

7. Ornithology

7.1 Introduction

7.1.1 This chapter considers the likely significant effects on ornithological features associated with the construction and operation of the Proposed Development.

7.1.2 The specific objectives of the chapter are to:

- describe the existing ornithological baseline conditions;
- describe the assessment methodology and significance criteria used in completing the impact assessment;
- identify the potential impacts associated with the Proposed Development, including direct, indirect and cumulative impacts;
- assess the resultant likely significant effects;
- describe the mitigation measures proposed to address any likely significant effects;
- assess the residual effects remaining following the implementation of mitigation; and
- outline those measures included as part of the Proposed Development that would conserve, restore and enhance biodiversity in accordance with National Planning Policy 4 (NPF4)

7.1.3 The assessment has been carried out by SLR Consulting in accordance with NatureScot and Chartered Institute of Ecology and Environmental Management (CIEEM 2024) guidelines. All staff contributing to this chapter have undergraduate and/or postgraduate degrees in relevant subjects, have extensive professional ornithological impact assessment experience, and/or hold professional CIEEM membership/abide by the CIEEM Code of Conduct.

7.1.4 This chapter is supported by the following figures and technical appendices:

- **Volume 3a: Figures and Drawings**
 - o **Figure 7.1:** Ornithological Designated Sites within 20km;
 - o **Figure 7.2:** Vantage Points and Viewsheds;
 - o **Figure 7.3:** Site Boundary and Study Areas;
 - o **Figure 7.4:** Raptor and Owl Activity: Goshawk, Merlin, Osprey and Short-eared Owl;
 - o **Figure 7.5:** Flight Activity: Merlin, Osprey and Short-eared Owl;
 - o **Figure 7.6:** Breeding Waders: Curlew, Lapwing and Ringed Plover;
 - o **Figure 7.7:** Flight Activity: Curlew, Golden Plover, Lapwing and Ringed Plover;
 - o **Figure 7.8:** Non-Breeding Waders: Golden Plover and Green Sandpiper;
 - o **Figure 7.9:** Flight Activity: Greylag Goose, Pink-footed Goose and Whooper Swan; and
 - o **Figure 7.10:** Flight Activity: Herring Gull.
- **Volume 4: Technical Appendices**



- o **Technical Appendix 7.1:** Baseline Ornithology Surveys;
 - o **Technical Appendix 7.3:** Collision Risk Modelling; and
 - o **Technical Appendix 7.4:** Ornithology Assessment Methodology.
- 7.1.5 Information relating to breeding, roosting and/or lekking sites of sensitive species (as defined in Scottish Natural Heritage¹ (SNH) 2016a and NatureScot 2025a) is summarised to an appropriate level within this Chapter, and further detailed within:
- **Volume 5:** Confidential Appendices
 - o **Technical Appendix 7.2:** Confidential Ornithology;
 - o **Technical Appendix 7.5:** Red Kite Population Model;
 - o **Confidential Figure 7.2.1:** Black Grouse Activity;
 - o **Confidential Figure 7.2.2:** Barn Owl Activity;
 - o **Confidential Figure 7.2.3:** Hen Harrier Activity;
 - o **Confidential Figure 7.2.4:** Flight Activity: Hen Harrier;
 - o **Confidential Figure 7.2.5:** Peregrine Falcon Activity;
 - o **Confidential Figure 7.2.6:** Flight Activity: Peregrine Falcon;
 - o **Confidential Figure 7.2.7:** Red Kite Activity; and
 - o **Confidential Figure 7.2.8:** Flight Activity: Red Kite.
- 7.1.6 This confidential information will not be made publicly available but will be provided to the Scottish Government, East Ayrshire Council, NatureScot and Royal Society for the Protection of Birds (RSPB) Scotland, to inform their own appraisals of the Proposed Development.
- 7.1.7 Figures and technical appendices are referenced in the text where relevant.

7.2 Consultation

- 7.2.1 Consultation undertaken prior to and during the EIA Scoping stage has been described in the EIA Scoping Report Appendix C of the Pre-Application Consultation (PAC) Report submitted as part of the application for Section 36 consent. **Table 7-1**, below, provides a summary of the scoping responses and an indication of how these responses were addressed.

Table 7-1: Summary of Consultation

Consultation Details	Consultee Comments	Applicant Response
East Ayrshire Council Scoping Response 2 nd March 2026	The Planning Authority has no particular comments to make with regards to ornithological matters and would suggest the Applicant ensure the requirements and requests of NatureScot and RSPB and any other relevant body with information and records of relevant ornithological interests are taken into account to inform the assessment of these matters for reporting within the EIA Report,	Noted.

¹ Scottish Natural Heritage, the former operating name of NatureScot.



Consultation Details	Consultee Comments	Applicant Response
	particularly in relation to the designated sites which border or are in close proximity to the site.	
RSPB Scoping Response 6th March 2026	RSPB agree with the species proposed to be scoped out of the detailed assessment.	Noted.
	In terms of further species, RSPB recommend that the designated features of the North Lowther Uplands SSSI that need to be considered in the assessment (non-breeding and breeding Hen Harrier, breeding Golden Plover, Merlin, Peregrine falcon and Short-eared owl).	All species listed are considered in this assessment – see Section 7.4 of this chapter.
	RSPB recommend that the status of Black Grouse is reviewed in line with the relevant data provided by RSPB for lekking activity both on site and within buffer zones and that infrastructure layout is informed directly by this data to minimise impacts (acknowledging that the Scoping Report suggests that the use of this data is likely).	Protected species data was used to inform the design of the Proposed Development - refer to Chapter 3: Design Evolution and Alternatives.
	RSPB also recommend that the assessment of impact to Black Grouse (site and cumulative) is based on the regional status of this species based on annual monitoring which can be confirmed by RSPB Scotland on request. RSPB also highlight that the relevant NHZ would be 19 (not 17 as suggested). However, since this is now ten years out of date, we consider regional data to be a more appropriate baseline to use to assess impacts.	See Section 7.4 of this chapter.
	With regards to habitat management measures, RSPB are unable to make comment on this detail without seeing the results of EIA. However, and without prejudice to our final position, we would highlight that sites as described above and qualifying species should be the focus of restoration measures considered for Biodiversity Enhancement measures in addition to those that may be required as part of mitigation or compensatory measures.	See the outline Biodiversity Enhancement Management Plan (Technical Appendix 6.6) and Section 7.5 of this chapter.
NatureScot Scoping Response 13th March 2026	Muirkirk and North Lowther Uplands SPA The Scoping Report states that the proposed site boundary ‘slightly’ overlaps with the SPA. The proposed development site also lies within a distance of the SPA at which we consider there is an overlap with both the core foraging ranges of the site’s qualifying interests and the distances at which the qualifying interests could be disturbed. In our view, this proposal is therefore likely to have a significant effect on the SPA and, consequently, Scottish Ministers, as competent authority, will be required to carry out an appropriate assessment in view of the site’s conservation objectives for its qualifying interests. We welcome the applicant’s intention to provide information as part of the EIA submission which would allow the competent authority to undertake	The Site boundary was reduced to remove the slight overlap of the Site with the SPA, and a 100 m avoidance buffer was applied to the SPA during design (refer to Chapter 3: Design Evolution and Alternatives). The qualifying species of the SPA and the potential effects of the Proposed Development are considered in this chapter. Technical Appendix 6.6: Outline Biodiversity Enhancement Management



Consultation Details	Consultee Comments	Applicant Response
	the appropriate assessment. This information should include assessment of the following potential impacts: - Collision risk to all SPA qualifying species and how this may affect the viability of the relevant species' population. - Direct and indirect impacts on habitats within the SPA and how this may affect the qualifying interests. - Disturbance to SPA qualifying species as a result of construction, operation and/or decommissioning of the development. The implications of the proposed development for the Powharnal Mitigation Management Plan. In addition to consideration of how the proposed development may affect the achievement of the aims and objectives of the plan (for example, how displacement around turbines relates to proposals for habitat improvement for qualifying interests), consideration of how the achievement of these may affect the development will also be required (for example, whether improving conditions for breeding and foraging birds in areas close to the proposed development could result in conflicts with the proposed development). We recommend that the applicant make contact with the Powharnal Management Committee for up-to-date information on the status and progress of the plan, and any monitoring results that they may be able to provide.	Plan has considered the Site's current baseline condition in cognisance of the relevant details of the Powharnal Mitigation Management Plan. (PMMP) and associated residual plan in order to complement and augment the measures undertaken locally, and to provide further similar enhancement to encourage ecological connectivity locally and strengthen nature networks. Measures within this OBEMP and which were also generally included within the PMMP include the creation of wader scrapes, and the enhancement of habitats for the local bird assemblage including waders and black grouse.
	Muirkirk Uplands SSSI The potential direct and indirect impacts of the Proposed Development on these features will require thorough consideration as part of the EIA process. In this respect: Breeding hen harrier & short-eared owl, and non-breeding hen harrier: These species will be considered in the assessment of the SPA interests and do not require specific additional consideration within the EIA. Breeding bird assemblage: The range of impacts set out in paragraph 4.6 above should also be assessed in relation to the SSSI breeding bird assemblage. The implications of the Proposed Development on the PMMP, and vice versa, should also be considered in relation to the SSSI breeding bird assemblage. This is likely to require particular consideration of waders and black grouse.	The species notified for the Muirkirk Uplands SSSI and the potential effects of the Proposed Development are considered in this chapter.
	Ailsa Craig SPA & SSSI Our advice is that at present there is insufficient information to determine whether the proposal is likely to have a significant effect on lesser black-backed gull and herring gull qualifying interests of Ailsa Craig SPA. In order for this to be determined,	Section 7.4 of this chapter details the baseline conditions for gull species. Baseline surveys across the two-year survey period recorded both herring and lesser black-backed gulls. Flight activity



Consultation Details	Consultee Comments	Applicant Response
	we recommend that the following additional information is obtained: An assessment of potential collision risk for lesser black-backed and herring gulls and how this may affect the viability of the relevant species' SPA population. We advise that this information should include flight lines from Vantage Point watches.	surveys recorded 31 herring gull flights only and collision risk modelling predicted a mean collision rate of one bird every 4.10 years. Section 7.4 therefore determines that due to the low predicted risk of collision, gull species, and therefore Ailsa Craig SPA & SSSI, are scoped out of the assessment.
	Birds in the Wider Countryside NatureScot note from Figure 7.4 of the Scoping Report (Ornithological Design Constraints) that there are nesting locations recorded within the site. It is unclear whether these were recorded by the applicant, or if these are historic nests. This should be clarified in the EIAR. We expect to see full methodology and results of ornithological surveys as part of the EIAR, in accordance with our bird survey guidance for onshore windfarms.	Full survey methodology is provided in Technical Appendix 7.1. Results of ornithological surveys are presented in Section 7.4 of this chapter or in Volume 5 where the results contain confidential information.

7.3 Assessment Methodology and Significance Criteria

Study Areas

7.3.1 The ornithology assessment considers the following study areas (as defined by NatureScot) which are based on the final turbine layout and associated infrastructure (**Figure 7.3**):

- Designated sites – the Proposed Development and a 20 km study area buffer (from the proposed turbines) (based on the greatest foraging range for any species, as provided in SNH 2016b) (**Figure 7.1**);
- Collision risk modelling – the results of the flight activity surveys have been used to inform collision modelling. A Collision Risk Analysis Area ('CRAA') has been created using a 500 m buffer around the proposed turbine locations (as per, NS 2024a) (**Figure 7.2**);
- Scarce breeding birds² – 2 km study area from the proposed turbines (800 m buffer for the access track/other infrastructure where it extends beyond the turbine area), as per NatureScot guidance (NS 2025d) and with reference to Goodship & Furness (2022);
- Black grouse: 1.5 km study area from the proposed turbines (750 m for the access track/other infrastructure where it extends beyond the turbine area) as

² Scarce breeding birds are those listed on Annex 1 of the EU Birds Directive or Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) and in the case of the Proposed Development consists of any raptor and owl species listed on either Annex I or Schedule 1.



per NatureScot guidance (NS 2025d) and with reference to Goodship & Furness (2022);

- Breeding waders: 500 m study area from the proposed turbines/access track as per NatureScot guidance (NS 2025d) and with reference to Goodship & Furness (2022); and
- Cumulative assessment: as per NatureScot guidance (NS 2025b), the Natural Heritage Zone (NHZ) level is considered practical and appropriate for most breeding species not connected to designated sites (for the Proposed Development, the NHZ will be NHZ 19, Western Southern Uplands and Inner Solway), unless a different geographical area is considered more relevant to a particular species.

Desk Study

7.3.2 The following key sources have been consulted for existing ornithological information within proximity to the Proposed Development to inform the assessment:

- NatureScot's SiteLink (NS, 2026);
- South Strathclyde Raptor Study Group (SSRSG); and
- RSPB Data Unit.

Field Surveys

7.3.3 The following surveys were completed between April 2023 and February 2025 to provide a two-year survey period. All surveys were undertaken in line with the appropriate guidance (NS 2025b, Hardey *et al.* 2013, Gilbert *et al.* 1998) and survey areas are detailed below. All survey areas were created using survey-specific buffers based on the Proposed Development provided at the time of survey commencement. Full details of baseline surveys including methodologies, survey conditions and survey areas are presented in **Technical Appendix 7.1**.

- Flight activity surveys: monthly from April 2023 to February 2025 allowing for coverage of the 2023 and 2024 breeding seasons and 2023/2024 and 2024/2025 non-breeding seasons; minimum of 36 hours per vantage point (VP) per season, as per NS 2025b (**Figure 7.2**).
- Scarce² breeding bird surveys: 2023 and 2024 breeding seasons, 2 km survey area (**Figure 7.3**).
- Black grouse lek surveys: 2023 and 2024 breeding seasons, 1.5 km survey area (**Figure 7.3**).
- Breeding wader surveys: 2023 and 2024 breeding seasons, 500 m survey area (**Figure 7.3**).
- Winter walkover surveys: 2023/2024 and 2024/2025 non-breeding season, 500 m survey area (**Figure 7.3**).

7.3.4 A target species list was defined from the following lists and refined on the basis of the species' perceived sensitivity to onshore wind farm developments (e.g., as set out in NS 2025d and Annex 1 of NS 2025c), knowledge of bird-habitat associations at the local/Scottish level and preliminary survey visits:

- Annex I of the EU Birds Directive;
- Schedule 1 of the Wildlife and Countryside Act 1981; and



- Species (excluding passerines) included on the Birds of Conservation Concern (BoCC) Red list (Stanbury *et al.* 2021 and Stanbury *et al.* 2024).

Assessment of Potential Effect Level and Significance

- 7.3.5 The assessment methodology, including the criteria for assessing sensitivity of IOFs, magnitude of change and overall significance criteria, is detailed in **Technical Appendix 7.4**.

Limitations, Difficulties and Uncertainties

- 7.3.6 The assessment presented within this chapter is based on the Proposed Development as described in **Chapter 2: Project Description**, and the adoption of embedded and standard mitigation set out in Section 7.5.
- 7.3.7 There are considered to be no substantial limitations to the baseline studies or assessment presented within this chapter however, for completeness a discussion of minor constraints and uncertainties is provided below.

Species Conservation Status And Sensitivity

- 7.3.8 Some limitations do exist within the knowledge base for how some species, and the populations to which they belong, react to impacts associated with onshore wind farms developments and construction activities. A precautionary approach is therefore taken in these circumstances, and as such, it is considered that these limitations do not affect the robustness of the assessment.
- 7.3.9 During the baseline ornithological surveys (April 2023 to February 2025), Stanbury *et al.* (2021) issued an addendum to the Birds of Conservation Concern (BoCC) 5 list in September 2024 (Stanbury *et al.* 2024). This addendum reclassified common gull and great black-backed gull as Red list species (previously Amber list species), which would now include them as target species for recording during onshore wind farm surveys as recommended in NatureScot guidance (2025a and 2025c). These gull species were however only infrequently noted during baseline surveys (as secondary species) and so would not have been scoped into the assessment due to the low activity rates within the breeding and wintering bird study area and the absence of potentially significant effects.

Baseline Survey Coverage

- 7.3.10 The turbine array is completely covered by the flight activity survey viewshed coverage (**Figure 7.2**) and the flight activity survey effort is considered to have met minimum requirements stipulated in NatureScot guidance (2025d). Baseline survey areas as stipulated in the **Field Surveys** section above all provide appropriate coverage of the associated assessment study area as shown on **Figure 7.3**.
- 7.3.11 In general, weather conditions were appropriate for the surveys, but where they were not, surveys were suspended and rescheduled (or additional surveys were undertaken) (**Technical Appendix 7.1**).
- 7.3.12 Considering the scale of the survey areas, it was not uncommon for more than one surveyor to be present at the Site to undertake surveys. As standard practice, surveyors ensured that their survey plans were coordinated ahead of surveys so that their survey plans worked in harmony and did not introduce additional disturbance on the Site during surveys. Given the overall size of the Site, and the subsequent large size of the survey areas, there is not considered to be any limitations as a result of these surveys occurring concurrently and the data gathered is robust and representative.



- 7.3.13 Overall, baseline survey coverage is considered to be appropriate and representative to allow for a robust assessment on the potential impacts to ornithological interests.

7.4 Baseline Conditions and Scope of Assessment

Designated Sites

- 7.4.1 There are no statutory designations within the Site, however the Proposed Development is within 20 km of one SPA and two SSSIs, as listed below and shown on **Figure 7.1**.

- Muirkirk and North Lowther Uplands SPA (underpinned by the Muirkirk Uplands SSSI and North Lowther Uplands SSSI), is adjacent to the Site and designated for non-breeding hen harrier, breeding golden plover, hen harrier, merlin, peregrine falcon, short-eared owl and a breeding bird assemblage³.

Flight Activity Surveys

- 7.4.2 A summary of all target species recorded during flight activity surveys at the Site is presented in **Table 7-2**. This summarises all flights observed during the baseline survey period regardless of the location of the flights in relation to proposed wind turbine locations. For further details of the flight activity surveys, refer to **Technical Appendix 7.3**.
- 7.4.3 A summary of collision risk model results is presented in **Table 7-3** (refer to **Technical Appendix 7.3** for detailed results).

Table 7-2: Target Species Recorded During Flight Activity Surveys

Species	Total Number of Flights Recorded	Total Number of Birds Recorded	Total Bird Seconds Recorded
Curlew	38	57	2,067
Golden plover	13	881	195,010
Greylag goose	8	56	2,440
Hen harrier	65	71	12,011
Herring gull	31	91	8,681
Lapwing	3	3	48
Merlin	6	6	238
Osprey	1	1	19
Peregrine falcon	30	36	4,125
Pink-footed goose	9	830	132,140
Red kite	43	47	8,672
Ringed plover	1	1	5
Short-eared owl	4	7	7,510
Whooper swan	1	6	360

³ The citation lists red grouse, raven, dunlin, snipe, teal, curlew, redshank, whinchat and wheatear.



Table 7-3: Predicted Collision Rates

Species	Candidate Turbine Type	Mean ⁴ Breeding Season	Mean Non-Breeding Season	Mean Annual	Number of Years Per Collision
Curlew	V132	0.1358	0.0023	0.1381	7.24
Golden plover	V132	1.9715	8.3745	10.3460	0.10
Greylag goose	V162	0.0212	0	0.0212	47
Hen harrier	V132	0.0107	0.0398	0.0506	19.8
Herring gull	V132	0.0668	0.1769	0.2438	4.10
Lapwing	V132	0.0005	0	0.0005	2,108
Merlin	V132	0	0.0027	0.0027	376
Osprey	V132	0.0019	0	0.0019	518
Peregrine falcon	V162	0.1133	0.0247	0.1380	7.25
Pink-footed goose	V162	0	0.2917	0.2917	3.43
Red kite	V162	0.1318	0.0354	0.1672	5.98
Ringed plover	V132	0.0006	0	0.0006	1,556
Short-eared owl	V132	0.0180	0.0026	0.0206	49
Whooper swan	V162	0	0.0074	0.0074	135

Black Grouse

- 7.4.4 Black grouse lek surveys undertaken during the 2023 and 2024 breeding seasons did not identify any active leks. Furthermore, no evidence of black grouse was recorded across the two-year baseline survey period.
- 7.4.5 Data provided by the RSPB Data Unit indicated the presence of black grouse on 50 occasions between 2014 and 2023, of which five records were within 750 m of the Proposed Development. These five records were from 2021, 2022 and 2023 and all of individual males displaying at what is considered to be one lek area.
- 7.4.6 In line with NatureScot's standard advice (2024b), the Proposed Development would as part of industry standard good practice, include measures within the BDMP specific to avoiding the potential for disturbance of black grouse at their lek sites during construction works (including along the proposed access track route) and where relevant during operational maintenance works.
- 7.4.7 The small-seeding broadleaved and scrub planting proposed as part of the OBEMP (**Technical Appendix 6.6**) will serve to benefit local black grouse populations should they still be present in the area, or return to the area, through the provision of foraging resources and natural shelter opportunities.
- 7.4.8 The above mitigation and limited evidence that lekking activity recorded within 750 m of the Proposed Development is related to an established lek, is considered sufficient to minimise potentially significant construction or operational effects upon black grouse and black grouse are scoped out of the assessment.

⁴ Candidate turbines representative of the maximum turbine heights described in Chapter 2 have been used to conduct collision risk modelling for the purposes of assessment. Turbine selection would take place post-consent, prior to construction – the turbines selected would be within the maximum parameters set out in Chapter 2.



Raptors and Owls (Schedule 1 / Annex I)

Barn Owl

- 7.4.9 Baseline surveys identified nine potential nest/roost locations within the survey area, with a barn owl also recorded outwith the survey area on one occasion (**Confidential Figure 7.2.2**).
- 7.4.10 Data provided by the RSPB Data Unit indicated the presence of barn owl in the wider area on two occasions (once in 2017 and in 2023), however the records were not within the Site / did not indicate breeding.
- 7.4.11 Guidance from Shawyer (2011) for continuous activity disturbance distances provides a range of 20 m (pedestrian movement) to 175 m (heavy construction works) for breeding barn owl and more recently, a review of bird disturbance distances by Goodship & Furness (2022) recommends a buffer of 50 m to 100 m. Of these nine locations, none are within 175 m of proposed turbines and four are within 175 m of the proposed infrastructure (BO_1.1, BO_1.2, BO_3 and BO_4, **Confidential Figure 7.2.2**).
- 7.4.12 As a species listed on Schedule 1 of the Wildlife and Countryside Act 1981, standard measures to avoid the potential for disturbance to any possible future breeding birds and enable legislative compliance are set out in Section 7.5.
- 7.4.13 Considering the species' limited presence within the Site, absence of predicted collision risk and embedded mitigation, barn owl is scoped out of the assessment.

Goshawk

- 7.4.14 Baseline surveys recorded a single goshawk on one occasion within the survey area (**Figure 7.4**) across the two-year survey period with no evidence of breeding recorded.
- 7.4.15 Data provided by the RSPB Data Unit indicated the presence of goshawk in the wider area on two occasions (once in 2022 and in 2024), however the records were not within the Site / did not indicate breeding.
- 7.4.16 As a species listed on Schedule 1 of the Wildlife and Countryside Act 1981, standard measures to avoid the potential for disturbance to any possible future breeding birds and enable legislative compliance are set out in Section 7.5.
- 7.4.17 Considering the species' limited presence within the Site, absence of known breeding sites, negligible predicted collision risk, and embedded mitigation, goshawk is scoped out of the assessment.

Hen Harrier

- 7.4.18 Baseline surveys recorded hen harrier within the survey area on 15 occasions (**Confidential Figure 7.2.3**). No evidence of breeding was identified during the baseline surveys, however a potential roost was identified during the 2024/2025 non-breeding season with a single ringtail stooping out of view just prior to sunset in October 2024 (HH_R1, **Confidential Figure 7.2.3**). Across all baseline surveys, hen harrier were recorded on 80 occasions and activity was predominately recorded during the non-breeding seasons with 50 and 16 of those records during the 2023/2024 and 2024/2025 non-breeding seasons respectively. Activity was predominately associated with hunting behaviour offsite during the day (**Confidential Figure 7.2.3** and **Confidential Figure 7.2.4**). A maximum of five different birds were recorded during the 2023/2024 breeding season and three different birds during the 2024/2025 non-breeding season.



- 7.4.19 Data provided by the SSRSG from the 2014 formal monitoring of the Muirkirk and North Lowther Uplands SPA indicated that the nearest known hen harrier nest is approximately 2.5 km from the Site and outwith the core foraging range of breeding hen harrier (SNH 2016b). Data provided by the SSRSG within 2 km of the Site for all Schedule 1 raptor or owl species for between 2013 and 2023 did not indicate any breeding or roosting hen harrier within 2 km of the Site.
- 7.4.20 Data provided by the RSPB Data Unit indicated the presence of hen harrier in the wider area between 2018 and 2024, however the records did not indicate breeding. Of the 38 records, four were within the Site (two in 2023 and two in 2024).
- 7.4.21 Flight activity surveys recorded 65 flights (**Table 7-2, Confidential Figure 7.2.4**), and collision risk modelling predicted a mean collision rate of one bird every 19.8 years (**Table 7-3**).
- 7.4.22 As a species listed on Schedule 1 of the Wildlife and Countryside Act 1981, standard measures to avoid the potential for disturbance to any possible future breeding birds and enable legislative compliance are set out in Section 7.5.
- 7.4.23 Considering the species' activity within the 2 km study area, predicted collision risk, and potential connectivity to the Muirkirk and North Lowther Uplands SPA, **hen harrier is scoped into the assessment.**

Merlin

- 7.4.24 Baseline surveys recorded individual merlin on two occasions within the survey area (**Figure 7.4**) across the two-year survey period with no evidence of breeding recorded.
- 7.4.25 Data provided by the SSRSG from the 2014 formal monitoring of the Muirkirk and North Lowther Uplands SPA indicated that the nearest known merlin nest is over 7 km from the Site and outwith the core foraging range of breeding merlin (SNH 2016b). Data provided by the SSRSG within 2 km of the Site for all Schedule 1 raptor or owl species for between 2013 and 2023 did not indicate any breeding merlin within 2 km of the Site.
- 7.4.26 Data provided by the RSPB Data Unit indicated the presence of merlin in the wider area on nine occasions between 2016 and 2023, however the records were not within the Site / did not indicate breeding.
- 7.4.27 Flight activity surveys recorded six flights (**Table 7-2, Figure 7.5**), and collision risk modelling predicted a mean collision rate of one bird every 376 years (**Table 7-3**).
- 7.4.28 As a species listed on Schedule 1 of the Wildlife and Countryside Act 1981, standard measures to avoid the potential for disturbance to any possible future breeding birds and enable legislative compliance are set out in Section 7.5.
- 7.4.29 Considering the species' limited presence within the Site, absence of known breeding sites, negligible predicted collision risk, and embedded mitigation, merlin is scoped out of the assessment.
- 7.4.30 Whilst the Proposed Development is within 5 km of the Muirkirk and North Lowther Uplands SPA and therefore within the core foraging range of breeding merlin associated with the SPA, the baseline described above indicates that the Site is not regularly in use by foraging (or breeding) merlin and as such there is considered to be limited likelihood of a likely significant effect on the breeding merlin population associated with the Muirkirk and North Lowther Uplands SPA as a result of the Proposed Development. Consequently, there is considered to be no adverse effect on the integrity of the Muirkirk and North Lowther Uplands SPA and is therefore scoped out of further assessment.



Osprey

- 7.4.31 Baseline surveys recorded a single osprey on one occasion within the survey area (**Figure 7.4**) across the two-year survey period with no evidence of breeding recorded.
- 7.4.32 Flight activity surveys recorded one flight (**Table 7-2, Figure 7.5**), and collision risk modelling predicted a mean collision rate of one bird every 518 years (**Table 7-3**).
- 7.4.33 Data provided by the RSPB Data Unit indicated the presence of osprey in the wider area on two occasions (once in 2023 and in 2024), however the records were not within the Site / did not indicate breeding.
- 7.4.34 As a species listed on Schedule 1 of the Wildlife and Countryside Act 1981, standard measures to avoid the potential for disturbance to any possible future breeding birds and enable legislative compliance are set out in Section 7.5.
- 7.4.35 Considering the species' limited presence within the Site, absence of known breeding sites, negligible predicted collision risk, and embedded mitigation, osprey is scoped out of the assessment.

Peregrine Falcon

- 7.4.36 Baseline surveys recorded peregrine falcon within the survey area on 17 occasions (**Confidential Figure 7.2.5**). Breeding was confirmed at one location during the 2023 and 2024 breeding seasons (PE_1, **Confidential Figure 7.2.5**).
- 7.4.37 Data provided by the SSRSG within 2 km of the Site for all Schedule 1 raptor or owl species for between 2013 and 2023 identified two breeding peregrine falcon territories, PE_1 and a second territory (PE_A, **Confidential Figure 7.2.5**) approximately 2.5 km from the nearest turbine. Neither nest is located within the Muirkirk and North Lowther Uplands SPA, with PE_1 approximately 1.2 km from the SPA and the second territory 3.2 km from the SPA. Guidance from NatureScot (SNH 2016a) regarding alternative nest sites states a "*mean distance of 3km*" for alternative nest sites for peregrine falcon territories and so there is potential for PE_1 to be an alternative nest site associated with the SPA population. However, data provided by the SSRSG shows that the PE_1 site has been in consistent occupation since 2017 (and PE_A since 2013) and it is therefore considered that this is a pair associated with the wider countryside population rather than an alternative nest site for a pair holding a territory within the SPA.
- 7.4.38 Data provided by the RSPB Data Unit indicated the presence of peregrine falcon in the wider area on 15 occasions between 2015 and 2023, however the records were not within the Site / did not indicate breeding.
- 7.4.39 Flight activity surveys recorded 30 flights (**Table 7-2, Confidential Figure 7.2.6**), and collision risk modelling predicted a mean collision rate of one bird every 7.25 years (**Table 7-3**).
- 7.4.40 Guidance from Goodship & Furness (2022) recommends a buffer of 500 m to 750 m for breeding peregrine falcon. PE_1 is 500 m from the nearest proposed turbine / 324 m from the nearest proposed infrastructure.
- 7.4.41 As a species listed on Schedule 1 of the Wildlife and Countryside Act 1981, standard measures to avoid the potential for disturbance to any possible future breeding birds and enable legislative compliance are set out in **Section 7.5**.
- 7.4.42 Considering the species' presence within the Site and predicted collision risk, peregrine falcon is scoped into the assessment.



Red Kite

- 7.4.43 Baseline surveys recorded red kite within the survey area on four occasions (**Confidential Figure 7.2.7**). Breeding was probable at one location during the 2024 breeding season (KT_1, **Confidential Figure 7.2.7**). No roosting locations were identified.
- 7.4.44 Data provided by the SSRSG within 2 km of the Site for all Schedule 1 raptor or owl species for between 2013 and 2023 identified one breeding red kite territory over 3 km from the Site. No roosting locations were identified by the SSRSG.
- 7.4.45 Data provided by the RSPB Data Unit indicated the presence of red kite in the wider area on seven occasions between 2022 and 2023 (with one record within the Site), however the records did not indicate breeding.
- 7.4.46 Flight activity surveys recorded 43 flights (**Table 7-2, Confidential Figure 7.2.8**), and collision risk modelling predicted a mean collision rate of one bird every 5.98 years (**Table 7-3**).
- 7.4.47 Guidance from Goodship & Furness (2022) recommends a buffer of 150 m to 300 m for breeding (or roosting) red kite. KT_1 is 522 m from the nearest proposed turbine / 431 m from the nearest proposed infrastructure.
- 7.4.48 As a species listed on Schedule 1 of the Wildlife and Countryside Act 1981, standard measures to avoid the potential for disturbance to any possible future breeding birds and enable legislative compliance are set out in **Section 7.5**.
- 7.4.49 Considering the species' presence within the Site and predicted collision risk, red kite is scoped into the assessment.

Short-eared Owl

- 7.4.50 Baseline surveys recorded short-eared owl on three occasions (two records of three birds and one record of two birds) within the survey area (**Figure 7.4**) across the two-year survey period with no evidence of breeding or roosting recorded.
- 7.4.51 Data provided by the SSRSG from the 2014 formal monitoring of the Muirkirk and North Lowther Uplands SPA identified three probable breeding attempts for short-eared owl, one of which was approximately 800 m from the nearest turbine. Data provided by the SSRSG within 2 km of the Site for all Schedule 1 raptor or owl species for between 2013 and 2023 did not indicate any breeding short-eared owl within 2 km of the Site. No roosting locations were identified by the SSRSG.
- 7.4.52 Flight activity surveys recorded four flights (**Table 7-2, Figure 7.5**), and collision risk modelling predicted a mean collision rate of one bird every 49 years (**Table 7-3**).
- 7.4.53 As a species listed on Schedule 1 of the Wildlife and Countryside Act 1981, standard measures to avoid the potential for disturbance to any possible future breeding birds and enable legislative compliance are set out in **Section 7.5**.
- 7.4.54 Considering the species' limited presence within the Site, absence of known breeding sites, negligible predicted collision risk, and embedded mitigation, short-eared owl is scoped out of the assessment.
- 7.4.55 Whilst the Proposed Development is within 2 km of the Muirkirk and North Lowther Uplands SPA and therefore within the core foraging range of breeding short-eared owl associated with the SPA, the baseline described above indicates that the Site is not regularly in use by foraging (or breeding) short-eared owl and as such there is considered to be limited likelihood of a likely significant effect on the breeding short-eared owl population associated with the Muirkirk and North Lowther Uplands SPA as a result of the Proposed Development. Consequently, there is considered



to be no adverse effect on the integrity of the Muirkirk and North Lowther Uplands SPA and potential effects on the SPA have been scoped out of further assessment.

Waders

- 7.4.56 Moorland breeding bird surveys recorded an assemblage of breeding waders representative of the agricultural grassland and dormant opencast mine habitats present within the Site. The number of estimated breeding wader territories of target wader species recorded during surveys is summarised in **Table 7-4**, with species breeding registrations illustrated on **Figure 7.6**. Due to the difficulty in accurately estimating territory numbers, a range is provided in some cases.

Table 7-4: Number of Wader Breeding Territories (min-max)⁵

Species	2023	2024
Curlew	4 – 6 (3)	2 – 3 (2)
Lapwing	1 – 2 (1 – 2)	1 – 4 (0 – 2)
Ringed plover	9 – 12 (9 – 12)	9 -10 (8 – 9)

Curlew

- 7.4.57 Flight activity surveys recorded 38 flights (**Table 7-2**, **Figure 7.7**), and collision risk modelling predicted a mean collision rate of one bird every 7.24 years (**Table 7-3**).
- 7.4.58 Considering the species' presence within the Site and predicted collision risk, curlew is scoped into the assessment.

Golden Plover

- 7.4.59 Baseline surveys recorded golden plover on 15 occasions (**Figure 7.8**) within the survey area across the two-year baseline survey period. Records were all considered to be of wider-countryside population non-breeding/wintering birds with the majority of records of flocks ranging from 15 to 220 birds. Activity was almost exclusively associated with an area of dormant opencast to the west of turbine 12 and turbine 11 (**Figure 7.8**).
- 7.4.60 Flight activity surveys recorded 13 flights (**Table 7-2**, **Figure 7.7**), and collision risk modelling predicted a mean collision rate of one bird every 0.10 years (**Table 7-3**). Again, activity was exclusively of wider-countryside population non-breeding/wintering birds with the majority of records of flocks ranging from six to 150 birds with activity focussed in the same area as the other wintering records. The additional predicted annual mortality due to collision with operational turbines would result in an increase of 0.48 % to 0.85 % over the calculated annual baseline mortality rate (0.27, British Trust for Ornithology (BTO), 2026, BirdFacts⁶), which is negligible in the context of the Ayrshire wintering population (see below).
- 7.4.61 Whilst breeding golden plover are listed as a priority bird species for onshore wind farm assessment (Annex 1 of NS 2025c), their wintering populations are not considered to be sensitive to wind farm developments. The Scottish wintering golden plover population is estimated be up to 60,000 in the autumn, 35,000 in mid-winter and 30,000 in the spring (Forrester *et al.* 2012) and golden plover continue to be included on the BoCC Green list (Stanbury *et al.* 2021). The Ayrshire estuarine

⁵ Estimated number of breeding territories within 500 m of the Wind Turbine Array is shown in brackets.

⁶ Available at: <https://www.bto.org/learn/about-birds/birdfacts/golden-plover>



coastal estimates represent around 10 % of the Scottish coastal total which would indicate a regional spring, autumn and winter population between 3,000 and 6,000 individuals. Given that in the region of 15,000 to 20,000 birds also winter inland and that rocky coasts are not included in the coastal estimates (Forrester *et al.* 2012), the adjusted regional golden plover population for Ayrshire is estimated to lie between 4,500 and 8,000 birds.

- 7.4.62 Whilst wintering golden plover are not listed as a priority bird species for onshore wind farm assessment or as a species with a restricted range potentially at-risk from onshore wind farm development (Annex 1 of NS 2025c), it is proposed to retain areas of suitable wintering habitat for golden plover within the Site (**Technical Appendix 6.6**). In addition, the BDMP would include measures to safeguard golden plover, with pre-construction checks for wintering golden plover undertaken by the ECoW or suitably qualified ornithologist to locate any wintering activity.
- 7.4.63 Considering the proposed retention of key wintering habitat, negligible collision risk in the context of the Ayrshire wintering population and the provision of the BDMP, golden plover is scoped out of the assessment.

Green Sandpiper

- 7.4.64 Baseline surveys recorded individual green sandpiper on two occasions in July/August 2023 (**Figure 7.8**). No evidence of breeding was recorded.
- 7.4.65 Considering the species' limited presence within the Site, absence of known breeding sites, no predicted collision risk, and embedded mitigation, green sandpiper is scoped out of the assessment.

Lapwing

- 7.4.66 Flight activity surveys recorded three flights (**Table 7-2, Figure 7.7**), and collision risk modelling predicted a mean collision rate of one bird every 2,108 years (**Table 7-3**).
- 7.4.67 Considering the species' presence within the Site, lapwing is scoped into the assessment.

Ringed Plover

- 7.4.68 Flight activity surveys recorded one flight (**Table 7-2, Figure 7.7**), and collision risk modelling predicted a mean collision rate of one bird every 1,556 years (**Table 7-3**).
- 7.4.69 Ringed plover were identified to be breeding within 500 m of the Proposed Development with between eight and 12 territories identified (**Table 7-4**). Due to their highly mobile nature (of both adults and chicks) and nests being little more than a scrape in bare ground/between stones, it was not possible to estimate a specific number of territories and hence a minimum and maximum has been used with the true number of ringed plover territories likely to lie between these estimates.
- 7.4.70 Forrester *et al.* (2012) estimates the Scottish breeding population to be between 4,900 and 6,700 pairs and the potential worst-case permanent loss of 12 pairs from the population as a result of the Proposed Development would therefore equate to a loss of 0.2 % of the Scottish population. Considering this species' known use of man-made habitats (oystercatcher are another species known to utilise man-made habitats successfully), and particularly active gravel pits, they are likely to be able to tolerate and/or habituate to a level of human disturbance, it is therefore considered unlikely that all breeding pairs would be permanently lost as a result of the Proposed Development, however it is likely that some pairs will experience some displacement (in particular during the construction phase).



- 7.4.71 Breeding activity was entirely associated with the unrestored surface mine ground located on the Site with breeding activity concentrated around the various small sized waterbodies located within this bare/scrub ground. Forrester *et al.* (2012) notes that ringed plover are widespread breeders around Scottish coasts but have also bred inland in a variety of habitats (including man-made habitats) from around the 1920s and so their presence on the unrestored surface mine workings is not unusual. It should also be noted that the long-term availability of this ringed plover breeding habitat has only resulted due to these worked surface mining areas remaining unrestored following the collapse of Scottish Coal in 2013. In standard surface mining lifecycles, these areas would have been restored, once worked, to similar habitats that existed prior to the presence of the surface mine.
- 7.4.72 Whilst ringed plover are not listed as a priority bird species for onshore wind farm assessment or as a species with a restricted range potentially at-risk from onshore wind farm development (Annex 1 of NS 2025c), considering their status as BoCC red listed species (Stanbury *et al.* 2020), it is proposed to retain areas of suitable breeding habitat for ringed plover within the Site (**Technical Appendix 6.6**). In addition, the BDMP would include measures to safeguard ringed plover nests, with pre-construction checks for breeding ringed plover undertaken by the ECoW or suitably qualified ornithologist to locate any breeding activity.
- 7.4.73 Considering the proposed retention of key breeding habitat, the provision of the BDMP, ringed plover is scoped out of the assessment.

Wildfowl

Greylag Goose

- 7.4.74 Baseline surveys recorded greylag geese on seven occasions within the survey area across the two-year baseline survey period. With the exception of one record, activity was all during the breeding seasons and activity focussed over 500 m from the Proposed Development.
- 7.4.75 Flight activity surveys recorded eight flights (**Table 7-2, Figure 7.9**), and collision risk modelling predicted a mean collision rate of one bird every 47 years (**Table 7-3**).
- 7.4.76 Considering this species' limited presence within the study area and negligible predicted risk of collision, greylag goose is scoped out of the assessment.

Pink-footed Goose

- 7.4.77 Baseline surveys recorded flocks of pink-footed geese overflying the Site on five occasions across the two-year baseline survey period. No evidence of pink-footed geese foraging or roosting within the Site was recorded.
- 7.4.78 Flight activity surveys recorded nine flights (**Table 7-2, Figure 7.9**), and collision risk modelling predicted a mean collision rate of one bird every 3.43 years (**Table 7-3**).
- 7.4.79 Considering this species' limited presence within the study area and negligible predicted risk of collision, pink-footed goose is scoped out of the assessment.

Whooper Swan

- 7.4.80 Flight activity surveys recorded one flight (**Table 7-2, Figure 7.9**), and collision risk modelling predicted a mean collision rate of one bird every 135 years (**Table 7-3**). No other evidence of whooper swan was recorded across the two-year baseline survey period.



- 7.4.81 Considering this species' limited presence within the study area and negligible predicted risk of collision, whooper swan is scoped out of the assessment.

Gulls

- 7.4.82 Baseline surveys across the two-year survey period recorded five species of gull (black-headed, common, great black-backed, herring and lesser black-backed), however as noted in the limitations section above, gull species were broadly considered to be secondary species. Of these, a small number of common gull were identified to be breeding at Dalfad (approximately 800 m from the nearest turbine). Activity of all five gull species was predominately recorded to be associated with the area of dormant opencast (including a lagoon) to the west of turbines 12 and 11 or in the wider area foraging in the lowland farmland.
- 7.4.83 Flight activity surveys recorded 31 herring gull flights (**Table 7-2, Figure 7.10**), and collision risk modelling predicted a mean collision rate of one bird every 4.10 years (**Table 7-3**).
- 7.4.84 Considering the limited presence within 500 m of the Proposed Development and low predicted risk of collision for herring gull, gull species are scoped out of the assessment.

Future Baseline in Absence of Proposed Development

- 7.4.85 In the absence of the Proposed Development, or assuming a gap between baseline surveys and the commencement of the Proposed Development, any noticeable changes in baseline conditions (for example, in the distribution and population of breeding and non-breeding ornithological features) are most likely to result from habitat modifications within or surrounding the Site, or due to widespread land management practices. Such changes are not predicted to happen at least in the foreseeable short or medium-term.
- 7.4.86 The Site is not subject to any other development pressures, which may have the potential to affect habitats and species in such a way as to substantially alter the baseline reported here. In the absence of the Proposed Development, the habitats within the Site are therefore considered most likely to remain under the existing management regime, largely comprising grazing for livestock and dormant / restored opencast mine workings.

7.5 Embedded and Standard Mitigation

- 7.5.1 Embedded mitigation includes design/standard best practice measures as described in **Chapter 2: Project Description** and **Chapter 3: Design Evolution and Alternatives**.

Iterative Design Process

- 7.5.2 As part of the iterative design process the following ornithological constraints and design principles (i.e. embedded mitigation) were considered to avoid or reduce potential negative effects on ecological features where possible.
- 7.5.3 The findings of baseline studies were digitised as GIS data. The layout of the Proposed Development, including the positioning of proposed turbines and other key infrastructure, has then subsequently been designed to avoid or otherwise minimise construction/operational effects upon IOFs through the adherence to disturbance avoidance buffers recommended by NatureScot (2024b) and Goodship & Furness 2022, where possible.



- 7.5.4 The following species-specific disturbance avoidance buffers were adopted in the siting of proposed turbine locations (and other key infrastructure), in so far as possible:
- Barn owl: with reference to Shawyer (2011), 175 m disturbance buffer around identified/suspected nest/roost sites (**Confidential Figure 7.2.2**). No turbines located within this buffer and infrastructure minimised.
 - Black grouse: consideration of black grouse lek activity provided by the RSPB Scotland Data Unit with reference to the 500 m (operational disturbance) and 750 m (construction disturbance) buffers advocated by NatureScot.
 - Hen harrier: with reference to Goodship & Furness (2022), 500 m disturbance buffer (no development within this buffer) and 750 m disturbance buffer (with development minimised within this buffer) around identified roost sites (**Confidential Figure 7.2.3**).
 - Peregrine falcon: with reference to Goodship & Furness (2022), 500 m disturbance buffer (no turbines within this buffer) and 750 m disturbance buffer (development minimised within this buffer) around the identified nest site (**Confidential Figure 7.2.5**).
 - Red kite: with reference to Goodship & Furness (2022), 300 m disturbance buffer (with no development within this buffer) around the identified nest site (**Confidential Figure 7.2.7**).
- 7.5.5 The under-grounding of all on-site cables would also serve to minimise any additional collision risk for bird species.

Standard Mitigation Measures

- 7.5.6 This assessment has been undertaken on the basis that all works would be carried out in line with industry good practice construction measures, guidance and legislation.
- 7.5.7 To ensure all reasonable precautions are taken to avoid disturbance to birds and comply with environmental legislation, prior to construction and decommissioning the Applicant will appoint a suitably qualified Ecological Clerk of Works (ECoW) who will advise the Applicant and the Contractor on all ornithological matters (with the assistance of a suitably qualified/licenced ornithologist if required). The ECoW will be required to be present on Site during the construction period and will carry out monitoring of works and briefings with regards to any ornithological sensitivities on the Site to the relevant staff within the Contractor and subcontractors.
- 7.5.8 A Bird Disturbance Management Plan (BDMP) will be implemented during construction of the Proposed Development and will form part of the Construction Environmental Management Plan (CEMP). The BDMP will detail measures to ensure legal compliance and safeguard breeding birds known to be in the area and will include species-specific guidance. The BDMP shall include pre-construction surveys and good practice measures during construction. Pre-construction surveys will be undertaken to check for any new breeding bird activity in the vicinity of the construction works. The ECoW will oversee the implementation of the above measures. The BDMP would be prepared and implemented for the Proposed Development following consent. The BDMP would detail all good practice and species-specific measures to be implemented during the construction, decommissioning and where relevant during the operation of the Proposed Development, to enable legislative compliance and safeguard all wild and sensitive bird species including those listed on Schedule 1, A1 and 1A of the Wildlife and



Countryside Act 1981. The BDMP would be informed by information obtained during baseline studies, pre-commencement surveys, consultation with third-party recording groups (as necessary) and would require the implementation of suitable working restrictions defined in consultation with NatureScot and industry good practice applicable at the time (e.g. the adoption of recommended disturbance avoidance buffers as per Goodship & Furness 2022, controlling the timing, location and nature of construction activities).

- 7.5.9 There would be a contractual management requirement for the successful Principal Contractor to develop and implement a comprehensive, Site-specific and robust CEMP which would be submitted to East Ayrshire Council (EAC) for consideration in consultation with SEPA. This document would detail how the successful Contractor would manage the works in accordance with all commitments and mitigation detailed in the EIAR, the BDMP, statutory consents and authorisations, and good industry practice and guidance for environmental management, including implementation of appropriate pollution prevention and biosecurity (particularly in relation to watercourses).

Summary of Mitigation

- 7.5.10 As the embedded and standard / best practice mitigation would form an integral part of the Proposed Development, there would be no consented scenario where the mitigation measures would not be implemented. As such, the assessment of likely significant effects assumes that these mitigation measures are implemented.

7.6 Scope of Assessment

Potential Impacts Scoped In

- 7.6.1 The assessment considers the potential for significant effects upon those scoped-in ornithological features, hereafter referred to as IOFs, which are considered to be of 'medium' or 'high' Nature Conservation Importance (NCI) (in accordance with the criteria set out in **Technical Appendix 7.4**, and as confirmed through baseline studies. These IOFs are summarised in **Table 7-5** and the conservation status of each IOF is detailed in **Table 7-6**.

Table 7-5: Summary of Scoped-In IOFs

Feature	NCI	Justification for NCI
Hen harrier	High	Muirkirk and North Lowther Uplands SPA feature. Schedule 1/1A and Annex I listed, BoCC Red list (Stanbury <i>et al.</i> 2021). Priority bird species for assessment (NatureScot 2025c).
Peregrine falcon	Medium	Schedule 1 and Annex I listed, BoCC Red list (Stanbury <i>et al.</i> 2021). Priority bird species for assessment (NatureScot 2025c).
Red kite	Medium	Schedule 1/A1 and Annex I listed. Priority bird species for assessment (NatureScot 2025c).
Curlew	Medium	BoCC Red list (Stanbury <i>et al.</i> 2021). Priority bird species for assessment (NatureScot 2025c)
Lapwing	Medium	BoCC Red list (Stanbury <i>et al.</i> 2021). Priority bird species for assessment (NatureScot 2025c)



Table 7-6: Conservation Status of Scoped-In IOFs

Feature	Conservation Status	Muirkirk and North Lowther Uplands SPA	Information
Hen harrier	Unfavourable	Unfavourable declining	Hen harrier is included on the BoCC Red list due to a historical decline in the UK breeding population without substantial recent recovery (Stanbury <i>et al.</i> 2021). From the species' most recent census in 2023, the UK plus the Isle of Man population was estimated to be 691 territorial pairs, of which 653 are found in the UK. This is a 20 % increase since the last census in 2016 (RSPB 2023). Scotland holds the bulk of the population with an estimated 529 breeding pairs in 2023 (RSPB 2023). The regional NHZ 19 breeding population is most recently cited by Wilson <i>et al.</i> (2015) as 18 pairs (range 15 – 20) in 2011, although it was recognised that this was likely an underestimate. In the most recent assessment of regional and national conservation status, Fielding <i>et al.</i> (2011) considered that although the regional NHZ 19 population passed the 'Level 1' and 'Level 2' tests of habitat occupancy and density, the NHZ 19 population was in unfavourable conservation status due to its low productivity rates (1.03 young fledged/pair). The regional/NHZ breeding population is assigned an unfavourable conservation status for the purposes of assessment. An estimated 1,050 – 1,540 birds are thought to be present in the winter, with the population thought to be supplemented to some degree by wintering birds from Scandinavia (Forrester <i>et al.</i> 2012). On the basis that the NHZ 19 breeding population represents approximately 3.5 % of the Scottish breeding population (Wilson <i>et al.</i> 2015), it could be estimated that the wintering NHZ population may be between 37 and 55 birds (not taking into account birds wintering in the region from outwith Scotland).
Peregrine falcon	Favourable	Unfavourable no change	Woodward <i>et al.</i> (2020) most recently estimated the peregrine falcon UK breeding population to be 1,750 pairs (based on 2014 data), and the species is included on the BoCC Green list (Stanbury <i>et al.</i> 2021) indicating that the national population is considered to be in favourable conservation status. The regional NHZ 19 breeding population is most recently cited by Wilson <i>et al.</i> (2015) as 34 pairs in 2014. The NHZ 19 area is largely comparable in extent with the SRMS Dumfries & Galloway (D&G) monitoring area and for which more contemporary population data is available, a minimum NHZ 19 breeding population of 43 pairs, equating to the D&G monitoring area population, can be adopted. The regional NHZ 19 breeding peregrine falcon population is consequently assumed to be stable, but



Feature	Conservation Status	Muirkirk and North Lowther Uplands SPA	Information
			growing, and is assigned a favourable conservation status for the purposes of assessment.
Red kite	Favourable	Not applicable	Woodward <i>et al.</i> (2020) most recently estimated the red kite UK breeding population to be 4,400 pairs (based on 2017 data), with the species now included on the BoCC Green list (Stanbury <i>et al.</i> 2021) indicating that the national population is considered to be in favourable conservation status. Following reintroduction efforts between 1989 and 2009, the Scottish red kite breeding population was estimated by the SRMS to be at least 291⁷ pairs in 2023 (Peniche <i>et al.</i> 2025). The national and regional populations of red kite in Scotland are considered to still remain in their expansion phase. Annual productivity rates remain high (1.5 young fledged/pair laying eggs in 2023, Peniche <i>et al.</i> 2025), with the species populations continuing to grow in size and distribution. The NHZ 19 area is largely comparable in extent with the SRMS Dumfries & Galloway (D&G) monitoring area and for which more contemporary population data is available, a minimum NHZ 19 breeding population of 124 pairs (248 adults, as monitored in 2023), equating to the D&G monitoring area population, can be adopted. The regional NHZ 19 breeding red kite population is consequently assumed to be stable, but growing, and is assigned a favourable conservation status for the purposes of assessment.
Curlew	Unfavourable	Not applicable	The national breeding curlew population estimate was 59,000 pairs in 2016 (Woodward <i>et al.</i> 2020), with long-term declines documented across Scotland. The most recently published breeding bird survey report from 2025 suggests a 12 % decline in breeding curlew numbers for the period 2014 to 2024 (Heywood <i>et al.</i> 2026) The NHZ 19 population was most recently estimated by Wilson <i>et al.</i> (2015) as 4,284 pairs (range 3,851 to 4,717). Based on suggested population trends and a 12 % decline in Scotland, the current NHZ 19 population figures may be around 3,770 breeding pairs. The continued inclusion of the species on the BoCC Red list (Stanbury <i>et al.</i> 2021) and population declines suggests that the national and regional NHZ populations are in an unfavourable conservation status.
Lapwing	Unfavourable	Not applicable	The most recent national breeding lapwing population was estimated to be 98,000 pairs in 2016 (Woodward <i>et al.</i> 2020), with long-term declines documented across Scotland. The most recently published breeding bird survey report from 2025 suggests a 7 % decline in

⁷ Number of home ranges checked.



Feature	Conservation Status	Muirkirk and North Lowther Uplands SPA	Information
			breeding lapwing numbers between 2014 and 2024 (Heywood <i>et al.</i> 2026), suggesting that the Scottish population may currently be around 91,140 pairs. The continued inclusion of the species on the BoCC Red list (Stanbury <i>et al.</i> 2021) and population declines suggests that the national and regional NHZ populations are in an unfavourable conservation status. The NHZ 19 lapwing population is unknown but based on the Scottish population, a minimum of 5,000 pairs are likely to be within NHZ 19.

Potential Impacts Scoped Out

- 7.6.2 The assessment focusses on impacts that are likely to result in significant effects on potential IOFs. Impacts that are not likely to result in significant effects (at the species relevant reference population scale) have therefore been scoped out of the assessment. A summary of the impacts scoped out is presented in **Table 7-7**.

Table 7-7: Impacts Scoped Out of the Assessment

Impact	Reasoning
Direct habitat loss	Overall direct habitat losses arising from the built footprint of the Proposed Development are small, relative to the extent of remaining habitat within the Site and surrounding area and which would otherwise be available for bird species. Providing the implementation of measures set out in the Construction and Environmental Management Plan (CEMP) (Technical Appendix 11.1) and an Outline Biodiversity Enhancement Management Plan (OBEMP) (Technical Appendix 6.6) for the Proposed Development finalised in consultation with relevant consultees, direct habitat losses would be relatively localised, sufficiently offset and not significant for any potential IOF.
Artificial lighting	NatureScot (2020a) advises that an assessment of the possible effects of lighting on birds may be required in the following three situations, where the risk of impact is greater: - wind turbines on or adjacent to a seabird colony that hosts burrow nesting species; - wind turbines that are on or adjacent to protected areas that host large concentrations of wintering waterbirds, where such sites are located within open country away from other sources of artificial light; and - where wind farms are located on migratory corridors or bottlenecks for nocturnally migrating passerines. As the location of the Proposed Development does not fall into any of the above greater risk scenarios, an assessment is not required.

7.7 Assessment of Potentially Significant Effects

- 7.7.1 This section describes the likely impacts and effects during the construction, operation and decommissioning of the Proposed Development on the identified IOFs.
- 7.7.2 For details of the assessment methodology, see **Technical Appendix 7.4**. This outlines the process in which overall significance of an effect is determined, using a combination of sensitivity of feature and impact magnitude.



- 7.7.3 The potential for significant effects is assessed in the context of species' regional NHZ 19 populations, as recommended in NatureScot guidance (2025c) and where it is considered most appropriate to do so. Where alternative geographical populations are considered more appropriate this is justified within the text.

Hen Harrier

Construction Phase

- 7.7.4 **Impact:** Roosting hen harrier may be displaced from roosting habitats within proximity to the Proposed Development during construction by disturbance, thereby impacting on fitness and survival rates within the non-breeding season population.
- 7.7.5 **Sensitivity/condition:** High NCI (**Table 7-5**) and unfavourable conservation status (**Table 7-6**); the Muirkirk and North Lowther Uplands SPA population is considered to be in unfavourable condition.
- 7.7.6 **Magnitude of impact:** baseline studies identified a potential wintering hen harrier roost (HH_R1, **Confidential Figure 7.2.3**), located within 750 m of the Proposed Development, the upper recommended disturbance buffer for non-breeding hen harriers (Goodship & Furness 2022), but over the 500 m disturbance buffer also recommended by Goodship & Furness (2022); there will be no direct habitat loss from the roost feature as a result of the Proposed Development. The potential roost location was identified during October 2024 when a single ringtail was recorded stooping out of view just prior to sunset. Hen harrier were recorded hunting in the area around the potential roost during both the 2023/2024 non-breeding (up to five different birds) and 2024/2025 non-breeding (up to three different birds) seasons. Consultation with the SSRSRG did not indicate any roosts within 2 km of the Site.
- 7.7.7 As hen harrier are dispersive over the non-breeding season, with roost sites and wintering foraging areas often well away from breeding sites, individual birds using a roost location will be transient, likely occupying multiple roost sites over the course of the non-breeding season. Alternative roost sites may become more favourable and/or there is a degree of flexibility in roost site choice in the surrounding wider area. Hen harrier are therefore assumed to be able to seek alternative roost sites, or an alternative position within a roosting feature, away from a perceived disturbance source if required.
- 7.7.8 Hen harrier is listed on Schedule 1 and 1A of the Wildlife and Countryside Act 1981 (as amended). The Proposed Development's BDMP will therefore include for standard species-specific restrictions during the construction works to enable legislative compliance and avoid (or otherwise minimise) the disturbance to roosting hen harrier. This would specifically include for the avoidance of activity within the 750 m buffer of roosting hen harrier overnight and within two hours of dusk (two hours before official sunset time) and dawn (two hours after official sunrise time) during the non-breeding season in accordance with current NatureScot guidance (SNH 2014).
- 7.7.9 An effect of negligible and short-term magnitude is therefore predicted.
- 7.7.10 **Significance of effect:** the unmitigated effect on the non-breeding hen harrier population is therefore concluded as **negligible** and therefore **not significant** in the context of the EIA Regulations.
- 7.7.11 **Effects on the Muirkirk and North Lowther Uplands SPA:** considering the continued availability of the potential roosting location/other adjacent suitable roosting habitat, the distance from the potential roost to the nearest construction, what is known regarding hen harrier roosting behaviour, and the inclusion of specific



restrictions for roosting hen harrier in the BDMP, there is considered to be **no adverse effect** on the integrity of the non-breeding hen harrier population of the Muirkirk and North Lowther Uplands SPA as a result of the Proposed Development.

Operational Phase – Displacement and Barrier Effects

- 7.7.12 **Impact:** roosting hen harrier may be at risk of displacement from roosting habitats during the operation of the Proposed Development (and operational maintenance works), thereby impacting on fitness and survival rates.
- 7.7.13 **Sensitivity/condition:** High NCI (**Table 7-5**) and unfavourable conservation status (**Table 7-6**); the Muirkirk and North Lowther Uplands SPA population is considered to be in unfavourable condition.
- 7.7.14 **Magnitude of impact:** possible effects on wintering hen harrier from operational wind farms are not well understood however, evidence broadly suggests that hen harrier are not very sensitive to displacement around operational infrastructure.
- 7.7.15 Studies conducted at Irish and Scottish wind farms (Madden & Porter 2007, Robson 2012, Haworth & Fielding 2012) have all recorded harrier flights close to operational turbines. Haworth & Fielding (2012) have also presented several examples, from within the UK, where hen harrier have been recorded nesting close to operating turbines. In their review they found no clear evidence of hen harrier foraging displacement at distances beyond 100 m from turbines at wind farms in Scotland, and no evidence that turbines restrict hen harrier nesting attempts, except at perhaps a distance of 200 – 250 m. It was their conclusion that *“even if the effects of wind farms are much larger than the available evidence suggests it is highly unlikely that these effects would result in significant population level effects”* (Haworth & Fielding 2012).
- 7.7.16 Based on published evidence, a 100 m displacement distance is likely to be a reasonable extent within which possible effects on hen harrier activity around turbine locations of the Proposed Development could occur. Even if displacement effects to roosting hen harriers were of greater spatial extent, based on information obtained from baseline studies it appears that there is very likely to be a degree of flexibility in roost site choice by individual hen harrier over the non-breeding season.
- 7.7.17 The Proposed Development’s BDMP will inherently include for species-specific restrictions during the operational maintenance works to enable legislative compliance and avoid (or otherwise minimise) the disturbance to roosting hen harrier. As for construction works, this would similarly include for the avoidance of activity within a 750 m buffer of roosting hen harrier overnight and within two hours of dusk (two hours before official sunset time) and dawn (two hours after official sunrise time) during the non-breeding season, which is in accordance with current NatureScot guidance (SNH 2014).
- 7.7.18 Considering the above and that the potential roosting area is over 500 m from the nearest proposed turbine, it is considered unlikely that the roosting feature may become unattractive to hen harrier due to the presence of operational infrastructure. The unmitigated impact on the non-breeding hen harrier population is considered to be negligible but permanent magnitude on the population
- 7.7.19 **Significance of effect:** the unmitigated effect on the non-breeding hen harrier population (national dispersive) from operational displacement is concluded to be no more than **negligible** and therefore **not significant** in the context of the EIA Regulations.
- 7.7.20 **Effects on the Muirkirk and North Lowther Uplands SPA:** considering the continued availability of the potential roosting location/other adjacent suitable



roosting habitat, the distance from the potential roost to the nearest operational turbine, what is known regarding hen harrier roosting behaviour/their tolerance to wind farms, and the extension of the BDMP for the operational phase, there is considered to be **no adverse effect** on the integrity of the non-breeding hen harrier population of the Muirkirk and North Lowther Uplands SPA as a result of the Proposed Development.

- 7.7.21 To further minimise the magnitude of potential operational effects upon roosting hen harrier, the habitat management measures outlined in the OBEMP (**Technical Appendix 6.6**) have ensured that any planting will be outwith the 750 m roost buffer.

Operational Phase – Collision Mortality Risk

- 7.7.22 **Impact:** birds that utilise the airspace within the Proposed Development at potential collision heights may be at risk of collision with turbines, thereby increasing the annual mortality rate of the population above background levels.
- 7.7.23 **Sensitivity/condition:** High NCI (**Table 7-5**) and unfavourable conservation status (**Table 7-6**); the Muirkirk and North Lowther Uplands SPA population is considered to be in unfavourable condition.
- 7.7.24 **Magnitude of impact:** A mean breeding and non-breeding collision mortality risk of 0.0107 and 0.0398 respectively was predicted for hen harrier (**Table 7-3**).
- 7.7.25 **Significance of effect:** The NHZ 19 breeding population is estimated at 18 breeding pairs (**Table 7-6**). The additional predicted annual mortality due to collision with operational turbines would result in an increase of 0.16 % over the calculated annual baseline mortality rate (0.19, British Trust for Ornithology (BTO) BirdFacts⁸), which is negligible in the context of the regional population level.
- 7.7.26 The NHZ 19 non-breeding/wintering population is estimated to be 55 birds (**Table 7-6**). The additional predicted annual mortality due to collision with operational turbines would result in an increase of 0.38 % over the calculated annual baseline mortality rate (0.19, British Trust for Ornithology (BTO) BirdFacts⁹), which is negligible in the context of the regional population level.
- 7.7.27 Additionally, reported collisions are considered to be very rare (three fatalities reported in the last 10 years¹²). The increase in baseline mortality is therefore considered to be an effect of negligible but long-term magnitude.
- 7.7.28 **Significance of effect:** The effect on the NHZ 19 hen harrier population as a result of potential collision risk is concluded to be **negligible** and, therefore, **not significant** in the context of the EIA Regulations.
- 7.7.29 **Effects on the Muirkirk and North Lowther Uplands SPA:** Data provided by the SSRSRSG indicated that the nearest known hen harrier nest is approximately 2.5 km from the Site and outwith the core foraging range of breeding hen harrier (SNH 2016b). As such, the risk of collision for breeding hen harrier associated with the SPA population is limited and is considered to result in **no adverse effect** on the integrity of the Muirkirk and North Lowther Uplands SPA.
- 7.7.30 The SPA non-breeding/wintering population is stated to be 12 birds (**Table 7-6**). The additional predicted annual mortality due to collision with operational turbines would potentially result in an increase of 1.75 % over the calculated annual baseline

⁸ Available at: <https://www.bto.org/learn/about-birds/birdfacts/hen-harrier>

⁹ Available at: <https://www.bto.org/learn/about-birds/birdfacts/hen-harrier>



mortality rate (0.19, British Trust for Ornithology (BTO) BirdFacts¹⁰), which would be considered minor in the context of the SPA population. The increase in baseline mortality is therefore considered to be an effect of minor but long-term magnitude.

- 7.7.31 In general, hen harrier forage by quartering low across open moorland and are accepted to spend a large proportion of their flight time at low flight altitudes. This is corroborated by the baseline data with 89 % of the bird seconds recorded during flight activity surveys recorded below 20 m. The Proposed Development will comprise of a combination of V162 and V132 turbine models that will have 38 m and 17.9 m ground clearance respectively (five of the 14 turbines will be the V132 model). **Technical Appendix 7.3** presents collision modelling for both turbine models with the 'worst-case' presented for each species in **Table 7-3** as a precautionary approach. For hen harrier, the V132 model output is presented (0.0398 mean non-breeding) as the theoretical worst case however this is over precautionary when considering that only five of the 14 turbines will be of this model. The mean non-breeding predicted collision rate for the V162 turbine model for hen harrier is 0.007 (**Technical Appendix 7.3**) which would result in an increase of 0.31 % over the calculated annual baseline mortality rate. This would be considered negligible in the context of the SPA population. The increase in baseline mortality is therefore considered to be an effect of minor but long-term magnitude.
- 7.7.32 As noted above, hen harrier are not considered particularly susceptible to collision with turbines (three fatalities reported in the last 10 years¹²). Considering this alongside their known low flying behaviour and the majority of their non-breeding activity related to foraging behaviour outwith the turbine array it is considered unlikely that the precautionary worst case predicted collision rate is realistic. As such, the risk of collision for non-breeding hen harrier associated with the SPA population is anticipated to be negligible and is considered to result in **no adverse effect** on the integrity of the Muirkirk and North Lowther Uplands SPA.

Peregrine Falcon

Construction Phase

- 7.7.33 **Impact:** Disturbance to breeding and/or foraging peregrine falcon resulting from construction works. Potentially impacting on breeding success, productivity and/or survival rates.
- 7.7.34 Sensitivity/condition: Medium NCI (Table 7-5) and favourable conservation status (Table 7-6).
- 7.7.35 **Magnitude of impact:** baseline surveys identified a breeding peregrine falcon territory within the Site (PE_1, **Confidential Figure 7.2.5**). PE_1 is 500 m from the nearest proposed turbine / 324 m from the nearest proposed infrastructure.
- 7.7.36 Guidance from Goodship & Furness (2022) recommends a buffer of 500 m to 750 m for breeding peregrine falcon. This may be over precautionary as there are limited observations of disturbance actually recorded (and where they were, the distances were considerably less than 500 m to 750 m). Indeed, Petty (1998) recommends a 400 m to 600 m disturbance buffer for peregrine falcon. Furthermore, peregrine falcon are known to successfully nest in active quarries/urban settings (historically and in the more recent past as populations have recovered) and are considered to be highly tolerant (or at least easily habituate, Ruddock and Whitfield 2007) to

¹⁰ Available at: <https://www.bto.org/learn/about-birds/birdfacts/hen-harrier>



- human activity/disturbance. Disturbance to nesting or roosting birds due to construction activities is therefore unlikely.
- 7.7.37 Through its listing on Schedule 1 of the Wildlife and Countryside Act 1981, measures to avoid the disturbance to breeding peregrine falcon, would be included within the BDMP (this would include but not be limited to the deployment of visual screening where considered appropriate). The potential for disturbance of peregrine falcon at their nest site during construction works would therefore not occur.
- 7.7.38 Overall, construction impacts to peregrine falcon are therefore predicted to be short-term and of minor magnitude.
- 7.7.39 **Significance of effect:** the effect on the regional NHZ 19 peregrine falcon population as a result of construction works is concluded to be **minor** (at worst) and, therefore **not significant** in the context of the EIA Regulations.

Operational Phase – Displacement and Barrier Effects

- 7.7.40 **Impact:** Displacement and therefore indirect habitat loss for breeding and/or foraging peregrine falcon due to the presence and operation of turbines or other infrastructure. Potentially impacting on breeding success, productivity and/or survival rates.
- 7.7.41 Sensitivity/condition: Medium NCI (Table 7-5) and favourable conservation status (Table 7-6).
- 7.7.42 **Magnitude of impact:** baseline surveys identified one confirmed breeding territory within 2 km of the Site (PE_1, **Confidential Figure 7.2.5**) with a second territory identified by the SSRSG over 2 km from the Site (PE_A, **Confidential Figure 7.2.5**). As detailed in the construction section above, PE_1 is 500 m from the nearest turbine which is within the range of buffer distances provided by various sources with regards to potential displacement and is considered to be an appropriate distance to mitigate potential displacement from PE_1 as a result of the presence of the turbines themselves.
- 7.7.43 The core foraging range from the nest site is given by NatureScot (SNH 2016a) as 2 km, and so breeding birds may be at risk from displacement. Peregrine falcon were recorded relatively frequently across the two-year baseline survey period (a total of 47 records), with activity predominately associated around the known territory. In addition to ensuring turbines were not located within 500 m of PE_1, consideration was given to the general scheme in relation to the nest site with the scheme kept to only the eastern side of the Site to avoid potential encirclement of PE_1 (regardless of the distance to the turbines) that could have resulted in barrier effects in relation to the birds from PE_1 foraging within the wider area. It can be seen on **Confidential Figure 7.2.5** that clear movement between the nest location and appropriate foraging areas has been retained. Commonly in these lowland areas, peregrine falcon are likely to feed locally on pigeons, corvids and gulls, and so in general, prey species are unlikely to be noticeably displaced by the presence of wind turbines and will continue to be present in the wider area away from the turbines.
- 7.7.44 Although some displacement from hunting may occur around individual wind turbines, effects on breeding birds are considered to be of negligible spatial and long-term temporal magnitude.
- 7.7.45 **Significance of effect:** the effect on the regional NHZ 19 peregrine falcon population as a result of construction works is concluded to be **minor** (at worst) and, therefore **not significant** in the context of the EIA Regulations.



Operational Phase – Collision Mortality Risk

- 7.7.46 **Impact:** birds that utilise the airspace within the Proposed Development at potential collision heights may be at risk of collision with turbines, thereby increasing the annual mortality rate of the population above background levels.
- 7.7.47 Sensitivity/condition: Medium NCI (Table 7-5) and favourable conservation status (Table 7-6).
- 7.7.48 **Magnitude of impact:** An annual mean collision mortality risk of 0.1380 was predicted for peregrine falcon (**Table 7-3**).
- 7.7.49 The NHZ 19 breeding population, conservatively estimated at 43 breeding pairs (**Table 7-6**). The additional predicted annual mortality due to collision with operational turbines would result in an increase of 0.84 % over the calculated annual baseline mortality rate (0.19, British Trust for Ornithology (BTO) BirdFacts¹¹), which is small in the context of the regional population level. Furthermore, peregrine falcon are understood to have a flight style that is highly manoeuvrable with the majority of their flight time spent in 'powered flight' and so are not considered to be a species particularly vulnerable to potential collision with wind turbines/collisions are considered to be very rare (two fatalities reported in the last 10 years¹²).
- 7.7.50 The increase in annual baseline mortality is therefore considered to be an effect of negligible but long-term magnitude
- 7.7.51 **Significance of effect:** The effect on the NHZ 19 peregrine falcon population as a result of potential collision risk is concluded to be **negligible** and, therefore, **not significant** in the context of the EIA Regulations.

Cumulative Effects

- 7.7.52 Given the evidence for limited displacement of peregrine falcon around operational wind farms, and the very small collision mortality risk predicted for peregrine falcon as a result of the Proposed Development, it is highly unlikely that either effect would contribute to a potentially significant cumulative risk at the NHZ 19 population level.
- 7.7.53 Potential cumulative operational displacement/collision effects upon peregrine falcon arising from the Proposed Development in-combination with other relevant wind farm proposals, are therefore considered to be at worst, of low yet long-term magnitude, and which is overall **minor** and, therefore, **not significant** in the context of the EIA Regulations.

Red Kite

Construction Phase

- 7.7.54 **Impact:** Disturbance to breeding and/or foraging red kite resulting from construction works. Potentially impacting on breeding success, productivity and/or survival rates.
- 7.7.55 Sensitivity: Medium NCI (Table 7-5); favourable conservation status (Table 7-6).
- 7.7.56 **Magnitude of impact:** Baseline surveys identified one red kite breeding site within proximity to the Proposed Development (**Confidential Figure 7.2.7**). Guidance from Goodship & Furness (2022) recommends a buffer of 150 m to 300 m for

¹¹ Available at: <https://www.bto.org/learn/about-birds/birdfacts/peregrine>

¹² Deaths of Birds of Prey in Scotland from wind farms [Online] Available at: <https://www.nature.scot/doc/freedom-information-request-deaths-birds-prey-scotland-windfarms>



- breeding (or roosting) red kite. KT_1 is 522 m from the nearest proposed turbine / 431 m from the nearest proposed infrastructure.
- 7.7.57 Through its listing on Schedule 1 and 1A of the Wildlife and Countryside Act 1981, measures to avoid the disturbance to breeding (and roosting red kite), would be included within the BDMP. The potential for disturbance of red kites at their nest site during construction works would therefore not occur.
- 7.7.58 Red kite usually forage within 3 km of their nest sites but can forage up to 6 km (Hardey *et al.* 2013). Much of the red kite activity recorded within the Site is therefore most likely related to birds that breed locally, including at the breeding site identified during baseline studies. Some activity will however be attributable to juvenile or non-breeding adults that can range across much wider areas.
- 7.7.59 Red kites are generally accepted as being opportunistic foragers and scavengers and can often be found nesting close to human habitation and roadways. Any disturbance of foraging birds within proximity to construction working areas is therefore likely to be minimal.
- 7.7.60 Overall, construction impacts to red kite are therefore predicted to be short-term and of negligible magnitude.
- 7.7.61 **Significance of effect:** The effect on the regional NHZ 19 red kite population as a result of construction works is concluded to be **negligible** and, therefore **not significant** in the context of the EIA Regulations.

Operational Phase – Displacement and Barrier Effects

- 7.7.62 **Impact:** Displacement and therefore indirect habitat loss for breeding and/or foraging red kite due to the presence and operation of turbines or other infrastructure. Potentially impacting on breeding success, productivity and/or survival rates.
- 7.7.63 Sensitivity: Medium NCI (Table 7-5); favourable conservation status (Table 7-6).
- 7.7.64 **Magnitude of impact:** Current evidence suggests that red kite do not exhibit a strong degree of displacement from operational wind farms in Scotland (Duffy and Urquhart 2014). It is also reasonable to assume that the pair recorded nesting in proximity to the Proposed Development (**Confidential Figure 7.2.7**) currently have a degree of tolerance to the passing of nearby vehicles and therefore any operational vehicle access taken along access tracks.
- 7.7.65 The implementation of the BDMP would also continue as relevant throughout the operational phase of the Proposed Development, to avoid disturbance to breeding (and where relevant roosting) birds.
- 7.7.66 Overall operational displacement and barrier impacts to red kite are concluded as being of no more than long-term and negligible magnitude, as there would continue to be sufficient available foraging habitat and nesting opportunities for the species surrounding the Proposed Development
- 7.7.67 **Significance of effect:** The effect on the regional NHZ 19 red kite population as a result of operational displacement is concluded to be **negligible** and **not significant** in the context of the EIA Regulations.

Operational Phase – Collision Mortality Risk

- 7.7.68 **Impact:** birds that utilise the airspace within the Proposed Development at potential collision heights may be at risk of collision with turbines, thereby increasing the annual mortality rate of the population above background levels.



- 7.7.69 Sensitivity: Medium NCI (Table 7-5); favourable conservation status (Table 7-6).
- 7.7.70 **Magnitude of impact:** A mean annual collision mortality risk of 0.1672 is predicted for red kite. Based on a likely minimum regional NHZ 19 population of 248 adult breeding birds (**Table 7-6**), the additional mortality due to collisions represents an increase in baseline mortality of 0.48 % (based on the precautionary assumption that all collisions are attributable to breeding adults, and using an annual adult mortality rate of 0.14, as per Sansom *et al.* 2016).
- 7.7.71 To help determine the magnitude of impact on the population due to collisions, a Population Viability Analysis (PVA) has been used to investigate the impact of additional mortality associated with wind turbine collisions on the future growth rates of the NHZ 19 red kite population (**Confidential Technical Appendix 7.5**).
- 7.7.72 Reflecting the continued expansion of the NHZ 19 (and wider south Scotland red kite population), the predicted current annual population growth rate appears to be healthy, at 13.6 %. Assuming that no density-dependence may limit this growth within the modelled 25-year period (similar assumptions were made by Samson *et al.* (2016) and Hereward *et al.* (2024) who modelled the north Scotland and Welsh red kite populations respectively), the total population would increase from an estimated 422 individuals (as per 2022 when 124 pairs were monitored for the SRMS), to nearly 11,000 individuals.
- 7.7.73 The addition of 0.1672 deaths on average per year was shown to change the predicted growth rate very little, with a reduction from 13.6 % to 13.5 % in the NHZ 19 population growth rate, thus remaining healthy (total population at year 25 would be c. 10,500 individuals).
- 7.7.74 These findings are consistent with previous population modelling for the north Scotland population (Samson *et al.* 2016) which demonstrated that the growth (even where constrained by other significant anthropogenic sources e.g. persecution events) is not necessarily further constrained by additional predicted baseline mortality from onshore wind farms i.e. growth is slowed, but the population remains stable and expanding.
- 7.7.75 Given the small predicted increase in annual baseline mortality for red kite, which would make very little change to the growth rate of the regional population, an impact of long-term and negligible magnitude is predicted.
- 7.7.76 **Significance of effect:** The effect on the NHZ 19 red kite population as a result of potential collision risk is concluded to be **negligible**, therefore, and **not significant** in the context of the EIA Regulations.
- 7.7.77 To further minimise the magnitude of potential operational collision risks upon red kite, it is proposed that an operational livestock carcass monitoring and removal strategy would be implemented for the Proposed Development. This would include for the regular searching of livestock carcasses within the turbine array, and removal of such off Site to an agreed location.

Cumulative Effects

- 7.7.78 Given the evidence for limited displacement of red kite around operational wind farms, only collision mortality risks are assessed within a cumulative regional (NHZ 19) context.
- 7.7.79 Despite the numerous operational wind farms within NHZ 19, very few of these developments recorded sufficient, if any, red kite activity to require an assessment of potential collision mortality risks. This is likely to be a reflection of the much lower abundance and distribution of the species at the time of baseline surveys for these



developments (e.g. undertaken prior to species-reintroduction efforts and former range establishment). In practice, it is likely that red kite activity is now higher within the area of at least some of these developments, and so collision mortality risks may occur and/or be higher than otherwise previously estimated. It should however also be noted, that many of these cumulative developments have been operational for a relatively long time, and so their potential impacts on red kite mortality may be considered as being incorporated into the population parameters included within the red kite population model (**Confidential Technical Appendix 7.5**), and as taken from the most recent annual SRMS monitoring reports.

- 7.7.80 Nevertheless, an NHZ 19 cumulative annual collision mortality risk of 3.115 is estimated. This is comprised of estimates for the Proposed Development (0.1672), operational developments (0.014), those under construction (0.387), consented development (1.001) and other application stage developments (1.0082) and should be considered as a minimum estimate, both due to possible information gaps, and the increasing red kite population.
- 7.7.81 When considering this additional mortality on the NHZ 19 population in the population model, an additional three deaths per year would reduce the annual growth rate from 13.6 % to 13.0 %, resulting in a predicted population of c. 9,000 individuals after 25 years (compared to nearly 11,000 under the baseline scenario). Growth in the NHZ 19 population would therefore remain relatively strong.
- 7.7.82 Accounting for the total cumulative collision mortality risk being a possible underestimation of cumulative collision risk, the population model has been run for a range of additional annual mortality of up to ten individuals per year. At five birds, the population growth rate would reduce to 12.1 %, and at ten birds this would be 10.4 %, resulting in 25-year populations of c.7,500 and 4,000 individuals respectively (compared to 422 individuals presently).
- 7.7.83 Thus, even accounting for underestimations of additional cumulative mortality, other parameters in the population model such as survival rates within NHZ 19, or the potential for density dependence limiting numbers at some stage, evidence suggests that the regional NHZ 19 red kite population would continue to grow despite additional mortality that may arise from foreseeable wind farm projects.
- 7.7.84 Overall, therefore, the cumulative collision risk for red kite is considered to be of low, long-term impact magnitude, and no more than a **minor adverse** effect and, therefore, **not significant** in the context of the EIA Regulations.
- 7.7.85 The contribution of the Proposed Development to cumulative collision risks upon red kite would also be minimised through the proposed operational livestock carcass monitoring and removal strategy.

Breeding Wader Assemblage

Construction Phase

- 7.7.86 **Impact:** Disturbance to breeding and/or foraging curlew, golden plover and/or lapwing resulting from construction works. Potentially impacting on breeding success, productivity and/or survival rates.
- 7.7.87 **Sensitivity:** Medium NCI (Table 7-5); unfavourable conservation status (Table 7-6).
- 7.7.88 **Magnitude of impact:** Baseline surveys over the 2023 and 2024 breeding seasons recorded the following breeding activity (refer to **Table 7-4** for a more detailed breakdown):



- Curlew: 4-6 territories with a maximum of three (representing 0.08 % of the possible current NHZ 19 breeding population, **Table 7-6**) within 500 m of the Proposed Development.
 - Lapwing: 1-4 territories with a maximum of two (representing 0.04 % of the possible current NHZ 19 breeding population, **Table 7-6**) within 500m of the Proposed Development.
- 7.7.89 A disturbance buffer of up to 300 m is currently recommended as being appropriate to avoid the potential for disturbance to breeding curlew (Goodship & Furness 2022). Specific disturbance buffers for lapwing are not available, however given their breeding behaviour, the distances provided for curlew are likely to be an appropriate proxy for lapwing. As such, it is unlikely that all breeding curlew and/or lapwing pairs within 500 m of the core construction area of the Proposed Development would be displaced from the regional NHZ 19 population in any year due to construction activities associated with the Proposed Development.
- 7.7.90 Construction activity would also not take place simultaneously across the whole Site during the breeding season and some pairs, where affected by construction disturbance, may move to adjacent suitable habitats within and surrounding the Site, unaffected by construction activities. Where active nest locations are found during pre-construction surveys, restrictions as part of the BDMP would be imposed upon construction activities as part of the BDMP (as for all wild birds), to avoid or where otherwise minimise disturbance and enable compliance with the Wildlife and Countryside Act 1981.
- 7.7.91 As a worst-case, assuming some breeding pairs would be temporarily displaced during the construction phase, (and considered temporarily lost to the NHZ 19 populations for the purposes of assessment) an impact of no more than negligible and short-term magnitude is predicted.
- 7.7.92 **Significance of effect:** the effect on the regional NHZ 19 curlew and lapwing populations as a result of construction disturbance is therefore considered to be no more than **negligible** and, therefore, **not significant** in the context of the EIA Regulations.

Operational Phase – Displacement and Barrier Effects

- 7.7.93 **Impact:** Displacement and therefore indirect habitat loss for breeding or foraging curlew, golden plover and/or lapwing due to the presence and operation of turbines or other infrastructure. Potentially impacting on breeding success, productivity and/or survival rates.
- 7.7.94 Sensitivity: Medium NCI (Table 7-5); unfavourable conservation status (Table 7-6).
- 7.7.95 **Magnitude of impact:** Current evidence does not suggest the occurrence of total displacement of breeding curlew and/or lapwing from onshore wind farm sites.
- 7.7.96 Evidence from monitoring surveys at the operational Fallago Rig Wind Farm referred to within the Fallago Rig II EIA Report (2015) indicate that curlew were not wholly displaced from operational turbines, with surveys in 2012 recording seven to nine pairs within 200 m of turbines and 16 pairs within 500 m of turbines in 2013. This was stated as being comparable with the pre-construction baseline for the development, of eight pairs in 2004.
- 7.7.97 A study by Pearce-Higgins *et al.* (2009) across 12 wind farms also did not conclude the complete displacement of breeding curlew from turbine arrays but estimated that curlew density within 500 m of turbines decreased by 42 %. An earlier study by Whitfield *et al.* (2010), whilst on a smaller scale, also recorded the presence of



breeding curlew territories within 500 m of operational turbines. In the Whitfield *et al.* (2010) study, one turbine from one wind farm had three territories located within 200 m, even though there had been no curlew reported at the particular location prior to construction.

- 7.7.98 It is therefore unlikely that all breeding curlew recorded within 500 m of the turbine array would be lost from the regional NHZ 19 population over the Proposed Development's operational lifetime. Adopting the findings of the Pearce-Higgins *et al.* (2009) study and a 42 % decrease in the number of breeding curlew pairs within 500 m of the turbine array (up to three pairs), this would represent a potential displacement of around one pair, representing 0.02 % of a possible NHZ 19 breeding population estimate (**Table 7-6**). At least some of such pairs would however most likely be displaced into suitable alternative breeding habitat within the Site or surrounding area.
- 7.7.99 It is similarly considered unlikely that all breeding lapwing recorded within 500 m of the turbine array would be lost from the regional NHZ 19 population over the Proposed Development's operational lifetime. Some pairs where affected would most likely be displaced into suitable breeding habitat within the Site or surrounding area. Only one pair is within 500 m of the turbine array, representing 0.02 % of a possible NHZ 19 breeding population estimate (**Table 7-6**). At least some of such pairs would however most likely be displaced into suitable alternative breeding habitat within the Site or surrounding area.
- 7.7.100 The BDMP would also continue throughout the operational period of the Proposed development and ensure the adoption of measures to enable legislative compliance with regards any recorded active nest sites.
- 7.7.101 An impact of negligible but long-term magnitude is therefore predicted for curlew and lapwing.
- 7.7.102 **Significance of effect:** The effect on the regional NHZ 19 curlew and/or lapwing population as a result of operational displacement is concluded to be **negligible** and therefore **not significant** in the context of the EIA Regulations.
- 7.7.103 Habitat enhancement measures to be included as part of Proposed Development and set out further in the OBEMP (**Technical Appendix 6.6**) are also likely to provide benefits to curlew and lapwing (at least at a local level) and offset potential displacement effects to some extent.

Operational Phase – Collision Mortality Risk

- 7.7.104 **Impact:** birds that utilise the airspace within the Proposed Development at potential collision heights may be at risk of collision with turbines, thereby increasing the annual mortality rate of the population above background levels.
- 7.7.105 Sensitivity: Medium NCI (Table 7-5); unfavourable conservation status (Table 7-6).
- 7.7.106 **Magnitude of impact:** An annual mean collision mortality risk of 0.1381 for curlew and 0.0005 for lapwing is predicted (**Table 7-3**).
- 7.7.107 Curlew activity across the baseline survey period was almost exclusively recorded during the breeding seasons (March to August) and predicted collision rates are therefore attributed to the NHZ 19 breeding population, conservatively estimated at 3,770 breeding pairs (**Table 7-6**). The additional predicted annual mortality due to collision with operational turbines would result in an increase of 0.018 % over the



calculated annual baseline mortality rate (0.101, British Trust for Ornithology (BTO) BirdFacts¹³), which is small in the context of the regional population level.

- 7.7.108 Lapwing activity across the baseline survey period was almost exclusively recorded during the breeding seasons (March to August) and predicted collision rates are therefore attributed to the NHZ 19 breeding population, conservatively estimated at 5,000 breeding pairs (**Table 7-6**). The additional predicted annual mortality due to collision with operational turbines would result in an increase of 0.00002 % over the calculated annual baseline mortality rate (0.295, BTO BirdFacts¹⁴), which is very small in the context of the regional population level.
- 7.7.109 The increase in annual baseline mortality for curlew and/or lapwing is therefore considered to be an effect of negligible but long-term magnitude
- 7.7.110 **Significance of effect:** The effect on the NHZ 19 curlew and lapwing populations as a result of potential collision risk is concluded to be **negligible** and, therefore, **not significant** in the context of the EIA Regulations.

Cumulative Effects

- 7.7.111 Given the very small collision mortality risk predicted for curlew and/or lapwing as a result of the Proposed Development, it is highly unlikely that such an effect would contribute to a potentially significant cumulative risk at the NHZ 19 population level. As such, only potentially significant displacement effects are assessed in detail. Furthermore, given that a maximum of one lapwing territory (representing 0.02 % of the NHZ 19 population), it is considered that the Proposed Development's contribution to any potential cumulative displacement to breeding lapwing is at most negligible.
- 7.7.112 In review of available information for other wind farm developments located within NHZ 19, a minimum estimate (due to unavailable data) of around 135 pairs of curlew are estimated to be displaced from operational, under construction, consented and application stage developments, including the Proposed Development, representing up to 3.7 % of the breeding population (3,641 pairs, **Table 7-6**).
- 7.7.113 This estimate is however considered to represent an unlikely scenario for the regional NHZ 19 curlew population. In some cases, information available for the various cumulative developments relates to the number of breeding curlew territories located within 500 m of proposed infrastructure, and therefore beyond currently recommended buffers to avoid the potential for disturbance to breeding curlew (300 m, Goodship & Furness 2022).
- 7.7.114 The estimations also do not take into account the potential for any overlap in “zones of influence” for each cumulative development, and the potential for some pairs to have been “double-counted” in the cumulative displacement figure as a result. The assessment also does not take into account that actual displacement may be variable between developments, on account of individual pair tolerance of disturbance sources.
- 7.7.115 Predicted losses presented for wind farm developments would therefore likely exceed reality, and furthermore the assessment does not consider the provision of positive enhancement measures that may be realised for curlew and/or lapwing, such as those set out for the Proposed Development, for Ravengill, Watchman, M74 West, Cloud Hill (and likely other projects) to further reduce potential displacement

¹³ Available at: <https://www.bto.org/learn/about-birds/birdfacts/curlew>

¹⁴ Available at: <https://www.bto.org/learn/about-birds/birdfacts/lapwing>



effects and deliver enhancements for curlew and lapwing (and other breeding waders) in the short to long-term future.

- 7.7.116 Potential cumulative operational displacement effects upon curlew and arising from the Proposed Development in-combination with other relevant wind farm proposals, are therefore considered to be of low yet long-term magnitude, and which is overall **minor** and, therefore, **not significant** in the context of the EIA Regulations.

7.8 Additional Mitigation and Enhancement

- 7.8.1 **Table 7-8** sets out additional mitigation measures (also known as secondary mitigation, comprising measures beyond embedded/standard mitigation) and enhancement measures to which the Applicant has committed. These measures are designed to reduce identified adverse effects and/or to enhance beneficial effects.

Table 7-8: Additional (Secondary) Mitigation and Enhancement

Reference	Mitigation/ Enhancement Measure	Description
ORN001	Bird Disturbance Management Plan	Inclusion of species-specific restrictions to ensure legislative compliance and avoid (or otherwise minimise) the disturbance to: • Roosting/wintering hen harrier • Breeding/roosting peregrine falcon • Breeding/roosting red kite • Breeding/roosting waders, with particular reference to golden plover, lapwing, curlew and ringed plover
ORN002	Outline Biodiversity Enhancement and Management Plan	• Avoidance of planting within 750 m of the hen harrier roost. • Provision and enhancement of habitats for breeding/roosting waders
ORN003	Livestock carcass monitoring	Regular checking and removal of any livestock carcasses within the turbine array to minimise risk of collision.

7.9 Residual Effects

- 7.9.1 Following the adoption of additional specific mitigation measures and enhancement measures detailed above, the residual effects upon assessed IOFs remain no more than negligible or minor adverse and, therefore, not significant in the context of the EIA Regulations.

7.10 Summary and Statement of Significance

- 7.10.1 Impacts arising during construction, operation and decommissioning are predicted as being negligible/minor for all IOFs.
- 7.10.2 Residual effects upon all IOFs are therefore predicted to be Not Significant as a result of the Proposed Development alone, or cumulatively with any other wind farm development. A summary of assessment outcomes is provided in **Table 7-9**.



Table 7-9: Summary of Significance of Effects

Description of Effect	Mitigation/Enhancement Measure(s)	Significance of Residual Effect	
		Level and Significance	Beneficial/ Adverse
During Construction & Decommissioning			
Disturbance to breeding or roosting behaviour – hen harrier, peregrine falcon, red kite, curlew and lapwing	Implementation of BDMP Pre-construction surveys Appointment of ECoW Implementation of CEMP	Negligible/Minor (not significant)	Adverse
During Operation			
Disturbance to breeding or roosting behaviour – hen harrier, peregrine falcon, red kite, curlew and lapwing	Implementation of BDMP	Negligible/Minor (not significant)	Adverse
Collision mortality risk – red kite	Livestock carcass monitoring and removal	Negligible/Minor (not significant)	Adverse
Collision mortality risk – hen harrier, peregrine falcon, curlew and lapwing	Not required	Negligible/Minor (not significant)	Adverse
Cumulative Effects			
Collision mortality risk – red kite	Livestock carcass monitoring and removal	Negligible/Minor (not significant)	Adverse
Collision mortality risk – hen harrier, peregrine falcon, curlew and lapwing	Not required	Negligible/Minor (not significant)	Adverse
Disturbance to breeding or roosting behaviour – hen harrier, peregrine falcon, red kite, curlew and lapwing	Not required	Negligible/Minor (not significant)	Adverse



7.11 Grid Connection and AIL Route

- 7.11.1 Consideration of likely significant effects of the grid connection is based on the assumed routeing corridor and grid connection type even though the grid connection does not form part of the Section 36 application for consent. The grid connection route, land assembly, specification, construction methodology, mitigation measures and other details are not confirmed at this stage and are not in the control of the Applicant. However, this EIA Report, including Chapter 7, includes a proportionate assessment of likely significant effects of the grid connection.
- 7.11.2 An appraisal of likely significant effects of the likely grid connection route and associated works (assuming the construction of an overhead line (OHL) to a point of connection at the consented Glenmuckloch substation) and the proposed AIL route associated with the Proposed Development (as outlined in **Chapter 2**) is detailed in respect of ecology within **Technical Appendix 6.7**. Findings of the Technical Appendix are summarised below in reference to ornithology.
- 7.11.3 The OHL corridor identified for the grid connection, as presented in **Figure 2.16**, has been identified considering the balance of technical feasibility and economic viability with the least disturbance to the environment and to people as far as practicable.
- 7.11.4 No ornithological surveys have been undertaken specifically for the OHL corridor and likely grid connection route. A desk study is however presented in **Technical Appendix 6.7**, which highlights the following:
- there is no overlap with statutory designated sites;
 - One designated site (Muirkirk and North Lowther Uplands SPA / SSSI) is within 500m of the OHL route corridor;
 - there is overlap with one non-statutory designated site (i.e. Glenmuir Water: Lugar to Kyle Castle LNCS); and
 - there is likely a mix of habitats within the OHL routeing corridor, but the predominant habitat type appears to be low conservation value mesotrophic agriculturally improved and semi-improved grassland.
- 7.11.5 As noted in Section 7.4, Muirkirk and North Lowther Uplands SPA is designated for non-breeding hen harrier, breeding golden plover, hen harrier, merlin, peregrine falcon, short-eared owl and a breeding bird assemblage and potential effects from the OHL route cannot be ruled out. OHLs present a risk to bird species through collision risk, electrocution from power lines, and displacement.
- 7.11.6 It is assumed site based ornithological baseline surveys will be undertaken in due course along the proposed grid connection route should the Proposed Development receive Section 36 consent. Survey works will be in accordance with guidance from NatureScot (2025e). Constraints identified through those baseline survey results would be considered to avoid or reduce potential negative effects on IOFs where possible, in line with relevant legislation, policy, guidance and best practice (e.g. the incorporation of disturbance buffers from Goodship and Furness, 2022).
- 7.11.7 Embedded design mitigation will involve both an iterative design process and good practice mitigation measures. Relevant guiding principles and the desk-based identification/avoidance of potential ecological sensitivities/constraints have materially influenced the location and extent of the proposed OHL routeing corridor.
- 7.11.8 It is also assumed all OHL works would be carried out in line with good industry practice construction measures, guidance and legislation. For example, it is



- assumed that a comprehensive, site-specific and robust Construction Environmental Management Plan (CEMP) will be in place which would be discharged in advance in consultation with SEPA and the local planning authority.
- 7.11.9 It is further assumed a Species Protection Plan (SPP) will be implemented during the construction phase. The SPP will detail measures to safeguard IOFs known or likely to be in the area. The SPP would include the requirement for pre-construction surveys and adherence to good practice measures during construction. Furthermore, an Operational Bird Protection Plan will be submitted to the Planning Authority (and in consultation with NatureScot) where works are proposed to be within 750m of the SPA/SSSI.
- 7.11.10 Additional mitigation, if required, would be in reference to NatureScot guidance (2025e).
- 7.11.11 The appraisal of the OHL and grid connection route, when considering embedded design and standard mitigation, therefore concludes at this preliminary stage that no significant effects in respect of ornithology are expected during construction of the OHL within the corridor identified. Furthermore, the combined effects of the OHL grid connection construction with the effects reported in this chapter in respect of the Proposed Development's construction are not likely to be significant.
- 7.11.12 In respect of the AIL Route, the relevant stretch considered here, for the Proposed Development, relates to the section of highway from the Site entrance on the A70 (an existing access which previously served the Dalfad opencast mine) to the A76. The areas of the AIL route considered here do not overlap with any statutory or non-statutory designated sites and are generally agriculturally improved and intensively managed grasslands of low conservation value. The associated roadside verges mostly appear to be unmanaged or infrequently managed typical neutral grassland communities.
- 7.11.13 Again, when considering embedded design and standard mitigation in place, concludes that the construction and use of the AIL route for the Proposed Development would not result in likely significant effects on any IOF, either standalone or in-combination with the Proposed Development.

7.12 References

- British Trust for Ornithology (BTO) (2026) BTO Bird Facts Available at [BirdFacts | BTO](#)
- CIEEM (2024). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. Version 1.3, September 2024. Chartered Institute of Ecology and Environmental Management (CIEEM), Winchester.
- Directive 2009/147/EC of the European Parliament and of the Council. Available at: <https://www.legislation.gov.uk/eudr/2009/147/contents>
- Gilbert, G., Gibbons, D. W. and Evans, J. (1998) Bird Monitoring Methods. RSPB, Sandy.
- Goodship, N.M. and Furness, R.W. (2022) Disturbance Distances Review: An updated literature review of disturbance distances of selected bird species. NatureScot Research Report 1283. Available at: <https://www.nature.scot/doc/naturescot-research-report-1283-disturbance-distances-review-updated-literature-review-disturbance>
- Hardey, J., Crick, H., Wernham, C., Riley, H., Etheridge, B. and Thompson, D. (2013) Raptors: a field guide for surveys and monitoring (3rd edition). The Stationery Office, Edinburgh.



Heywood, J.J.N., Massimino, D., Baker, L., Balmer, D.E., Brighton, C.H., Kelly, L.A., Noble, D.G., Pearce-Higgins, J.W., White, D.M., Workman, E. & Wotton, S. 2026. The Breeding Bird Survey 2025. BTO Research Report 802 British Trust for Ornithology, Thetford, Norfolk

NatureScot (2024a). Guidance on using an updated collision risk model to assess bird collision risk at onshore wind farms. Available at: <https://www.nature.scot/doc/guidance-using-updated-collision-risk-model-assess-bird-collision-risk-onshore-wind-farms>

NatureScot (2025a). Sensitive Species of Scotland List. Available at: <https://www.nature.scot/doc/sensitive-species-scotland-list>

NatureScot (2025b). Assessing the cumulative impacts of onshore wind farms on birds. Available at: <https://www.nature.scot/doc/guidance-assessing-cumulative-impacts-onshore-wind-farms-birds>

NatureScot (2025c). Assessing the significance of impacts on bird populations from onshore wind farms that do not affect protected areas. Available at: <https://www.nature.scot/doc/guidance-note-assessing-significance-impacts-bird-populations-onshore-wind-farms-do-not-affect>

NatureScot (2025d) Recommended bird survey methods to inform impact assessment of onshore wind farms. Available at: <https://www.nature.scot/doc/recommended-bird-survey-methods-inform-impact-assessment-onshore-windfarms>

NatureScot (2025e) Assessment and mitigation of impacts of power lines and guyed meteorological masts on birds. Available at: [Guidance - Assessment and mitigation of impacts of power lines and guyed meteorological masts on birds | NatureScot](#)

NatureScot (2026). NatureScot: SiteLink Available at: <https://sitelink.nature.scot/>

National Planning Framework 4 (NPF4) Available at: <https://www.gov.scot/publications/national-planning-framework-4/>

Peniche, G., Challis, A., Beckmann, B., Wilson, M., Eaton, M., Stevenson, A., Stirling-Aird, P., Thornton, M. & Wilkinson, N. (2025). Scottish Raptor Monitoring Scheme Report 2023. BTO Scotland, Stirling.

Scottish Government (1981). Wildlife and Countryside Act 1981. Available at: <https://www.legislation.gov.uk/ukpga/1981/69>

Scottish Natural Heritage (2016a). Environmental Statements and Annexes of Environmentally Sensitive Bird Information. Available at: <https://www.nature.scot/doc/environmental-statements-and-annexes-environmentally-sensitive-bird-information>

Scottish Natural Heritage (2016b) Assessing connectivity with Special Protection Areas (SPAs). Available at: <https://www.nature.scot/doc/assessing-connectivity-special-protection-areas>

Shawyer, C. R. (2011). Barn owl *Tyto alba* Survey Methodology and Techniques for use in Ecological Assessment: Developing Best Practice in Survey and Reporting. IEEM, Winchester.

Stanbury, A. J., Burns, F., Aebischer, N. J., Baker, H., Balmer, D. E., Brown, A., Dunn, T., Lindley, P., Murphy, M., Noble, D. G., Owens, R., and Quinn, L. (2024) The status of the UK's breeding seabirds: an addendum to the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain. *British Birds*, 117, pp. 471-487.

Stanbury, A., Eaton, M., Aebischer, N., Balmer, D., Brown, A., Douse, A., Lindley, P., McCulloch, N., Noble, D., and Win I. (2021) The status of our bird populations: the fifth Birds



of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain. *British Birds*, 114, pp. 723-747.

Woodward, I., Aebischer, N., Burnell, D., Eaton, M., Frost, T., Hall, C., Stroud, D.A. & Noble, D. (2020). Population estimates of birds in Great Britain and the United Kingdom. *British Birds*, 113, pp. 69–104.

