Chapter 9

Ornithology

SP ENERGY NETWORKS

Table of contents

Chapter 9
Ornithology

9.1 Introduction

1. This Chapter of the EIAR considers the potential effects on ornithology that may arise from the proposed development. It presents the findings of the assessment of the likely significant effects associated with the construction and operation of the proposed development as described in **Chapter 4: Development Description**. The objectives of this Chapter are to:

- Describe the ornithological baseline conditions;
- Describe the assessment methodology and significance criteria used in completing the impact assessment;
- Describe the potential effects, including direct, indirect and cumulative;
- Describe the mitigation measures proposed to address any likely significant effects; and
- Assess the residual effects remaining following the implementation of mitigation.

2. Effects on flora and non-avian fauna are addressed separately in **Chapter 8: Ecology and Biodiversity**.

3. Planning policies of relevance to this assessment are provided in **Chapter 5: Planning Policy**.

4. This Chapter is supported by the following appendices:

- **Appendix 9.1 Breeding Bird Survey Report**;
- **Appendix 9.2 Wintering Bird Survey Report**; and
- **Appendix 9.3 Black Grouse Report**.

5. Due to the proximity of the proposed works to a number of internationally designated sites (refer to **Section 9.4.1** below), a Habitats Regulations Appraisal (HRA) Screening Report and Statement to Inform Appropriate Assessment have also been prepared for the proposed development (RSK, 2022).

9.2 Scope of the Assessment

9.2.1 General

6. This Chapter considers the effects of construction and operation of the proposed development upon those ornithological features identified during the review of desk-based information and field survey data (the extents of the study areas are set out in **Section 9.3.4** below).

7. The Chapter also assesses the potential for additional cumulative effects when considered in addition to other consented or proposed developments which are subject to EIA.

8. The assessment is based on the proposed development as described in **Chapter 4: Development Description**.

9.2.2 Effects Assessed in Full

9. The following effects in relation to the construction of the proposed development are assessed:

- The potential to temporarily displace birds which are qualifying species of the Muirkirk and North Lowther Uplands Special Protection Area (SPA);
- Tempoary fragmentation of habitats or severance of ecological corridors of likely importance to birds during construction; and
- Tempoary disturbance of birds within and adjacent to the working area due to construction noise, vibration, lighting and site personnel.

10. Potential impacts on ornithological features associated with operation include:

- The potential for bird strike with the proposed OHL.

9.2.3 Effects scoped out

11. No potential construction or operational ornithological effects associated with the impacts outlined above have been scoped out of the assessment.

12. On the basis of experience from other relevant projects and policy guidance/standards, any species that would be included in the categories detailed below have been scoped out of the assessment, since significant effects are unlikely at a population level:

- Common and/or species of low nature conservation importance not recognised in statute as requiring special conservation measures, i.e. bird species not listed on Annex I of the EU Birds Directive 1 or Schedule 1 of the Wildlife and Countryside Act 1981 (as amended);
- Common and/or species of low nature conservation importance not included in non-statutory lists that indicate birds whose populations are at some risk either generally or in parts of their range (e.g. the Birds of Conservation Concern (BoCC) Red list, Eaton *et al.* 2015); and
- Passerine species not generally considered to be at risk from OHL developments, unless being particularly rare or vulnerable at a national level.

9.3 Assessment methodology

9.3.1 Legislation and policy

13. This assessment is carried out in accordance with the principles in the following legislation and policy:

- Directive 2009/147/EC of the European Parliament on the Conservation of Wild Birds ('the Birds Directive');
- The Ramsar Convention on Wetlands;
- The Conservation of Habitats and Species Regulations 2017 ('the Habitats Regulations');
- Environmental Impact Assessment Directive 85/337/EEC (as amended);
- The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017;
- Scottish Planning Policy;
- The Nature Conservation (Scotland) Act 2004 (as amended);
- Wildlife and Natural Environment (Scotland) Act 2011; and
- The Wildlife and Countryside Act 1981 (as amended).

9.3.2 Guidance

14. This assessment is carried out in accordance with the principles contained in the following:

- Planning Advice Note PAN 1/2013 – Environmental Impact Assessment (Scottish Government 2013);
- Planning Circular 1/2017: Environmental Impact Assessment Regulations (Scottish Government 2017);
- Chartered Institute of Ecology and Environmental Management (2018). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine, 3rd edition. CIEEM, Winchester;
- Eaton, M., Aebischer, N., Brown, A., Hearn, R., Lock, L., Musgrove, A., Noble, D., Stroud, D. and Gregory, R. (2015). Birds of Conservation Concern 4: The population status of birds in the UK, Channel Islands and Isle of Man. British Birds 108: 708-746;
- Scottish Executive Rural Affairs Department (SERAD) (2000). Habitats and Birds Directives, Nature Conservation; Implementation in Scotland of EC Directives on the Conservation of Natural Habitats and of Wild Flora and Fauna and the

Conservation of Wild Birds ('the Habitats and Birds Directives'). Revised Guidance Updating Scottish Office Circular No 6/1995; and

- The Scottish Biodiversity List (SBL) comprises habitats and species that Scottish Ministers consider to be of principal importance for biodiversity conservation in Scotland SNH (2000).

9.3.3 Consultation

15. In undertaking the assessment, consideration has been given to the scoping responses and other consultation undertaken, as detailed in **Table 9.1**. Reference should also be made to **Chapter 2: Approach to EIA**, **Appendix 2.1 Summary of Scoping Responses**.

Consultee	Date and format	Consultation /issues raised and response
NatureScot (formerly SNH)	Face to face pre-application meeting on 6 December 2018 between SNH and RSK.	The purpose of this pre application meeting was to allow a formal introduction of the 132kv OHL project and discuss ornithological surveys in relation to the project. It was agreed with SNH that due to the amount of data already available for the Study Area that two years of ornithological assessments would not be required and that one year of survey work of the proposed route would be sufficient.
NatureScot (formerly SNH)	Face to face meeting on 24 January 2019 between SNH, RSK and SPEN.	SNH confirmed that it would be acceptable for certain surveys to be undertaken pre-construction (i.e. black grouse (*Lyrurus tetrix*) surveys) and secured through appropriate conditions negating the need to undertake the surveys as part of the application process.
NatureScot (formerly SNH)	Online meeting on 17 April 2020 between RSK and SNH.	The main purpose of this meeting was to introduce the project to a new SNH officer to discuss the impacts of Covid 19 on ornithological surveys. This was followed up with the SNH officer discussing the ramifications with an SNH ornithologist. It was fed back that a full set of breeding bird walkover surveys and raptor nest searches of the whole proposed route should be undertaken in spring/summer 2021. In addition, vantage point surveys in April and May 2021 must be undertaken and winter walkover surveys of the entire route are required. Finally, it was also decided that black grouse surveys were to be undertaken prior to planning rather than as pre-construction surveys as previously discussed.
NatureScot (formerly SNH)	Email communication with NatureScot and RSK in October 2020.	RSK and SPEN requested that instead of four winter walkovers, only one is undertaken of the proposed route over winter 2020/2021 based on the fact there is a wealth of information available for the area and that the winter walkover of two sections of the route in February 2020 recorded only one additional species to the vantage point surveys, which continued all through the winter in 2019/2020. NatureScot accepted this as long as it is fully justified within the EIA. NatureScot also provided the following feedback in relation to the nearby Muirkirk and North Lowther Uplands SPA - ''*Given the findings of the Kennoxhead Extension surveys, it might be worth noting the presence of SPA qualifying species in the area around Kennoxhead (i.e. the open ground between the two sections of the SPA) and the possibility of collision with the line as a sensitivity here too''*.
NatureScot (formerly SNH)	Consultation response via email – 4 September 2020	The preferred route for the development lies between two areas of the Muirkirk and North Lowther Uplands SPA. Approximately 4km of the route lies within 2km of the SPA, while approximately 8km lies within 5km of the SPA. Survey work undertaken for both the proposed development and the Kennoxhead Wind Farm Extension have recorded SPA qualifying species within the area occupied by the preferred route. This proposal could potentially, therefore, result in a likely significant effect on the SPA by virtue of its overlap with the core foraging ranges of the site's qualifying interests. Consequently, Scottish Ministers, as competent authority, will be required to carry out an appropriate assessment in view of the site's conservation objectives for is qualifying interests. While the proposed development would have no direct impact on the SPA, in assessing potential impacts on the site, the following is given particular attention in this assessment: • The potential for collision risk to qualifying bird species from overhead lines once constructed. • The potential for significant disturbance to the qualifying species during the breeding season and, for hen harrier (*Circus cyaneus*), during the non-breeding season. • The potential for temporary displacement of the qualifying features from foraging areas outside the SPA during construction. • Cumulative impacts The application contains sufficient information on these matters to allow the competent authority to undertake the Habitats Regulations Assessment (HRA). Information on breeding raptors from the South Strathclyde Raptor Study Group has been sought to inform this assessment, as they may hold useful information relevant to the assessment of both SPA-related impacts and issues which may need to be addressed during the construction phase. In respect of the ornithological work, it was agreed that use of all the relevant wind farm data is appropriate, even data that is in excess of five years' old, provided there's some more recent data that supports conclusions. Survey work missed this during 2020/2021 due to COVID-19 restrictions does need to be completed, despite the existence of the wind farm data. The wind farm data does however confirm NatureScot's view that only the one year of survey is needed. The principal survey requirements are the 2020/21 winter walkovers and Moorland Breeding Bird /Scarce Breeding Bird surveys in 2021. Black grouse surveys are to be used to assist in the detailed route planning as the pre-construction surveys will only permit mitigation during construction. It's evident from some of the most recent wind farm survey work that the black grouse population in the Study Area is of potential national significance, especially when set in the context of the declining population in southern Scotland.

Table 9.1: Consultation undertaken

9.3.4 Study Area

16. A range of surveys were employed to accurately record baseline ornithological conditions within the application boundary of the proposed development[1] ('the Site') and appropriate survey buffers. Terms referred to are as follows:

- 'Survey Area' is defined as the area covered by each survey type at the time of survey; and
- 'Study Area' is defined as the area of consideration of effects on each species at the time of assessment and as the area used for any desk-based study.

17. Details of the spatial extent of each Survey Area are described in **Section 9.4** of this Chapter and are presented in **Appendix 9.1, 9.2 and 9.3**.

9.3.5 Desk Study

18. Existing information relating to statutory and non-statutory nature conservation sites, priority habitats and species, and bird species was gathered from various sources. A background data search (BDS) was undertaken in January 2019, which involved using the sources shown in **Table 9.2**. A search for statutory and non-statutory designated sites and noteworthy species within 2 km of the Study Area was undertaken. Only those relevant to birds are included below in **Table 9.2**.

Information Obtained	Available From
Protected and Noteworthy species-records	Glasgow Museums Biological Records Centre
Designated site locations and citations	NatureScot website
Designated site locations and citations	Glasgow Museums Biological Records Centre
Designations and legal protection of noteworthy species	Joint Nature Conservation Committee (JNCC) website
Details of species and habitats listed on the West Lothian LBAP	Local BAP website[2]
Raptor records	Raptor Study Group

Table 9.2: Sources of background information

19. In addition to the sources detailed above, RSK Biocensus undertook a desk-based data review, which involved reviewing ornithology data from the following existing nearby projects:

- Dalquhandy to Coalburn OHL project (2017);
- Kennoxhead Wind Farm (2012);
- Douglas West Wind Farm (2015);
- Poniel Wind Farm (2012); and
- Glentaggart Wind Farm (2010).

20. In addition to those projects listed above, information from ornithology surveys undertaken in relation to the Kennoxhead Wind Farm Extension site became available in April 2020. This site is also in very close proximity to Muirkirk and North Lowther Uplands SPA, and is within the southern section of the proposed development Study Area.

9.3.6 Field Surveys

21. The following ornithological surveys were undertaken within the Study Areas (refer to **Technical Appendices 9.1, 9.2, 9.3** and **9.4** for details):

- Vantage point surveys undertaken over 12 months - four vantage point locations (Chapel Hill, Kennox Head, Poniel Water and Wedder Hill) were chosen to adequately survey the proposed OHL route, including both the overhead line connection and underground cabling sections. In 2020, the proposed OHL route was refined, and two survey locations (Chapel Hill and Wedder Hill) were discontinued. From February 2020, surveys were carried out at Kennox Head and Poniel Water only. VPs were not undertaken in April and May due to Covid restrictions and were therefore undertaken in April and May 2021 to compensate;
- Winter walkover surveys – a single winter walkover survey of two sections (start and end) of the proposed OHL route was undertaken in February 2020; this was prior to the route being finalised, but nonetheless provides relevant contextual information;
- A winter walkover of the entire proposed OHL route and 250 m buffer was undertaken in December 2020;
- A breeding bird survey and raptor nest search was undertaken in June 2020 of the same two sections as the February 2020 surveys;
- A raptor nest search of the entire proposed OHL route and a 500 m buffer was undertaken in March and April 2021 to compensate for missing the 2020 window due to Covid 19;
- A breeding bird survey of the entire proposed OHL route and a 250 m buffer was undertaken in April, May, June and July 2021; and
- Black grouse surveys were undertaken in March and April 2021. These included visits to two leks previously identified in the area during the background data search.

9.3.7 Assessing Ornithological Importance, Potential Effects and Significance

22. The first stage of an ornithological impact assessment is 'determining value' of ornithological features or 'receptors'. CIEEM places the emphasis on identifying different aspects of ornithological value including designations, biodiversity value, potential value, secondary or supporting value, social value, economic value, legal protection and multi-functional features. These values are applied to the receptors within a defined geographical context and examples can be seen in **Table 9.3**.

Ornithological Importance	Definition	Relevant Significance
International	A study area is considered of international ornithological importance when it supports: • An internationally designated site or candidate site (SPA, potential SPA (pSPA), Ramsar site, Biogenetic Reserve) or an area which NatureScot has determined meets the published selection criteria for such designations, irrespective of whether or not it has yet been notified. • >1% of the European resource of an internationally important species, i.e. those listed in Annex 1 of the Birds Directive. • Resident or regularly occurring populations of species which may be considered at an International / European level, the loss of which would adversely affect the conservation status or distribution of the species at an International / European level.	Europe

[1] The application for consent under section 37 of the Electricity Act 1989 and that planning permission is deemed to be granted.

[2] https://www.southlanarkshire.gov.uk/downloads/file/1191/biodiversity_strategy_2018_-_2022

Ornithological Importance	Definition	Relevant Significance
UK/National	A study area is considered of national ornithological importance when it supports: • A nationally designated site (Site of Special Scientific Interest (SSSI) or National Nature Reserve (NNR)) or a discrete area which NatureScot has determined meets the published selection criteria for national designation irrespective of whether or not it has yet been notified. • >1% of the National Resource of a regularly occurring population of a nationally important species, i.e. a priority species listed in the Scottish Biodiversity List and/or Schedule 1 of the Wildlife and Countryside Act. • Resident or regularly occurring populations of species which may be considered at the UK or National level, the loss of which would adversely affect the conservation status or distribution of the species across Britain the Country.	UK/Scotland
Regional	A study area is considered of regional ornithological importance when it supports: • Non-statutory designated sites that represent a scale, or habitat/species assemblage, of importance across a number of counties within a recognised regional context. Non-designated sites that the designating authority has determined meet the published ecological selection criteria for designation, particularly large or represent habitat or species assemblages of importance at a regional level. • Any regularly occurring population of an internationally/nationally important species or a species in a relevant policy which is important for the maintenance of the regional meta-population. • Resident or regularly occurring populations of species which may be considered at the Regional level, the loss of which would adversely affect the conservation status or distribution of the species across the Region.	Southern Scotland
County	A study area is considered of county ecological value when it supports: • County sites and other sites which the designating authority has determined meet the published ecological selection criteria for designation, e.g. local nature conservation sites. • Any regularly occurring population of an internationally/nationally important species or a species in a relevant County BAP which is important for the maintenance of the county meta-population. • Resident or regularly occurring populations of species which may be considered at the County level, the loss of which would adversely affect the conservation status or distribution of the species across the County.	South Lanarkshire
Local	A study area is considered of local ecological value when it supports: • Commonplace and widespread semi-natural habitats, e.g. scrub, poor semi-improved grassland, coniferous plantation woodland, intensive arable farmland, which, despite their ubiquity, contribute to the ecological function of the local area (habitat networks, etc.); • Very small, but viable, populations of internationally/nationally important species or a species in a relevant UK/Council BAP which is important for the maintenance of the local meta-population. • Areas of habitat or populations/communities of species considered to appreciably enrich the habitat resource within the local context.	Study Area plus a 5 km radius.
Study Area	A study area is considered of study area ecological value when it supports: • Habitats of limited ecological value, e.g. amenity grassland, but which contribute to the overall function of the application site's ecological functions. • Very small, but viable, populations of internationally/nationally important species or habitats, or a species or habitat in a relevant UK/Council BAP which is not important for the maintenance of the local meta-population, but are nonetheless of importance within the proposed development area.	Study Area
Negligible	Areas of heavily urbanised or intensively managed land with negligible value to ornithology.	None

Table 9.3: Resource/Receptor Evaluation Criteria

23. Following the assessment of ornithological importance, potential effects are identified. This process involves the study of the proposed development construction methods and timescales with a view to identifying the pathways by which ornithological features may be affected. Inbuilt mitigation known as primary or embedded mitigation and sensitive design consideration, also known as 'Good Practice Measures' have been reviewed. Further information on these measures are provided in later sections of this Chapter.

24. Potential direct and indirect effects can be grouped as follows:

- Direct habitat loss;
- Severance (disruption of ecological processes through fragmentation, isolation and barriers);
- Mortality (direct loss of life to avian species or populations); and
- Disturbance (through noise, vibration, lighting and human presence).

25. To determine significance, effects are considered with reference to the following parameters:

- Positive or negative;
- Extent;
- Magnitude;
- Duration;
- Frequency; and
- Reversibility.

26. The response of individual species to disturbance during relevant behaviours is considered when determining spatial and temporal magnitude of impact and is assessed using guidance including Bright et al. (2006), Hill *et al.* (1997) and Ruddock and Whitfield (2007).

27. Effects are judged in terms of magnitude in space and time, and there are five levels of spatial and temporal effects as detailed in **Table 9.4** and **Table 9.5**, respectively. The examples given in these two tables provide a guideline to the assessment, but professional judgement will be relied upon in each individual case.

Spatial Magnitude	Definition
Very High	Total/near total loss of a bird population due to mortality or displacement. Total/near total loss of breeding productivity in a bird population due to disturbance. Guide: >80% of population lost through additive mortality.

Spatial Magnitude	Definition
High	Major reduction in the status or breeding productivity of a bird population due to mortality, displacement or disturbance. Guide: 21-80% of population lost through additive mortality.
Medium	Partial reduction in the status or breeding productivity of a bird population due to mortality, displacement or disturbance. Guide: 6-20% of population lost through additive mortality.
Low	Small but discernible reduction in the status or breeding productivity of a bird population due to mortality, displacement or disturbance. Guide: 1-5% of population lost through additive mortality.
Negligible	Very slight reduction in the status or breeding productivity of a bird population due to mortality, displacement or disturbance. Reduction barely discernible, approximating to the "*no change*" situation. Guide: <1% population lost through additive mortality.

Table 9.4: Spatial Magnitude of Impact

Spatial Magnitude	Definition
Permanent	Impact continuing indefinitely beyond the span of one human generation (taken as approximately 30 years), except where there is likely to be substantial improvement after this period. Where this is the case, Long Term may be more appropriate.
Long Term	Approximately 15-30 years (or longer, see 'Permanent').
Medium Term	Approximately 5-15 years.
Short Term	Up to approximately 5 years.
Negligible	Very minor (<6 months) or no temporal effect.

Table 9.5: Temporal Magnitude of Impact

28. The CIEEM Guidelines stress consideration of the likelihood that "*a change/activity will occur and also the degree of confidence in the assessment of the impact on ecological structure and function*". Likelihood is then specified using the following terms;

- Certain (95% probability or higher);
- Probable (50-94% probability);
- Unlikely (5-49% probability); or
- Extremely unlikely (less than 5% probability).

29. Based on the combination of these parameters and likelihood, an effect is then considered to be either significant or not significant in the context of the EIA Regulations. An effect is considered to be significant if it has the potential to affect the integrity of a habitat or the conservation status of a species.

30. Integrity of a habitat or site is defined by the Scottish Executive (2000) as "*the coherence of its ecological structure and function, across its whole area, that enables it to sustain the habitat, complex of habitats and/or the levels of populations of the species for which it was classified*".

31. As defined by SNH (2018), the conservation status of a species is, "*the sum of the influences acting on it which may affect its long-term distribution and abundance, within the geographical area of interest*" (SNH 2018). Conservation status is considered to be favourable under the following circumstances (SNH 2018):

- "*Population dynamics indicate that the species is maintaining itself on a long-term basis as a viable component of its habitats*";
- "*The natural range of the species is not being reduced, nor is it likely to be reduced for the foreseeable future*"; and
- "*There is (and probably will continue to be) a sufficiently large habitat to maintain its population on a long-term basis"*.

32. SNH states that "*an impact should therefore be judged as of concern where it would adversely affect the existing favourable conservation status of a species or prevent a species from recovering to favourable conservation status, in Scotland*" (SNH 2018).

33. The significance of a potential effect is considered, using professional judgement, within the context of the geographically-based ecological importance of the feature. For example, the significance of a potential effect on a species of local importance is considered to be significant, or not significant, at a local level. In some cases, where only a small part of an ornithological feature is affected, the potential effect may be significant at a lower geographical level; for example, an effect deemed to be significant on a feature of county-level importance may be only considered significant at the local level.

34. Best practice guidance does not recommend that significance is defined as 'Major', 'Moderate' or 'Minor' due to the complexities of ecological processes. Therefore, for the purposes of EcIA, all 'significant' effects are considered significant within the context of the EIA Regulations.

35. However, to allow the potential effects identified in this assessment to be considered alongside those addressed in other assessment chapters, a 'conversion' has been undertaken as set out in **Table 9.6**. Converted effects of Major and Moderate are considered 'significant' in the context of the EIA Regulations.

EcIA Significance	Conversion
International	Major
UK/National	Major
Regional	Moderate
County	Moderate
Local	Minor
Site	Minor

Table 9.6: Effects Significance Conversion

9.3.8 Identifying Mitigation and Assessing Residual Significance

36. Where potential significant effects are identified, mitigation measures are identified to reduce their significance. The standard mitigation hierarchy applies, whereby the following sequential measures are considered:

- Avoidance: the effect is avoided by removing its pathway, e.g. by changing the route of an access track to avoid important habitats;
- Mitigation: measures are taken to reduce the significance of the effect, e.g. vegetation clearance is undertaken outside the breeding bird season to avoid disturbing and damaging nest sites; and
- Compensation: where the effect cannot be reduced, alternative action is taken elsewhere within the Site e.g. landscape proposals include native species of local provenance.

37. Using the assessment method described above, significant effects are re-assessed on the basis that mitigation measures will be applied, and a residual significance identified. An important part of this step is the identification of the likely success, or confidence in, the proposed mitigation measure.

9.3.9 Cumulative Effects

38. The significance of cumulative effects is assessed following the same methodology as detailed above for the proposed development alone. The assessment follows SNH (2018) guidance for cumulative assessment.

9.3.10 Assessment Assumptions and Limitations

39. Vantage point surveys were not undertaken in April or May 2020 due to Covid 19 restrictions. These surveys were therefore undertaken in April and May 2021 to compensate.

40. The following limitations have been identified:

- A single walkover and raptor nest search was undertaken in June 2020 for two sections of the proposed OHL route only (the Kennoxhead control building point to main road and from the ponds in the northern section to Coalburn), since it was previously agreed that these surveys didn't need to cover areas where existing wind farm data existed (refer to **Table 9.1**);
- Breeding bird walkover surveys and raptor nest searches of the entire proposed OHL route could not be completed in 2020 due to Covid 19 restrictions. These were therefore undertaken between April and July 2021; and
- Winter walkover surveys of the entire proposed OHL route were only undertaken once over the winter of 2020/2021, rather than four times; this was agreed with SNH due to the wealth of background data available for the local area. In addition, a winter walkover was undertaken of two sections of the proposed OHL route (as described above for the raptor nest search) in February 2020.

41. The reliability of archived biological data is often unknown due to the lack of any traceable validation (e.g. information on whether recorders had sufficient expertise to identify the species concerned). Archived data do not provide comprehensive lists of species present within a Zone of Influence (ZOI). A lack of records for a species in a given area does not necessarily indicate its absence; it may simply be due to under-recording.

42. It is likely that the construction of Kennoxhead Wind Farm and several other developments within the wider area of the proposed development, including the Douglas West Wind Farm, has resulted in the displacement of some bird species within the Study Area.

43. Based on the findings of the surveys, and the background data available, the data collected during the field surveys are considered sufficient (and robust enough) to inform this assessment.

44. Specific limitations on the assessment of ornithological features are given in the respective **Technical Appendices 9.1, 9.2, 9.3** and **9.4**.

9.4 Existing (Baseline) Conditions

45. The sections below provide information on statutory designations and a summary of the results for the surveys that were undertaken. For each target species recorded, it is also determined (based on desk study and field data) if they can be reasonably scoped out of the assessment at this stage, due to a lack of likely significant effects.

9.4.1 Designated Sites

46. There are a number of statutory designated sites applicable to birds within 2 km of the Site. The sites that fall within 2 km of the proposed route and are designated for ornithological features are outlined below in **Table 9.7**. This table also provides information on their distance from the proposed development.

Designation	Name and characteristics	Distance to OHL route
Special Protection Area (SPA)	**Muirkirk and North Lowther Uplands SPA** This SPA regularly supports breeding populations of European importance of the Annex 1 species: hen harrier (between 1994 and 1998, an average of 29.2 breeding females, representing 6% of the GB population), short-eared owl (*Asio flammeus*) (between 1997 and 1998, an average of 26 pairs, representing 3% of the GB population), merlin (*Falco columbarius*) (between 1989 and 1998, an average of 9 pairs, representing 0.7% of the GB population), peregrine falcon (*Falco peregrinus*) (between 1992 and 1996, an average of 6 pairs, representing 0.5% of the GB population) and golden plover (*Pluvialis apricaria*) (in 1999, an estimated minimum of 154 pairs, representing 0.7% of the GB population). The boundaries of the SPA are coincident with those of North Lowther Uplands SSSI and Muirkirk Uplands SSSI and are located within the south-western corner of the Study Area and proposed OHL route.	470 m Occupies a considerable area of upland to the west and south-west of the Study Area.
Site of Special Scientific Interest (SSSI)	**Muirkirk Uplands SSSI** This SSSI includes two upland areas situated to the north and south of the town of Muirkirk and Airds Moss and a low-lying blanket bog. The mosaic of habitats within the Muirkirk Uplands supports a diverse upland breeding bird community which is of national importance. The upland moorland bird assemblage includes teal (*Anas crecca*), hen harrier, buzzard (*Buteo buteo*), merlin, peregrine falcon, short-eared owl, red grouse (*Lagopus lagopus scotica*), golden plover, dunlin (*Calidris alpine*), snipe (*Gallinago gallinago*), curlew (*Numenius arquata*), redshank (*Tringa tetanus*), whinchat (*Saxicola rubetra*), stonechat (*Saxicola rubicola*), wheatear (*Oenanthe Oenanthe*), and ring ouzel (*Turdus torquatus*). In particular, the site is of importance, both nationally and internationally, for breeding hen harrier and short-eared owl. Hen harriers also winter within the site in nationally important numbers.	470 m Occupies a considerable area of upland to the west and south-west of the Study Area.
	North Lowther Uplands SSSI This SSSI is situated to the south of the Muirkirk Uplands SSSI. The range of habitats, many of them heather dominated, provides a mosaic of breeding and foraging habitats for the diverse upland bird community, which is of national importance. Amongst the species present are hen harrier, short-eared owl, merlin, peregrine falcon, golden plover, red grouse, raven (*Corvus corax*), dunlin, snipe, teal, curlew, redshank, whinchat and wheatear. The breeding population of hen harriers is of both national and European importance.	1660 m Occupies a considerable area of upland to the west and south-west of the Study Area.
Important Bird Area (IBA)	**Muirkirk and North Lowther Uplands IBA** Muirkirk and North Lowther Uplands IBA (IBA) also lies in the southern part of the Study Area.	470 m

Table 9.7: Statutory Designated Sites

47. There are no non-statutory designated sites of ornithological importance within 2 km of the Study Area.

9.4.2 Black Grouse

48. Black grouse have been recorded in the Study Area, based on a review of information from existing projects. Most recently, field surveys undertaken by MacArthur Green between September 2016 and August 2019 in relation to the Kennoxhead Wind Farm Extension site identified black grouse. Nine black grouse leks were recorded during surveys, with most activity concentrated in two locations – an area of open ground between Auchendaff Hill and Kennox Hill and the area around Flow Moss.

49. No leks were found during the black grouse surveys undertaken in March and April 2021 for the proposed development and no black grouse had been seen during other surveys of the proposed route between September 2020 and March 2020. It is likely that the construction of Kennoxhead Wind Farm has resulted in the displacement of the leks in this area where they were previously known to be present.

9.4.3 Raptors, Owls and Raven

50. The desk based study has identified the following species of raptors and owls were within the Study Area: barn owl (*Tyto Alba),* buzzard, goshawk (*Accipiter gentilis*), hen harrier, kestrel (*Falco tinnunculus*), merlin, osprey (*Pandion haliaetus*), peregrine falcon, short-eared owl, sparrowhawk (*Accipiter nisus*) and tawny owl (*Strix aluco*).

51. During the field surveys for the Kennoxhead Wind Farm Extension site between 2016 and 2019, target species of raptors recorded7antageanatge points were goshawk, hen harrier, merlin and red kite (*Milvus milvus*). Surveys established that there are four potential goshawk territories in the area, three of which may be used for breeding in any one year. There was no evidence that hen harriers were breeding or roosting within the Study Area. Short-eared owl were discovered breeding at two locations in 2017 close to an access track and no breeding activity by merlin was recorded during the surveys.

52. The Scottish Raptor Study Group returned the records of breeding raptors shown in **Table 9.8**.

Species	Date	Location	Breeding Status
Peregrine falcon	2015, 2016, 2017	Spireslack, Glenbuck	Breeding confirmed. Three fledge in 2015 and two fledged in 2016 and 2017.
	2018		Birds on site in early April then disappeared.
	2019		Breeding confirmed. One fledged.
	2020		As of June 2020, the site was occupied, and breeding was taking place.
	2017	Mainshill, Douglas	Breeding confirmed. Two fledged.
	2018, 2019		Negative. Site works in 2018, birds on territory but did not breed.
	2020		As of June 2020, the site was occupied, and breeding was taking place.
Hen harrier	2015	Westonhill, Glentaggart	Negative. Pair on site during April, disappeared on 6 May.
Goshawk	2015, 2016	Andershaw, Glentaggart	Breeding confirmed. Two fledged.
	2017		Negative. Birds on territory early in season, no breeding thereafter.
	2018	Blackmire Wood, Glentaggart	Breeding confirmed. Two fledged. Timber harvesting at previous location (see above), relocated here.
	2019		Negative. Birds on territory early in season, then disappeared
	2017	Long Plantation, Douglas	Probable but not confirmed. Birds alarming on approach, outcome unknown, assume breeding occurred.
Short-eared owl	2016	Weston Hill, Glentaggart	Breeding confirmed. Minimum of three fledged.

Table 9.8: Raptor Group Records

53. During field surveys for the proposed development, the only target raptor species recorded during vantage point surveys undertaken between September 2019 and August 2020 (with the exception of April and May 2020) were hen harrier and peregrine.

54. Both male and female hen harriers were observed at vantage point 1b only, along with a single peregrine. Buzzard and kestrel were also observed from vantage point 1b, as well as from vantage point 2a. Sparrowhawk was seen from vantage point 2a and raven was observed from both 1b and 2a.

55. The only additional target species recorded during the winter walkover of two sections of the proposed OHL route in February 2020 (either end of the route) was merlin, which was recorded along the track between Chapel Hill and Kennoxhead, flying at the approximate height of the proposed OHL. During the winter walkover survey of the entire proposed OHL route, undertaken in December 2020, no additional observations of raptors, owls or raven were made.

56. During the raptor nest search undertaken in June 2020 of two sections of the proposed OHL route (either end of the route), kestrel were recorded as breeding, recorded just west of Coalburn. No breeding raptors were identified during the raptor nest search of the entire proposed OHL route in March 2021. In April 2021, goshawk activity was recorded in Long Plantation, Douglas and it is assumed that breeding occurred.

57. During breeding bird surveys in 2020 and 2021, the only raptor confirmed to be breeding was kestrel, with buzzard and raven being recorded as probable breeders.

58. There is good raptor habitat along the full length of the proposed OHL route, in the woodland and muirland habitats. However, in 2020 and 2021, evidence of breeding raptors was observed in only two locations: goshawk in Long Plantation, approximately 150 m south-west of pole 81 in 2021; and kestrel close to pole 131, north of Coalburn. Male and female hen harrier were observed on multiple during vantage point surveys in 2020 at the southernmost end of the route around Kennoxhead, Kennox Hill and Chapel Hill, although they appear to have been displaced by construction work for Kennoxhead wind farm in 2021.

9.4.4 Waders

59. The desk based study has identified the following species of waders within the Study Area: common sandpiper (*Actitis hypoleucos*), curlew, dotterel (*Charadrius morinellus*), greenshank (*Tringa nebularia*), golden plover, lapwing (*Vanellus vanellus*), oystercatcher (*Haematopus ostralegus*), redshank (*Tringa totanus*), ringed plover (*Charadrius hiaticula*), snipe and whimbrel (*Numenius phaeopus*).

60. During the field surveys for the Kennoxhead Wind Farm Extension site between 2016 and 2019, target species of waders recorded were curlew, golden plover and ringed plover. Curlew were the most frequently recorded species of wader and were seen to be breeding mostly on open ground between Kennox Hill, Auchendaff Hill and Pinkstone Rig, and between Flow Moss, Auchensaugh Rig and Mid Rig. Breeding lapwing were recorded along the Mid Rig access track only, mostly around Auhendaff where the land was grazed by sheep. Breeding ringed plover were recorded within previous opencast workings and Glentaggart Cottage. No evidence of breeding golden plover was recorded, although this species was recorded using the site over winter.

61. During vantage point surveys undertaken between undertaken between September 2019 and May 2021, the following species of waders were recorded during vantage point surveys: common sandpiper, curlew, golden plover, lapwing, oystercatcher, ringed plover and snipe.

62. At vantage point 1b, lapwing and curlew were observed on and around the water-filled gravel pit between Hareshaw Hill and Chapel Hill. Target species observed at vantage point 2a were common sandpiper, curlew, golden plover, lapwing, oystercatcher, ringed plover and snipe. All of the wader species were observed on or around the water-filled disused gravel pit. The golden plover were only observed on one occasion and were repeatedly flushed from the ground by dog-walkers. Snipe were observed performing breeding displays in the area around the gravel pit.

63. During a breeding bird walkover survey in June 2020 of two sections of the proposed OHL route (either end of the route), the only target waders confirmed to be breeding were common sandpiper, with snipe and lapwing being recorded as probable and curlew as possible breeders.

64. During the breeding bird walkover survey in 2021, oystercatcher, common sandpiper and lapwing were confirmed as breeding on site, with snipe, curlew and ringed plover were recorded as probable breeding species.

65. No additional waders were identified during the winter walkover of the two sections of the proposed OHL route in February 2020; however, woodcock (*Scolopax rusticola*) was identified in fields north of Coalburn during the winter walkover of the entire proposed OHL route in December 2020.

66. Key habitat areas for breeding waders along the route include the disused quarry pit and ponds between Chapel Hill and Kennox; the upland moorland between Longhouse Hill and Poniel; and the disused quarry at Dalquhandy.

9.4.5 Wildfowl and Gulls

67. The desk based study has identified the following species of wildfowl and gulls were identified within the Study Area: barnacle goose (*Branta leucopsis*), canada goose (*Branta canadensis*), greylag goose (*Anser anser*), goldeneye (*Bucephala clangula*), pink-footed goose (*Anser brachyrhynchus*), teal (*Anas crecca*), tufted duck (*Aythya fuligula*) and whooper swan (*Cygnus cygnus*).

68. During the field surveys for the Kennoxhead Wind Farm Extension site betwen 2016 and 2019, species of geese and gulls recorded were greylag goose, herring gull (*Larus argentatus*), pink-footed goose and whooper swan.

69. During vantage point surveys between September 2019 and May 2021, the following species of wildfowl and gulls were recorded: Bewick's swan (*Cygnus columbianus bewickii*), black-headed gull (*Chroicocephalus ridibundus*), canada goose, common gull (*Larus canus*) greylag goose, goldeneye, goosander (*Mergus merganser*), herring gull, mute swan (*Cygnus olor*), pink-footed goose, pochard (*Aythya farina*), teal, and wigeon (*Anas penelope*).

70. From vantage point 1b, black-headed gull, common gull, herring gull, Canada goose and greylag goose were observed flying from the gravel pit at the approximate height of the proposed OHL and pink-footed goose were observed flying high over the site.

71. Species observed at vantage point 2a were Bewick's swan, black-headed gull, Canada goose, greylag goose, herring gull, goldeneye, goosander, mute swan, pink-footed goose, pochard, teal and wigeon. Of the goose or swan species, only mute swan and Canada goose were observed on the site; the others were recorded flying over at height. However, all of the duck species were observed on or around the water-filled disused gravel pit. Other species observed were common gull, little grebe (*Tachybaptus ruficollis*), mallard (*Anas platyrhynchos*) and tufted duck.

72. During a breeding bird walkover survey in June 2020 of two sections of the proposed OHL route (either end of the route), the only target species of wildfowl or geese confirmed to be breeding were Canada goose and greylag goose, with black-headed gull and wigeon being recorded as probable breeders. Herring gull and mute swan were recorded as possible breeders.

73. During the breeding bird walkover surveys in 2021 Canada goose and greylag goose were confirmed to be breeding at the disused quarry pit at Chapel Hill. Mute swan, black headed gull, mallard, wigeon and tufted duck were recorded as possibly breeding at the disused quarry pits at Dalquhandy.

74. Wildfowl and gull activity is concentrated around the disused quarry pits at Kennoxhead and at Dalquhandy. Breeding activity has been recorded at both areas, as have flights at the approximate height of the proposed OHL.

9.4.6 Passerines

75. The only target passerine bird species identified from the desk-based study was common crossbill (*Loxia curvirostra*). This species has not been identified during surveys for the proposed development.

76. During a breeding bird walkover survey in June 2020 of two sections of the proposed OHL route (either end of the route), meadow pipit (*Anthus pratenis*) and skylark (*Alauda arvensis*) were confirmed breeding. Blackbird (*Turdus merula*), grasshopper warbler (*Locustella naevia*), reed bunting (*Emberiza schoeniclus*), song thrush (*Turdus philomelos*), stonechat (*Saxicola rubicola*), swallow (*Hirundo rustica*) and willow warbler (*Phylloscopus trochilus*) were all recorded as probable breeders and pied wagtail (*Motacilla alba*) was recorded as a possible breeder.

77. During breeding bird walkover surveys in 2021, meadow pipit, skylark, starling (*Sturnus vulgaris*) and willow warbler were confirmed breeding. Blackbird, bluetit (*Cyanistes caeruleus*), chaffinch (*Fringilla coelebs*), chiffchaff (*Phylloscopus collybita*), coal tit (*Periparus ater*), dunnock (*Prunella modularis*), goldcrest (*Regulus regulus*), goldfinch (*Carduelis carduelis*), great tit (*Parus major*), linnet (*Linaria cannabina*), nuthatch (*Sitta europaea*), reed bunting, reed warbler (*Acrocephalus scirpaceus*), robin (*Erithacus rubecula*), sedge warbler (*Acrocephalus schoenobaenus*), song thrush, stonechat and wren (*Troglodytes troglodytes*) were classified as probably breeding. Collared dove (*Streptopelia decaocto*), great spotted woodpecker (*Dendrocops major*), grey wagtail (*Motacilla cinerea*), house martin (*Delichon urbicum*), lesser redpoll (*Acanthis cabaret*), long-tailed tit (*Aegithalos caudatus*), pied wagtail, swallow, wheatear (*Oenanthe oenanthe*) and woodpigeon (*Columba palumbus*) were recorded as possibly breeding.

78. None of these species are considered target species whereby impacts associated with the proposed development could be likely to result in significant adverse effects on those species populations.

9.4.7 Vantage Point Summary

79. 79 flights of target species at approximate height of the proposed OHL were observed from vantage point 1b. Most of the flights that were at the approximate height of the proposed OHL were along the length of the Kennox Water, with some flights across the gully or in the cleared area north of the gravel pit.

80. Of the target species observed from vantage point 2a, 429 flights at the approximate height of the proposed OHL were observed on the site, 151 of which were associated with golden plover during the October 2020 survey.

9.4.8 Consideration of SPA Connectivity

81. **Table 9.9** details the species listed on Muirkirk and North Lowther Uplands SPA in relation to the recommended connectivity distances (SNH 2016). Considering the information detailed in **Table 9.9** and the information recorded during baseline surveys it is concluded that there is likely to be some connectivity between the Study Area and the SPA.

SPA species	Foraging Range (SNH, 2016)	Connectivity to proposed development
Golden plover (breeding)	3 km	Potential connectivity
Hen harrier (breeding)	2 km	Potential connectivity
Merlin (breeding)	5 km	Potential connectivity
Peregrine falcon (breeding)	2 km	Potential connectivity
Short-eared owl (breeding)	2 km	Potential connectivity

Table 9.9: Muirkirk and North Lowther Uplands SPA Qualifying Species and Connectivity Likelihood to the proposed development (SNH 2016)

82. As such, the Muirkirk and North Lowther Uplands SPA (and associated SSSIs) is scoped into the assessment for consideration of likely significant effects.

83. The Muirkirk and North Lowther Uplands SPA conservation objectives are detailed below:

1. "*To avoid deterioration of the habitats of the qualifying species* (**Table 9.9**) *or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained*"; and
2. "*To ensure for the qualifying species that the following are maintained in the long term:*
   a) population of the species as a viable component of the SPA;
   b) distribution of the species within the SPA;
   c) distribution and extent of habitats supporting the species;
   d) structure, function and supporting processes of habitats supporting the species; and
   e) *no significant disturbances of the species.*"

84. The results of baseline surveys and scientific conclusions presented in this Chapter will therefore be used to inform the HRA process, and potentially for the competent authority to conduct an Appropriate Assessment where likely significant effects have been identified.

9.5 Importance of Ornithological Features

85. **Table 9.10** outlines the nature conservation importance assigned to the valued ornithological receptors that scoped into this assessment.

Ornithological receptor	Intrinsic Value of the Feature in the Context of the proposed development	Justification
Muirkirk and North Lowther Uplands SPA	International	This SPA regularly supports breeding populations of European importance of the Annex 1 species hen harrier, short-eared owl, merlin, peregrine falcon and golden plover. These species have been recorded within the Study Area for the proposed development and the foraging ranges for these species could overlap with the site. These species could therefore feasibly be impacted by the construction and operation phases of the proposed development.
Muirkirk Uplands SSSI	National	The range of habitats within he SSSI, many of them heather dominated, provides a mosaic of breeding and foraging habitats for the diverse upland bird community, which is of national importance. The SSSI is located within approximately 1.2 km of the Site and it is feasible that the foraging ranges of the bird species associated with the SSSI could overlap with the Site. These species could therefore feasibly be impacted by the construction and operation phases of the proposed development.
North Lowther Uplands SSSI	National	The mosaic of habitats within the Muirkirk Uplands supports a diverse upland breeding bird community which is of national importance. The SSSI is located within approximately 1.5 km of the Site and it is feasible that the foraging ranges of the bird species associated with the SSSI could overlap with the Site. These species could therefore feasibly be impacted by the construction and operation phases of the proposed development.
North Lowther Hills IBA	National	This site comprises moorland and areas of active blanket bog and supports a range of breeding upland species, including hen harrier and black grouse, populations of which are of national importance. The IBA is located within approximately 1.5 km of the Site and it is feasible that the foraging ranges of the bird species associated with it could overlap with the Site. These species could therefore feasibly be impacted by the construction and operation phases of the proposed development.
Airds Moss and Muirkirk Uplands IBA	National	This site comprises moorland and areas of active blanket bog and supports a range of breeding upland species, including hen harrier and black grouse, populations of which are of national importance. The IBA is located within approximately 1.3 km of the Site and it is feasible that the foraging ranges of the bird species associated with it could overlap with the Site. These species could therefore feasibly be impacted by the construction and operation phases of the proposed development.
Hen harrier	Regional	One pair of hen harriers were observed flying within the Study Area during vantage point surveys undertaken between September 2019 and May 2021, although nesting within close proximity to the Site was considered unlikely, since hen harrier were not recorded during other targeted breeding bird surveys. One pair of birds is likely to represent less than 5% of the hen harrier population within the Muirkirk and North Lowther Uplands SPA, based on the published estimated population of 29.2 breeding females within the SPA. Hen harrier is a red-listed BoCC due to a historical decline in the UK between 1800 and 1995, without substantial recent recovery. The UK and Isle of Man hen harrier population was estimated at 662 territorial pairs in 2010, which is a decline of 18% since 2004. Scotland holds the bulk (76%) of the population (505 territorial pairs, where a decline of 20% since the previous survey was observed (Hayhow *et al*. 2013). Thus, the national population is considered to be in unfavourable conservation status. The regional Natural Heritage Zone (NHZ) 19 (Western Southern Uplands and Solway) population was considered by Fielding *et al*. (2011) to be in unfavourable conservation status due to persecution and low productivity. The NHZ 19 population was estimated by Wilson *et al*. (2015) to be 18 (range 15-20) pairs in 2011, with 39 breeding attempts in South Strathclyde monitored by the Scottish Raptor Study Group in 2014.
Merlin	Local	A single observation of merlin was made during the winter walkover survey of the proposed OHL route in February 2020. Furthermore, this species was scoped-out of the assessment for the Kennoxhead Wind Farm Extension, due to a lack of observed activity and potential for likely significant effects to occur (PNE Wind, 2013). Merlin is a frequent winter visitor to the UK and the observation of the bird that was made in February 2020 was not likely to be associated with the breeding population of the Muirkirk and North Lowther Uplands SPA, since merlin do not ordinarily establish nests until April/May (BTO BirdFacts website).
Peregrine falcon	Local	A single peregrine was observed passing through the site during the vantage point surveys undertaken at VP 1b between 2019-2021. Furthermore, a low-level of activity for this species was observed during surveys undertaken between September 2016 and August 2019 for the Kennoxhead Wind Farm Extension EIA and no evidence of breeding was recorded (PNE Wind, 2013). This species was subsequently scoped-out of the assessment for the Kennoxhead Wind Farm Extension, due to a lack of observed activity and potential for likely significant effects to occur (PNE Wind, 2013).

Ornithological receptor	Intrinsic Value of the Feature in the Context of the proposed development	Justification
Short-eared owl	Regional	Short-eared owl were not recorded within the Study Area during any of the surveys that were undertaken to inform the proposed development. Two pairs of short-eared owl were found to be breeding within 800m of the Mid Rig access track in 2017 during surveys that were undertaken to inform the 2019 for the Kennoxhead Wind Farm Extension EIA (PNE Wind, 2013). The Scottish breeding population is estimated as ranging from 125-1,250 pairs, with high densities in the Southern Uplands (Forrester et al. 2012). The population is described as nomadic, linked to cyclic populations of field voles, and so difficult to monitor. The national and regional population trends are therefore unknown. The NHZ 19 population was estimated by Wilson et al. (2015) to be 35 (range 7-67) pairs in 2013, with one breeding attempt in South Strathclyde monitored by the Scottish Raptor Study Group in 2014. Assuming a precautionary approach, the population of the breeding short-eared owl that could be present within the Study Area could represent approximately 5.7% of the regional population.
Goshawk	Local	Goshawk activity was observed during raptor nest searches in 2021 and it is assumed that breeding occurred on site in one location. There are an estimated 400 pairs of goshawk in Britain (Musgrove et al. 2013). The NHZ 19 population was estimated by Wilson et al. (2015) to be 31 (range 17-41) pairs in 2013. The goshawk population appears to be expanding in range in Scotland (Forrester et al. 2012) and as the species is BoCC Green-listed, the national and regional/NHZ populations are likely to be in favourable conservation status.
Black grouse	Regional	Black grouse is red-listed BoCC due to a historical decline in the UK between 1800 and 1995, without substantial recent recovery. It also qualifies due to a severe decline in the UK breeding population size of >50% over 25 years. Breeding numbers in the UK declined by 80% between 1991 and 2004. Sim et al. (2008xiii) estimated there to be 5,078 male black grouse in the UK in 2005, with approximately two-thirds of these occurring in Scotland. However, Forrester et al. (2012xi) estimate that in Scotland there are around 3,550 to 5,750 lekking males, representing about 71% of the British population. In Scotland, the breeding range is contracting, and numbers declining, though the rate of decline varies regionally, being highest in southern Scotland, suggesting that the national and regional populations are in unfavourable conservation status. The NHZ 19 (Western Southern Uplands and Solway) population was estimated by Wilson et al. (2015xiv) to be 121 (range 71-168) displaying males. Although this species hasn't been recorded within the Site during recent bird surveys to inform the proposed development, it had been previously recorded within the Study Area and its recent absence is attributed to the construction of nearby wind farm developments, resulting in a temporary displacement of the birds. Although no black grouse have been found during the current surveys, assuming a precautionary approach, it is feasible that black grouse could be present within the Site during future years and subject to impacts associated with the operation of the proposed development. The historical presence of up to nine leks within the Study Area represents a significant proportion of the population associated with the North Lowther Hills IBA and the wider region.
Golden plover	County	Golden plover is an Annex 1 species due to the loss and deterioration of their habitat and disturbances during the breeding period. The Scottish golden plover population was estimated by Wilson et al. (2015) to be 37,475 pairs, with the NHZ 19 population estimated to be 778 (716 to 839) pairs in 2005. These populations are supplemented by winter migrants. The species is BoCC green listed and and the national and regional/NHZ populations are likely to be in favourable conservation status (BTO BirdFacts website). Golden plover activity was observed during a single vantage point survey undertaken at VP2a in October 2019. There was no evidence of golden plover breeding on site, so the birds observed were not likely to be associated with the breeding population of the Muirkirk and North Lowther Uplands SPA. Although golden plover has not been recorded as breeding on site, they are likely to be using the site during the winter. During the October 2019 vantage point survey, numerous golden plover flights at potential collision risk height were recorded.

Ornithological receptor	Intrinsic Value of the Feature in the Context of the proposed development	Justification
Curlew	County	Curlew is a red-listed BoCC due to a historical decline in the UK between 1800 and 1995, without substantial recent recovery. The national curlew population was most recently estimated to be 68,000 pairs in 2009 (BTO BirdFacts website) with the NHZ 19 population estimated by Wilson et al. (2015) to be 4,284 (3,851 to 4,717) pairs in 2005. The recent inclusion of the species on the BoCC Red list suggests that the national and regional populations are in unfavourable conservation status. During the 2019-2021 bird surveys, curlew were confirmed as probably breeding on site. In addition, several flights at potential collision risk height were observed at both VP1b and VP2a. Assuming a precautionary approach, the population of the breeding curlew that could be present within the Survey Area could represent approximately 0.5% of the regional population.
Other wader species	Local	Common sandpiper, lapwing, oystercatcher, ringed plover and snipe were confirmed as breeding or probable breeding species during surveys in 2020 and 2021. Lapwing and woodcock were also observed during wintering vantage point and walkover surveys. Common sandpiper is an amber-listed BoCC due to a recent decline in the breeding population in the UK. The UK breeding population was estimated to be 13,000 pairs in 2016 (BTO BirdFacts website). There is no specific data on the regional population, however The recent inclusion of the species on the BoCC Amber list suggests that the national and regional populations are in unfavourable conservation status. Lapwing is a red-listed BoCC due to long term severe breeding population decline and recent wintering population decline in the UK. The UK breeding population was estimated to be 97,500 pairs in 2016 (BTO BirdFacts website). The inclusion of the species on the BoCC Red list suggests that the national and regional populations are in unfavourable conservation status. Oystercatcher is an amber-listed BoCC due to it's inclusion on the European red list and the importance of British populations. The UK breeding population was estimated to be 97,500 pairs in 2016 (BTO BirdFacts website). There is no specific data on the regional population, however there has been a significant, moderate decline in the Scottish population since 1995, which suggests that the national population is in unfavourable conservation status. Ringed plover is a red-listed BoCC due to recent declines in both breeding and wintering populations. The UK breeding population was estimated to be 5450 pairs in 2007 (BTO BirdFacts website). There is no specific data on the regional population but there has been an overall decrease in UK population of around 37% since 1984 suggesting that the national population is in unfavourable conservation status. Snipe is an amber-listed BoCC due to a historical decline in the UK between 1800 and 1995, without substantial recent recovery. The Scottish snipe population was estimated by Wilson et al. (2015) to be 34,594 pairs, with the NHZ 19 population estimated to be 1,252 (954 to 1,646) pairs in 2005. Habitat-specific trends for this species are unknown and populations can vary widely across regions so this estimate assumes that population trends apply uniformly to all habitats. Overall, it is assumed that the national snipe population is in unfavourable conservation status. Woodcock is a red-listed BoCC due to a long-term severe breeding range decline. The UK population was estimated to be 57 thousand males in 2016 (BTO BirdFacts website) and this is supplemented by winter migrants. There is no specific data on the regional population however the recent inclusion of the species on the BoCC Red list suggests that the national and regional populations are in unfavourable conservation status.
Wildfowl and gulls	Local	Canada goose, greylag goose, pink-footed goose, Bewick's swan, mute swan, wigeon, goldeneye, goosander, teal, pochard and herring gull were observed during winter vantage point and walkover surveys in 2019-2021. Canada goose, greylag goose, mallard, tufted duck and black-headed gull were confirmed as breeding or probably breeding on site. Of these species, 6 are amber-listed BoCC, and 4 are red-listed BoCC, indicating that the national and regional populations are in unfavourable conservation status. Pink-footed goose and Bewick's swan were only observed flying high over the site and were not considered to be using the Study Area, however all of the other wildfowl and gull species were observed using the site or flying at potential collision risk height.

Table 9.10: Nature conservation importance of the valued ornithological receptors

9.6 Assessment of Likely Effects

86. This section provides an assessment of the likely effects of the proposed development on the important ornithological features scoped in to the assessment. The assessment of effects is based on the description of the proposed development outlined in **Chapter 4: Development Description** and is structured as follows:

- Construction effects:
  - Direct habitat loss
  - Displacement through disturbance or direct habitat loss
  - Mortality
- Operational effects
  - Collision risk
  - Electrocution
- Cumulative/in-combination effects

9.6.1 Construction Effects

Direct habitat loss

87. Both permanent and temporary habitat loss have been assessed in **Chapter 8: Ecology and Biodiversity**. This includes permanent loss of vegetation due to the erection of poles, temporary loss of habitat due to dieback of vegetation under laydown areas, accesses and underground cable installation, and alteration of local hydrological conditions changing vegetation composition. Direct habitat loss could reduce the quantity and quality of available breeding, roosting and foraging habitat for bird species, including raptors, waders and wildfowl. This effect may also include the permanent removal of trees/scrub as part of the wayleave associated with the proposed OHL.

88. The assessment within **Chapter 8: Ecology and Biodiversity** concludes that the extent of habitat losses, both temporary and permanent would be restricted to the immediate footprint of the proposed works and would be small-scale, especially when considered in the context of the large extent of the Study Area. Effects from temporary losses would be short-term since vegetation communities would be expected to recover quickly (within 5 years) following the completion of construction.

89. The baseline surveys undertaken to inform the proposed development, as well as other developments in the wider area such as the Kennoxhead Wind Farm Extension, recorded a low level of activity associated with those species of birds that are qualifying features of the Muirkirk and North Lowther Uplands SPA. Hen harrier, merlin, short-eared owl and golden plover are ground-nesting species, favouring open moorland habitat. The extent of the habitat losses within suitable habitat for SPA species would be small-scale and not sufficient to result in a discernible reduction in the status or productivity of the bird populations.

90. Tree clearance, which may be required to create the required wayleave corridor for the proposed OHL route could reduce the extent of the available nesting and foraging habitat for goshawk, as well as other tree-nesting species. Four potential goshawk territories were recorded within the Study Area, with up to three thought likely to be being used for breeding in any given year. The extent of the required tree clearance would be small-scale in comparison to the available woodland habitat that would be retained within the Study Area. Furthermore, the creation of wayleaves would provide additional woodland edge habitat, which provides optimal habitat for hunting. It is therefore likely that the magnitude of the effect of habitat loss on goshawk would be low, which would be not significant.

91. The results of the baseline surveys demonstrate that no black grouse leks would be lost as a result of the proposed development.

92. Overall, the magnitude of the effects on birds from direct habitat loss would be negligible, with no discernible change in the status or productivity of the bird populations within the Study Area. Therefore, the effect of habitat loss on birds would be not significant. The confidence in this prediction is 'certain' (95% probability or higher).

Displacement

93. Construction activity may result in temporary displacement of birds through disturbance caused by the activities of personnel and the movements of vehicles and other machinery on site.

94. Black grouse are listed under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) and their leks are protected from disturbance, which can occur at a distance of 300-500 m. Goshawk, hen harrier, merlin and short-eared owl are also protected against disturbance whilst breeding, under the provisions of the Wildlife and Countryside Act 1981 (as amended).

95. Pre-construction surveys would be undertaken as part of the embedded mitigation for the proposed development to identify any nesting bird constraints, including those species that form qualifying features of the Muirkirk and North Lowther Uplands SPA. Measures will be outlined within an Ecological Management and Mitigation Plan and a Breeding Bird Protection Plan to safeguard any black grouse leks and nest sites of birds. Furthermore, the Ecological Management and Mitigation Plan and a Breeding Bird Protection Plan would be frequently updated by the Environmental Clerk of Works (ECoW) to ensure any disturbance impacts on birds listed under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) are avoided.

96. Although it is possible that small numbers of foraging birds may be displaced due to construction of the proposed development, the effects would be temporary and alternative foraging and breeding habitat would be available in the surrounding area. It is likely that any displaced birds would relocate to other suitable habitat nearby, without resulting in any discernible reduction in the status or productivity of the bird populations. As such, displacement due to disturbance is likely to be of low magnitude and therefore not significant. The confidence in this prediction is 'certain' (95% probability or higher).

Mortality

97. Mortality of birds and the destruction of active birds' nests during construction works would be avoided through the implementation of standard best practice construction methods and embedded mitigation that is included as part of the proposed development. These measures will be outlined further in the Ecological Management and Mitigation Plan and a Breeding Bird Protection Plan that will be produced for the proposed development. The effect on birds would therefore be negligible and not significant. The confidence in this prediction is 'certain' (95% probability or higher).

9.6.2 Operational effects

Collision risk

98. Any birds flying over the OHL component of the proposed development, particularly large raptors, geese and swans, are at potential risk of collision with the conductor and earth wires. Collision with the proposed OHL could result in the mortality of the bird and consequently impact on the population of the species, and therefore it's conservation status.

99. The Study Area has been found to be used infrequently by those bird species that are associated with the Muirkirk and North Lowther Uplands SPA, with only a single merlin flight being recorded at potential collision-risk height within the Site. Merlin are agile flyers and are not a species that would be likely to be at significant risk of collision with the proposed OHL.

100. Hen harriers have been found to be most at risk of collision with structures when involved in courtship display flights (Hardy *et al.,* 2013). Nesting hen harrier have not been recorded within the Study Area and it is unlikely that any pairs present within the wider area would partake in display flights in the vicinity of the proposed OHL. All hen harrier flights recorded within the Study Area were of birds hunting and no display flights were observed. Due to the low frequency of flights within the Study Area, the risk of collision-related mortality would be low and consequently not significant for hen harrier.

101. It is not predicted that the proposed development would result in a significant effect on the qualifying features for the SPA. The confidence in this prediction is 'certain' (95% probability or higher). Further details on this assessment are provided in the Habitat Regulations Assessment report.

102. Several species of geese, swans and other wildfowl have been observed using the site for both wintering and breeding. These species are considered to be at particular risk of significant impacts from collision-related mortality with OHL infrastructure, due to their large body size and tendency to fly in flocks or in low light, as well as the fact that many of these species are migratory and may not be familiar with the terrain (SNH 2016). Mortality relating to collision with the proposed OHL would consequently impact the population of the species and therefore it's conservation status. Without mitigation such as line markers, the numbers of birds killed could be significant. The confidence in this prediction is "probable" (50-94% probability).

103. Large waders such as curlew, lapwing, oystercatcher and woodcock may also be impacted by collision-related mortality with the proposed OHL infrastructure, again due to their larger body size and tendencies to fly in flocks or in low light (in the case of woodcock). Some of these species are also migratory and may not be familiar with the local terrain. Mortality relating to collision with the proposed OHL would consequently impact the population of the species and therefore it's conservation status. Without mitigation such as line markers, the numbers of birds killed could be significant. The confidence in this prediction is "probable" (50-94% probability).

104. Black grouse have been found to be a species that could be significantly impacted by collision-related mortality with OHL developments, being a somewhat inept flyer. The baseline surveys that were undertaken to inform the proposed development suggests that the population of black grouse that had historically been present within the Study Area may have been displaced by the construction of Kennoxhead Wind Farm, since no leks or other black grouse activity has been recorded within the study during the recent surveys to inform the proposed development. However, it is feasible that the population could recover and return to the habitats within the Study Area, following the construction of the proposed development. In assuming a precautionary approach, it is possible that black grouse could be at risk of collision with the proposed OHL route associated with the proposed development, although the likely magnitude of the effect would be low and not significant. The confidence in this prediction is 'probable' (50-94% probability).

Electrocution

105. Birds can be at risk of electrocution from contact with unprotected wires and associated metal infrastructure. Large birds are generally more vulnerable to electrocution by OHLs because of the greater risk of spanning between two phase conductors or energised and earthed structures with outreached wings or other body parts (Lehman, 2007). Many bird species (particularly raptors) are attracted to OHLs and their supports, as they provide lookout posts, as well as being used generally for perching, nesting and roosting. Ground nesting species (such as hen harrier) rarely use OHL supports for perching/hunting and are therefore at less risk from electrocution (Haas *et al.,* 2005).

106. Studies carried out to investigate avian electrocution in Europe, associated with wooden poles, concluded that wingspan was the key biometric associated with the possibility of being electrocuted (Janss and Ferrer, 1999). The configuration of the wires

and poles of the proposed development means that it is not possible for a bird to be able to touch a conductor while it is perched on an earthed pole, touch a conductor and the earth wire simultaneously, or touch two conductor wires simultaneously. This is because the gaps between the conductors and perch points are 2.5 m wide and greater than any wing span of those birds species recorded within the Study Area.

107. The risk of electrocution to birds from the proposed development is therefore negligible and would not result in any likely significant effects. The confidence in this prediction is 'certain' (95% probability or higher).

9.6.3 Cumulative Effects

108. There are several wind farms being constructed or going through the consenting process including several within the proposed development Study Area. The proposed development is not expected to have any cumulative effects associated with habitat loss or disturbance in regard to these additional developments, given the small land uptake of the wooden poles and temporary nature of the disturbance during the construction works. The likely effects of collision-related mortality have been assessed as being negligible and would not be sufficient whereby there would be likely significant cumulative effects associated with other developments. The confidence in this prediction is 'certain' (95% probability or higher).

9.7 Proposed Mitigation

109. Mitigation measures are set out below to adress any potential negative significant effects identified above. Specific mitigation is designed to reduce the significance of effects, while general site-wide mitigation provides a mechanism for best practice measures and those that will support compliance with wildlife legislation, irrespective of the significance of effects.

9.7.1 Mitigation by Design

An iterative process of corridor and route selection has been undertaken to identify the optimal alignment for the proposed development (see **Chapter 4: Development Description**). Ornithology was a key consideration throughout and, as such, key locations that provide the most sensitive locations for birds, such as the designated sites outlined in **Table 9.7** were avoided.

9.7.2 Pre-construction Surveys

110. Prior to any work commencing on site, ecological surveys would be undertaken to identify any potential constraints. This would include surveys for nesting birds. The information gathered during these surveys will be used to develop an Ecological Management and Mitigation Plan and a Breeding Bird Protection Plan. These will be live documents, which would be updated regularly in accordance the project requirements. They will outline relevant best practice construction measures to safeguard nesting birds, including the establishment of buffer zones around active nest sites to avoid disturbance of specialist protected birds that are listed under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended).

9.7.3 Timing of Construction Works

111. In order to reduce the impact on the assemblage of breeding birds present in the vicinity of the proposed development, any vegetation removal that is necessary to facilitate construction would be undertaken during the bird non-breeding season (September-February), where possible. Should this not be possible for any reason, such as due to inclement weather conditions, for example, then inspections of the vegetation will be undertaken within 24 hours prior to its removal, to first confirm the absence of nesting birds. Such best practice mitigation measures will be outlined within the Ecological Management and Mitigation Plan and a Breeding Bird Protection Plan, which will include procedures for the timing and methods of vegetation removal to safeguard nesting birds.

9.7.4 Bird Deterrents

112. In order to prevent any birds identified on site as potential breeders from settling, deterrence measures would be considered. These may include:

- Distributing iridescent tape across the Site prior to construction;
- Bird deterring devices which produce intermittent loud noises; and
- Walking of the cleared areas on a regular basis to prevent birds settling and to monitor if any birds are settling to nest on areas close to planned construction activity.

9.7.5 Deflectors

113. Deflectors, also known as line markers, have been shown to reduce bird collisions by 78% (Barrientos *et al*., 2011). As a precaution, it is proposed that deflectors would be installed on the earth wires between poles 1 and 28, between poles 50 and 60, between poles 83 and 103, and between poles 110 and 120. The exact positioning of the deflectors would be confirmed during the development of the detailed design for the proposed development.

9.7.6 Maintenance Works

114. Any maintenance required on the proposed OHL and underground cable will be timed to take place outside of sensitive periods such as the bird breeding season. Where this is not possible, surveys will be undertaken to first identify any bird constraints and confirm any resultant mitigation requirements. Such measures will be outlined in the Ecological Management and Mitigation Plan and a Breeding Bird Protection Plan.

9.8 Residual Effects

115. No likely significant effects on ornithology were predicted as a result of the proposed development. The mitigation outlined above follows general best practice measures or has been proposed on a precautionary basis (e.g. the use of bird deflectors). On the assumption that mitigation measures are successfully and correctly applied, there are no likely significant residual effects.

9.9 References

Barrientos R., Alonso J.C., Ponce C. and Palacin C. (2011). Meta-analysis of the Effectiveness of Marked Wire in Reducing Avian Collisions with Power Lines.

Bright, J. A., Langston, R. H. W., Bullman, R., Evans, R. J., Gardner, S., Pearce-Higgins, J. and Wilson, E. (2006) Bird Sensitivity Map to provide locational guidance for onshore windfarms in Scotland. RSPB Research Report No. 20.

BTO BirdFacts website. Accessed April 2021. Available at Welcome to BirdFacts | BTO - British Trust for Ornithology

Chartered Institute of Ecology and Environmental Management (CIEEM) (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine, 3rd edition. CIEEM, Winchester.

Dalquhandy Wind Farm to Coalburn Substation 132kv Overhead Line Ecological Baseline Report: Ramboll: 2017.

Douglas West and Dalquhandy DP Renewable Energy Project: MacArthur Green: 2015.

Eaton M.A., Aebischer N.J., Brown A.F., Hearn R.D., Lock L., Musgrove A.J., Noble D.G., Stroud D.A. and Gregory R.D. (2015). Birds of Conservation Concern 4: the population status of birds in the United Kingdom, Channel Islands and Isle of Man. British Birds 108, 708–746.

Fielding, A., Haworth, P., Whitfield, P., McLeod, D. & Riley, H. (2011). A Conservation Framework for Hen Harriers in the United Kingdom. JNCC Report 441. Joint Nature Conservation Committee, Peterborough.

Forrester, R.W., Andrews, I.J., McInerny, C.J., Murray, R.D., McGowan, R.Y., Zonfrillo, B., Betts, M.W., Jardine, D.C. & Grundy, D.S. (eds) 2012. The Digital Birds of Scotland. The Scottish Ornithologists' Club, Aberlady.

Glentaggart Wind Farm EIAR: SLR Consulting Ltd: 2010.

Haas, D., Nipkow, M., Fielder, G., Schneider, R., Haas, W. and Schurenberg, B. (2005) Protecting birds from powerlines. Nature and Environment, 140. Council of Europe Publishing, Strassbourg

Hardey, J., Crick, H., Wernham, C., Riley, H., Etheridge, B. & Thompson, D. (2013) Raptors: a field guide to survey and monitoring (3rd Edition). The Stationery Office, Edinburgh

Hayhow, D.B., Eaton, M.A., Bladwell, S., Etheridge, B., Ewing, S.R., Ruddock, M., Saunders, R., Sharpe, C., Sim, I.M.W., and Stevenson, A. (2013). The status of the Hen Harrier, Circus cyaneus, in the UK and Isle of Man in 2010. Bird Study 60:4, 446-458.

Hill, D. A., Hockin, D., Price, D., Tucker, G., Morris, R. and Treweek J. (1997). Bird Disturbance: Improving the Quality of Disturbance Research. Journal of Applied Ecology, 34: 275-288.

Janss , G. and Ferrer, M. (1999) Avian electrocution on power poles: European experiences. Birds and Power Lines: Collision, Electrocution and Breeding. Quercus, Madrid, Spain, pp. 145 – 164.

Kennoxhead Wind Farm Environmental Statement: PNE Wind: 2013.

Lehman, R., Kennedy, P. and Savidge, J. (2007) The state of the art in raptor electrocution research: A global review. Biological Conservation 136 159-174

Musgrove, A., Aebischer, N., Eaton, M., Hearn, R., Newson, S., Noble, D., Parsons, M., Risely, K. and Stroud, D. (2013). Population estimates of birds in Great Britain and the United Kingdom. British Birds 106, 64 –100.

Proposed Wind Farm Development at Poniel, South Lanarkshire - Environmental Statement: WSP Environment & Energy & WYG Planning & Environment: 2012.

Ruddock, M. and Whitfield, D. P. (2007) A Review of Disturbance Distances in Selected Bird Species. A report from Natural Research (Projects) Ltd to Scottish Natural Heritage.

Scottish Executive (2000) Nature conservation: implementation in Scotland of EC Directives on the conservation of natural habitats and of wild flora and fauna and the conservation of wild birds ('The Habitats and Birds Directives'). Revised guidance updating Scottish Office Circular no. 6/1995 http://www.scotland.gov.uk/library3/nature/habd-00.asp

Scottish Natural Heritage (2016) Assessing connectivity with Special Protection Areas (SPAs).

Scottish Natural Heritage (2016) Guidance - Assessment and mitigation of impacts of power lines and guyed meteorological masts on birds.

Scottish Natural Heritage (2018) Assessing Significance of Impacts from Onshore Wind Farms Out-with Designated Areas.

Scottish Planning Policy: Scottish Government: 2014. Available at: https://www.gov.scot/publications/scottish-planning-policy/ [Accessed in June 2020].

Wilson, M. W., Austin, G. E., Gillings S. and Wernham, C. V. (2015). Natural Heritage Zone Bird Population Estimates. SWBSG Commissioned report number SWBSG_1504. pp72. Available from:www.swbsg.org