

12. Ornithology

12.1 Introduction

12.1.1 This chapter of the EIA Report assesses the likely significant effects⁵⁷ of the Proposed Development with respect to ornithology. The chapter should be read in conjunction with the description of the Proposed Development provided in **Chapter 3 – Description of the Proposed Development**, of the EIA Report and with respect to relevant parts of other chapters, including **Chapter 11 – Ecology**, of the EIA Report, where common receptors have been considered and where there is an overlap or relationship between the assessments of effects. The Chartered Institute of Ecology and Environmental Management (CIEEM, 2022) “*Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine (Version 1.2)*” refer to receptors being ‘ecological features’, defined in the guidance as pertaining to habitats, species and ecosystems. However, for the purposes of this EIA Report, for which has a separate ecology and ornithology chapter has been produced, the term ‘ornithological feature’ is adopted to differentiate terminology and avoid any confusion between the two chapters.

12.2 Limitations of this Assessment

12.2.1 The results of a desk study and field surveys (**Appendices 12A-E** and **Confidential Appendices 12F-G**) have been used to determine the baseline context of the study area. While the desk study extended beyond the Development Site, field surveys beyond part of this was not possible due to access restrictions (see **Appendices 12A-E**). However, it is considered that the information available provides a robust basis for undertaking an Ecological Impact Assessment (‘EclA’) as:

- Desk study data is available for adjacent areas, and this suggests that these are not markedly different to the Development Site in respect of the potential presence of notable ornithological features⁵⁸ and those with legal protection;
- Aerial imagery and observation from within the study area indicates that habitats within adjacent areas, where access was not possible, are likely to be similar to those accessible areas within the Development Site and the overall study area. It is reasonable to assume therefore that ornithological features in adjacent areas of similar habitat where access was not possible are not markedly different from those that occur within the Development Site; and
- The likelihood of potentially significant effects generally diminishes with distance from a proposed development, particularly where these relate to direct effects.

12.2.2 Field surveys predominantly followed the survey guidance that is widely recognised by NatureScot (2014 and 2017 V.2) (formerly Scottish Natural Heritage (SNH)). However, where deviations occurred due to issues including adverse weather, health and safety requirements and lack of access to adjacent areas, these are described in the accompanying survey reports (**Appendices 12A-E**)

⁵⁷ In this Ornithology chapter, the term “potentially significant effects” is used in the sections prior to the “scope of the assessment” (**Section 12.7**) being determined, as it accords with CIEEM (2022) guidance. The term “likely significant effects” is used once the scope of the assessment has been determined. The use of this term is not to be confused with Likely Significant Effects (LSEs) as used in the context of a Habitats Regulations Assessment.

⁵⁸ Notable ornithological features are those with conservation designations, but no legal protection.

12.3 Relevant Legislation, Planning Policy, Technical Guidance

Legislative Context

- 12.3.1 The following legislation has been considered in the assessment of the effects on ornithological features:
- *Conservation (Natural Habitats, &c.) Regulations 1994 (as amended)* (Habitats Regulations);
 - *Wildlife and Countryside Act 1981 (as amended)*;
 - *Nature Conservation (Scotland) Act 2004*; and
 - *Wildlife and Natural Environment (Scotland) Act 2011*.

Planning Policy Context

- 12.3.2 A summary of the relevant planning policies is given in **Table 12.1**. The East Ayrshire Local Development Plan ('East Ayrshire LDP') is set to be supplanted by the Local Development Plan 2 ('East Ayrshire LDP2'), which was submitted to Scottish Ministers for Examination in December 2022 and submitted to the Scottish Government's Planning and Environmental Appeals Division ('DPEA') in February 2023. Relevant draft policies from East Ayrshire LDP2 have been set out below in **Table 12.1** below the active policies from the 2017 East Ayrshire LDP.

Table 12.1 Planning Policy Issues relevant to Ornithology

Policy reference	Policy issue	Considered in Section
National planning policies		
NPF4: Policy 3 (Biodiversity) and Policy 4 (Natural Places)	Policies 3 and 4 set out detailed policy provisions relating to the protection and enhancement of different types of natural resources and natural heritage assets, as detailed below.	Section 12.7
NPF4: Biodiversity (LDP)	NPF4 requires biodiversity to be protected, conserved, restored and enhanced in line with the mitigation hierarchy through LDPs.	Sections 12.7, 12.8 and 12.13
NPF4: Natural Places (LDP)	NPF4 requires locally, regionally, nationally and internationally important natural assets to be identified and appropriately protected through LDPs.	Sections 12.7, 12.8 and 12.13
NPF4: Biodiversity (Policy 3)	Policy 3 states that: "a) <i>Development proposals will contribute to the enhancement of biodiversity, including where relevant, restoring degraded habitats and building and strengthening nature networks and the connections between them. Proposals should also integrate nature-based solutions, where possible.</i> b) <i>Development proposals for national or major development, or for development that requires an Environmental Impact Assessment will only be supported</i>	Sections 12.4-12.14 and Appendices 12A-E

Policy reference	Policy issue	Considered in Section
	<p>where it can be demonstrated that the proposal will conserve, restore and enhance biodiversity, including nature networks so they are in a demonstrably better state than without intervention. This will include future management. To inform this, best practice assessment methods should be used. Proposals within these categories will demonstrate how they have met all of the following criteria:</p> <ul style="list-style-type: none"> i. the proposal is based on an understanding of the existing characteristics of the site and its local, regional and national ecological context prior to development, including the presence of any irreplaceable habitats; ii. wherever feasible, nature-based solutions have been integrated and made best use of; iii. an assessment of potential negative effects which should be fully mitigated in line with the mitigation hierarchy prior to identifying enhancements; iv. significant biodiversity enhancements are provided, in addition to any proposed mitigation. This should include nature networks, linking to and strengthening habitat connectivity within and beyond the development, secured within a reasonable timescale and with reasonable certainty. Management arrangements for their long-term retention and monitoring should be included, wherever appropriate; and v. local community benefits of the biodiversity and/or nature networks have been considered. <p>c) Proposals for local development will include appropriate measures to conserve, restore and enhance biodiversity, in accordance with national and local guidance. Measures should be proportionate to the nature and scale of development. Applications for individual householder development, or which fall within scope of (b) above, are excluded from this requirement.</p> <p>d) Any potential adverse impacts, including cumulative impacts, of development proposals on biodiversity, nature networks and the natural environment will be minimised through careful planning and design. This will take into account the need to reverse biodiversity loss, safeguard the ecosystem services that the natural environment provides, and build resilience by enhancing nature networks and maximising the potential for restoration”.</p>	
<p>NPF4: Natural Places (Policy 4)</p>	<p>Policy 4(b) states that: “Development proposals that are likely to have a significant effect on an existing or proposed European site (Special Area of Conservation or Special Protection Areas) and are not directly connected with or necessary to their conservation management are required to be subject to an “appropriate assessment” of the implications for the conservation objectives”.</p> <p>Policy 4(f) states that “Development proposals that are likely to have an adverse effect on species protected by legislation will only be supported where the proposal meets the relevant statutory tests. If there is reasonable evidence to suggest that a protected species is present on a site or may be affected by a proposed development,</p>	<p>Section 12.5, 12.7, 12.8, 12.13 and Appendices 12A-E</p>

Policy reference	Policy issue	Considered in Section
	<i>steps must be taken to establish its presence. The level of protection required by legislation must be factored into the planning and design of development, and potential impacts must be fully considered prior to the determination of any application”.</i>	
NPF4: Energy (Policy 11)	Policy 11(e) states that: “ <i>In addition, project design and mitigation will demonstrate how the following impacts are addressed: ix. biodiversity including impacts on birds; xiii. cumulative impacts.</i> ”	Sections 12.8-12.14
The 2020 Challenge for Scotland’s Biodiversity, Scottish Government, 2013 (The 2020 Challenge)	Favourable condition is targeted for SPAs, Special Areas of Conservation (‘SACs’), Ramsar sites, Sites of Special Scientific Interest (‘SSSIs’), National Nature Reserves (‘NNRs’) and Local Nature Reserves (‘LNRs’). Meeting conservation objectives for priority species (including SBL birds) is also a government priority.	Sections 12.5, 12.7 and 12.10
Scottish Biodiversity Strategy to 2045	The strategy is for “ <i>for Scotland to be Nature Positive by 2030. By 2045, Scotland will have restored and regenerated biodiversity across our land, freshwater and seas. Our natural environment, our habitats, ecosystems and species, will be diverse, thriving, resilient and adapting to climate change. Regenerated biodiversity will drive a sustainable economy and support thriving communities, and people will play their part in the stewardship of nature for future generations</i> ”.	Sections 12.8 and 12.13
Local planning policies		
East Ayrshire LDP 2017	ENV6 “Nature Conservation” has elements relating to ornithology directly and is detailed in Table 12.2 . Policies OP1 “Overarching Policy”, RE3 “Wind Energy Proposals”, ENV8 “Protecting and Enhancing the Landscape” and ENV9 “Trees, Woodland and Forestry” have elements relating to the natural environment and biodiversity, further details of which are presented in Chapter 5 – Planning Policy Context of this EIA Report.	Sections 12.7, 12.8 and 12.11
East Ayrshire LDP2 2023	NE5 “Protection of Areas of Nature Conservation Interest” and NE6 “Vulnerable, Threatened and Protected Species” have elements relating to ornithology directly and are detailed in Table 12.2 . Policies SS2 “Overarching Policy”, RE1 “Renewable Energy”, NE4 “Nature Crisis”, NE8 “Trees, Woodland, Forestry and Hedgerows”, NE9 “Woodland Creation” and NE12 “Water, air, light and noise pollution” have elements relating to the natural environment and biodiversity, further details of which are presented in Chapter 5 - Planning Policy Context of this EIA Report.	Sections 12.7, 12.8 and 12.11
Dumfries and Galloway Council (‘DGC’) LDP2 2019	NE4 “Sites of International Importance for Biodiversity”, NE5 “Species of International Importance” and NE6 “Sites of National Importance for Biodiversity and Geodiversity” have elements relating to ornithology directly and is detailed in Table 12.2 .	Sections 12.7, 12.8 and 12.11

Policy reference	Policy issue	Considered in Section
	Policies OP1 “Development Considerations”, ED10 “Galloway and Southern Ayrshire Biosphere”, IN1 “Renewable Energy”, IN2 “Wind Energy”, NE7 “Forestry and Woodland” and CF2 “Green Networks” have elements relating to the natural environment and biodiversity, further details of which are presented in Chapter 5 – Planning Policy Context of this EIA Report.	
Biodiversity policies		
UK Biodiversity Action Plan (‘UKBAP’) / UK Post-2010 Biodiversity Framework (‘UKBAP’)	The UKBAP, produced in 1994 by the UK Government, was a national strategy for the conservation of biodiversity. The UKBAP was updated in July 2012 with a plan which covers the period 2011-2020. This framework is implemented individually by each of the four UK countries. Within Scotland, the UKBAP is coordinated through the Biodiversity Action Reporting System (BARS), which is an online tool which contains a list of Scottish priority habitats and species (The SBL). All UKBAP species and habitats are listed in the SBL.	Section 12.7, Appendix 12H
Scottish Biodiversity List (SBL)	The SBL is a list of flora, fauna and habitats considered by the Scottish Ministers to be of principal importance for biodiversity conservation and its publication was a requirement of Section 2(4) of The Nature Conservation (Scotland) Act 2004.	Section 12.7, Appendix 12H
Dumfries and Galloway Local Biodiversity Action Plan (LBAP)	This LBAP is referred to for species action plans relevant to the Proposed Development.	Section 12.7, Appendix 12H
Ayrshire LBAP	This LBAP is referred to for species action plans relevant to the Proposed Development.	Section 12.7, Appendix 12H

Development Plan Policies

12.3.3 A summary of the relevant development plan policies is given in **Table 12.2**.

Table 12.2 Development Plan Policy Issues Considered within the Assessment of Ornithology

Policy reference	Policy issue	Considered in Section
East Ayrshire LDP 2017 policies		
ENV6 “Nature Conservation”	<i>‘The importance of nature conservation and biodiversity will be fully recognised in the assessment of development proposals. (i) Any development likely to have a significant effect on a Natura 2000 site which is not directly connected with or necessary to its conservation management must be subject to a “Habitats Regulations Appraisal”. Such development will only be approved if the</i>	Sections 12.4, 12.5, 12.7 Appendix 12H

Policy reference	Policy issue	Considered in Section
	<p><i>appraisal shows that there will be no adverse effect on the integrity of the site;</i></p> <p>(ii) <i>Any development affecting a SSSI will only be permitted where it will not adversely affect the integrity of the area or the qualities for which it has been designated or where any significant adverse effects on the qualities for which it is designated are clearly outweighed by social, environmental or economic benefits of national importance.</i></p> <p>(iii) <i>Any development that may adversely impact on areas of local importance for nature conservation, including provisional wildlife sites, local geodiversity sites and local nature reserves, will be expected to demonstrate how any impact can be avoided or mitigated.</i></p> <p>(iv) <i>If there is evidence that protected species may be affected by a development, steps must be taken to establish their presence. The planning and design of any development which has the potential to impact on a protected species will require to take into account the level of protection afforded by legislation and any impacts must be fully considered prior to the submission of any planning application.</i></p> <p>(v) <i>Any new development must protect, and where appropriate incorporate and/or extend, existing habitat networks, helping to further develop the Central Scotland Green Network in Ayrshire.'</i></p>	

EAC LDP2 2023 policies

<p>NE5 “Protection of Areas of Nature Conservation Interest”</p>	<p><i>‘Development should aim to protect and enhance nature and biodiversity. Positive contributions can be achieved through appropriate siting and design, in order to minimise any adverse impacts on habitats, network connectivity and species; individually or cumulatively.</i></p> <p><i>In order to ensure that areas of nature conservation interest are adequately protected from any direct or indirect adverse impacts from development:</i></p> <p>(i) <i>There will be a presumption against development which could adversely impact areas of international importance designated or proposed by Scottish Ministers for designation as Special Protection Areas or Special Areas of Conservation (Natura 2000 sites and Important Bird Areas). Development will only be permitted in such areas where:</i></p> <ul style="list-style-type: none"> <i>• An assessment of the proposal indicates that it will not adversely affect the integrity of the area; or</i> <i>• It has been demonstrated that there are no alternative solutions;</i> <i>• There are reasons of over-riding public interest, including social and economic; and</i> <i>• Compensatory measures are taken to ensure that the overall coherence of the Natura 2000 network is protected.</i> <p><i>Any development likely to have a significant effect on a Natura</i></p>	<p>Sections 12.4, 12.5, 12.7 Appendix 12H</p>
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Policy reference	Policy issue	Considered in Section
	<p><i>2000 site (Special Areas of Conservation, Special Protection Areas and Important Bird Areas) which is not directly connected with or necessary to its conservation management must be subject to a “Habitats Regulations Appraisal” or an ‘appropriate assessment; of the implications for the conservation objectives. Such development will only be approved if the appraisal shows that there will be no adverse effect on the integrity of the site.</i></p> <ul style="list-style-type: none"> <li data-bbox="496 555 1238 824"><i>(ii) Any development affecting sites of national importance for biodiversity and geodiversity, such as a Site of Special Scientific Interest (SSSI) will only be permitted where it will not adversely affect the integrity of the area or the qualities for which it has been designated or where any significant adverse effects on the qualities for which it is designated are clearly outweighed by social, environmental or economic benefits of national importance.</i> <li data-bbox="496 831 1238 1249"><i>(iii) There will be a presumption against any development which could have an adverse impact on sites of local importance (i.e., Local Nature Conservation Sites and Local Nature Reserves) and other sites which are undergoing or have undertaken in-situ conservation and/or long-term enhancement work (i.e. bog and peatland restoration sites). All sites of recognised nature conservation value will be safeguarded wherever possible. Development will only be permitted on such sites where appropriate measures will be put in place to conserve and manage, as far as possible, the site’s biological and geological interest and to provide for replacement habitats, species and features where damage is unavoidable.</i> <li data-bbox="496 1256 1238 1375"><i>(iv) The effective management and conservation of existing landscape features which are of major importance for wild fauna and flora, including linear features such as rivers and existing field boundaries, and other features such as ponds and small woods and hedgerows which are essential for migration, dispersal and exchange of wild species, will be achieved. Cognisance should be given to the Central Scotland Green Network habitats and hotspots mapping.</i> <li data-bbox="496 1382 1238 1559"><i>(v) The effective management and conservation of existing landscape features which are of major importance for wild fauna and flora, including linear features such as rivers and existing field boundaries, and other features such as ponds and small woods and hedgerows which are essential for migration, dispersal and exchange of wild species, will be achieved. Cognisance should be given to the Central Scotland Green Network habitats and hotspots mapping.’</i> 	
NE6 “Vulnerable, Threatened and Protected Species”	‘Biodiversity Action Plan <i>Development adversely affecting priority habitats or species set out within the Ayrshire Local Biodiversity Action Plan will not be permitted unless it can be demonstrated the impacts are clearly outweighed by social or economic benefits of local importance. Where there is likely to be an adverse impact on biodiversity, an ecological appraisal will be required. This appraisal must identify</i>	Sections 12.4, 12.5, 12.7 Appendix 12H

Policy reference	Policy issue	Considered in Section
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potential impacts to all biodiversity assets (international, national and locally important) within or adjacent to the proposed site, providing detail on how detrimental impacts will be avoided, minimised, or if this is not possible, methods of mitigation which will provide opportunities for biodiversity enhancement, where applicable.

Protected Species

The Council will not support development which would have an unacceptable adverse impact on protected species, as follows:

- (i) European Protected Species (See Schedules 2 & 4 of the Habitats Regulations 1994 (As Amended) for definition);*
- (ii) Birds, Animals and Plants listed on Schedules 1, 5 and 8 (respectively) of the Wildlife and Countryside Act 1981 (As Amended);*
- (iii) Badgers as per section 10 of the Protection of Badgers Act 1992; and*
- (iv) Species detailed within the Scottish Biodiversity List (SBL) which includes, protected and threatened species, as well as species where conservation action is needed, where negative impacts should be avoided and watching brief only.*

Planning permission will only be permitted where proposals meet the relevant statutory tests and where a consultation response from NatureScot concludes that a species license is likely to be granted. If there is evidence that protected species may be affected by a development, steps must be taken to establish their presence. The planning and design of any development which has the potential to impact on a protected species will require to take into account the level of protection afforded by legislation and any impacts must be fully considered prior to the submission of any planning application. Planning permission will not be granted for developments that would be likely to have an adverse effect on protected species.

Threatened and Vulnerable Wildlife

The Council will not support development which would have an unacceptable adverse impact on critically endangered, endangered, vulnerable, near threatened and least-concern species.

Invasive Non-Native Species

The Council will at all times seek to protect indigenous species. Where there are invasive non-native species present on a development site, or where planting is planned as part of the proposed development, developers should take account of legislative provisions relating to non-native species’.

Dumfries and Galloway Council (DGC) LDP 2019 policies

NE4 “Sites of International Importance for Biodiversity”

Development proposals likely to have a significant effect on an existing or proposed SPA, existing or candidate SACs or Ramsar Site, including developments outwith the site, will require an appropriate assessment and will only be permitted where:

- the development does not adversely affect the integrity of the site; or
- there are no alternative solutions; there are imperative reasons of overriding public interest, including those of a social or economic nature; and compensatory measures

Policy reference	Policy issue	Considered in Section
	have been identified and agreed to ensure that the overall coherence of the Natura network is protected.	
NE5 “Species of International Importance”	Development proposals that would be likely to have an adverse effect on a European Protected Species will not be permitted unless it can be shown that: <ul style="list-style-type: none"> • there is no satisfactory alternative; and • the development is required for preserving public health or public safety or for other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment; • and the development would not be detrimental to the maintenance of the population of the species at a favourable conservation status in its natural range. 	Sections 12.9 and 12.10 Appendix 12H
NE6 “Sites of National Importance for Biodiversity and Geodiversity”	Development that affects Sites of Special Scientific Interest, not designated as International Sites, and other national nature conservation designations will only be permitted where: <ul style="list-style-type: none"> • it will not adversely affect the integrity of the area or the qualities for which it has been designated; or • any such adverse effects are clearly outweighed by social, environmental or economic benefits of national importance. 	Sections 12.4 and 12.5 Appendix 12H

Technical Guidance

Overarching guidance

- 12.3.4 The Chartered Institute of Ecology and Environmental Management has produced relevant general guidance on impact assessment in ecology and ornithology:
- *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. Version 1.2.*

Guidance specific to wind farms

- 12.3.5 NatureScot have also published a technical guidance series covering bird surveys and assessment for wind farms:
- Recommended bird survey methods to inform impact assessment of onshore wind farms (NatureScot, 2017 v2);
 - Assessing significance of impacts from Onshore Wind Farms outwith Designated Areas (NatureScot, 2018a);
 - Assessing Connectivity with Special Protection Areas (SPAs) (NatureScot, 2016a);
 - Assessing the cumulative impacts of onshore wind farms on birds (NatureScot, 2018b);
 - Dealing with construction and birds (NatureScot, 2016b);
 - Natural Heritage Zones Bird Population Estimates (Scottish Wind Farm Bird Steering Group, Wilson *et al.*, 2015);

- Disturbance Distances Review: An updated literature review of disturbance distances of selected bird species. NatureScot Research Report 1283. (Goodship and Furness (MacArthur Green), 2022); and
- Guidance – Good Practice during Wind Farm Construction (4th Edition) (NatureScot, 2019).

12.3.6 Technical guidance that has been used to define the survey methods used to inform this assessment is referenced in **Section 12.4** and in **Appendices 12A-E**.

12.4 Data Gathering Methodology

Study Area(s)

12.4.1 The study area encompasses the area over which all desk-based and field data was gathered to inform the assessment presented in this chapter. Due to the presence of multiple ornithological features and many potential effects, the level and type of data collection varies across the study area. The “study area” comprises:

- The Development Site (as defined in **Chapter 3 – Description of the Proposed Development** and illustrated on **Figure 1.1, Chapter 1 – Introduction**);
- The desk study area for statutory and non-statutory ornithological sites (**Figure 12.1**);
- The desk study area for legally protected and notable ornithological features (**Figure 12.2**); and
- The field survey areas (**Figure 12.3**).

12.4.2 The extent of the desk study area(s) and field survey areas (see **Table 12.4**) were determined based on best practice guidance (NatureScot, 2016a and 2017) and a high-level overview of the types of ornithological features present, and the potential effects that could occur. The study area was defined on a precautionary basis to ensure that, as a minimum, the Zone of Influence (‘Zol’)⁵⁹ relevant to all ornithological features (see **Table 12.6** and **Section 12.7**) were covered during baseline data collection activities.

12.4.3 As the design process has evolved iteratively, the study area, and its constituent parts, has been regularly reviewed to ensure that its extent was adequate to enable the assessment of all potentially significant effects on the ornithological features identified. Changes to the initial developable area, or the precise nature of the development, have been reviewed in light of the ornithological features present (which was in turn informed by the data gathering exercise) and the potential effects that could occur. At each stage of design evolution, the extent of the study area, including all of its components, was tested using the methodology described in **Section 12.7** to ensure adequate information was available on which to base an assessment. These ornithological features and respective study area(s) are defined in the following paragraphs and are shown on **Figures 12.1-3**.

Desk Study

12.4.4 A desk-based data-gathering exercise was undertaken to obtain existing information relating to relevant ornithological features; these are statutory and non-statutory biodiversity sites, habitats and species of principal importance⁶⁰, legally protected and

⁵⁹ The Zol in this context is the area over which an individual ornithological feature may be subject to a potentially significant effect resulting from changes in the baseline environment due to the Proposed Development.

⁶⁰ Habitats of Principal Importance and Species of Principal Importance are referred to in this chapter as HPI and SPI respectively.

controlled species and other conservation notable species that have been recorded since 2010⁶¹. **Table 12.3** lists the data compiled within the desk study area, which is the Development Site and the additional areas of search beyond and is shown on **Figure 12.1** and **Figure 12.2**.

Table 12.3 Information Relevant to the Desk Study

Ecological Feature	Description	Desk Study Areas
Statutory sites designated under international conventions or European Directives	Wetlands of International Importance (also known as Ramsar sites) and Special Protection Areas (SPAs).	The Development Site and 20 km buffer.
Statutory sites designated under national legislation	SSSIs, NNRs and Local Nature Reserves (LNRs) with ornithological qualifying features.	The Development Site and 10 km buffer.
Locally designated sites	Often termed as Local Wildlife Sites (LWS), County Wildlife Sites (CWS), Sites of Interest for Nature Conservation (SINC).	The Development Site and 2 km buffer.
Scottish Biodiversity List; Red listed species⁶²; and Legally protected species	Bird species of principal importance for the conservation of biodiversity in Scotland. Red listed Birds of Conservation Concern (<i>Stanbury et al., 2021</i>). Legally protected bird species include those listed on Schedule 1 of the <i>Wildlife and Countryside Act 1981</i> (as amended in Scotland).	The Development Site and 2 km buffer (6 km buffer for eagle species).

12.4.5 **Table 12.4** lists the organisations and other sources that have supplied desk study data, together with the nature of that data.

Table 12.4 Sources of Desk Study Data

Source	Summary of information provided
Magic.gov.uk	Locations of statutory and non-statutory designated sites.
NatureScot interactive map facility at (https://sitelink.nature.scot/home)	Access to data and information on key protected areas across Scotland.
RSPB	All protected and notable bird species data within 2 km of the Development Site, and eagle species data out to 6 km.

⁶¹ The ornithological impact assessment was first drafted in 2020 and data from a 10 year period at that point was reviewed. Data remained relevant when checked in February 2023.

⁶² Red listed species for the purposes of this assessment refer to those who, following a review of the status of birds in the UK, Channel Islands and Isle of Man using standardised criteria, were assessed and assigned to the Red list of Birds of Conservation Concern (BoCC). The assessment criteria include conservation status at global and European levels and, within the UK, historical decline, trends in population and range, rarity, localised distribution and international importance (*Stanbury et al., 2021*).

Source	Summary of information provided
Scottish Raptor Study Group	All Annex I and Schedule 1 raptor/owl species data within 2 km of the Development Site, and eagle species data out to 6 km. Annual publications detailing population and productivity estimates based on monitored populations for raptor species at the national and regional level.
Enoch Hill Wind Farm 2015 Environmental Statement ('ES')	Desk based review, breeding and non-breeding bird baseline surveys undertaken to inform the EIA of the adjacent Enoch Hill Wind Farm together with contextual material regarding the consented wind farm.

Survey Work

- 12.4.6 A list of the ornithological field surveys carried out to inform the preparation of this chapter is provided in **Table 12.5**. The detailed methodologies for, and results of, these surveys can be found in **Appendices 12A-E**. Following NatureScot guidance (NatureScot, 2016c), **Confidential Appendices 12F-G** presents data and figures of flight activity, roosting locations and breeding locations associated with sensitive species, and should be read in conjunction with **Appendices 12A-E**.
- 12.4.7 Additionally preliminary surveys were undertaken by Environmental Consultancy MacArthur Green between 2010 and 2012, which are summarised as follows:
- Vantage Point ('VP') survey comprising a total of 44 hours of survey effort from two VP locations during the 2010/11 non-breeding season (September to mid-March), a total of 142 hours of survey effort from three VP locations during the 2011 breeding period (mid-March to August), and a total of 63 hours of survey effort during the 2011 autumn migration period (September to October);
 - a four visit Brown and Shepherd (1993) survey of the Development Site and 500m buffer during the 2011 breeding season (April to July);
 - raptor surveys of the Development Site and 2 km buffer during the 2011 breeding season;
 - black grouse surveys of the Development Site and 1.5 km buffer during the 2011 breeding season;
 - winter walkover surveys of the Development Site, comprising a single visit in February 2011 and two visits in December 2011;
 - woodland point counts of the Development Site, comprising a single visit in February 2011 and May 2011; and
 - long-eared owl and nightjar survey of the Development Site and 500 m buffer between April and June 2011.
- 12.4.8 **Table 12.5** lists the data compiled within the field survey area(s) as detailed in **Appendices 12A-E**.

Table 12.5 Summary of Ornithological Surveys

Survey	Relevant guidance	Field Survey Area	Survey period	Reference
VP surveys	NatureScot (2014) Recommended bird survey methods to inform impact assessment of onshore wind farms.	Proposed Development	18/04/2016-17/08/2016	Appendices 12A, 12B, 12D and 12E
	NatureScot (2017 V.2) Recommended bird survey methods to inform impact assessment of onshore wind farms.		20/09/2016-23/03/2017-29/11/2017-29/03/2018-25/04/2018-14/08/2018	
Moorland Bird Survey	NatureScot (2014) Recommended bird survey methods to inform impact assessment of onshore wind farms.	Access Track and 500 m buffer	12/04/2017-12/07/2017	Appendices 12C and 12E
	NatureScot (2017 V.2) Recommended bird survey methods to inform impact assessment of onshore wind farms.	Development Site and 500 m buffer plus Access Track and 500 m buffer	12/04/2018-15/07/2018	
Breeding raptor surveys	NatureScot (2014) Recommended bird survey methods to inform impact assessment of onshore wind farms.	Development Site and 2 km buffer	30/03/2016-08/07/2016	Appendices 12A, 12C and 12E
	NatureScot (2017 V.2) Recommended bird survey methods to inform impact assessment of onshore wind farms.	Access Track and 500 m buffer only Development Site and 2 km buffer plus Access Track and 500 m buffer	12/04/2017-13/07/2017-11/04/2018-05/07/2018	
Lekking black grouse surveys	NatureScot (2014) Recommended bird survey methods to inform impact assessment of onshore wind farms	Development Site and 1.5 km buffer	31/03/2016-11/05/2016	Appendices 12A, 12C and 12E
	NatureScot (2017 V.2) Recommended bird survey methods to inform impact assessment of onshore wind farms.	Access Track and 500 m buffer Development Site and 1.5 km buffer	13/04/2017-13/05/2017 12/04/2018-27/04/2018	

Survey	Relevant guidance	Field Survey Area	Survey period	Reference
		plus Access Track and 500 m buffer		
Nightjar surveys	NatureScot (2014) Recommended bird survey methods to inform impact assessment of onshore wind farms.	Development Site and 500 m buffer	08/06/2016-21/07/2016	Appendix 12A

12.5 Overall Baseline

12.5.1 A summary of the ornithological baseline as determined through desk study and field survey is provided below. Further species-specific baseline details are provided in **Section 12.10**, and detailed descriptions are provided in **Appendices 12A-E** and **Confidential Appendices 12F-G**.

Current Baseline

Site Context and Surrounding Habitats

12.5.2 The Development Site lies at the southwestern end of a ridge that runs from Ashmark Hill in the northeast to Strandlud Hill on the Development Site. The Development Site is entirely forested except for the exposed boggy peak on Strandlud Hill. Most forestry on the Development Site is at the thicket stage of development and the only clear areas are located along watercourses and rides and an area of more open land around the abandoned farmhouse dwelling at Monquhill. The Development Site is bordered by similar forestry to the south, east and west and moorland to the north, which is used primarily for sheep grazing, with habitats predominantly consisting of wet modified bog and marshy grassland. Several watercourses border the Development Site, including the Water of Deugh to the southeast. The Development Site also borders several wind farms that are consented but have yet to be built / become operational, comprising the consented Enoch Hill to the northwest, South Kyle to the west and Pencloe to the east. The operational Brockloch Rig Wind Farm extension lies to the south of the Development Site.

12.5.3 The planned access track to the Development Site starts at Pencloe Farm and runs through enclosed rough pasture, grazed by sheep and cattle before it meets a forest block to the west of the Lochingerroch Burn. The proposed access track then lies entirely within the forest block and meets the Development Site near Monquhill Farmhouse.

Statutory Nature Conservation Sites (International/European)

12.5.4 **Figure 12.1** illustrates the locations of the statutory nature conservation sites designated under international conventions or via European directives. This comprises:

- Muirkirk and North Lowther Uplands SPA (~11 km north-east of the Proposed Development), which is designated for:
 - ▶ short-eared owl (30 breeding pairs);
 - ▶ hen harrier (30 breeding pairs and ten overwintering individuals);
 - ▶ merlin (six breeding pairs);

- ▶ peregrine (nine breeding pairs); and
- ▶ golden plover (175 breeding pairs).

Statutory Nature Conservation Sites (National)

12.5.5 No statutory nature conservation sites designated under national conventions were recorded within the study area.

Non-Statutory Nature Conservation Sites

12.5.6 No non-statutory nature conservation sites were recorded within the study area.

Species

12.5.7 **Table 12.6** provides a brief summary of all species recorded during bird surveys. A detailed summary of the species recorded across the Development Site is presented in **Appendices 12A-E**. Following NatureScot guidance (NatureScot, 2016c), **Confidential Appendices 12F-G** presents data and figures of flight activity associated with sensitive species and should be read in conjunction with **Appendices 12D and 12E**.

12.5.8 **Table 12.6** indicates whether the bird is a qualifying feature of Muirkirk and North Lowther Uplands SPA, is listed on Annex 1 of the Birds Directive, Schedule 1 of the Wildlife and Countryside Act (as amended) ('WCA') or is a species of principal importance on the SBL. The species status on the fifth edition of the Birds of Conservation Concern List ('BoCC5') is displayed as green, amber or red (Stanbury *et al.*, 2021). Species have been arranged alphabetically as opposed to taxonomically for convenience.

Table 12.6 Summary of Ornithological Survey Results March 2016 – August 2018

Species	Status	No. of territories in Development Site	Summary
Black grouse	SBL, BoCC5 Red List	0	Three males recorded in 1.5 km survey buffer in 2016 (~500 m – 1 km to the east of the Development Site) but no lekking was recorded. Single incidental record of three males in the 2016-17 non-breeding season (1 km to the northwest of the Development Site).
Curlew	SBL, BoCC5 Red List	0	One territory within 500 m of the Access Track in 2017 and 2018 (near Pencloe Farm).
Golden plover	Muirkirk and North Lowther Uplands SPA, Annex 1 Birds Directive, SBL, BoCC5 Green List	0	One flight (comprising 6 birds) was recorded during VP surveys. 24 incidental records between 2016 and 2018, with a peak count of 50 individuals (all outside of the Development Site on moorland to the north, west and/or east).
Goshawk	Schedule 1, BoCC5 Green List	0	11 flights were recorded during VP surveys.

Species	Status	No. of territories in Development Site	Summary
			Two probable breeding attempts within 1 km survey buffer of the Development Site in 2018. Four incidental records between 2016 and 2018 (all outside of the Development Site).
Hen harrier	Muirkirk and North Lowther Uplands SPA, Annex 1 Birds Directive, Schedule 1/1A, SBL, BoCC5 Red List	0	Four flights were recorded during VP surveys. Three incidental records between 2016 and 2018 (all outside of the Development Site).
Merlin	Muirkirk and North Lowther Uplands SPA, Annex 1 Birds Directive, Schedule 1, SBL, BoCC5 Red List	0	One flight was recorded during VP surveys.
Osprey	Annex 1 Birds Directive, Schedule 1, SBL, BoCC5 Amber List	0	Two incidental records between 2016 and 2018 (all outside of the Development Site).
Peregrine	Muirkirk and North Lowther Uplands SPA, Annex 1 Birds Directive, Schedule 1, SBL, BoCC5 Green List	0	Three incidental records between 2017 and 2018 (all outside of the Development Site).
Snipe	BoCC5 Amber List	0	One territory within 500 m of the Access Track in 2017 (near Pencloe Farm).

Previous Field Surveys

12.5.9 Notable findings from the 2010-12 surveys undertaken by MacArthur Green are summarised as follows:

- Infrequent flights of peregrine in winter and golden plover during the breeding season (plus single flights of merlin and black grouse);
- Black grouse were recorded on-site in the 2011 breeding season (no lekking was observed), although black grouse were not recorded within 1.5 km of the Development Site during the targeted black grouse surveys;
- No Schedule 1 raptor / owl species recorded breeding within 2 km of the Development Site and no nightjar recorded breeding within 500 m of the Development Site; and
- A single territory of curlew, 1-2 pairs of oystercatcher and a single snipe territory within 500 m of the Development Site.

Future Baseline

12.5.10 Determining a future baseline draws upon information about the likely future use and management of the Development Site in the absence of the Proposed Development, known population trends (for species), climate change and any other proposed developments (consented or otherwise) that may act cumulatively with the Proposed Development to affect ornithological features.

- 12.5.11 Land use/management is currently anticipated to remain largely unchanged in the absence of the Proposed Development, although with the maturation of the forestry within the Development Site and in the local area, the numbers of certain woodland species may increase due to an increase in potential nest sites e.g., goshawk.
- 12.5.12 Climate change may lead to wetter and windier weather during the breeding season period, and this may affect productivity.
- 12.5.13 Overall, although it is likely that the general bird assemblage would remain relatively constant, there are a number of factors that would act over the short and long-term to modify distribution and abundance of species. However, in the absence of empirical data on long-term population trends, it is considered that the current baseline is equally likely, or even more likely, to persist over the anticipated lifespan of the Proposed Development rather than there being a fundamental change. It is therefore considered appropriate to use the current baseline for the purpose of this assessment.

12.6 Consultation

- 12.6.1 **Table 12.7** provides a summary of consultee comments about the Proposed Development and the responses given.

Table 12.7 Summary of Consultee Comments Regarding Ornithology

Consultee(s)	Comment	Response and how considered in this chapter	Section Reference
Scottish Natural Heritage ('SNH')	<p>Designated Sites SNH stated that: “the proposed development site is situated approximately 11 km south west of Muirkirk and North Lowther Uplands SPA which is classified for its breeding and wintering populations of hen harrier and breeding populations of merlin, peregrine, short-eared owl and golden plover... the development would be situated out with the core foraging range for all SPA species, which is the area in which we would consider there may be connectivity between the development site and the qualifying interests of the SPA. Therefore, in our view, it is unlikely that the proposal would have a significant effect on the qualifying interests of Muirkirk and North Lowther Uplands SPA either directly or indirectly. <u>An appropriate assessment is therefore not required, and we consider that Muirkirk and North Lowther Uplands SPA can be scoped out of the EIA.</u> The proposed development is out with the boundary of the (Muirkirk Uplands) SSSI and therefore we do not consider that the ecological interests of the site would be affected by the proposal, nor do we consider the ornithological interests of the SSSI would be affected for the reasons detailed in the SPA section above. Therefore, the Muirkirk Uplands SSSI can be scoped out of the EIA. The proposed development is out with the boundary of the (North Lowther Uplands) SSSI and therefore we do not consider that... the ornithological interests of the SSSI would be affected for the reasons detailed in the SPA section above. Therefore, the North Lowther Uplands SSSI can be scoped out of the EIA.”</p>	NatureScot ('SNH') stated an appropriate assessment is not necessary and the Muirkirk and North Lowther Uplands SPA can be scoped out of the EclA. Therefore, no further assessment of this designated site (or the Muirkirk Uplands SSSI, and North Lowther Uplands SSSI) is considered in this chapter.	N/A
	<p>Survey Methods Full details of survey methodologies, areas surveyed and details of any limitations to survey efforts should be included within the Environmental Statement ('ES'). The ES should also report the survey results including figures showing the survey areas/results with infrastructure/turbine layout overlapping, evaluate impacts predicted</p>		

Consultee(s)	Comment	Response and how considered in this chapter	Section Reference
	<p>to arise as a result of the development proposals, assess the significance of these impacts and recommend mitigation and/or compensation measures as is necessary and appropriate.”</p>	<p>reports the survey results including figures showing the survey areas/results with infrastructure/turbine layout overlapping, evaluates impacts predicted to arise as a result of the Proposed Development, assesses the significance of these impacts and recommends mitigation and/or compensation measures as is necessary and appropriate, as requested by NatureScot.</p>	
	<p><u>Wider Countryside/Nesting birds</u> “Advice with regards to breeding birds is that the following mitigation is required to minimise the impact of the development: - Ground or vegetation clearance works should be undertaken out-with the main bird nesting season (March-August inclusive). If this is not possible, a suitably experienced ecologist should check the development site before work commences to determine the presence of any nesting birds. If nesting birds are found, a suitably sized buffer zone should be set up around the nest and no work within this zone should commence until the young have fledged or the nest is no longer in use. This would ensure that no nests are destroyed during the site construction works and no offences are committed under the Wildlife and Countryside Act 1981 (as amended). If the development is not carried out in accordance with this mitigation measure, the Applicant may risk committing an offence.”</p>	<p>As part of an overarching Construction Environmental Management Plan (‘CEMP’), a Bird Protection Plan would be developed and agreed, in consultation with the Project Ecologist and the relevant consultees, in advance of construction works commencing. Method Statements (MSs) would be developed to detail the mitigation approach for all bird receptors. These would cover the site and receptor specific requirements of the embedded mitigation as outlined in Table 12.9.</p>	<p>Section 12.8</p>
<p>East Ayrshire Council (‘EAC’)</p>	<p>The reporting of baseline surveys and collision risk modelling along with any displacement risks and habitat loss is welcome. RSPB have responded to the scoping consultation to advise that provided all ornithological surveys are carried out in accordance with SNH guidance, they would have no comments to make regarding the ornithological chapter. RSPB note that some data appears to be out of date, though further contact with RSPB is recommended to ensure that any potential concerns over the robustness of the data set can be overcome. Confirmation, therefore, from SNH and RSPB that the baseline data remains up to date should be sought and updated if</p>	<p>Surveys were undertaken in the 2016, 2017 and 2018 breeding seasons and the 2016/17 and 2017/18 non-breeding season. Knowledge of the Development Site and recent visits to undertake other protected species ecological survey work (March 2023) confirm that habitats remain unchanged, and it is likely that the baseline bird community it supports remains unchanged.</p>	<p>Sections 12.2, 12.4 and 12.12</p>

Consultee(s)	Comment	Response and how considered in this chapter	Section Reference
	<p>necessary. Agreement should also be reached with SNH as to the acceptability of the proposed approach to cumulative assessment based on the range of each species to be assessed, given the number of other wind farms (existing, consented and proposed) throughout this area. It is expected that consideration of the potential larger section 36c variation turbines of Enoch Hill wind farm be considered if such a variation is going to be sought.</p>	<p>The cumulative assessment will follow NatureScot (2018b) guidance and will assess all wind farm schemes within Natural Heritage Zone 19 that are operational, consented or at the application stage.</p>	
<p>Dumfries and Galloway Council ('DGC')</p>	<p>At this time, owing to its location outwith the Council's administrative area, the Council will not be providing a formal response.</p>	<p>N/A</p>	<p>N/A</p>
<p>Royal Society for the Protection of Birds ('RSPB')</p>	<p>Providing that all ornithological surveys have been carried out as per SNH guidance, we have no comments to make regarding the ornithological chapter. Some of the data quoted does appear to be out of date, though where more recent surveys have been carried out there appears to have been little change in the ornithological interest over time. However, we reserve full judgement on the findings until we have seen the EIA.</p> <p>We would also wish to see any compensatory planting for the forest lost during construction of this windfarm to be planted in a way that is sympathetic to the biodiversity of the chosen area. For this reason, we would recommend that native broadleaved trees and scots pine are used as compensatory species, and that encroachment onto valuable open habitats is avoided where possible.</p>	<p>Refer to the NatureScot response above for the approach taken on survey methods and data age.</p>	<p>Sections 12.2 and 12.4</p>

12.7 Scope of the Assessment

Introduction

- 12.7.1 The construction, operation and decommissioning phases of the Proposed Development may result in a number of direct and indirect environmental changes that could significantly affect ornithological features/receptors:
- Construction and decommissioning disturbance: Activities including use of plant and the presence of workforce resulting in an increase in aural and visual stimuli due to noise and vibration, and movement of construction vehicles resulting in disturbance or temporary displacement of breeding and foraging birds (potential effects are likely to be greatest during the breeding season (mainly between March and August, depending on species) and behavioural sensitivity to the effects would vary between species).
 - Operational disturbance: The operation of turbines and associated human activities for maintenance purposes also has the potential to cause disturbance and displace birds from the Proposed Development, although it is recognised that disturbance effects during the operational phase would be less than during the construction phase (Pearce-Higgins *et al.*, 2012).
 - Operational displacement leading to barrier effects: individual turbines, or the wind farm as a whole, may present a barrier to the movement of birds, restricting or displacing birds from much larger areas. The effect this would have on a population is subtle and difficult to predict with any great certainty. If birds regularly have to fly over or around obstacles or are forced into suboptimal habitats, this may result in reduced feeding efficiency and greater energy expenditure. By implication, this would reduce the efficiency with which they accumulate energy reserves, potentially affecting breeding success.
 - Collision risk: Collision with a turbine rotor is almost certain to result in the death of the bird. It should be noted that operational disturbance and collision risk effects are mutually exclusive in a spatial sense: i.e., a bird that avoids the wind farm area due to disturbance cannot be at risk of collision with the turbine rotors at the same time. However, they may not be mutually exclusive in a temporal sense; should a bird initially avoid the wind farm, but later habituate to it and return, it would then be at risk of collision.
- 12.7.2 Ornithological impact assessments for onshore wind farms in the UK generally focus on construction/decommissioning disturbance and collision risk as disturbance and displacement effects during operation are (in most cases) unlikely to result in significant effects on bird populations. Furthermore, as the decommissioning phase is of shorter duration than the construction phase and involve less intrusive groundworks, disturbance/displacement effects typically focus on the construction period.
- 12.7.3 With the exception of **Chapter 11 – Ecology** of the EIA Report, the method for determining the scope of the assessment within this chapter differs from that used in other technical chapters within this EIA Report in order to correspond with topic specific guidance (i.e., CIEEM 2022 which guides against the use of matrices to assess significance). However, the approach is similar in many respects to the approach taken in other chapters in that the relevant receptors (i.e., ornithological features) are assessed in terms of importance/value, the magnitude of change as a result of the Proposed Development is considered and the spatial and the temporal scope are defined. The

method has multiple stages enabling the scope of the assessment to be progressively refined and the approach is described in the following sub-sections.

Ornithological Features

Scoping - Determining Importance

- 12.7.4 The first stage in determining the scope of the assessment is to identify which ornithological features identified through the desk study and field surveys (see **Section 12.4**) are 'important'⁶³ in the context of the Proposed Development. Following CIEEM (2022) guidance, the importance of ecological features is first determined with reference to UK legislation and policy and then with regard to the extent of habitat or size of population that may be affected by the Proposed Development.
- 12.7.5 As the importance of ornithological features is determined with regard to the extent of habitat or size of population that may be affected by the Proposed Development, each status can differ from that which would be conferred by legislative protection or identification as a conservation notable species. For example, skylark is important at a national level because it is an SBL species and features on the BOCC5 red list. However, a small population that could be affected by a development would be assessed as being of less than national importance due to the large, albeit declining, UK wide population (of around 1.5 million pairs).
- 12.7.6 Wherever possible, information regarding the extent and population size, population trends and distribution of the ornithological features has been used, to inform the categorisation of importance described in **Table 12.8**. Where detailed criteria or contextual data are not available, professional judgement was used to determine importance.
- 12.7.7 An explanation of all determinations of importance of scoped in ornithological features is provided in this section and **Table 12.9**. **Appendix 12H** provides a summary of assessed importance for all ornithological features, i.e., those scoped in and out, to ensure transparency.

⁶³ Importance relates to the quality and extent of designated sites and habitats, habitat/species rarity and their rate of decline. Ornithological features that are not considered to be important are those that are sufficiently widespread, unthreatened and resilient and with populations that will remain viable and sustainable irrespective of the Proposed Development.

Table 12.8 Geographic Importance of Ornithological Features

Geographic context of importance	Example / Description
International or European⁶⁴	1. Sites including SPAs, SACs, candidate SACs and Sites of Community Importance ('SCI'), potential SPAs ('pSPA') possible SACs ('pSACs'). 2. Areas of habitat or populations of species ⁶⁵ which meet the published selection criteria for designation as an SPA or Ramsar Site, but which are not themselves currently designated at this level.
National	1. A nationally designated site including SSSIs and NNRs. 2. Areas (and the populations of species which inhabit them) which meet the published selection criteria guidelines for selection of biological SSSIs, but which are not themselves designated based on field data collected, and in agreement with NatureScot. 3. SBL habitats and species, Red listed and legally protected species that are not addressed directly in Part 2 of the "Guidelines for Selection of Biological SSSIs" but can be determined to be of national importance using the principles described in Part 1 of the guidance ⁶⁶ .
Regional	1. SBL habitats and species, Red listed, and legally protected species considered to be of regional importance in the context of population size and distribution.
County	1. LNRs and Non-statutory designated sites. 2. Areas which based on field data collected to inform the EclA meet the published selection criteria for those sites listed above (for habitats or species, including those listed in relevant Local Biodiversity Action Plans) but which are not themselves designated.
Local	1. SBL habitats and species, Red listed and legally protected species that based on their extent, population size, quality etc are determined to be at a lesser level of importance than the geographic contexts above. 2. Common and widespread native species occurring within the Study Area in numbers greater than may be expected in the local context.
Negligible	1. Common and widespread species that do not occur in levels elevated above those of the surrounding area.

12.7.8 All ornithological features that were determined to be of negligible importance in relation to the geographic context have been scoped out of the assessment at this stage. Further, ornithological features of local importance were also scoped out at this stage where there was a specific technical justification to do so. This is because effects on them would not

⁶⁴ Following the UK's exit from the European Union in January 2020, SACs and SPAs in the UK no longer form part of the EU's Natura 2000 ecological network. The legislation giving effect to these changes includes the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 in England and Wales and the Conservation (Natural Habitats, &c.) (EU Exit) (Scotland) (Amendment) Regulations 2019 in Scotland (the "2019 Regulations"). The 2019 Regulations refer to a national/UK site network on land and at sea, including both the inshore and offshore marine areas in the UK. The national/UK site network includes pre-existing SACs and SPAs as well as new SACs and SPAs designated under the Habitats Regulations as amended.

⁶⁵ This includes habitats and species listed under Annex I and Annex II of the Habitats Directive.

⁶⁶ In international and UK bird conservation, it has become a well-established practice to regard 1% of a species' total population in the range under consideration (e.g. national, international, flyway, global) as a significant threshold when assessing whether sites should be designated.

influence the decision-making about whether or not consent should be granted for the Proposed Development (i.e., a significant effect in EclA terms could not occur). This approach is consistent with that described in CIEEM 2022. Specific justification for exclusion of each of these ecological features is provided in **Appendix 12H (Tables 12H.1-2)**.

- 12.7.9 All ornithological features that are of sufficient geographical importance were then taken through to the next stage of the assessment.

Spatial Scope

- 12.7.10 Key to establishing which environmental changes may result in likely significant effects, is the determination of a Zol for each important ornithological feature identified. Zols differ depending on the type of environmental change (i.e., the change from the existing baseline) as a result of the Proposed Development and the ornithological feature being considered.
- 12.7.11 The most straightforward Zol to define is the area affected by land-take and direct land-cover changes associated with the Proposed Development. This Zol is the same for all affected ornithological features.
- 12.7.12 By contrast, for each environmental change that can extend beyond the area affected by land-take and land-cover change (e.g., increased noise associated with construction activities within the land-take area), the Zol may vary between ecological features, dependent upon their sensitivity to the change and the precise nature of the change. For example, a water vole might only be disturbed by noise generated close to its burrow, while nesting goshawk might be disturbed by noise generated at a much greater distance, and other species (e.g., many invertebrates) may be unaffected by changes in noise. In view of these complexities, the definition of the Zol that extends beyond the land-take area was based upon professional judgement informed as far as possible by a review of published evidence (e.g., disturbance criteria for various species) and discussions with the technical specialists who are working on other chapters of the EIA Report.
- 12.7.13 It should be noted that the avoidance of potentially significant effects through the design process are implicitly taken into account through the consideration of each Zol, as are standard construction practices that are commonplace. When scoping in or out ornithological features from further assessment, environmental measures (see Section 12.8) that are described within the Code of Practice for planning and development (BSI, 2013) and Good Practice during Wind Farm Construction (NatureScot, 2019) have been taken into account (e.g., appropriately scheduled vegetation removal etc.) and referenced in **Appendix 12H**.

Temporal Scope

- 12.7.14 In line with the general methodology of the EIA Report (outlined in **Chapter 4 – Approach to Preparing the EIA Report**), the temporal scope of the assessment of the Ornithology assessment covers the construction, operation and decommissioning periods.
- Construction of the Proposed Development would be completed over a period of approximately 18 months. Construction activities have been assumed to take place between 07:00 to 19:00 hours on weekdays (Monday to Friday) and 07:00 to 13:00 hours on Saturdays;
 - Operation of the Proposed Development is anticipated to be 35 years;
 - For the purposes of this EIA Report, it is assumed that above ground structures (wind turbines, kiosks, and control building/substation, battery storage) will be removed and

below ground infrastructure (e.g., transmission cables) will be left in situ. As with below ground infrastructure, the removal and disposal of access track and crane hardstanding materials would have a greater environmental impact than leaving in situ and it is therefore assumed these will remain for use by the landowner.

- 12.7.15 The environmental changes identified could occur during the construction phase, operational phase and decommissioning phases of the Proposed Development. The potential effects of the environmental changes are considered with respect to their duration, frequency, timing and reversibility for each scoped in ornithological feature.
- 12.7.16 Ornithological features that are scoped into the assessment from **Appendix 12H** (i.e., those of sufficient importance occurring within a relevant ZOI) are summarised in **Table 12.9**, along with a summary of the justification for inclusion. All ornithological features that were determined to be of negligible importance have been scoped out of the assessment (See **Section 12.7.6**). **Table 12.9** notes both the level of importance of an ornithological feature in the context of legislation and policy and the level of importance of the feature in the context of the Development Site. The rationale for this is that while peregrine, for example, may be considered to be of international importance, if it is a designated feature of Muirkirk and North Lowther Uplands SPA, the importance assigned to it as an ornithological feature within the context of the Development Site, if this species was only recorded once in flight over it, would be much reduced.
- 12.7.17 For each ornithological feature presented in **Table 12.9**, the potential environmental changes and potential significant effects resulting from the Proposed Development are provided. The full assessment for each scoped in ornithological feature can be found in **Sections 12.10-12.14**.

Table 12.9 Likely Effects, Zols and Justification for Scoped in Ornithological Features

Ornithological Feature	Importance – legislation and policy	Importance – Development Site	Environmental changes and likely significant effects	Zone of Influence	Relevant assessment criteria and scoped in justification
Goshawk	National	Regional	<p>Construction activity including use of plant and the presence of workforce resulting in an increase in aural and visual stimuli due to noise and movement of construction vehicles resulting in temporary disturbance or displacement of breeding goshawk.</p> <p>Potential disturbance and displacement of goshawk due to the operation of turbines and associated human activities for maintenance purposes.</p> <p>Potential collision with operational turbines.</p>	<p>Within 300-500 m of Proposed Development footprint (based on disturbance distance as described by Goodship and Furness, 2022).</p> <p>Within 300-500 m of Proposed Development footprint (based on disturbance distance as described by Goodship and Furness, 2022).</p> <p>Within 500 m of the Proposed Development boundary (based on guidance in NatureScot 2017 V.2).</p>	<p>Exact locations of breeding birds are unknown as access was unavailable to these areas.</p> <p>Although effects during the operational phase would be less than that experienced during the construction phase, goshawk may still be disturbed during this phase.</p> <p>Flight activity indicates that there is potential for significant effects to occur on the regional population.</p>

12.8 Environmental Measures Embedded into the Development Proposals

12.8.1 A range of environmental measures have been embedded into the Proposed Development as outlined in **Chapter 3 – Description of the Proposed Development** of the EIA Report. **Table 12.10** outlines how these embedded measures would influence the ornithology assessment.

Table 12.10 Summary of the Embedded Environmental Measures and how these Influence the Assessment

Ornithological Feature	Changes and Effects	Embedded measures and influence on assessment
Breeding bird species	Construction and decommissioning disturbance	<p>The following measures would be incorporated into the Proposed Development to minimise construction effects to breeding bird species:</p> <ol style="list-style-type: none"> 1. As part of an overarching Construction Environmental Management Plan ('CEMP'), a Breeding Bird Protection Plan ('BBPP') would be developed in consultation with the relevant consultees in advance of construction works commencing. Construction Method Statements ('CMSs') would be developed to detail the mitigation approach for all bird receptors. These would cover the Proposed Development and receptor specific requirements of the embedded mitigation as outlined in the remainder of this table. 2. Site supervision would be provided by a suitably experienced Environmental Clerk of Works ('ECoW'), who would be responsible for ensuring the successful implementation of embedded measures, including pollution prevention, monitoring of buffers around construction areas and reference to areas of high ecological sensitivity, and adherence to current construction best practice. 3. Pre-construction verification check surveys would be undertaken for all protected bird species where potential significant effects or legal breaches could occur otherwise. 4. Implementation of species-specific buffers detailed in the BBPP between construction areas and active nests/'winter' roosts or development of method statements outlining solutions to allow works to continue within buffer areas where appropriate. For example, in some cases, there may be a requirement to install suitable screening around working areas to allow it to continue within a buffer area. An ornithologist may be required to monitor the nesting birds during the working phase in certain areas and halt any significantly disturbing activities in consultation with the ECoW. 5. An emergency procedure would be implemented by site workers if a nest of a breeding bird is encountered. The ECoW would inspect the Development site and define appropriate measures (if required). 6. It is expected that these measures would be incorporated into a CEMP which would be specified by Planning Condition.

Ornithological Feature	Changes and Effects	Embedded measures and influence on assessment
	Operational disturbance	Mitigation would be expected to be of a similar nature to construction where impacts and thus effects could occur, but proportionally reduced in scale as less likely to occur.
	Changes to surface hydrology	A construction area stand-off of at least 50 m has been applied to all watercourses and water bodies (except for watercourse crossings). All watercourse crossings would be designed in accordance with the SEPA Good Practice Guide for the Construction of River Crossings (2010) and, where culverts are required, have been designed in accordance with the CIRIA Culvert Design and Operation Guide (2010).
	Pollution incidents	A Pollution Prevention Plan ('PPP') and Pollution Incident Response Plan ('PIRP') would be prepared and subject to consultation with SEPA and NatureScot in advance of any construction activities and implemented as part of the overall CEMP. This would set out site management and working practices and draw heavily upon SEPA's Pollution Prevention and Control Guidelines ('PPGs').

12.9 Assessment Methodology

Introduction

- 12.9.1 The generic project-wide approach to the assessment methodology is set out in **Chapter 4 – Approach to Preparing the EIA Report**, and specifically in **Section 4.5**. However, whilst this has informed the approach that has been used in this ornithology assessment, it is necessary to align with the standard industry guidance provided by CIEEM (2022).
- 12.9.2 The assessment has been based upon not only the results of the desk study and field surveys, but also relevant published information (for example on the status, distribution, sensitivity to environmental changes and ecology of the ornithological features scoped into the assessment, where this information is available), and professional knowledge of ecological processes and functions.
- 12.9.3 For the scoped-in ornithological feature (goshawk), effects were assessed against the current baseline conditions during construction, operation and decommissioning.
- 12.9.4 The initial results of the assessment regarding potentially significant effects were used to inform whether additional baseline data collection is required, together with the identification of environmental measures that should be embedded into the Proposed Development to avoid or reduce adverse effects or to deliver enhancements (see **Section 12.8**). The results of the assessment, as set out in **Section 12.10**, therefore reflect the final scheme design (i.e., incorporating the environmental measures described in **Section 12.8** and **Table 12.10**).
- 12.9.5 The spatial extent of the assessment (see **Table 12.9**) reflects the area occupied by the ornithological feature that is being assessed (goshawk) and, as a minimum, the ZoI of the changes that are likely to affect this species.
- 12.9.6 For species that occur within the ZoI, the assessment has considered the total area that is used by the affected individuals or the local population of the species (e.g., for foraging or as breeding territories).

Significance of Effects Evaluation Methodology

Overview

- 12.9.7 CIEEM (2022) defines a significant effect as one “that either supports or undermines biodiversity conservation objectives for ‘important ecological features’ or for biodiversity in general”.
- 12.9.8 When considering potentially significant effects on ornithological features, whether these be adverse or beneficial, the following characteristics of environmental change are taken into account⁶⁷:
- Extent – the spatial or geographical area over which the environmental change may occur;
 - Magnitude – the size, amount, intensity or volume of the environmental change;
 - Duration – the length of time over which the environmental change may occur;
 - Frequency – the number of times the environmental change may occur;
 - Timing – the periods of the day/year etc. during which an environmental change may occur; and
 - Reversibility – whether the environmental change can be reversed through restoration actions.

Magnitude of Change

- 12.9.9 Although the characteristics described above are all important in assessing effects by using information about the way in which habitats and species are likely to be affected, a scale for the magnitude of the environmental change as a result of the Proposed Development has been described in **Table 12.11**. This is to provide an understanding of the relative change from the baseline position, be that adverse or beneficial change.

Table 12.11 Guidelines for the Assessment of the Scale of Magnitude

Scale of change	Criteria and resultant effect
High	The change permanently (or over the long-term) affects the conservation status of a habitat/species, reducing or increasing the ability to sustain the habitat or the population level of the species within a given geographic area. Relative to the wider habitat resource/species population, a large area of habitat or large proportion of the wider species population is affected. For designated sites, integrity is compromised. There may be a change in the level of importance of the receptor in the context of the project.
Medium	Relative to the wider habitat resource/species population, a small-medium area of habitat or small-medium proportion of the wider species population is affected. There may be a change in the level of importance of this receptor in the context of the project.
Low	The quality or extent of designated sites or habitats or the sizes of species’ populations, experience some small-scale reduction or increase. These changes are likely to be within the range of natural variability and they are not expected to result in any permanent change

⁶⁷ The definitions of the characteristics of environmental change are based on the descriptions provided in CIEEM (2022). Other chapters in this ES may use some of the same terms albeit with a different definition.

Scale of change	Criteria and resultant effect
	in the conservation status of the species/habitat or integrity of the designated site. The change is unlikely to modify the evaluation of the receptor in terms of its importance.
Very Low	Although there may be some effects on individuals or parts of a habitat area or designated site, the quality or extent of sites and habitats, or the size of species populations, means that they would experience little or no change. Any changes are also likely to be within the range of natural variability and there would be no short-term or long-term change to conservation status of habitats/species receptors or the integrity of designated sites.
Neutral	A change, the level of which is so low, that it is not discernible on designated sites or habitats or the size of species' populations.

Determining Significance of Effects - Adverse and Beneficial

- 12.9.10 Adverse effects are assessed as being significant if the favourable conservation status of an ecological feature would be lost as a result of the Proposed Development. Beneficial effects are assessed as those where a resulting change from baseline improves the quality of the environment (e.g., increases species diversity, increases the extent of a particular habitat etc., or halts or slows down an existing decline). For a beneficial effect to be considered significant, the conservation status would need to positively increase in line with a magnitude of change of “high” as described in **Table 12.11**.
- 12.9.11 Conservation status is defined as follows (as per CIEEM 2022):
- *“For habitats, conservation status is determined by the sum of the influences acting on the habitat that may affect its extent, structure and functions as well as its distribution and typical species within a given geographical area;*
 - *For species, conservation status is determined by the sum of influences acting on the species concerned that may affect its abundance and distribution within a given geographical area”.*
- 12.9.12 NatureScot (2018a) details that a species’ conservation status is favourable when:
- Population dynamics indicate that the species is maintaining itself on a long-term basis and is therefore likely to persist in the habitat it occupies;
 - 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 will probably continue to be) a sufficiently large habitat to maintain its populations on a long-term basis.
- 12.9.13 NatureScot (2018a) recommends that the concept of maintaining a favourable conservation status of a species should be applied at the level of its Scottish population, to determine whether an impact is sufficiently significant to be of concern. This is a test which maintains compatibility with the aims of UK legislation and Government policy.
- 12.9.14 Nonetheless, developments should be assessed, alone or in combination, at a regional (or analogous scale) for their impacts on a species population size, trend and range. An adverse impact on a species at a regional scale (e.g., East Ayrshire) may adversely affect its national (Scotland) conservation status (for example where a specific region holds the majority of the national population). For wind farms which do not have an impact on designated sites, NatureScot (2018a) highlights the relevance of the Natural Heritage Zone (‘NHZ’) as the basis for the geographical range selection, the boundaries of which

have been drawn to reflect biogeographical differences between different zones, with a high level of environmental coherence within each zone. The Proposed Development is within NHZ 19 (Western Southern Uplands and Inner Solway).

- 12.9.15 NHZ-level population estimates for a number of breeding bird populations and a number of estimates for key wintering waterfowl populations are available (Wilson *et al.*, 2015).
- 12.9.16 In some cases, such as wintering goose and swan populations that are highly mobile, it may be necessary to undertake assessment at a much broader scale such as that of the entire Scottish population. Passage migrants and some wintering populations may show high levels of movement within the non-breeding season, and it is therefore difficult to define coherent regional populations with any confidence. This would be especially true where there is substantial site-based turnover in species' populations.
- 12.9.17 Alternative geographical areas to NHZs may be acceptable as the basis for assessment where there are definable regional or biogeographical populations that do not conform to NHZ boundaries (for example the distinct regional populations of red kites in Scotland). For some migratory species, patterns of migration may determine the spatial scale at which impacts should be considered, e.g., corncrakes migrate up the west coast of Ireland and Scotland and any impacts during migration would be likely to affect the population as a whole. In considering a species' distribution, it is important to consider its distribution across its range.
- 12.9.18 Regional populations may be of particular importance to a species' conservation status at a national or international population because:
- They are core or 'stronghold' areas, and the overall viability of the population is dependent on the maintenance of such areas; or
 - They are 'edge of range' populations, which may (over time) be important in maintaining range as well as providing the potential for expansion or range shift.
- 12.9.19 For example, the Scottish golden eagle population encompasses areas that can be considered to be core and edge populations. The 'golden eagle framework' indicates the variation in vulnerability of the golden eagle in both core and edge of range areas to additional impacts, such as those from wind farms, across Scotland.
- 12.9.20 The decision as to whether the conservation status of an ornithological feature would alter has been made using professional judgement, drawing upon the information produced through the desk study, field survey and assessment of how each assessed feature is likely to be affected by the Proposed Development, by:
- Preventing a recovering species from reaching favourable conservation status, at a national or international level; or
 - Changing a species' status from favourable to unfavourable; or
 - For a species that is already in decline, the assessment should focus on whether the proposal would undermine the potential for halting its decline and allowing it to recover to favourable conservation status.
- 12.9.21 A similar approach is used where designated sites may be affected by the Proposed Development, except that the focus is on the effects on the integrity of each site; defined as:
- "The coherent sum of the site's ecological structure, function and ecological processes, across its whole area, which enables it to sustain the habitats, complex of habitats and/or populations of species for which the site is designated."*

- 12.9.22 The assessment of effects on integrity draws upon the assessment of effects on the conservation status of the features for which the site has been designated. Where these features are not clearly defined, which is often the case for non-statutory biodiversity sites, it is necessary to use professional judgement to identify the interest features or obtain additional information about these from NatureScot, Scottish Wildlife Trust or the Council responsible for identifying these sites, so that sufficient information on which to base an assessment is available.
- 12.9.23 The EIA Report should set out the consequences for the integrity of the species' population in terms of its size, trend, distribution (where known) and the area of suitable habitat.

12.10 Assessment of Effects: Goshawk

Baseline Conditions

Desk Study

- 12.10.1 Goshawk is listed in Schedule 1 of the Wildlife & Countryside Act 1981 (as amended) and is a Green listed BoCC (Stanbury *et al.*, 2021).
- 12.10.2 The Scottish population of goshawk was estimated to be 279 breeding pairs in 2020 (Eaton *et al.*, 2022), with 31 pairs in the Western Southern Uplands and Inner Solway NHZ (Wilson *et al.*, 2015). Woodward *et al* (2020) provides a UK population estimate of 620 pairs in the UK, although it is thought to represent an underestimate and that the actual UK population is more than 1,300 pairs (Eaton *et al.*, 2022).
- 12.10.3 The RSG provided no known goshawk breeding sites within a 2 km search area of the Development Site, with the nearest known nest over 10 km from the Proposed Development. The RSPB also provided no breeding goshawk records within a 2 km search area of the Development Site.

Field Surveys

- 12.10.4 Field surveys were carried out from March 2016 to August 2018, and full details are provided in **Appendices 12A-E** and **Confidential Appendices 12F-G**.

March to August 2016

- 12.10.5 No goshawk flights were recorded during the flight activity surveys between March and August 2016 and no breeding attempts were recorded within the Development Site survey area. There was a single incidental record of a female flushed from Chang Hill (c. 1.5 km northwest of the Development Site) on 07 July.

September 2016 to January 2017

- 12.10.6 No goshawk flights were recorded during the flight activity surveys between September 2016 and January 2017.

February to July 2017

- 12.10.7 Three goshawk flights were recorded during the flight activity surveys, all pertaining to the same individual female on 23 March. A total of 901 seconds of flight time was recorded at 30-130m height, with a further 58 seconds of flight time spent at <30m height.

November 2017 to January 2018

- 12.10.8 No goshawk flights were recorded during the flight activity surveys between November 2017 and January 2018.

February to August 2018

- 12.10.9 Eight goshawk flights were recorded during the flight activity surveys. Flights were recorded from late February to late May, with both male and female individuals recorded (therefore a minimum of two individuals were involved). A total of 310 seconds of flight time was recorded at 30-150m height, with a further 46 seconds of flight time spent at <30m height and 120 seconds of flight time spent at >150m height; and a total of 48 seconds of flight time was recorded at 10-150m height, with a further 42 seconds of flight time spent at <10m height⁶⁸.
- 12.10.10 There were two territories / possible breeding attempts recorded within the Development Site survey area, although productivity of these attempts was not ascertained due to a lack of access.
- 12.10.11 There were also incidental goshawk records: a male in flight recorded out-with the viewshed of Vantage Point A on 26 March; a female recorded in-flight out-with the Development Site on 12 April; and an immature recorded in-flight over the Development Site on 26 April.

Summary of Flight Activity

- 12.10.12 **Table 12.12** presents a summary of flight activity recorded within the Collision Risk Zone (CRZ⁶⁹) during VP surveys.

Table 12.12 Goshawk: VP Flight Activity Data

Season	Total Number Flights	Total Seconds Below PCH*	Total Seconds at PCH	Total Seconds Above PCH
Breeding (April to August 2016)	0	n/a	n/a	n/a
Non-breeding (September 2016 to March 2017)	2	58	687	0
Non-breeding (November 2017 to March 2018)	4	31	195	120
Breeding (April to August 2018)	1	42	41	0

* PCH refers to Potential Collision Height – this was measured at 30-130m in 2016 breeding and 2016/17 non-breeding seasons; and 30-150m in 2017/18 non-breeding and 2018 breeding seasons.

- 12.10.13 Note that the figures presented in **Table 12.12** relate to the survey period that activity was recorded in whilst those presented in **Appendix 12I Table 12I.4** relate to the species-specific breeding seasons defined within Hardey *et al.*, (2013).

⁶⁸ Recording parameters were amended mid-way through this period due to changes in potential turbine parameters.

⁶⁹ The collision risk zone (CRZ) is defined as the wind farm polygon, taken as the perimeter of the Development Site Boundary plus a 500 m buffer. NatureScot guidance currently recommends a 500 m buffer to allow for observer inaccuracies when mapping flights during surveys (NatureScot, 2017b).

Future Baseline

- 12.10.14 In the absence of development, the goshawk breeding population in the region is reasonably expected to continue to increase in the short term before plateauing at an increased population.

Predicted Effects and their Significance

- 12.10.15 Two goshawk territories potentially fall within the Zol (500 m), although no access was permitted to search for any nest sites. This is equivalent to 6.5% of the NHZ population (Wilson *et al.*, 2015); 0.7% of the national population (Eaton *et al.*, 2022); and 0.2-0.3% of the estimated UK population (Eaton *et al.*, 2022).
- 12.10.16 At less than 1% of the national population, two territories are not considered to be of national importance though at 6.5% of the NHZ population, goshawk are assessed as being of regional importance for the purpose of this assessment.

Construction and Decommissioning Disturbance

- 12.10.17 Construction and decommissioning related disturbance/displacement effects to goshawk within the Zol would be temporary and sporadic and in light of the embedded measures outlined in **Table 12.10**, the magnitude of change to the NHZ goshawk population is considered to be low, and the resultant adverse effect on the species conservation status is **not significant**.

Operational Disturbance

- 12.10.18 In light of the embedded measures outlined in **Table 12.10**, operational related disturbance and displacement effects to goshawk within the Zol would be of low magnitude of change. The magnitude of change to the NHZ goshawk population is therefore considered to be very low and effects would be **not significant**. There would be **no adverse significant effects** on the favourable conservation status of goshawk as a result of operational disturbance.

Potential Collision with Operational Turbines

- 12.10.19 The CRM (**Appendix 8J**) calculated an annual CRM of 0.03 (which included all flights from VP surveys within CRZ at PCH) representing 0.05% of the NHZ population of 31 pairs⁷⁰. Assuming an operational life of 35 years, this would result in 1.05 collisions over this period (or one collision every ~33 years) and the magnitude of change is considered to be low. Therefore, it is anticipated that there would be **no adverse significant effects** on the NHZ population with respect to potential collision with operational turbines.

Summary of Effects on Goshawk

- 12.10.20 Given the short-term low level change during construction, the short-term low-level change during operation, and temporary low level change during decommissioning, the overall magnitude of change on goshawk is considered to be adverse and low, and the resultant effect on its conservation status is **Not Significant**.

⁷⁰ This considers the 'worst case scenario' using 2017 flight data. If 2018 flight data was modelled, this provides an annual collision related death rate of 0.003 birds per year (0.005% of the NHZ population).

12.11 Assessment Summary

- 12.11.1 A summary of the assessment is provided in **Table 12.13**. This deals in an integrated way, with the effects of all phases of the Proposed Development. Potential effects are considered together as the assessment focuses on the favourable conservation status of goshawk and as such, is assessed throughout the lifespan of the Proposed Development. Often, changes to a feature would occur during several stages of the Proposed Development and the resultant effect may reverse during different phases. For example, during construction a local population may decline as a result of disturbance, however, this effect may be reversed during operation.

Table 12.13 Summary of Significance of Adverse Effects

Ecological feature	Summary of predicted effects	Importance of Ornithological Feature ¹	Magnitude of change ²	Significance ³	Summary rationale
Goshawk: breeding	Construction and decommissioning disturbance	Regional	Low	Not significant	Two breeding pairs of goshawk fall within the Zol and this is equivalent to 0.7% of the national population and 6.5% of the regional ('NHZ') population (therefore considered Regionally Important). Construction and decommissioning related disturbance/displacement effects to goshawk within the Zol would be temporary and sporadic and in light of the embedded measures, would be of low magnitude. Furthermore, there may be no pairs present during the construction phase if alternate sites are used within their respective territories. Additionally, the extent of available habitat within the local area that would remain undisturbed during construction and decommissioning would offer any potential prospective breeding pairs alternative habitats. The magnitude of change to the national goshawk breeding population is therefore considered to be low, and the resultant effect on the species favourable conservation status is not significant.
	Operational disturbance	Regional	Very low	Not significant	Disturbance effects during the operational phase are generally considered to be less than that experienced during the construction phase. In light of the embedded measures, operational related disturbance/displacement effects to breeding goshawk within the Zol are considered to be of very low magnitude. Therefore, the resultant effect on the species favourable conservation status is not significant.
	Potential collision with operational turbines	Regional	Low	Not significant	The levels of flight activity recorded from VP surveys resulted in a theoretical annual collision rate of 0.03 per year (based on greatest period of flight activity in 2017)) and this equates to 0.05% of the NHZ population. Assuming an operational life of 35 years, this would result in 1.05 collisions over this period (or ~33years for one collision) and the magnitude of change is considered to be low. The resultant effect on the species' favourable conservation status would be not significant.

1. The importance of the feature is defined as per **Table 12.9, Section 12.7**, using the criteria set out in **Table 12.8**, and method in **Section 12.7**.

2. The magnitude of change on a receptor resulting from activities relating to the development is defined using the criteria set out in **Section 12.9**, and **Table 12.13** above and is defined as neutral, very low, low, medium, and high.

3. The significance of the environmental effects are either significant or not significant subject to the evaluation methodology outlined in **Section 12.9**.

12.12 Assessment of Cumulative Effects

- 12.12.1 As outlined in **Section 4.8**, consideration has been given as to whether any of the ornithological features that have been taken forward for assessment in this chapter are likely to be subject to cumulative effects in combination with other developments.
- 12.12.2 Significant effects may not occur when considering the Proposed Development in isolation, but in combination with other developments, cumulative effects may be significant. The context in which cumulative effects are considered depends upon the ecology of the species or habitat in question. The need to consider cumulative effects is a requirement of the EIA process, as specified by the EIA Regulations.
- 12.12.3 Specific guidance has also been provided for assessment of cumulative impacts of onshore wind farms on bird populations (NatureScot, 2018b). Projects to be included in such an assessment must include existing projects as well as those consented but not yet built⁷¹.
- 12.12.4 In order to undertake a cumulative impact assessment, it is necessary to define:
- The ornithological features affected by the Proposed Development that may be subject to significant cumulative effects in combination with other projects; and
 - The relevant projects for which cumulative effects must be considered.
- 12.12.5 Upon defining these, a cumulative impact assessment is undertaken by drawing on the assessment of effects for ornithological features affected by the Proposed Development that are also considered in the EIA of other projects. This cumulative assessment considers all wind farms in the NHZ that are operational, consented but not yet built or at the application stage.
- 12.12.6 The purpose of the cumulative impact assessment is to determine whether effects are likely to affect the Favourable Conservation Status of an ornithological feature. Where the species is associated with an SPA or other designated site, effects are assessed in context with this population or area. Where species are not associated with an SPA, effects are assessed in a regional context, this being NHZ 19 in the case of the Proposed Development.
- 12.12.7 The only effects with potential for cumulative impacts were those associated with flight activity and corresponding risk of collisions with turbines. Therefore, the only receptor taken forward for cumulative assessment is the NHZ goshawk population.
- 12.12.8 In respect of collision risk, the theoretical collision rates per year of the wind farms within the NHZ that are operational or consented but not yet built and those that are still at the application stage are presented in **Table 12.14**.

Table 12.14 30-year Cumulative Assessment: NHZ Goshawk (deaths per year)

Wind Farm	Status	No. of turbines	No. of predicted theoretical collision related deaths per year*
Afton	Operational	27	0
Airies	Consented	14	0.054

⁷¹ Sites in Scoping are not included.

Wind Farm	Status	No. of turbines	No. of predicted theoretical collision related deaths per year*
Andershaw	Operational	11	0
Arecleoch	Operational	60	No information available.
Artfield Fell	Operational	15	No information available.
Auchrobert	Operational	12	0
Balmurrie Fell (Artfield Fell Extension)	Operational	7	No information available.
Bankend Rig	Operational	11	0
Bankend Rig II	Consented	3	Scoped out of assessment due to limited activity recorded.
Barlockhart Moor	Operational	4	No information available.
Barlockhart Moor Extension	Consented	4	No information available.
Benbrack	Consented	18	0.2
Blackcraig	Consented	23	0
Broken Cross (2T)	Consented	2	Species not raised as a significant concern.
Broken Cross (10T)	Consented	10	0
Calder Water	Operational	13	0
Carscreugh	Operational	18	0
Chapelton Farm	Operational	3	No information available.
Clyde	Operational	152	0
Clyde Extension	Operational	54	0
Cornharrow	Consented	8	0.118
Crookedstane	Consented	4	0
Cumberhead	Under Construction	14	0.118
Cumberhead West	Consented	21	Negligible effects predicted.
Dalquhandy	Under Construction	15	No residual effects predicted.
Dalswinton	Operational	15	Two historic breeding records nearby. Not raised as a particular concern.
Dersalloch	Operational	23	0

Wind Farm	Status	No. of turbines	No. of predicted theoretical collision related deaths per year*
Douglas West	Operational	13	No residual effects predicted.
Douglas West Extension	Consented	13	Negligible effects predicted.
Draffanmarshill Farm	Operational	2	0
Dungavel Hill	Operational	13	0.044
Enoch Hill	Consented	16	0.03
Fell	Consented	9	Negligible collision risk.
Galawhistle	Operational	22	0-0.125
Gass	Lapsed Consent	9	0
Glen App	Consented	11	No information available.
Glenchamber	Consented	11	0
Glenkerie Extension	Consented	6	0
Glenmuckloch	Consented	8	Negligible effects predicted.
Glenshimmeroch	Consented	10	Negligible effects predicted.
Hagshaw Hill Extension	Operational	20	No information available.
Hagshaw Hill Repowering	Consented	14	0
Hare Craig	Consented	8	0
Hare Hill	Operational	20	0
Hare Hill Extension	Operational	35	Scoped out.
Harestanes / Forest of Ae	Operational	68	Limited information available, but some adverse effects identified that required planning conditions to ensure appropriate mitigation. Goshawk use of the site has continued during monitoring.
High Park Farm	Operational	1	No significant concerns identified.
Hill of Eastertown (Mackies)	Operational	3	No information available.
Irvine (GSK)	Operational	2	0
Kennoxhead	Under Construction	19	0
Kennoxhead Extension	Consented	8	Minor residual effects on one possible territory from disturbance and displacement.

Wind Farm	Status	No. of turbines	No. of predicted theoretical collision related deaths per year*
Kilgallioch (Arecleoch Phase 2)	Operational	96	0-0.005
Kirk Kill	Consented	8	0.5 / year (over 25 years).
Knockman Hill	Consented	5	0
Knockshinnoch	Consented	2	No information available.
Kype Muir	Operational	26	0
Kype Muir Extension	Operational	15	Scoped out due to limited presence.
Ladehead Farm	Operational	3	Limited information available but appears not to have been raised as a significant concern.
Lethans	Consented	22	0.15
Lion Hill	Consented	4	0
Lochhead Cluster	Operational	5	Considered low risk for raptors. No adverse impacts predicted.
Lorg	Consented	9	Negligible residual effects predicted.
Margree	Consented	17	0
Mark Hill	Operational	28	Limited information but appears not to have been raised as a significant concern.
Middle Muir	Operational	15	0
Minnycap	Operational	10	No adverse effect.
Mochrum Fell	Consented	8	0.04-0.16 / year (over 25 years).
Myres Hill	Operational	2	Limited information but appears not to have been raised as a concern.
North Kyle	Consented	54	<0.11 / year (over 25 years).
Nutberry	Operational	6	0
Overhill	Consented	10	Negligible residual effects predicted.
Penbreck	Consented	9	0
Pencloe	Consented	19	0
Plascow	Operational	3	No adverse effects noted.
Polquhairn	Consented	10	No information available.
Poniel	Consented	3	0

Wind Farm	Status	No. of turbines	No. of predicted theoretical collision related deaths per year*
Rigmuir	Consented	3	Limited information but does not appear to be of any concern.
Sandy Knowe	Operational	24	0
Sanquhar	Operational	9	0
Sanquhar Six	Consented	6	Low impacts during construction and operation.
Solwaybank	Consented	15	0.024
Sneddon Law	Under Construction	15	0.048
South Kyle	Under Construction	50	0.01
Stranoch	Consented	24	0
Stranoch 2	Consented	20	0.00063
Sunnyside	Operational	2	0
Torrs Hill	Consented	2	0
Troston Loch	Consented	14	0.14
Twentyshilling Hill	Operational	9	0
West Browncastle	Operational	12	0
Wether Hill	Operational	14	0
Whitelaw Brae	Consented	14	Scoped out due to limited breeding suitability and presence.
Whitelee	Operational	144	No information available.
Whitelee Extension 1	Operational	36	Limited information, but no significant concern appears to have been raised.
Whitelee Extension 2	Operational	39	Limited information, but no significant concern raised.
Whiteside Hill	Operational	10	0
Windy Rig	Operational	12	Negligible effects predicted.
Brockloch Rig	Operational	36	No adverse effects anticipated.
Brockloch Rig Extension	Consented	30	0
Brockloch Rig Phase III	Consented	20	0
Sub-total			1.8 collision related deaths per year

Wind Farm	Status	No. of turbines	No. of predicted theoretical collision related deaths per year*
Blackwood	Application	5	Negligible residual effects predicted.
Chalmerston (Burnhead)	Application	-	No information available.
Carrick	Application	13	0
Clauchrie	Application	18	Minor adverse effect from displacement.
Cornharrow Variation	Application	7	No collision-related deaths predicted in comparison with main application.
Craiginmoddie	Application	14	0
Daer	Application	17	Minimal to no effects predicted.
Euchanhead	Application	21	Negligible residual effects predicted.
Fell Variation	Application	9	Only one flight recorded; negligible collision risk.
Grayside	Application	21	Scoped out due to limited presence and collision risk, and lack of breeding.
Greenburn	Application	16	Scoped out of CRM.
Hallsburn Farm	Application	3	No information available.
Harestanes South Extension	Application	8	Negligible collision impacts.
High Dykes Farm	Application	2	No information available.
Knockcronal	Application	9	Limited activity. Scoped out.
Knockkippen	Application	12	Scoped out due to limited presence and collision risk, and lack of breeding.
Loch Urr	Application	-	Limited information, but no significant concern raised.
Low Drumclog	Application	3	Very minimal risk due to limited presence.
Lorg Variation	Application	15	0.044
Mill Rig	Application	6	Species recorded on only few occasions.
Mochrum Fell Variation	Application	9	Negligible collision impacts.
Overhill Variation	Application	10	Negligible collision impacts.
Penbreck Variation	Application	8	Negligible collision impacts.
Sandy Knowe Extension	Application	6	0
Sanquhar II	Application	50	Negligible collision impacts.

Wind Farm	Status	No. of turbines	No. of predicted theoretical collision related deaths per year*
Scienteuch/Keirs Hill Windfarm	Application	9	0.18
Scoop Hill	Application	75	0
Shepherd's Rig	Application	19	0.018
Brockloch Rig Repower	Application	8	Negligible collision impacts.
Total			2.1 collision related deaths per year

12.12.9 The cumulative number of annual theoretical collisions for goshawk is approximately 2.1 individuals based on operational and consented schemes. The figure is a minimum number given the lack of information from some sites and constitutes 3.4% of the NHZ population. Background mortality for this species within the NHZ is 6.2-10.5 individuals per year (considering adult survival⁷²) and despite the increase in the number of operational turbines, the goshawk population has continued to increase in the NHZ. It is therefore considered that the resultant adverse cumulative effect on the favourable conservation status of the goshawk NHZ population would be not significant.

12.12.10 In summary, there are no likely significant adverse cumulative effects in combination with the above schemes.

12.13 Consideration of Optional Additional Mitigation or Compensation

12.13.1 The Proposed Development is relatively small scale, and no significant impacts are predicted on any scoped in receptors. The population of goshawk in the NHZ is increasing and nest sites would change in the medium to long term as trees mature and are subsequently lost naturally or as a result of commercial felling. As such, no bird specific mitigation or compensation is proposed.

12.14 Conclusions of Significance Evaluation

12.14.1 An assessment has been made of the likely effects of the Proposed Development during the construction, operation and decommissioning stages. No significant effects are predicted for ornithological features scoped into this assessment (goshawk), in terms of the EIA Regulations.

12.14.2 It is concluded that provided good practice is followed to avoid disturbance to breeding birds, including the use of exclusion zones during construction and avoiding damage or destruction of occupied nests, significant effects on any ornithological feature are unlikely.

⁷² The goshawk adult mortality rate is 10-17%; and juvenile (up to age 2) mortality rate is 60% (BTO Bird Facts, 2022 (<https://www.bto.org/understanding-birds/birdfacts/goshawk> accessed on 24/02/2022)).

Implementation of Environmental Measures

12.14.3 **Table 12.15** describes the Environmental Measures relevant to ornithology which are embedded within the Proposed Development and the mechanism by which they would be implemented and who is responsible for their implementation.

Table 12.15 Summary of Environmental Measures Relevant to Ornithology

Environmental measure	Responsibility for implementation	Compliance mechanism
Construction Phase		
Preparation of Construction Environmental Management Plan (CEMP)	Developer	Planning condition
Preparation of Species Protection Plans (including bird protection plan)	Developer	Planning condition
Toolbox talks	Construction Manager and ECoW.	Set out in the CEMP to be required by planning condition.
Pre-construction surveys to be set out in an Ornithological Monitoring Plan and implemented	Developer/Contractor	Planning condition
Operational Phase		
All maintenance working areas would be clearly defined and checked for breeding birds before works undertaken.	Developer and ECoW	Planning condition
Decommissioning Phase		
Preparation of a Restoration and Decommissioning Plan	Developer	Planning condition