construction, though probably not the complete displacement assumed in this worst-case assessment. Even in that worst case, a complete displacement of 18 pairs would be of negligible magnitude on a medium value receptor, resulting in an effect of negligible significance, which would not be significant.

Greylag Goose

9.7.21 28 pairs of greylag geese were found within 500 m of the site (compared to 30 in the EIA Report October 2023), and hence would be at risk of disturbance during construction (**Figure 9.3**). This species is an amber-listed species of conservation concern, so it has been classed as low value. No NHZ population estimate is available (Wilson *et al.* 2015), but the numbers within the potential

disturbance zone would be considered to be of regional importance. Some disturbance of these birds is likely during construction, though probably not the complete displacement assumed in this worst-case assessment. Even in that worst case, a complete displacement of 28 pairs would be only of negligible magnitude on a low value receptor resulting in an effect of negligible significance, which would not be significant.

Merlin

9.7.22 A pair of merlin bred successfully within the potential construction disturbance zone in both 2022 and 2023 but at different locations (see Confidential **AEI Technical Appendix 9.3** for further details). This is the same as the EIA Report October 2023. This species is specially protected from disturbance under Schedule 1 of the Wildlife and Countryside Act, so mitigation measures will need to be put in place to avoid a significant impact during construction.

Short-eared Owl

9.7.23 A pair of short-eared owls bred within the potential construction disturbance zone in 2022, but there were no records in 2023. Intermittent breeding at a site is usual for this species. This is the same as the EIA Report October 2023. This species is an EU Birds Directive Annex 1 species, so it has been classed as high value. The NHZ population is 35 pairs (Wilson *et al.* 2015), so the numbers within the potential disturbance zone would be considered to be of regional importance. Displacement of one pair during construction would be an effect of low magnitude on a high value receptor, an effect of minor significance, which would not be significant.

Other scarce raptor species

9.7.24 Several other high value raptor species were observed flying over the site during the baseline surveys, including golden eagle, osprey, goshawk, red kite, hen harrier, marsh harrier and peregrine. All were, however, only seen infrequently, with no evidence of breeding within the survey area or that it was important for foraging for any of them. Further analysis of golden eagle in the context of the South of Scotland release scheme is given in **AEI Technical Appendix 9.3**. Whilst some displacement may occur during construction, this would be an effect of negligible magnitude and significance on all these species, and not significant (the same conclusion as reached in the EIA Report October 2023).

Operational Effects

Summary of Assessment of Original Proposed Development

9.7.25 The EIA Report October 2023 identified a range of likely ornithological effects of the operation of the wind farm, including:

- displacement of birds from the zone around wind turbines;
- disturbance to Schedule 1 and Annex 1 breeding species – merlin, golden plover and short-eared owl;
- disturbance to other breeding species – notably curlew, lapwing and greylag goose;
- disturbance to wintering birds – notably lapwing and curlew; and

- mortality through bird collision with wind turbines – notably red kite, goshawk, golden eagle, peregrine and golden plover.

Assessment of Revised Proposed Development

Operational Displacement

Nature of Impact

9.7.26 The presence and operation of wind turbines could potentially displace birds from breeding and foraging areas. Birds may avoid the operational wind turbines and the surrounding area due to the visual appearance of large vertical structures in the landscape, the mechanical noises and wind noises of the blades, or the presence of periodic maintenance vehicles and personnel. Displacement due to operational wind turbines could force birds into less suitable habitat and this might reduce their ability to survive and reproduce. If not displaced, birds may experience reduced foraging success or reduced productivity. Displacement effects can vary over time as birds habituate to the presence of operating wind turbines or site-faithful birds are lost from the population.

Ornithological Receptor Value

9.7.27 **AEI Table 9.2** shows the peak breeding bird populations found within 500 m of the proposed wind turbine locations during the baseline surveys, where this distance has been used to identify the potential distance zone (though also giving consideration to particularly sensitive species in a wider area around that).

9.7.28 **AEI Table 9.3** shows the peak wintering bird populations that were found within 600 m of the proposed wind turbine locations during the baseline surveys, where this distance has been used to identify the potential distance zone (though also giving consideration to particularly sensitive species in a wider area around that).

Effects of Operational Disturbance on NatureScot Key Species

9.7.29 The following section assesses the operational disturbance effects on each of the NatureScot key species that were found within the potential disturbance zone within the breeding season (**AEI Table 9.2**) and at other times of year (**AEI Table 9.3**).

Curlew

9.7.30 11 pairs of curlew were found within 500 m of the wind turbines (compared to 30 pairs in the EIA Report October 2023) and hence would be at risk of disturbance during operation (**AEI Figure 9.6**). This species is a red-listed Scottish BAP species, so has been classed as medium value. The NHZ population is 1,400 pairs (Wilson *et al.* 2015) and NatureScot and RSPB have advised this has reduced further to 1,220 pairs, so the numbers within the potential disturbance zone would be considered to be of local importance compared to regional in the EIA Report October 2023.

9.7.31 This species has been shown to be affected by disturbance, particularly during construction (Pearce-Higgins *et al.* 2012). Some displacement of breeding birds during the operational phase would be expected. The effect in a worst case, assuming complete displacement from this zone, would be of low magnitude on a medium value receptor, which would be of minor significance and not significant.

Golden Plover

9.7.32 Six pairs of golden plover were found within 500 m of the wind turbines (compared to 12 in the EIA Report October 2023), and hence would be at risk of disturbance during operation (**AEI Figure 9.4**). This species is an EU Birds Directive Annex 1 species, so it has been classed as high value. The NHZ population is 1,058 pairs (Wilson *et al.* 2015), so the numbers within the potential disturbance zone would be considered to be of regional importance. Some disturbance of these birds is likely during operation, though probably not the complete displacement assumed in this worst-case assessment. Even in that worst case, a complete displacement of six pairs would be of low magnitude on a high value receptor resulting in an effect of minor significance, which would not be significant.

Lapwing

9.7.33 One pair of lapwing were found within 500 m of the wind turbines (compared to 10 pairs in the EIA Report, October 2023), and hence would be at risk of disturbance during operation (**AEI Figure 9.5**). This species is a red-listed Scottish BAP species, so has been classed as medium value. No NHZ population estimate is available (Wilson *et al.* 2015) but the numbers within the potential disturbance zone would be considered to be of local importance. Some disturbance of these birds is likely during operation, though probably not the complete displacement assumed in this worst-case assessment. Even in that worst case, this would be only of negligible magnitude on a medium sensitivity receptor resulting in an effect of negligible significance, which would not be significant (the same conclusion as reached in the EIA Report October 2023)..

Greylag Goose

9.7.34 18 pairs of greylag geese were found within 500 m of the wind turbines (compared to 26 pairs in the EIA Report October 2023), and hence would be at risk of disturbance during operation (**AEI Figure 9.3**). This species is an amber-listed species of conservation concern, so has been classed as low value. No NHZ population estimate is available (Wilson *et al.* 2015) but the numbers within the potential disturbance zone would be considered to be of regional importance. Some disturbance of these birds is likely during operation, though probably not the complete displacement assumed in this worst-case assessment. Even in that worst case, this would only be a negligible magnitude on a low sensitivity receptor resulting in an effect of negligible significance, which would not be significant (the same conclusion as reached in the EIA Report October 2023)..

Merlin

9.7.35 A pair of merlin bred successfully within the potential operational disturbance zone in both 2022 and 2023, but at different locations (see Confidential **AEI Technical Appendix 9.3** for further details). This is the same as the EIA Report October 2023. This species is specially protected from disturbance under Schedule 1 of the Wildlife and Countryside Act. The NHZ population is 22 pairs (Wilson *et al.* 2015), so the numbers within the potential disturbance zone would be considered to be of regional importance. Some small-scale displacement is possible, but this would be an effect of low magnitude on a high value species, which would be of minor significance and not significant (the same conclusion as reached in the EIA Report October 2023)..

Short-eared Owl

9.7.36 A pair of short-eared owls bred within the potential operational disturbance zone in 2022, but there were no records in 2023. Intermittent breeding at a site is usual for this species. This is the same as the EIA Report October 2023. This species is an EU Birds Directive Annex 1 species, so it has been classed as high value. The NHZ population is 35 pairs (Wilson *et al.* 2015), so the numbers within the potential disturbance zone would be considered to be of regional importance. Some small-scale displacement is possible, but this would be an effect of low magnitude on a high value species, which would be of minor significance and not significant (the same conclusion as reached in the EIA Report October 2023)..

Other scarce raptor species

9.7.37 Several other high value raptor species were observed flying over the site during the baseline surveys, including golden eagle, osprey, goshawk, red kite, hen harrier, marsh harrier and peregrine. All were, however, only seen infrequently, with no evidence of breeding within the survey area or that it was important for foraging for any of them. Further analysis of golden eagle in the context of the South of Scotland release scheme is given in Confidential **AEI Technical Appendix 9.3**. Whilst some displacement may occur during operation, this would be an effect of negligible magnitude and significance on all these species, and not significant (the same conclusion as reached in the EIA Report October 2023)..

Direct Effects: Collision Mortality

Nature of Impact

9.7.38 Birds that collide with a wind turbine blade are likely to be killed or fatally injured. Increased mortality rates from collision with wind turbines could potentially affect the maintenance of bird populations, particularly for species that are otherwise experiencing poor reproductive or survival levels due to other factors e.g. food availability. The frequency of collision with wind turbines is assumed to be dependent on the amount of flight activity across the site and the ability of birds to detect the rotating blades and take avoidance action.

9.7.39 Operational displacement and collision with wind turbines are spatially mutually exclusive (if a bird is displaced from the wind farm, it is not at risk of collision). However, displacement effects may change through time, as birds that were at first displaced from an area may habituate to the presence of the operating wind turbines after a period of time and become exposed to the risk of collision

9.7.40 **AEI Table 9.4** summarises the collision risk analysis for each species carried out previously for the original proposed development layout. Data are presented separately for each of the two baseline survey years (2021-22 and 2022-23). The collision risk zone for the revised proposed development was taken as the wind turbines plus a 500 m buffer (following NatureScot guidance). Reference NHZ population sizes were derived from Wilson *et al.* (2015), and for curlew a reduced NHZ population of 1,220 pairs, as advised by RSPB and NatureScot during consultation.

9.7.41 **AEI Table 9.4** gives the number of collisions predicted per year based on the precautionary NatureScot avoidance rate of 99% for red kite and marsh harrier, 99.5% for swans and gulls, 99.8%

for the three goose species and 98% for all of the other species, the percentage increase that this would represent over the baseline mortality and an assessment of the magnitude of these effects.

9.7.42 **AEI Table 9.5** summarises the collision risk analysis for each species for the revised proposed development layout, following the same methods and precautionary NatureScot avoidance rates as for the assessment presented in Chapter 9 of the EIA Report October 2023. For further details, see **AEI Technical Appendix 9.3: Collison Risk Modelling Calculations**.

AEI Table 9.4: Collision Risk Modelling Predictions EIA Report October 2023

Species	Precautionary Predicted Number of Collisions per Year (NS avoidance rate)		Percentage Increase in Baseline Mortality		Magnitude
	2021-22	2022-23	2021-22	2022-23	
Whooper Swan	0	0.13	0%	<0.1%	Negligible
Pink-footed Goose	0.31	1.78	<0.1%	<0.1%	Negligible
Greylag Goose	0.14	0.44	<0.1%	<0.1%	Negligible
Marsh Harrier	0	0.07	-	-	Negligible
Goshawk	0	0.15	0%	1.9%	Low/negligible
Red Kite	0.14	6.33 (1.0)	-	-	Low/negligible
Golden Eagle	0	0.10	0%	1.3%	Low/negligible
Peregrine	0.04	0.49	0.2%	2.5%	Low/negligible
Golden Plover	5.32	40.3	0.4%	3.0%	Low/negligible
Lapwing	0.82	10.2	<0.1%	0.6%	Negligible
Curlew	0	1.56	0%	0.1%	Negligible
Herring Gull	1.07	1.71	0.5%	0.7%	Negligible

- Notes: red kite collision risk in 2022-23 heavily skewed by 4 birds present for 1.2 hours in November 2022; the value in brackets excludes those data and better reflects the overall risk.
- No baseline population available for marsh harriers as this species does not breeding in this NHZ.

AEI Table 9.5: Collision Risk Modelling Predictions AEI

Species	Precautionary Predicted Number of Collisions per Year (NS avoidance rate)		Percentage Increase in Baseline Mortality		Magnitude
	2021-22	2022-23	2021-22	2022-23	
Whooper Swan	0	0.13	0%	<0.1%	Negligible
Pink-footed Goose	0.17	0.67	<0.1%	<0.1%	Negligible
Greylag Goose	0.12	0.26	<0.1%	<0.1%	Negligible
Marsh Harrier	0	0.07	-	-	Negligible
Goshawk	0	<0.01	0%	<0.1%	Negligible
Red Kite	0.09	0.46	-	-	Negligible
Golden Eagle	0	0.06	0%	0.8%	Negligible
Peregrine	0	0.12	0%	0.6%	Negligible
Golden Plover	5.31	0.10	0.4%	<0.1%	Negligible
Lapwing	0	<0.01	0%	<0.1%	Negligible
Curlew	0	0.16	0%	<0.1%	Negligible
Herring Gull	0.72	0.73	0.3%	0.3%	Negligible

9.7.43 The following section assesses the operational collision risk for the revised proposed development to each of the NatureScot key species that were found within the collision risk zone (**AEI Table 9.5**).

Whooper Swan

9.7.44 A single flock of eight whooper swans was flying through the collision risk zone in September 2022 (**Figure 9.12**). Whooper swan is listed on Schedule 1 of the Wildlife and Countryside Act and Annex 1 of the EU Birds Directive, so is of high value. Collision risk was estimated at 0.13 collisions per year based on the 2022-23 data, an effect of negligible magnitude that would not be significant (the same as the EIA Report October 2023). This is the equivalent to no percentage increase in baseline mortality in 2021-22 and <0.1% increase in 2022-23.

9.7.45 There would clearly be no threat to the regional or national population of this species, so no significant adverse effect, following the NatureScot (SNH 2018) guidance, would occur.

Pink-footed Goose

9.7.46 Pink-footed goose was classed as very high value as a qualifying feature of the Fala Flow SPA and the Greenlaw Moor SPA. Pink-footed geese were regularly recorded overflying the site, mainly during their autumn migration (**AEI Figure 9.7**). Collision risk was predicted as 0.17 in the first of the two baseline years and 0.67 in the second (compared to 0.31 and 1.78 respectively in the EIA Report October 2023). This is equivalent to less than a 0.1% increase over the baseline mortality, an effect of

negligible magnitude that would not be significant in both the context of the NHZ population and the SPA populations, which would not be significant.

Greylag Goose

9.7.47 Greylag goose flight activity occurred year-round. Flights through the collision risk zone are shown in **Figure 9.8**. The predicted collision risk was 0.12 in 2021-22 and 0.26 in 2022-23, compared to 0.14 and 0.44 respectively for the EIA Report October 2023. This is less than a 0.1% increase over the baseline mortality and would be an effect of negligible magnitude and significance, which would not be significant.

Golden Eagle

9.7.48 Golden eagle is listed on Schedule 1 of the Wildlife and Countryside Act, so is of high value. A low number of golden eagle flights were recorded at rotor height through the collision risk zone (details are given in the Confidential **AEI Technical Appendix 9.3**), with resulting collision risks predicted at 0.06 in 2022-23, equivalent to a 0.8% increase over the baseline mortality (compared to 0.1 predicted collisions and a 1.3% percentage increase in baseline mortality in the EIA Report 2023 for the same year). No flights were observed through the collision risk zone in 2021-22. Collision risk to this species would be of negligible magnitude and would not be significant.

Marsh Harrier

9.7.49 Marsh harrier is listed on Schedule 1 of the Wildlife and Countryside Act and Annex 1 of the EU Birds Directive, so is of high value. Only two marsh harrier flights were recorded at rotor height through the collision risk zone (**AEI Figure 9.11**), with resulting collision risks predicted at 0.07 per year using the 2022-23 data (none were recorded in 2021-22). This is the same as the EIA Report October 2023. Collision risk to this species would be of negligible magnitude and not significant.

Goshawk

9.7.50 Goshawk is listed on Schedule 1 of the Wildlife and Countryside Act, so is of high value. A low number of goshawk flights were recorded at rotor height through the collision risk zone in 2022-23 (**AEI Figure 9.11**), with resulting collision risks predicted <0.01 per year, equivalent to <0.1% increase over the baseline mortality (compared to 0.15 predicted collision rate and 1.9% increase over baseline mortality in the EIA Report October 2023). No flights were observed through the collision risk zone in 2021-22. Collision risk to this species would be of negligible magnitude (in the context of the small NHZ population of only 13 pairs) based on the 2022-23 data and would not be significant.

Red Kite

9.7.51 Red kite is listed on Schedule 1 of the Wildlife and Countryside Act and Annex 1 of the EU Birds Directive, so is of high value. Generally, only occasional red kite flights were recorded at rotor height through the collision risk zone. The EIA Report October 2023 reported a small number of occasions in November 2022, when several birds were present for an extended period of time during VP watches but this was outside the AEI collision risk zone (Figure 9.9). The resulting collision risk was predicted at 0.09 per year using the 2021-22 data and 0.46 per year using the 2022-23 data (compared to 0.14 in 2021-22 and 6.33 (or 1.0 excluding the November 2022 data) in 2022-23 in the EIA Report October 2023). It is not possible to express this quantitatively as a percentage of the NHZ baseline mortality

as the published NHZ red kite population is zero (Wilson *et al.* 2015), reflecting this species' recent colonisation of this area. Overall, collision risk to this species would be of negligible magnitude and not significant.

Peregrine

9.7.52 Peregrine is listed on Schedule 1 of the Wildlife and Countryside Act and Annex 1 of the EU Birds Directive, so is of high value. Only a low number of peregrine flights were recorded at rotor height through the collision risk zone (**AEI Figure 9.10**), with resulting collision risks predicted at 0 per year using the 2021-22 data and 0.12 per year using the 2022-23 data (compared to 0.04 and 0.49 respectively in the EIA Report October 2023). This is equivalent to a 0% and 0.6% increase over the baseline mortality respectively (compared to 0.2% in 2021-22 and 2.5% in 2022-23 in the EIAR). Collision risk to this species would be of negligible magnitude and not significant.

Curlew

9.7.53 Curlew were infrequently observed flying through the collision risk zone (**AEI Figure 9.12**). Collision risk to curlew (a medium value receptor) was predicted to be 0 per year using the 2021-22 baseline data and 0.16 from the 2022-23 data (compared to 0 and 1.56, respectively, in the EIA Report October 2023). This would represent a 0% increase over the baseline mortality for this NHZ population in 2021-22 and <0.1% in 2022-23 (compared with 0% and 0.1% in the EIAR), so it would be an effect of negligible magnitude and not significant.

Lapwing

9.7.54 Lapwing were seen infrequently flying through the collision risk zone, during both the breeding and winter periods (**AEI Figure 9.13**). Collision risk to lapwing (a medium value receptor) was predicted to be 0 per year using the 2021-22 baseline data and <0.01 from the 2022-23 data (compared to the EIA Report October 2023 with 0.82 in 2021-22 and 10.2 in 2022-23). This would represent a 0% increase over the baseline mortality for this NHZ population for 2021-22, and a <0.1% increase for 2022-23 (compared to <0.1% and 0.6% respectively in the EIA Report October 2023), so it would be an effect of negligible magnitude and not significant.

Golden Plover

9.7.55 Golden plover were seen regularly flying through the collision risk zone, during both the breeding and winter periods (**AEI Figure 9.14**). Collision risk to golden plover (a high value receptor) was predicted to be 5.31 per year using the 2021-22 baseline data and 0.10 from the 2022-23 data (compared to 5.32 in 2021-22 and 40.3 in 2022-23 in the EIA Report October 2023). This would represent a 0.4% increase over the baseline mortality for this NHZ population for 2021-22, and a <0.1% increase for 2022-23 (compared to 0.4% and 3.0% respectively in the EIA Report October 2023), so it would be an effect of negligible magnitude and not significant.

Herring Gull

9.7.56 Herring gulls were frequently observed flying through the collision risk zone (**AEI Figure 9.15**). Collision risk to herring gull (a medium value receptor) was predicted to be 0.72 per year using the 2021-22 baseline data and 0.73 from the 2022-23 data (compared to 1.07 and 1.71 respectively in the EIA Report October 2023). This would represent a 0.3% increase over the baseline mortality for this

NHZ population in 2021-22 and 0.3% in 2022-23 (compared to 0.5% and 0.7% respectively in the EIA Report October 2023), so would be an effect of negligible magnitude and not significant.

Indirect Effects: Barrier Effect

9.7.57 A further potential operational disturbance effect could be disruption to important flight lines (barrier effect). Birds may see the revised proposed development and change their route to fly around it, rather than through it. This would reduce the risk of collision but could possibly have other effects, for example potentially making important feeding areas less attractive, by acting as a barrier to the birds reaching them, and, if diversions were of a sufficient scale, resulting in increased energy consumption. The distance needed to divert around the revised proposed development would be relatively small and would not be expected to act as a major barrier to movements and no important regularly used flight routes across the site have been identified. Accordingly, the ecological consequences of any such changes in flight lines would be of negligible magnitude and not significant.

Assessment of Effects on Other High Value Species

9.7.58 One additional high value species was recorded in the study area during the baseline surveys, common crossbill. It is specially protected from disturbance during breeding under Schedule 1 of the Wildlife and Countryside Act, so it has been classed as high value.

Common Crossbill

9.7.59 This species was breeding in the coniferous plantation (with two pairs in coniferous plantations in the northern and central parts of the survey area) around the site and was also present there outside the breeding season. Though these numbers are only locally important, this species is classed as high value because it is specially protected from disturbance during the breeding season under Schedule 1 of the 1981 Wildlife and Countryside Act. In the absence of any forest felling associated with the construction of the revised proposed development, this high value species would be unaffected, with no significant impacts.

Assessment of Effects on Other Medium Value Species

9.7.60 13 other medium value species were recorded breeding in the survey area: red grouse, snipe, grey partridge, cuckoo, skylark, dunnock, ring ouzel, song thrush, spotted flycatcher, linnet, lesser redpoll, bullfinch and reed bunting. All are Scottish Biodiversity List (SBL) species. None would be likely to be affected by the revised proposed development, given experience from other wind farms (Meek *et al.* 1993, Phillips 1994, Thomas 1999, Percival 2005, Devereux *et al.* 2008) and their large UK and Scottish population sizes. Effects would be of low/negligible magnitude and not significant.

Assessment of Effects on Other Low Value Species

9.7.61 The low value species are of lesser concern, as a higher magnitude impact would be necessary in order for a significant effect to occur. As these species are generally at low density within the survey area, such a magnitude of effect would be very unlikely and it can be safely concluded that there would not be any significant effect on any of these species.

Effects on Protected Sites

European Protected Sites

9.7.62 The potential ornithological effects of the revised proposed development on European Protected Sites are assessed in **AEI Technical Appendix 9.2**. Possible effects on the Fala Flow SPA and the Greenlaw Moor pink-footed goose populations constituted the only possible Likely Significant Effect (LSE) of the revised proposed development (either alone or in-combination) in the context of the Habitats Regulations.

9.7.63 The revised proposed development is (at its closest point) 7.9 km from Fala Flow SPA/Ramsar, and 16 km from Greenlaw Moor SPA/Ramsar. Both are designated for their internationally important wintering population of pink-footed geese and both lie within the 15-20 km foraging range of this species (SNH 2016).

9.7.64 There would be a collision risk to Fala Flow and Greenlaw Moor SPA/Ramsar pink-footed goose populations, but this would be only a negligible magnitude effect on the SPA population for both species. The conservation objective "*to maintain the population of the species as a viable component of the SPA*" would not be undermined. This level of additional mortality would not represent an adverse effect on the integrity of the SPA.

9.7.65 Neither cumulative disturbance nor cumulative collision risk would represent an adverse effect on the integrity of the SPA.

Other Protected Sites

9.7.66 No significant effects would be likely to occur on the ornithological interest features of any other statutory protected sites, with no other SSSIs with any ornithological interest features within 5 km.

Decommissioning Effects

Summary of Assessment of Original Proposed Development

9.7.67 Decommissioning of the original proposed development would have the same potential to cause bird disturbance as the construction phase, so would require the same mitigation measures. With those measures in place, there would be no significant ornithological effects of decommissioning

Assessment of Revised Proposed Development

9.7.68 The revised proposed development would have a reduced effect on birds in comparison with the original proposed development. It would have the same potential to cause bird disturbance as the construction phase, so would require the same mitigation measures, as set out in the following section.

9.8 Mitigation

9.8.1 The EIA Report October 2023 concluded that the original proposed development would not be likely to result in any significant ornithological effects. Nonetheless, a series of best practice measures were set out in the EIA Report October 2023, which would be followed, to ensure compliance with the nature conservation legislation. Measures to benefit biodiversity would be delivered as part of the project in order to satisfy NPF4.

9.8.2 In addition to the habitat enhancement measures set out in **AEI Technical Appendix 8.6** that will benefit curlew (including peatland re-wetting and restoration of dry heath), enhancement for curlew and other breeding waders will be delivered off-site. When available, further details on what has been agreed will be provided. The objective is to develop and implement a regional plan for breeding curlew and other upland waders, working collaboratively, where possible, with other interested parties, including the RSPB, the Tweed Forum and the Southern Uplands Partnership. There would be three components:

- **Conservation Planning** – to develop a strategy for the optimal delivery of conservation measures across the region.
- **Conservation Action** – to implement direct measures that benefit the regional curlew population, such as wetland habitat creation, peatland restoration, upland grazing management and predator control/management.
- **Monitoring** – to determine baseline curlew distribution and abundance, which will be used to identify suitable areas for conservation management, set targets and assess management progress.

9.8.3 **AEI Technical Appendix 8.6** will also deliver on-site habitat enhancement that will benefit breeding merlin, including peatland re-wetting and restoration of dry heath.

9.8.4 A carcass removal programme will be implemented for the revised proposed development, as a precautionary measure to reduce the collision risk to scavenging birds of prey such as red kite and golden eagle. Any sheep, cattle or deer carcasses would be promptly removed from the site to ensure that carrion-feeding birds are not attracted into the site.

9.8.5 The applicant has committed to the production of a CEMP to the satisfaction of NatureScot and other relevant stakeholders, before construction commences, and would follow *Windfarm Good Construction Guidance*, Scottish Renewables *et al.* (2019). An outline CEMP is included as Technical Appendix 3.1 of the EIA Report October 2023. An Environmental Clerk of Works (ECoW) will be appointed to monitor the implementation of the CEMP, the Breeding Bird Protection Plan (BBPP, see EIA Technical Appendix 9.6) and the Biodiversity Enhancement and Restoration Plan (BERP, see **AEI Technical Appendix 8.6).**

9.8.6 The revised proposed development will have a reduced ornithological impact, and no significant ornithological effects are predicted. However, the same mitigation measures will be implemented as for the original proposed development, though with the BERP updated to deliver more on-site benefits for breeding birds (including curlew and merlin). The reduced layout of the revised proposed development has meant that there is now more space for these measures to be delivered outside areas that could be affected by the wind turbines (i.e. >500 m from wind turbines). It is, however, expected that there will also be some benefit from this mitigation across the site (albeit reduced in closer proximity to the wind turbines).

9.9 Updated Assessment of Residual Effects

9.9.1 The residual ornithological effects of the revised proposed development will be a non-significant loss of a small amount of upland moorland habitat to the revised proposed development, and a non-significant risk of disturbance and collision.

9.9.2 Using evidence from existing wind farms, it is considered unlikely that there will be any long-term impact on the integrity of the study area's ornithological features, or the conservation status of the species found here.

9.10 Updated Assessment of Cumulative Effects

9.10.1 The potential for cumulative ornithological effects was considered following the SNH 2018b[4] guidance on *Assessing the Cumulative Impacts of Onshore Wind Farms on Birds*, considering impacts on the favourable conservation status of key species within the relevant NHZ (in this case NHZ 20 The Border Hills). The cumulative assessment has focussed on developments within 45 km of the site boundary. This includes operational and consented developments, as well as those in the planning process (though not those in scoping as insufficient information was available to assess those). Details of the developments within this range are given in **AEI Chapter 5 Approach to EIA AEI Table 5.1**. However, only sites within 20 km are likely to have any ornithological connectivity with the site.

9.10.2 All of the potential effects of wind farms (direct habitat loss and disturbance during construction; and collision risk and disturbance during operation) have the potential to contribute to the cumulative ornithological impacts, therefore have been considered in the cumulative assessment.

9.10.3 This cumulative assessment has scoped in all species with potential ecological linkage to SPAs, and all other key NatureScot target species with non-negligible residual impacts predicted, as for the cumulative assessment within the EIA Report October 2023. This included:

- cumulative collision risk to pink-footed goose; and
- cumulative disturbance to breeding curlew

9.10.4 Each of these is considered in turn below, using the information available from other developments that could contribute to the cumulative impacts, but given that full information from all developments is not available, a precautionary approach has been adopted to this cumulative assessment.

9.10.5 For all other species, the predicted residual effects of the revised proposed development, with regard to habitat loss and disturbance are so low (negligible magnitude), that it was considered that these would not make any material contribution to any potentially significant cumulative impact at the NHZ level.

Pink-footed Goose Cumulative Collision Risk

[4] Scottish Natural Heritage. 2018b. Assessing the cumulative impacts of onshore wind farms on birds. Guidance. Available at : https://www.nature.scot/sites/default/files/2018-08/Guidance%20-%20Assessing%20the%20cumulative%20impacts%20of%20onshore%20wind%20farms%20on%20birds.pdf

9.10.6 Pink-footed goose collision risk for the revised proposed development was predicted at 0.4 per year using the two baseline winters' data, equivalent to less than a 0.1% increase over the baseline mortality (and reduced from 1.1 per year for the original proposed development). Collision risk at other sites has been reported at such low levels that it has not been considered in any other cumulative assessments. Taking into account both the reported cumulative risks from other sites and the likely risks from schemes where collision risk has not been reported, it was concluded that the cumulative collision risk would be of negligible magnitude and would not contribute to any significant effects in both the context of the NHZ population and the SPA populations.

Curlew Cumulative Disturbance Risk

9.10.7 Curlew is a widespread breeding species across the upland habitats within the region, and present at the majority of wind farm sites in the NHZ.

9.10.8 There are a minimum of 27 pairs at risk of cumulative impact from operational and consented schemes (1.9% of the NHZ population of 1,400 pairs, 1.7% using the updated NHZ population estimate of 1,220 pairs). Developments currently in planning add at least a further 23 pairs to this number, and the revised proposed development another 11 pairs (reduced from 30 for the original proposed development), giving a total potential cumulative disturbance impact to at least 61 pairs. This would be a loss, in a worst case, of about 5% of the NHZ population. However, this worst case does not take into account the fact that there are habitat management measures in place or planned for most of the developments that would at least partially offset the loss through disturbance, and that the disturbance itself would be unlikely to be total for the whole 500 m buffer used in the assessment (for example, results from the Fallago Rig wind farm monitoring reported in the Dunside Wind Farm EIA Report[5] showed that curlew were not completely displaced from the operational wind turbines at that site). The residual cumulative operational effect is therefore considered to be of low magnitude on a medium value receptor. Applying the matrix set out in Table 9.4 of Chapter 9 of the EIA Report October 2023, this effect would be of minor significance and not significant.

9.11 Summary of Effects

9.11.1 **AEI Tables 9.6** and **9.7** provide a summary comparison of the effects of the original and revised proposed developments on features of ornithological interest detailed within this chapter. No significant residual ornithological effects were identified in the EIA Report October 2023 and this remains the case for the revised proposed development.

[5] Dunside Wind Farm EIA Report: Chapetr 7 Ornithology. June 2023. Available at: https://www.energyconsents.scot/ApplicationDetails.aspx?cr=ECU00003436

AEI Table 9.6: Summary of Residual Ornithological Effects – Construction and Decommissioning Phases

Receptor and Impact Pathway	Original Proposal Development		Revised Proposed Development	
	Magnitude of Impact	Residual Significance	Magnitude of Impact	Residual Significance
Habitat loss: construction of infrastructure including wind turbine foundations and access tracks	Negligible	Not significant	Negligible	Not significant
Disturbance to Schedule 1 and Annex 1 breeding species	Negligible	Not significant	Negligible	Not significant
Disturbance to other breeding species	Negligible	Not significant	Negligible	Not significant
Disturbance to wintering birds	Negligible	Not significant	Negligible	Not significant

AEI Table 9.7: Summary of Residual Ornithological Effects – Operational Phase

Receptor and Impact Pathway	Original Proposal Development		Revised Proposed Development	
	Magnitude of Impact	Residual Significance	Magnitude of Impact	Residual Significance
Displacement of birds from zone around wind turbines	Negligible	Not significant	Negligible	Not significant
Disturbance to Schedule 1 and Annex 1 breeding species	Negligible	Not significant	Negligible	Not significant
Disturbance to other breeding species	Negligible	Not significant	Negligible	Not significant
Disturbance to wintering birds	Negligible	Not significant	Negligible	Not significant
Mortality through bird collision with wind turbines	Negligible	Not significant	Negligible	Not significant

9.12 Conclusion

9.12.1 Overall, there are not likely to be any significant impacts on ornithology as a result of the revised proposed development. In relation to the key NatureScot wider countryside test, the revised proposed development would not affect the favourable conservation status of any bird species of conservation importance within the NHZ, either alone or in-combination with other schemes. It would also not contribute to any Likely Significant Effect on any SPA qualifying interests. No effects would result in any breach of the Habitats Regulations.

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