

# **Harestanes West**

# **Windfarm**

**Environmental Impact Assessment  
Report**

**Volume 2**

**Chapter 8: Ecology & Biodiversity**

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# Abbreviations

<b>BDS</b>	Background Data Search
<b>BPpH</b>	Bat Passes per Hour
<b>HMP</b>	Habitat Management Plan
<b>EcIA</b>	Ecological Impact Assessment
<b>LBAP</b>	Local Biodiversity Action Plan
<b>KEFs</b>	Key Ecological Features
<b>NDSFB</b>	North District Salmon Fishery Board
<b>NNR</b>	National Nature Reserve
<b>NVC</b>	National Vegetation Classification
<b>NWSS</b>	Native Woodland Survey of Scotland
<b>SAC</b>	Special Area of Conservation
<b>SBL</b>	Scottish Biodiversity List
<b>SFCC</b>	Scottish Fisheries Coordination Centre
<b>SPA</b>	Special Protection Area
<b>SSSI</b>	Site of Special Scientific Interest
<b>UK Habs</b>	UK Habitats
<b>WHPT</b>	Walley Hawkes Paisley Trigg index

## 8. Ecology and Biodiversity

### 8.1. Executive Summary

1. Harestanes West Windfarm (hereafter ‘the proposed Development’) has been assessed in relation to the potential impacts on ecology and biodiversity during the construction and operational phases. A desk-study was undertaken to inform the assessment as well as detailed surveys of the Site, including habitat and protected species surveys.
2. The assessment considered the sensitivity of the receptors, their proximity to the Application Boundary and any embedded mitigation measures which have been incorporated into the design of the proposed Development. Where particularly sensitive receptors were identified, additional mitigation procedures were outlined.
3. The results of ecological surveys were used to inform the design of the proposed Development. Sensitive habitats have been avoided as far as possible and mitigation measures have been put forward for bats based on the species and distribution of bats across the site over two years of surveying.
4. Upland dry heaths and lowland mixed deciduous woodland were the only habitats scoped into the assessment. Bats, fish and pine marten were the also scoped into the assessment. Of these, a significant effect in the absence of mitigation was identified for bats in relation to collision risk.
5. No significant residual effects are predicted to occur upon any important ecological feature as a result of the construction or operation of the proposed Development. Residual effects on bats remain but these are considered to be ‘**Not Significant**’.
6. An Outline Habitat Management Plan has been produced (**Technical Appendix 8.9**) which details proposals for habitat enhancement. A Bat Mitigation and Monitoring Plan (**Technical Appendix 8.10**) has also been produced which details mitigation and monitoring measures that will potentially significantly reduce negative impacts on bats.

### 8.2. Introduction

7. This Chapter of the Harestanes West Windfarm (hereafter the ‘proposed Development’) Environmental Impact Assessment (EIA) Report considers the potential effects on ecology that may arise from the proposed Development. The Chapter details the likely significant effects associated with the construction, operation and decommissioning of the proposed Development as described in **Chapter 3: Proposed Development**.
8. The objectives of this Chapter are to:
  - describe the assessment methodology and significance criteria used in completing the impact assessment;
  - describe the ecological baseline;
  - describe the potential effects, including direct, indirect and cumulative;
  - describe the mitigation measures proposed to address any likely significant effects; and

- assess the residual effects remaining following the implementation of mitigation.
9. A summary of designated sites, habitats and species within 2 km of the Application Boundary (20 km for bats) is provided as well as a summary of internationally designated sites within 10 km of the Application Boundary.
  10. The Chapter is supported by the following Figures presented in Volume 3a:
    - **Figure 8.1: Ecological Designated Sites;**
    - **Figure 8.2a-c: UK Habitats;**
    - **Figure 8.3: National Vegetation Classification;**
    - **Figure 8.4: Bat Static Detector Locations;**
    - **Figure 8.5: Bat Trees;**
    - **Figure 8.6: Protected Species; and**
    - **Figure 8.7: Electro-fishing Locations.**
  11. It is suggested that this Chapter is read in conjunction with the information provided in the following Technical Appendices in Volume 4:
    - **Technical Appendix 8.1: Habitats Report;**
    - **Technical Appendix 8.2: Protected Species Report;**
    - **Technical Appendix 8.3 Aquatic Ecology Report- Turbine Area;**
    - **Technical Appendix 8.4: Aquatic Ecology Report- Access Track;**
    - **Technical Appendix 8.5: Bat Report – Static Detector Surveys;**
    - **Technical Appendix 8.6: Bat Report – Tree Surveys;**
    - **Technical Appendix 8.7: Peatland Condition Assessment;**
    - **Technical Appendix 8.8: Marine Science Scotland Checklist;**
    - **Technical Appendix 8.9: Outline Habitat Management Plan; and**
    - **Technical Appendix 8.10: Bat Monitoring and Mitigation Plan.**
  12. This Chapter complements **Chapter 9: Ornithology** and **Chapter 10: Hydrology, Hydrogeology, Geology and Soils**. Note that in the interests of concision, information contained in other Chapters and appendices is not repeated herein unless essential for understanding and is instead cross referred to within this Chapter.
  13. An outline habitat management plan (HMP) (**Technical Appendix 8.9**) has been produced to implement positive land management for the benefit of biodiversity and nature conservation to compensate any adverse impacts on biodiversity that the windfarm may have. In addition to purely compensating against any adverse impacts, the HMP aims to enhance the ecological value of the Site and has taken the opportunity to provide not only compensation, but larger scale enhancement to provide wider benefits for nature and biodiversity. The HMP defines the aims and objectives of the habitat management measures that will be implemented to achieve this overall purpose. The focus of these



measures at the Site is the restoration of forested blanket bog habitat and native broadleaf planting.

14. Internationally designated sites are dealt with within **Chapter 9: Ornithology**, since those that are of relevance to the proposed Development are only pertinent to ornithology.

## 8.3. Legislation and Policy Context

### 8.3.1. Legislation

15. This assessment is carried out in accordance with the principles in the following legislation:
  - The Electricity Act 1989;
  - The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017;
  - Habitats Directive in relation to National Network Sites (Natura 2000) sites;
  - The Conservation (Natural Habitats, &c.) Regulations 1994 (as amended);
  - The Conservation of Habitats and Species Regulations 2017;
  - The Wildlife and Countryside Act 1981 (as amended);
  - The Nature Conservation (Scotland) Act 2004;
  - Wildlife and Natural Environment (Scotland) Act 2011;
  - The Protection of Badgers Act 1992;
  - The Salmon and Freshwater Fisheries (Consolidation) (Scotland) Act 2003; and
  - The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended).

### 8.3.2. Planning Policy

16. This assessment is carried out in accordance with the principles in the following Planning Policy documents:
  - National Planning Framework 4 (NPF4) 2023;
  - Dumfries and Galloway Local Development Plan 2 (LDP2); and
  - Scottish Government Planning Advice Note 60: Planning for Natural Heritage 2000, updated 2008.
17. NPF4 is the Scottish Government's national spatial strategy for Scotland which sets out spatial principles, regional priorities, national developments and national planning policy. This assessment is carried out in accordance with the principles contained in the following policies:
  - Policy 3 – “*Nature in Crisis*”, within the National Planning Framework 4 (NPF4, adopted 13 February 2023). This document superseded Scottish Planning Policy (SPP) and NPF3. Policy 3 outlines that development proposals for national or major, or for development that requires an EIA will only be supported 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 policy essentially intends to



protect biodiversity, reverse biodiversity loss, deliver positive effects from development and strengthen nature networks.

18. The Dumfries and Galloway Local Development Plan 2 (LDP2) was adopted in October 2019. The LDP2 outlines the Council's aims and provides guidance for all future development and land use within Dumfries and Galloway Council.
19. PAN 60 Planning for Natural Heritage (2000) provides developers with advice concerning the use of the EIA process to prevent negative impacts of development on ecology and biodiversity and the process of undergoing environmental assessments to identify and mitigate any identified adverse effects. The guidance also outlines the importance of consulting with the relevant planning authority and NatureScot (formally the Scottish Natural Heritage (SNH)).
20. Further detail of these planning policies is provided in **Chapter 4: Renewable Energy and Planning Policy**.

### 8.3.3. Guidance

21. This assessment is carried out in accordance with the following guidelines:
  - Scottish Government (2013) The Scottish Biodiversity List;
  - 'The Dumfries and Galloway Local Biodiversity Action Plan (LBAP) (2009);
  - General Pre-application/scoping advice to developers of onshore wind farms' (NatureScot, 2020a);
  - Chartered Institute of Ecology and Environmental Management (2018). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine, 3rd edition. CIEEM, Winchester;
  - Assessing the Cumulative Impact of Onshore Wind Energy Developments' (NatureScot, 2012);
  - 'Assessing the Cumulative Impact of Onshore Wind Energy Developments' (SNH, 2012);
  - 'Standing Advice for Planning Consultations. Protected Species: Otter' (NatureScot, 2020b);
  - 'Standing Advice for Planning Consultations. Protected Species: Badger' (NatureScot, 2020c);
  - 'Standing Advice for Planning Consultations. Protected Species: Pine Marten' (NatureScot, 2020d);
  - 'Standing Advice for Planning Consultations. Protected Species: Water Vole' (NatureScot, 2020e);
  - 'Standing Advice for Planning Consultations. Protected Species: Red Squirrel' (NatureScot, 2020f);
  - 'Standing Advice for Planning Consultations. Protected Species: Wildcat' (NatureScot, 2020g);





- Collins, J. (ed.) (2023) Bat Surveys for Professional Ecologists: Good Practice Guidelines (4th Edition). Bat Conservation Trust, London;
- Harris, S., and Yalden, D (2008) Mammals of the British Isles, Handbook (4th Edition). Mammal Society, Southampton;
- Forestry Commission Scotland, Scottish Environment Protection Agency, Scottish Natural Heritage and Condor (2018). Practice guide for forest managers to assess and protect Groundwater Dependent Terrestrial Ecosystems when preparing woodland creation proposals;
- NatureScot (2019, updated 2021) Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation;
- NatureScot (2024) Pre-application guidance for onshore wind farms;
- Scottish Government (2013) The Scottish Biodiversity List;
- Scottish Government (2000) Planning for Natural Heritage: Planning Advice Note 60;
- Scottish Environment Protection Agency (2017) Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems. Land Use Planning System SEPA Guidance Note 31;
- Scottish Environment Protection Agency (2019) The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended): A Practical Guide. Version 8.4; and
- Scottish Natural Heritage (2018) Environmental Assessment Impact Handbook. Guidance for competent authorities, consultation bodies, and others involved in the Environmental Impact Assessment process in Scotland. Version 5.

## 8.4. Consultation

22. A request for pre-application advice and EIA Scoping Opinion was submitted to the Energy Consents Unit (ECU) on 16 March 2023. Further details on scoping are provided in **Chapter 6: Scoping and Consultation**.
23. In addition, consultation with species specialist and biological recording groups was also undertaken to identify any existing ecological information for the Site (as defined by the Application Boundary) and the surrounding area.
24. In undertaking the assessment, consideration has been given to the scoping responses and other consultation undertaken, as detailed in **Table 8.1**.

*Table 8.1 Consultation summary*

Stakeholder/ Consultee and Date Received	Issues Raised	Actions Taken
<b>NatureScot (17 April 2023)</b>	<p>Pleased to see that the requirements of NPF4 in terms for biodiversity enhancement has been acknowledged.</p> <p>NatureScot expect a high standard of mitigation embedded in the proposal and a well-</p>	<p>A Habitat Management Plan (HMP) will be produced. An outline HMP is provided as part of this EIA in <b>Technical Appendix 8.9</b>.</p>

Stakeholder/ Consultee and Date Received	Issued Raised	Actions Taken
	<p>conceived Habitat Management Plan presented alongside the EIA that ensures this project has overall positive benefit to biodiversity.</p> <p>Referred applicant to NatureScot’s standing guidance: NatureScot (2024) Pre-application guidance for onshore wind farms.</p> <p>No further comments following the Gatecheck Report.</p>	<p>A Peatland Condition Assessment is included in <b>Technical Appendix 8.7</b></p>
<p><b>Galloway Fisheries Trust (11 April 2023)</b></p>	<p>Concern about the limited mention of fish in the scoping report, a baseline fish and aquatic invertebrate survey should be undertaken.</p> <p>Any new watercourse crossing must ensure fish access is protected.</p> <p>Wish to comment on any proposed Habitat Management Plans in future.</p> <p>No further comments following the Gatecheck Report.</p>	<p>Fish and aquatic invertebrate surveys were undertaken within the turbine area and along the access track.</p> <p>Protection measures are discussed within this Chapter (<b>Section 8.8</b>).</p> <p>Feedback on proposed Habitat Management proposals received from Galloway Fisheries Trust. The Outline Habitat Management Plan is provided in <b>Technical Appendix 8.9</b> for comment.</p>
<p><b>North District Salmon Fishery Board (NDSFB) and Nith DSFB (13 April 2023)</b></p>	<p>The site is located on the eastern edge of NDSFB’s jurisdiction, and it does include the water catchments of the Dollard Glen and Garroch Race, the Pennyland Moor and Dalswinton Common. These catchments should include fish/aquatic surveys to monitor for affects.</p> <p>Provided that the appropriate aquatic surveys described are undertaken NDSFB has no objection.</p> <p>NDSFB had no further comments to make in relation to this proposed development flowing the Gatecheck Report, additional to those which they made previously relating to the requirement to conduct the necessary monitoring surveys for fish, their habitats, and aquatic invertebrates in watercourses within the river Nith catchment.</p>	<p>Aquatic monitoring programme to be devised and submitted for approval prior to construction. A brief summary is provided in <b>Technical Appendix 8.3</b> and <b>Technical Appendix 8.4</b>.</p>
<p><b>Marine Scotland (28 March 2023)</b></p>	<p>Refer to standing advice including information checklist.</p> <p>Consideration should be given to watercourses within and downstream of site, any SACs where fish are a qualifying feature, and impacts on fish populations.</p>	<p>Aquatic monitoring programme to be devised and submitted for approval prior to construction.</p> <p>A brief summary is provided in <b>Technical Appendices 8.3</b> and <b>8.4</b>.</p>

Stakeholder/ Consultee and Date Received	Issued Raised	Actions Taken
	<p>Recommend conditions of consent including 12 months of water quality monitoring prior to construction.</p> <p>Marine Scotland advise their scoping guidelines are included with the scoping opinion. Marine Scotland advise that Annex 1, the MSS-EIA checklist within their standing advice is completed prior to submission of the EIA Report.</p>	<p>Annex 1 is included in <b>Technical Appendix 8.8.</b></p>

## 8.5. Methodology

25. The methodology for the assessment of likely significant ecological effects as a result of the proposed Development is outlined below.

### 8.5.1. Study Area(s)

26. The study areas within which baseline ecological information to inform the design and assessment of the proposed Development has been collected comprised land within the Application Boundary, extended to appropriate distances in accordance with relevant good practice guidance.

27. The Site is comprised of two principal components. The ‘turbine area’ comprises the proposed turbines, crane hardstandings, substation, meteorological mast, network of connecting tracks and associated infrastructure. The centre of the turbine area is at NX9599391814. The ‘access track’ to the turbine area consists of the proposed access track leading from the A701 public road to the turbine area within the Site.

28. The study areas for each ecological feature are defined within the appropriate technical appendix within Volume 4. A summary is provided in **Table 8.2**.

*Table 8.2 Summary of Ecological Field Surveys and Study Areas*

Survey	Study Area	Relevant Guidance	Survey Dates
<p><b>UK Habitat Classification (UK Habs survey)</b></p>	<p>All land within the Application Boundary, as shown in <b>Figures 8.2a-c.</b></p>	<p>UK Habitats survey methodology (Version 2.0; Butcher <i>et al.</i> 2023).</p> <p>Scottish Environment Protection Agency - Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems. Land Use Planning System SEPA Guidance Note 31 (SEPA, 2017).</p>	<p>August 2023 and July 2024.</p>



Survey	Study Area	Relevant Guidance	Survey Dates
National Vegetation Classification (NVC)	Habitats within the Application Boundary with the potential to be dependent on groundwater.	Scottish Environment Protection Agency - Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems. Land Use Planning System SEPA Guidance Note 31 (SEPA, 2017).	August 2023 and July 2024.
Protected species - amphibians, reptiles, badger, red squirrel, pine marten, otter and water vole.	Habitat within the Application Boundary for all species.  This extended to a 50 m buffer where possible along the proposed access track in suitable habitat for badger, pine marten, red squirrel and water vole as well as to 200 m in riparian habitat for otter.	BAP Mammals: Interim Guidance for Survey Methodologies, Impact Assessment and Mitigation (Creswell et al, 2012).  Otters: ecology, behavior, and conservation (Kruuk, 2006). Standing Advice for Planning Consultations. Protected Species (NatureScot, 2020a -g).  Surveying Badgers (Harris et al, 1989).	Between June and December in 2023 and also in July 2024.
Protected species - freshwater pearl mussel	Habitat within the Application Boundary.	Monitoring the Freshwater Pearl Mussel, <i>Margaritifera margaritifera</i> . (Young et al, 2003).	Between June and December in 2023 and also in July 2024.
Protected species - fish and aquatic Invertebrates	Electrofishing and invertebrate surveys were undertaken at ten sites within the Application Boundary and six sites outside of the Application Boundary. These sites were within the River Annan catchment. Two control sites within the River Nith catchment were also surveyed.	In 2021 Marine Directorate (formerly Marine Science Scotland) published guidance titled 'Monitoring watercourses in relation to onshore wind farm developments: generic monitoring programme', the baseline surveys adhere to this guidance (Marine Directorate, 2021).	September and October 2023.
Protected species - fish and aquatic Invertebrates	Electrofishing and invertebrate surveys were undertaken at a further eight locations along the proposed access route. All eight sites fell within the River Annan catchment.	In 2021 Marine Directorate (formerly Marine Science Scotland) published guidance titled 'Monitoring watercourses in relation to onshore wind farm developments: generic monitoring programme', the baseline surveys adhere to this guidance (Marine Directorate, 2021).	July 2024.

Survey	Study Area	Relevant Guidance	Survey Dates
Protected species – bats	Static detector surveys within turbine area (the portion of the Site within the Application Boundary in which the proposed Development turbines are located).	Bats and Onshore Wind Turbines: Survey Assessment and Mitigation (Bat Conservation Trust, 2021).	April to October 2022 and 2023.
Protected species – bats	Ground level tree surveys of trees along proposed access track and within a 20 m buffer.	Bats and Onshore Wind Turbines: Survey Assessment and Mitigation (Bat Conservation Trust, 2021).  Bat Surveys for Professional Ecologists: Good Practice Guidelines 4 <sup>th</sup> Edition (Collins, 2023).	July 2024.
Protected species – bats	Trees identified with bat roost potential along proposed access track and within a 20 m buffer using telescopic pole camera.	Bats and Onshore Wind Turbines: Survey Assessment and Mitigation (Bat Conservation Trust, 2021).  Bat Surveys for Professional Ecologists: Good Practice Guidelines 4 <sup>th</sup> Edition (Collins, 2023).	September 2024.
Protected species – bats	Ground-level tree surveys of trees within turbine area which fall within 285 m of proposed turbines and 30 m of proposed access track.	Bats and Onshore Wind Turbines: Survey Assessment and Mitigation (Bat Conservation Trust, 2021).  Bat Surveys for Professional Ecologists: Good Practice Guidelines 4 <sup>th</sup> Edition (Collins, 2023).	September 2024.

### 8.5.2. Desk Study

29. A background data search (BDS) was undertaken to obtain existing information on the presence of designated sites for nature conservation, protected and notable habitats, flora and faunal species within proximity to the Site as shown in **Table 8.3**.

*Table 8.3 Background Data Searches*

Ecological Receptor	Study Area	Date	Additional Information
Bats	Within 20 km of Application Boundary within the last 10 years	Spring 2022	This desktop study area was wider than the 10 km recommended in the guidelines (NatureScot, 2021) due to the presence of <i>Nyctalus</i> species in the area, which are known to travel up to 20 km from roosting locations (Mackie and Racey, 2007).

Ecological Receptor	Study Area	Date	Additional Information
Bats (updated search)	Within 20 km of Application Boundary	November 2023	This desktop study area was wider than the 10 km recommended in the guidelines (NatureScot, 2021) due to the presence of <i>Nyctalus</i> species in the area, which are known to travel up to 20 km from roosting locations (Mackie and Racey, 2007).
Statutory designated sites, non-statutory designated sites and protected species.	Within 2 km of the Application Boundary	August 2024	These search areas encompassed the likely Zones of Influence (Zol) for the proposed Development. The 'zone of influence' is the area over which ecological features may be affected by biophysical changes as a result of the proposed Development and associated activities.
Internationally designated sites	Within 10 km of the Application Boundary	August 2024	These search areas encompassed the likely Zones of Influence (Zol) for the proposed Development. The 'zone of influence' is the area over which ecological features may be affected by biophysical changes as a result of the proposed Development and associated activities.

30. Existing information relating to statutory and non-statutory designated sites of nature conservation importance, priority habitats and species, and legally protected species was gathered from various sources as outlined in **Table 8.4**.

*Table 8.4 Source of Background Information*

Information Obtained	Source of Information
Protected and noteworthy species-records.	South West Scotland Environmental Information Centre (SWSEIC).
Designated site locations and citations.	NatureScot Sitelink. Joint Nature Conservation Committee (JNCC) website.
Designations and legal protection of noteworthy species.	JNCC website.
Areas / Habitats of Strategic Significance.	Dumfries and Galloway Local Biodiversity Action Plan.

31. In addition, publicly available EIA documentation for the following adjacent windfarms was also reviewed, together with additional peer reviewed literature and publicly available sources where relevant and referenced where appropriate:



- Harestanes South Windfarm Extension Environmental Impact Assessment Report (ECU00002185); and
- Harestanes Windfarm Environmental Impact Assessment Report (ECU00004778).

### 8.5.3. Field Surveys

32. Ecological field surveys comprised a UK Habs survey, NVC survey and protected species surveys within the turbine area and along the proposed access track. Details of study areas and timings of these surveys are provided in **Table 8.2** in **Section 8.5.1**.
33. Full details of survey methodologies are provided in the ecological reports within Volume 4 of this EIA Report:
  - **Technical Appendix 8.1: Habitats Report;**
  - **Technical Appendix 8.2 Protected Species Report;**
  - **Technical Appendix 8.3: Aquatic Ecology – Turbine Area;**
  - **Technical Appendix 8.4: Aquatic Ecology – Access Track;**
  - **Technical Appendix 8.5: Bat Report – Static Detectors; and**
  - **Technical Appendix 8.6: Bat Report – Tree Surveys.**

### 8.5.4. Assessment Methodology

34. The assessment methodology includes the following stages:
  - determination and evaluation of important ecological features;
  - identification and characterisation of impacts;
  - outline of mitigating measures to avoid and reduce significant effects;
  - assessment of the significance of any residual effects after such measures;
  - identification of appropriate compensation measures to offset significant residual effects; and
  - outline of appropriate opportunities for ecological enhancement.

#### *8.5.4.1. Valuation of Receptors*

35. Ecological features are valued with regard to the guidance provided in Guidelines for Ecological Impact Assessment in the UK and Ireland (CIEEM, 2018). Value or ‘importance’ is assessed through consideration of attributes including rarity, legal status, population size, distribution and connectivity, and natural range. These values are applied to the ecological features within a defined geographical context and examples can be seen in **Table 8.5**.

Table 8.5 Evaluation of ecological features

Ecological Importance	Qualifying Criteria
<b>International</b>	<ul style="list-style-type: none"> <li>• An internationally designated site or candidate site (SPA, pSPA, SAC, cSAC, pSAC, Ramsar, Biogenetic Reserve) or an area which NatureScot has determined meets the published selection criteria for such designations, irrespective of whether or not it has yet been notified.</li> <li>• A viable area of a habitat type listed in Annex 1 of the Habitats Directive, or smaller areas of such habitat which are essential to maintain the viability of that ecological resource at an international scale.</li> <li>• A regularly occurring, nationally significant population of any internationally important species, listed under Annex II or Annex IV of the Habitats Directive.</li> </ul>
<b>National (i.e. Scotland)</b>	<ul style="list-style-type: none"> <li>• A nationally designated site (SSSI, NNR, Marine Nature Reserve) or a discrete area which NatureScot has determined meets the published selection criteria for national designation irrespective of whether or not it has yet been notified.</li> <li>• A viable area of a priority habitat referenced in the UK Post-2010 Biodiversity Framework or Scottish Biodiversity List, or smaller areas of such habitat which are essential to maintain the viability of that ecological resource at a national scale.</li> <li>• A regularly occurring, regionally significant population of any nationally important species listed as a SBL priority species and species listed under Schedule 1 or Schedule 5 of the Wildlife and Countryside Act or Annex II or Annex IV of the Habitats Directive.</li> </ul>
<b>Regional (i.e. Dumfries and Galloway)</b>	<ul style="list-style-type: none"> <li>• Small but viable areas of key semi-natural habitat identified in the SBL.</li> <li>• Sites which exceed the local authority-level designations but fall short of SSSI selection guidelines, including extensive areas of semi-natural woodland.</li> <li>• A regularly occurring, locally significant population of any nationally important species listed on the SBL, and species listed under Schedule 5 of the Wildlife and Countryside Act or Annex II or Annex IV of the Habitats Directive.</li> </ul>
<b>Local (i.e. Site and its vicinity, including habitats continuous with or linked to those on the Site)</b>	<ul style="list-style-type: none"> <li>• Nature conservation sites selected on local authority criteria.</li> <li>• Other species and habitats of local conservation importance, including those listed within the Dumfries and Galloway LBAP. Areas of habitat or species considered to appreciably enrich the ecological resource within the local context e.g. species-rich flushes or hedgerows.</li> </ul>
<b>Site</b>	<ul style="list-style-type: none"> <li>• Habitats of limited ecological value, e.g. amenity grassland, but which contribute to the overall function of the application site’s ecological functions.</li> <li>• Very small, but viable, populations of species or habitats of conservation importance, or a species or habitat in a relevant BAP which is not important for the maintenance of the local meta-population.</li> </ul>



#### 8.5.4.2. Characterisation of Effects

36. Following the ecological feature valuation stage, the next stage of an EclA is to predict and characterise the likely change and impact on the ecological features identified during the desk-based study and surveys. It is necessary to consider the following parameters:
- the sensitivity of affected features, on a scale of 'High', 'Medium', 'Low' or 'Negligible';
  - the extent of the area subject to a predicted impact;
  - the magnitude or severity of the change and whether the change is positive or negative;
  - the duration the impact is expected to last prior to recovery or replacement of the resource or feature;
  - the timing and frequency of the impact, i.e. conflicting with critical seasons or increasing impact through repetition; and
  - whether the impacts are reversible, with recovery through natural or spontaneous regeneration, or through the implementation of mitigation measures, or irreversible, when no recovery is possible within a reasonable timescale or there is no intention to reverse the impact.
37. The CIEEM Guidelines for Ecological Impact Assessment in the UK and Ireland (CIEEM, 2018) also stress consideration of the likelihood that 'a change/activity will occur and also the degree of confidence in the assessment of the impact on ecological structure and function'. Likelihood is then specified using the following terms:
- 'Certain' (95% probability or higher);
  - 'Probable' (50-94% probability);
  - 'Unlikely' (5-49% probability); or
  - 'Extremely unlikely' (less than 5% probability).

#### 8.5.4.3. Significance of Effects

38. Following the classification of an impact, a clear statement is made as to whether the resultant effect is 'Significant' or 'Not Significant'. Under the CIEEM guidelines (CIEEM, 2018) the significance of effect on the ecological features has been determined based on the analysis of the factors that characterise the impact.
39. A significant effect is defined in CIEEM guidelines as *"an effect that either supports or undermines biodiversity conservation objectives for the ecological feature or for biodiversity in general"*. The assessment considers whether an effect has the potential to affect the integrity of a habitat or the conservation status of a species. Site integrity of a habitat or site is defined in SG Circular 6/95 as *"the coherence of its ecological structure and function, across its whole area, that enables it to sustain the habitat, complex of habitats and/or the levels of populations of the species for which it was classified"*. The conservation status of a species is defined in CIEEM guidelines as *"the sum of the influences acting on it which may affect its long-term distribution and abundance, within the geographical area of interest"*. Conservation status is considered to be favourable under the following circumstances:



- population dynamics indicate that the species is maintaining itself on a long-term basis as a viable component of its habitats;
  - the natural range of the species is not being reduced, nor is it likely to be reduced for the foreseeable future; and
  - there is (and probably will continue to be) a sufficiently large habitat to maintain its population on a long-term basis.
40. CIEEM best practice guidance does not recommend that significance is defined as ‘Major’, ‘Moderate’ or ‘Minor’ due to the complexities of ecological processes. Therefore, for the purposes of EclA, all significant effects are considered significant within the context of the EIA Regulations.

#### *8.5.4.4. Avoidance, Mitigation, Compensation and Enhancement*

41. Following the assessment of likely significant effects, the requirement for additional specific mitigation measures (measures to avoid, reduce or remedy a specific negative impact *in situ*) would be considered. The likelihood of any residual effects following implementation of mitigation measures (if required) would then be assessed.
42. The mitigation hierarchy has been adopted to avoid, mitigate and compensate for potential ecological impacts as a result of the proposed Development:
- avoidance is used where an impact has been avoided e.g. through changes in design of the proposed Development;
  - mitigation is used to refer to measures to reduce or remedy a specific negative impact *in situ*;
  - compensation describes measures taken to offset residual effects, i.e. where mitigation *in situ* is not possible; and
  - enhancement is the provision of new benefits for biodiversity that are additional to those provided as part of mitigation or compensation measures, although they can be complementary.

#### *8.5.4.5. Potential Cumulative Effects*

43. Potentially significant ecological effects can result from individually insignificant but collectively significant actions of developments taking place over a period of time or concentrated in a near location.
44. The assessment presented within this Chapter, considered the potential for significant cumulative effects with other windfarm developments located within 15 km of the Site, depending upon the regular range of mobile species e.g. bats.
45. For aquatic features, potentially cumulative effects are however, only likely to be significant where other developments are located in closer proximity (2 km) and within the same hydrological catchment.
46. The assessment considers the potential for significant cumulative effects upon ecological features in-combination with other windfarm developments, which are operational, under construction, consented (but for which construction works may not yet have started), and those for which planning applications have been submitted.

47. Developments which have been withdrawn and/or refused are not considered. **Table 8.6** lists the projects that were considered.

*Table 8.6 Projects considered for cumulative effects*

Project Name	Number of Turbines	Tip Height (m)	Status	Distance from Nearest Turbine (km)
Dalswinton Wind Farm	15	110	Operational	0.6
Harestanes Wind Farm	68	125	Operational	3.1
Minnygap Wind Farm	10	125	Operational	6.7
Harestanes South Wind Farm Extension	8	200	In planning	4.1
Dear Wind Farm	17	180	In planning	9.6
Rivox Wind Farm	29	200-230	In planning	11.3

#### 8.5.4.6. Assumptions and Limitations

48. Specific limitations on the assessment of ecological features are given in the ecological reports presented in **Volume 4** of this EIA Report and are summarised below:

- the BDS does not provide a comprehensive list of species present within the search area; and a lack of records does not necessarily indicate a species absence;
- during the ground-level static surveys, some areas could not be accessed due to ongoing forestry operations and the presence of clear-fell and wind-felled trees;
- automated detectors deployed for the ground-level static surveys were positioned near proposed turbine locations; however, due to changes in the turbine layout, not all of the planned turbine locations were surveyed. Nonetheless, the detector locations covered a wide range of habitats and provided a representative sample of bat activity across the proposed turbine layout, so this is not considered a limitation to the overall assessment;
- bat activity per night is influenced by weather conditions, as bats typically avoid flight during nights with heavy rainfall, dense fog, or wind speeds exceeding 5 m/s. To mitigate the impact of unsuitable weather conditions on data validity, detectors for the ground-level static surveys were deployed for approximately 30 nights per season (April to May, June to mid-August, mid-August to September). This extended deployment period, which is greater than the ten consecutive nights required (as per standard NatureScot guidance), reduces the likelihood of unseasonal weather significantly skewing the overall bat activity within the Site. Consequently, it is concluded that weather conditions did not significantly restrict the overall assessment;
- Nathusius' pipistrelle (*Pipistrellus nathusii*) passes should be considered as potential Nathusius' pipistrelle due to overlapping call parameters with common pipistrelle (*Pipistrellus pipistrellus*) in cluttered habitats. This overlap may have skewed the 2023 data, leading to more frequent identification of Nathusius' pipistrelle, and some may have been missed in 2022 due to different analysis methods. Given its known presence in the wider area, it should be assumed that Nathusius' pipistrelle is present onsite. As both of these species are high collision risk species, the misidentification of this species does not alter the overall collision risk assessment;



- some species such as brown long-eared bats (*Plecotus auritus*) emit very faint echolocation calls and can be missed during recording periods if not within 5 m of the recording devices deployed for the ground-level static surveys;
- there was some data loss during the deployment of detectors for the ground-level static surveys due to equipment malfunction, specifically with detector 22MM03, which failed to record any data during the Autumn 2022 deployment. In addition, three detector locations recorded only between 14 and 17 nights within the 2023 season: 23MM03 (Spring), 23MM10 (Spring) and 23MM11 (Summer). However, as the majority of detectors successfully recorded data for the full deployment period of 30 nights, this minor data loss is not considered a significant limitation to the bat activity assessment or the overall conclusions regarding collision risk at the Site;
- large areas of the site had been severely impacted by windblown trees at the time of the habitat and protected species surveys of the turbine area. These areas were not safe to access and therefore only the edges of these areas were walked, where safe to do so. Dense, young Sitka plantation woodland also made up a significant proportion of the Site. The density made it difficult to survey in these blocks, so only the edges were walked unless a mammal path or other activity sign was noted and then followed to check for further activity;
- recent high-water levels in watercourses on the Site during the time of the protected species walkover within the turbine area may have washed away evidence of species such as otter (*Lutra lutra*) using these for commuting and hunting, however resting up sites would still have been recorded;
- the Scottish Fisheries Coordination Centre (SFCC) electric fishing technique used was developed for juvenile salmonids in shallow running water. Whilst other fish species may be captured during the survey, confidence in their population estimates is lower compared to salmonids. Electric fishing is an efficient method of surveying fish, but it cannot be guaranteed to capture all fish within a surveyed site; and
- trees within the cemetery at the start of the access track could not be fully inspected for bat roost potential due to access limitations.

## 8.6. Baseline Conditions

49. The results of the desk-based assessment and the field surveys undertaken between 2022 and 2024 are summarised below. Full details of the survey results can be found in the **Technical Appendices** provided within **Volume 4** of this EIA Report.

### 8.6.1. Statutory Designated Sites for Nature Conservation

50. There are no statutory designated sites within 2 km of the Site. The nearest is Black Loch Site of Special Scientific Interest (SSSI) which lies approximately 2.2 km southeast from the Site. Black Loch lies 10 km north of Dumfries and is the best example within Nithsdale District of a basin fen. The site shows a transition from a central fen to drier moorland with a variety of vegetation types. The basin fen occupies the site of a drained loch.
51. There are two Special Protection Areas (SPAs) within 20 km of the Site, these are discussed within **Chapter 9: Ornithology** and not considered further within this Chapter.



### 8.6.2. Non-Statutory Designated Sites for Nature Conservation

52. The Site is partially located within the outer transition zone of the Galloway and Southern Ayrshire UNESCO Biosphere Reserve, a bio-geographic region centred on the Merrick Kells, working to demonstrate the importance of landscapes and ecosystems for the future of sustainable development in the region. The Biosphere Reserve covers a total area of 526,888 ha. The transition zone is defined as *“the part of the reserve where the greatest activity is allowed, fostering economic and human development that is socio-culturally and ecologically sustainable”*.
53. There are no other non-statutory designated sites within 2 km of the Application Boundary.
54. There are 20 areas of ancient semi-natural woodland within 1 km of the Application Boundary. This includes one parcel of woodland listed on the Ancient Woodland Inventory (AWI) within 50 m of the Site. The woodland, which is categorised as being of Long-established (of plantation origin) is in the southeast corner of the Site, adjacent to the access track.

### 8.6.3. Habitats and Vegetation

55. The distribution and extent of the habitats encountered during the surveys are presented in **Figures 8.2a-c** and **8.3**, and detailed descriptions of the habitats are provided in **Technical Appendix 8.1: Habitats Report**.
56. **Table 8.7** provides a summary of the UK Habitat classification and corresponding NVC communities. Initial groundwater dependency scoring based on vegetation composition alone (SEPA, 2017) indicated that NVC communities M6, M15, M23, M25 and M27 present on site had the potential to be highly or moderately dependent on groundwater (**Technical Appendix 8.1: Habitats Report**). However, these scorings have been revised following hydrogeological assessment to there being no potential for groundwater dependency to these habitats onsite. This is because the occurrence of these habitats on peat preclude them from being groundwater dependent as there is no groundwater source available to them; and when these habitats are not located on peat there is no reliable source of shallow groundwater on which they can depend – they are likely to rely on a combination of rainfall and surface runoff, with some direct surface water in areas adjacent to watercourses and waterbodies (**Chapter 10: Hydrology, Hydrogeology, Geology and Soils**). Feature valuation is provided, based on criteria in **Table 8.5, Section 8.5.4** and adjusted for conditions of specific areas of habitats recorded on the Site, as well as on professional judgment.

Table 8.7 Summary of habitats recorded onsite, and their valuation.

UK Hab	NVC Communities	Conservation Status	Importance	Description and Receptor Valuation
Cereal crops (clc)	n/a	-	Site	One cereal field in the south of the Site, considered to be of <b>Site</b> value for its contribution to biodiversity at the Site.
Blanket bog (fla)	<b>M19</b> - <i>Calluna vulgaris</i> - <i>Eriophorum vaginatum</i> blanket mire	Annex 1 habitat type: 7130 Blanket bogs SBL Priority Habitat: Blanket bog LBAP Priority Habitat: Blanket bogs	Regional	This bog habitat is distinct from other areas of bog at the Site by an extensive Sphagnum cover. Occurs in few of the forest rides in the south of the Site, most extensively in a wetland in the centre of the Site which is made up of bog, marsh and small waterbodies. Vegetation characterised by species including purple moor grass ( <i>Molinia caerulea</i> ), hare's tail cottongrass ( <i>Eriophorum vaginatum</i> ) and heather ( <i>Calluna vulgaris</i> ), and bog-mosses <i>Sphagnum capillifolium</i> and <i>S. papillosum</i> - both these Sphagnum species are important peat-forming species. The largest area of this habitat may be considered extensive enough to be classed as 'active' i.e. Annex 1 habitat 7130 Blanket bogs and, as a small but viable area of key semi-natural habitat referenced in the SBL is considered to be of <b>Regional</b> importance. See <b>Technical Appendix 8.7</b> for the assessment of the proposed Development's effect on peatland, carbon rich soils and priority peatland habitats.
Degraded blanket bog (fla6)	<b>M19</b> - <i>Calluna vulgaris</i> - <i>Eriophorum vaginatum</i> blanket mire  <b>M25a</b> - <i>Molinia caerulea</i> - <i>Potentilla erecta</i> mire, <i>Erica tetralix</i> sub- community	SBL Priority Habitat: Blanket bog LBAP Priority Habitat: Blanket bogs	Regional	A string of degraded blanket bog across the Site in forestry rides; one of the areas would be crossed by a floating access track. Impoverished vegetation dominated by species including purple moor grass, hare's tail cottongrass and heather, with invasion by Sitka spruce and lacking significant cover of bog-mosses <i>Sphagnum</i> species. Although these species can all be peat-forming in certain circumstances, the areas of this habitat onsite are not considered to align with 7130 Blanket bogs (* if active) ('active' meaning still supporting a significant area of vegetation that is normally peat forming) because of their relatively small extent, and limited Sphagnum cover. However, they may be considered UKBAP and SBL Priority Habitat Blanket bog which encompass all areas of blanket bog supporting semi-natural blanket bog vegetation, whether or not it may be defined as 'active'. Considered to be of <b>Regional</b> value because of its listing within the SBL and LBAP.

UK Hab	NVC Communities	Conservation Status	Importance	Description and Receptor Valuation
Purple moor grass and rush pastures (f2b)	<p><b>M23a</b> <i>Juncus effusus/acutiflorus-Galium palustre</i> rushpasture, <i>Juncus acutiflorus</i> sub-community</p> <p><b>M23b</b> - <i>Juncus effusus/acutiflorus-Galium palustre</i> rush-pasture, <i>Juncus effusus</i> sub-community</p>	-	Site	<p>This rush-dominated community occurs regularly at the Site, extending through forestry rides and lining the banks of watercourses. The largest example of this habitat is in the wetland complex in the centre of the Site where it is dominated by soft rush (<i>Juncus effusus</i>) and is relatively species poor, with common grass and herb species of basic, moist soils growing among the rush tussocks such as marsh bedstraw (<i>Galium palustre</i>) and marsh thistle (<i>Cirsium palustre</i>). There are a few areas of this habitat onsite that are dominated by sharp flowered rush (<i>J. acutiflorus</i>) or tufted hair grass (<i>Deschampsia cespitosa</i>). This widespread habitat is considered to be of <b>Site</b> value, because of its contribution to a patchwork of wetland habitats on the Site that support biodiversity.</p>
Other wetlands (f2f)	<p><b>M6c</b> - <i>Carex echinata-Sphagnum fallax/denticulatum</i> mire, <i>Juncus effusus</i> sub-community</p> <p><b>M6d</b> - <i>Carex echinata-</i></p>	-	Site	<p>Small areas of rush over a carpet of Sphagnum species occur in forestry rides, and in the wetland complex in the centre of the Site. The habitat onsite is a species-poor representation of the habitat described by SBL Priority Habitat Upland Flushes, Fens and Swamps, and LBAP Priority Habitat Fens and is considered to be of <b>Site</b> value, because of its contribution to a patchwork of wetland habitats on the Site that support biodiversity.</p>

UK Hab	NVC Communities	Conservation Status	Importance	Description and Receptor Valuation
	<i>Sphagnum fallax/denticulatum</i> mire, <i>Juncus acutiflorus</i> sub-community			
	<b>M27c</b> - <i>Filipendula ulmaria</i> - <i>Angelica sylvestris</i> mire, <i>Juncus effusus</i> - <i>Holcus lanatus</i> sub-community	SBL Priority Habitat Upland Flushes, Fens and Swamps	Local	Three small areas of this tall herb mire dominated by meadowsweet ( <i>Filipendula ulmaria</i> ) bisected by a track in the west of the Site. Considered to align with SBL Priority Habitat Upland Flushes, Fens and Swamps. This is a widespread habitat with no rare species, which typically occurs in small but numerous stands. The areas onsite are considered to be of <b>Local</b> value, because of their contribution to the overall biodiversity of the local area being more species-rich than the habitats they occur within, and their contribution to the ecological resource within the local context.
	<b>S9</b> - <i>Carex rostrata</i> swamp	-	Site	Two small areas of swamp dominated by bottle sedge ( <i>Carex rostrata</i> ), one stand at the edge of a shallow pool and forming part of the wetland complex in the centre of the Site and the other within a wet depression in an area of upland heathland. As a component of the zonation of aquatic to terrestrial habitat on Site, this habitat is considered to be of <b>Site</b> value.
	<b>S12</b> - <i>Typha latifolia</i> swamp	-	Site	Stands of bulrush ( <i>Typha latifolia</i> ) dominated swamp, filling the two manmade ponds they are in. These are disparate patches of aquatic vegetation with no zonation to the adjacent woodland habitats and not forming part of a larger wetland system. However, this emergent vegetation is considered to be of <b>Site</b> value because of the contribution it makes to the Site's biodiversity.
Other upland acid grassland (g1b6)	n/a	-	Site	Small areas of unmanaged acid grassland across the Site, and in clear-felled areas. Not an assemblage of conservation interest but contributes to the Site's biodiversity and therefore considered to be of <b>Site</b> value.



UK Hab	NVC Communities	Conservation Status	Importance	Description and Receptor Valuation
Bracken (g1c)	n/a	-	Site	Bracken-dominated grassland which occurs in riparian valley areas at the Site and along forestry rides and tracks. Contributes to the diversity of vegetation on Site and therefore considered to be of <b>Site</b> value.
Other neutral grassland (g3c)	n/a	-	Site	Unmanaged neutral grassland within wider forestry rides and glades, dominated by coarse-leaved and tussocky grasses Yorkshire fog ( <i>Holcus lanatus</i> ) and false oat grass ( <i>Arrhenatherum elatius</i> ); occasional stands dominated by tufted hairgrass with soft rush usually present. Widespread habitat of common species; considered to be of <b>Site</b> value for the contribution the tussocky vegetation makes to the Site's biodiversity.
Deschampsia neutral grassland (g3c7)	<b>M23a</b> <i>Juncus effusus/acutiflorus</i> - <i>Galium palustre</i> rush-pasture, <i>Juncus acutiflorus</i> sub-community	-	Site	Small areas of this tussocky tufted hair grass-dominated habitat occurs along the access track. This widespread habitat is considered to be of <b>Site</b> value, because of its contribution to a patchwork of wetland habitats on the Site that support biodiversity.
Holcus-Juncus neutral grassland (g3c8)	<b>M23b</b> - <i>Juncus effusus/acutiflorus</i> - <i>Galium palustre</i> rush-pasture, <i>Juncus effusus</i> sub-community	-	Site	Small patches of damp habitat dominated by Yorkshire fog and soft rush. This widespread habitat is considered to be of <b>Site</b> value, because of its contribution to a patchwork of wetland habitats on the Site that support biodiversity.
Modified grassland (g4)	n/a	-	Site	Small area of species-poor vegetation in the south of the Site dominated by perennial rye grass ( <i>Lolium perenne</i> ). A widespread habitat made up of common species, considered to



UK Hab	NVC Communities	Conservation Status	Importance	Description and Receptor Valuation
				be of limited ecological value other than contributing to the Site's biodiversity and therefore considered to be of <b>Site</b> value.
Dry heaths, upland (h1b5)	n/a	Annex 1 habitat type: 4030 European dry heaths SBL Priority Habitat: Upland heathland LBAP Priority Habitat: Upland heaths	Regional	Few, small areas of upland dry heath, invaded by bracken, and mostly limited to the steeper and better drained slopes of the watercourse valleys which cross the Site. Aligned to habitats of conservation interest (Annex 1; SBL; LBAP) and considered to be of <b>Regional</b> value because of its contribution to Site biodiversity only: its limited extent onsite, and lack of connectivity to heathland beyond the boundary of the Site, means that it is not essential to maintain the viability of this habitat at a national scale, or in supporting associated species of conservation importance such as some breeding birds, non-flowering plants and invertebrates.
Wet heathland with cross leaved heath (h1b6)	<b>M15 - <i>Trichophorum germanicum</i> -<i>Erica tetralix</i> wet heath</b>	Annex 1 habitat type: 4010 North Atlantic wet heaths with <i>Erica tetralix</i> SBL Priority Habitat: Upland heathland LBAP Priority Habitat: Upland heaths	Regional	A few areas of wet heath onsite, the larger being a long stretch on the shallower southern slopes of the Goukstone Burn, comprising heather, cross leaved heath ( <i>Erica tetralix</i> ), deer grass ( <i>Trichophorum germanicum</i> ) and purple moor grass. Aligned to habitats of conservation interest (Annex 1; SBL; LBAP) and considered to be of <b>Regional</b> value because although of limited extent onsite, and lack of connectivity to wet heathland beyond the boundary of the Site, Scotland is the European stronghold for this habitat.
Willow scrub (h3j) and Mixed scrub (h3h)	n/a	LBAP Priority Habitat: Scrub woods	Site	This habitat was generally limited to regeneration along edges of tracks, dominated by willow <i>Salix</i> spp. with rowan ( <i>Sorbus acuparia</i> ). Few areas of dense willow <i>Salix</i> spp. scrub adjacent to the track. May align with LBAP priority habitat of Scrub Woods. A small area of a widespread habitat made up of common species, considered to be of limited ecological

UK Hab	NVC Communities	Conservation Status	Importance	Description and Receptor Valuation
				value other than contributing to the Site's biodiversity and therefore considered to be of <b>Site</b> value based on its size.
Eutrophic standing waters (r1a)	n/a	-	Site	One large, man-made pond fringed by marginal vegetation. Considered to be of <b>Site</b> value for the contribution the aquatic vegetation makes to the Site's biodiversity.
Acid peat-stained lakes and ponds (r1c7)	n/a	-	Site	Three small, shallow, nutrient-poor ponds in wetland areas, two in the wetland complex in the centre of the Site and supporting aquatic species bog pondweed ( <i>Potamogeton polygonifolius</i> ). Considered to be of <b>Site</b> value for the contribution the aquatic habitat makes to the Site's biodiversity.
Other rivers and streams (r2b)	n/a	-	Local	Several small watercourses flow through the Site. These do not meet the vegetation criteria to qualify as a Priority Habitat River and are considered to be of <b>Local</b> value for the contribution the aquatic habitat makes to the local area's biodiversity, and for the role small watercourses have in local ecological corridors
Other inland rock and scree (s1d)	n/a	-	Site	Two quarries within the Site. Considered to be of <b>Site</b> value for the contribution the habitat makes to the Site's biodiversity.
Other developed land (u1b6)	n/a	-	Site	Windfarm infrastructure and tracks, sparse colonising vegetation. Considered to be of <b>Site</b> value for the contribution the habitat makes to the Site's biodiversity.
Wet woodland (w1d)	<b>W1</b> - <i>Salix cinerea</i> - <i>Galium palustre</i> woodland	SBL Priority Habitat: Wet woodland LBAP Priority Habitat: Native wet woods	Local	An area of willow carr mature grey willow ( <i>Salix cinerea</i> ) and goat willow ( <i>S. caprea</i> ) and a fern-dominated ground layer in the north east of the Site, fringing a small wetland of rush mire and heathland. A widespread and fairly common but fragmented habitat across Dumfries and Galloway, considered to be of <b>Local</b> value at the Site with respect to its contribution to a wetland complex.
Lowland mixed deciduous	n/a	-	Local	Areas of lowland mixed deciduous woodland scattered throughout the Site and including a mixed canopy of rowan, willow ( <i>Salix spp.</i> ), birch ( <i>Betula pendula</i> ), cherry ( <i>Prunus avium</i> ), alder ( <i>Alnus glutinosa</i> ) and hazel ( <i>Corylus avellana</i> ). The stand lining the valley of the



UK Hab	NVC Communities	Conservation Status	Importance	Description and Receptor Valuation
woodland (w1f)				Windyhill Burn is listed by the Native Woodland Survey of Scotland (NWSS). Small areas of woodland usually in a mosaic with other types and considered to enrich the resource within the <b>Local</b> context.
Other broadleaved woodland (w1g)	n/a	SBL Priority Habitat: Upland birchwoods LBAP Priority Habitat: Native birch woods	Local	Represented on Site by a strip of woodland to the south of the public road, dominated by beech in its western section and birch with occasional rowan in the east. Birch woods are uncommon in Dumfries and Galloway, and the stand on Site, with its field layer remnant heath species bilberry ( <i>Vaccinium myrtillus</i> ) and ferns, is considered to be of <b>Local</b> value.
Other woodland mixed (w1h)	n/a	-	Site	Represented on Site by a large block of relatively young regenerating mixed woodland to the north of the public road, dominated by willow ( <i>Salix</i> spp.), birch ( <i>Betula</i> spp.) and Sitka spruce. More mature mixed woodland towards the northern Site boundary with similar species mix. Contributes to the diversity of vegetation on Site and therefore considered to be of <b>Site</b> value.
Other Scots pine woodland (w2b)	n/a	-	Site	A small block of Scots pine ( <i>Pinus sylvestris</i> ) woodland to the south of the public road with bracken-dominated ground layer. Considered to be of <b>Site</b> value because of its contribution to Site biodiversity.
Other coniferous woodland (w2c)	n/a	-	Site	Commercial conifer forestry covers the majority of the Site, dominated by Sitka spruce. Present in different stages of rotation (forestry stands, clear-fell and regenerating clear-fell). Considered to be of <b>Site</b> value because of its contribution to Site biodiversity.

#### 8.6.4. Invasive and Non-native Species

57. One invasive non-native species was found within the Site, which was a single stand of Montbretia (*Crococsmia* sp.) that was recorded near the edge of the track in the middle of the Site, close to recent clear-felled area.

#### 8.6.5. Protected Species

58. Feature valuation is provided, based on criteria in **Table 8.5, Section 8.5.4** as well as on professional judgement.

##### 8.6.5.1. Bats

59. The results of bat surveys undertaken at the Site are provided in **Technical Appendix 8.5** and **Technical Appendix 8.6**.
60. The Site features commercial forestry, primarily Sitka spruce plantations, forestry tracks, and clear-fell areas. Several watercourses, including Capel Water, Windyhill Burn, Goukstane Burn, and unnamed streams, traverse the Site. Loch Ettrick lies 300 m west, with larger watercourses like the Water of Ae within 1 km of the Site.
61. The Site includes habitats such as forestry tracks, trees, grassland, and watercourses that could be used by bats for foraging and commuting. According to NatureScot (2021) guidelines, the Site was classified as having moderate suitability primarily due to the limited availability of potential roosts and the absence of high-quality foraging and commuting habitat.
62. The desk study identified records for eight bat species within a 20 km radius of the Site, covering the period from 2013 to 2023. Records that could not be identified to species level have been excluded from this summary, with the exception of *Myotis* sp., where overlapping call parameters make species-level identification challenging. Species returned from the desk study are as follows:
- brown long-eared bat (*Plecotus auritus*) transitional/male roost recorded 2.0 km east of the Site;
  - common pipistrelle (*Pipistrellus pipistrellus*) bats foraging recorded 930 m west of the Site;
  - common pipistrelle roost with a count of 60 recorded 1.8 km west from the Site;
  - Daubenton's (*Myotis daubentonii*) bats foraging recorded 1.9 km east of the Site;
  - *Myotis* sp. bats foraging recorded 2.8 km east of the Site;
  - Nathusius' pipistrelle (*Pipistrellus nathusii*) bats recorded 3.1 km east of the Site;
  - Leislars (*Nyctalus leisleri*) bats foraging recorded 4.2 km west of the Site;
  - Noctule (*Nyctalus noctula*) bats foraging recorded 4.2 km west of the Site;
  - soprano pipistrelle (*Pipistrellus pygmaeus*) bats foraging recorded 1.9 km east of the Site; and
  - soprano pipistrelle roost with a count of +200 recorded 1.8 km east of the Site.



63. Bat species recorded in the wider area during ecological surveys for the Harestanes South Windfarm Extension EIA Report (ScottishPower Renewables Ltd, 2020) closely align with the findings of the desk study. Static bat detectors deployed during these surveys predominantly recorded common pipistrelle (57.7% of total passes), followed by soprano pipistrelle (28.2% of total passes), *Pipistrellus* sp. (8.4%), and Nathusius' pipistrelle (2.4%). The remaining 3.3% of recorded calls were attributed to *Myotis* sp., *Nyctalus* sp., and brown long-eared bat.
64. In 2022, 14 static detectors were deployed across the Site, with 11 detectors deployed in 2023. These detectors operated for at least the minimum required survey nights per season across three survey seasons each year (spring, summer, and autumn). This resulted in a total of 1,224 recording nights in 2022, comprising 385 nights in spring, 455 nights in summer, and 384 nights in autumn. In 2023, the total recording time was 927 nights, with 293 nights in spring, 304 nights in summer, and 330 nights in autumn. The locations of the static detectors are illustrated in **Figure 8.4**.
65. During this period, seven bat species or genera were recorded, including soprano pipistrelle, common pipistrelle, Nathusius' pipistrelle, *Myotis* sp. Leisler's bat, noctule bat, and brown long-eared bat. Across the entire survey period and all detectors, a cumulative total of 159,477 bat passes was recorded.
66. Across both years combined, as shown in **Table 4-2** within **Technical Appendix 8.5**, the most frequently recorded species was the common pipistrelle, accounting for 56.07% of all bat passes, followed by the soprano pipistrelle at 28.89%. Leisler's bat was the least recorded species, representing only 0.36% of all bat passes, however this may be underestimated given that some of the *Nyctalus* sp identified may have been Leisler's. Brown long-eared bat accounted for 0.67%.
67. In 2022, detector 22MM05 recorded the highest number of passes (20,013), followed by 22MM03 with 9,863 passes. The lowest number of passes that year was recorded by 22MM11 (1,275), closely followed by 22MM04 (1,278).
68. In 2023, detector 23MM10 registered the most passes (19,057), followed by 23MM09 with 12,468 passes. The lowest counts in 2023 were from detector 23MM06 (2,336), followed by 23MM03 (2,749).
69. Due to the variability of bat calls each night, the BPpH (Bat Passes per Hour) rate was used to represent the data. **Figures 3a** and **b**, within **Technical Appendix 8.5** shows the detector locations with bat call rates measured in BPpH.
70. The BPpH for each species at each detector location are presented in **Table 4-3** of **Technical Appendix 8.5**. The BPpN rates are indicated relative to their typical activity categories for the respective habitats, as defined by Dowse et al. (2015).
71. In 2022, detector 22MM05, situated at the Application Boundary, recorded the highest BPpH and BPpN rates across multiple species, including common pipistrelle, soprano pipistrelle and brown long-eared bat. In contrast, data from 2023 exhibited significant variation in BPpH and BPpN rates among detectors, with no single detector consistently recording the highest rates for more than one species.
72. Common pipistrelle was the most frequently recorded species, with soprano pipistrelle showing a relatively consistent presence throughout the surveys. Nathusius' pipistrelle,



also from the genus *Pipistrellus*, was detected in low numbers during the 2023 survey deployment. None were detected in 2022 however they may have been present and missed due to bat analysis methods used (see **Technical Appendix 8.5**).

73. Species from the genus *Myotis* exhibited high activity levels across the majority of detectors, reflecting the suitability of the available habitats.
74. Brown long-eared bat and species from the genus *Nyctalus* were recorded in significantly lower numbers compared to *Pipistrellus* species.
75. To assess the potential presence of roosts within or near the Site, the recorded bat activity was compared to species-specific emergence times. According to this analysis, Location 23MM07 (Location 7 in 2023) exhibited a small amount of soprano pipistrelle activity that overlapped with the species' emergence times, albeit towards the latter part of the period. This overlap suggests that the location may be in proximity to a roost, possibly situated either within or just outside the Application Boundary.
76. In Scotland, common and soprano pipistrelles are considered high collision risk species with a medium population-level vulnerability. Nathusius' pipistrelle, noctule, and Leisler's bat also have a high collision risk in Scotland but with a high population-level vulnerability. In contrast, brown long-eared bat and *Myotis* species are all classified as low collision risk species.
77. All three high collision risk *Pipistrellus* species (common pipistrelle, soprano pipistrelle, and Nathusius' pipistrelle) were recorded at the Site. Common pipistrelle activity levels were notably high at multiple detector locations, with similarly high activity levels of soprano pipistrelle observed at several detector locations, particularly in moorland (open) and edge habitats during both 2022 and 2023. Nathusius' pipistrelle was detected in low numbers in 2023; however, due to data limitations, the relative activity level of this species could not be conclusively determined.
78. In 2022, detector 22MM05 recorded the highest activity levels for common and soprano pipistrelle. This detector was located at the boundary between coniferous woodland and open moorland, with nearby watercourses, providing ideal foraging and commuting habitats for bat species. In contrast, in 2023, activity levels varied significantly across detectors, with no single detector consistently recording higher activity for more than one species.
79. Due to data limitations, the relative activity levels of Leisler's bat and noctule bat could not be precisely determined. However, because these species are on the edge of their geographical distribution in Dumfries and Galloway, their recorded activity levels at the Site are considered high in comparison to national data. High activity levels of *Nyctalus* species were recorded at the majority of detector locations.
80. High activity levels of *Myotis* species were recorded throughout the Site, with high activity levels of brown long-eared bat detected at locations between woodland blocks. Both *Myotis* species and brown long-eared bat are considered to be low collision risk species. Detectors 22MM03 and 23MM09 returned the highest relative *Myotis* sp. activity levels in both years of deployment. The habitat characterises at these detector locations closely align to those preferred by Daubenton's, a species adapted for foraging on and over water and are likely to be present within the Site.



81. All bat species found in Scotland are classed as European protected species which receive full protection under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended – the Habitats Regulations) (UK Statutory Instrument). This legal protection extends to all bat species identified within the Site: soprano and common pipistrelle bats, brown long-eared bats, Leisler's bats, Noctule bats, and the four *Myotis* species found in Scotland.
82. Regarding their IUCN Red List status in Scotland (Natural England, 2018), soprano and common pipistrelle bats, Noctule, brown long-eared bats, Daubenton's, and Natterer's bats are considered of "*Least Concern*" (LC). In contrast, Brandt's and whiskered bats are classified as "*Data Deficient*" (DD), Leisler's bat is "*Near Threatened*" (NT), and Nathusius' pipistrelle is considered "*Vulnerable*" (VU).
83. Population trends reported by the National Bat Monitoring Programme (Bat Conservation Trust, 2023) indicate that the soprano pipistrelle population in Scotland has increased over the long term and remained stable in the short term. The populations of common pipistrelle, brown long-eared bats, and *Myotis* species (Daubenton's, Natterer's, and whiskered/Brandt's) are considered stable in both the short and long term, although the roost index for brown long-eared bats has declined in Great Britain. There is currently insufficient data to assess the population trends of Leisler's bat and Nathusius' pipistrelle. Both Leisler's and Noctule bats are at the northern edge of their geographical range in Scotland. Nathusius' pipistrelle is an uncommon migratory species in the UK and is known to breed in the UK.
84. The feature importance of the assemblage of Leisler's, Noctule and Nathusius' pipistrelle, is considered to be '**Regional**'. This is due to their high collision risk with wind turbines, which could lead to significant cumulative bat fatalities affecting regional populations. In addition, Leisler's, Noctule, and Nathusius' pipistrelle are assessed as being of **Regional** importance due to their likely low regional populations. The feature importance of the assemblage of common pipistrelle, and soprano pipistrelle is considered to be '**Local**' due to their favourable conservation status and stable population trends. For *Myotis* species and brown long-eared bats the feature importance is assessed to be '**Local**' due to their favourable conservation status, stable population trends, and low collision risk with turbines.
85. Trees within the turbine area identified with potential roost features (PRFs) were all classed as PRF-I (PRF only suitable for individual bats or very small numbers of bats either due to size or lack of suitable surrounding habitats) and therefore no further surveys (i.e. bat emergence or tree climbing surveys) were required. Trees along the access track were also identified with potential roost features, some of which could not be fully investigated as access within the cemetery where they are located was not permitted. Several other trees were identified along the access track which had PRF-M features (PRF suitable for multiple bats). No signs of bats were recorded in the trees surveyed, although a bat box on a nearby tree had signs of use by pipistrelle bats. The results of the tree surveys are provided in **Technical Appendix 8.6** and shown on **Figure 8.5**.

#### **8.6.5.2. Badger**

86. Fifteen records of badger (*Meles meles*) were returned from within 2 km of the Site, including from within 100 m with the latest record being from 2023. No evidence of badger was found during surveys for Harestanes Wind Farm and no setts were found during





surveys for Harestanes South Wind Farm Extension although evidence of their presence was recorded outside of the Site.

87. No definite evidence of badgers was recorded within the turbine area although mammal paths were recorded throughout. Several areas were noted to have good potential habitat for badger, mainly in the middle and north of the Site. Badger latrines, snuffle holes, guard hair and a footprint were all found along the access track (**Figure 8.6**), but no associated setts were located. Badger is considered to be of **Site** importance due to their low conservation status in Scotland.
88. Some areas of the Site could not be accessed due to areas of windblow; therefore, it is possible that setts could be present and undetected in these areas.

#### 8.6.5.3. Otter

89. Thirty-six records of otter were returned from within 2 km of the Site, including some within 100 m. The latest record was from 2021 and was from the Water of Ae. Evidence of otter was recorded during surveys for Harestanes South Wind Farm Extension.
90. Watercourses within the Site have good connectivity to the Water of Ae and further watercourses beyond the Site. They therefore provide good commuting habitat for otter.
91. Evidence of otter was found on two burns within the turbine area – Poldivan Lake in the northern section and Goukstane Burn in the southern section. Spraints (*otter faeces*) were found along both of these burns as well as a potential resting-up site on a tributary to the Poldivan Lake, close to the confluence. No holts were recorded within the turbine area.
92. Thirty-three spraints were recorded along the extent of the access track and survey buffer as well as nineteen potential lay-up sites although evidence of otter was only found at two of these (old spraints present at one and a footprint at another), with a third one having a worn path but no spraints present. Several of the potential lay-up sites were classed as being of limited potential. An otter footprint was also located by a bridge along the access track and a potential otter holt was located close to the bridge although no evidence of otter was found to suggest it was in use. Furthermore, evidence of otter feeding was found along the riverbank, as well as a slide from the riverbank into the water. Evidence of otter is shown on **Figure 8.6**.
93. It is considered likely that otters will utilise the majority of the larger watercourses onsite for commuting and hunting, including the Capel Water and Windyhill Burn, as well as watercourses along the access track where they are clearly very active. Otter is considered to be of **Local** importance since it is a European protected species, but is widespread throughout Scotland.

#### 8.6.5.4. Water Vole

94. A record of water vole (*Arvicola amphibius*) from 2002 was returned from within 2 km of the Site. No definite evidence of water vole was found during the surveys at Harestanes Wind Farm with field vole (*Microtus agrestis*) found to be common in the area. However, evidence of water vole was found during surveys for Harestanes South Wind Farm Extension on Glenkiln Burn, on a tributary of Garrell Water and on Auchengaigroch Burn.
95. The majority of the watercourses within the turbine area are unsuitable for water vole with many being steep, fast flowing and travelling through dense plantation woodland. However, suitable habitat was noted on Poldivan Lake, where the burn is slower flowing



and passes through an open area of grassland and rushes. While no definitive evidence of water vole was found in this area, small mammal runs were found throughout this area adjacent to the watercourse, however these could be from field vole. A possible run and vole feeding signs were also found along a burn along the access track although small vole droppings were also found which suggests these may be field vole (**Figure 8.6**). No burrows were located.

96. Water vole is considered, on a precautionary basis, to be of **Local** importance.

#### 8.6.5.5. Red Squirrel

97. Multiple records of red squirrel (*Sciurus vulgaris*) were returned from within 2 km of the Site, including from within 100 m of the Site. The records began in 1996 and the latest record was returned in 2022. Red squirrels were recorded during surveys for Harestanes Wind Farm and potential evidence in the form of a drey and feeding remains were found during surveys for Harestanes South Wind Farm, although it was not confirmed if these were from red or grey squirrels (*Sciurus carolinensis*) as both are present in the geographical area.
98. The Site consists predominantly of Sitka spruce plantation of mixed ages which is not optimal habitat for red squirrel, but could provide some suitable habitat. The only potential evidence of red squirrel found were two chewed cones below trees near the edge of the existing access track (**Figure 8.6**), however these could be attributed to grey squirrel.
99. No definitive evidence of red squirrel was recorded during the survey; however, their presence cannot be ruled out. Red squirrel is considered, on a precautionary basis, to be of **Regional** importance due to its vulnerability within the UK.

#### 8.6.5.6. Pine Marten

100. Nine records of pine marten (*Martes martes*) were returned from within 2 km of the Site, including from within 100 m with the most recent record being from 2023. No evidence of pine marten was found during the Harestanes Wind Farm surveys although historical records were provided at that time. Surveys for Harestanes South Wind Farm Extension identified five potential denning sites but no definite evidence was found to confirm if these were in fact dens. Pine marten scats were however found throughout the site.
101. The mix of young and mature plantation, as well as large areas of windblown trees across the site provides suitable habitat for pine marten for both foraging and shelter.
102. No dens were recorded onsite; however, it is possible dens could be present in inaccessible areas of windblow. Several scats were found throughout the Site (including ten along the access track) which were considered to be pine marten and there is anecdotal evidence of a pine marten having been seen on the Site. In addition, there is a pine marten box located along the access track, in the northern section. Evidence of pine marten is shown on **Figure 8.6**. Pine marten is considered to be of **Regional** importance due to its vulnerability within the UK.

#### 8.6.5.7. Amphibians

103. Records of common toad (*Bufo bufo*), common frog (*Rana temporaria*), smooth newt (*Lissotriton vulgaris*) and Palmate newts (*Lissotriton helveticus*) from within 2 km of the Site were returned.
104. Palmate newts were recorded in a small pool alongside the track in the middle portion of the Site and noted within a pond in the south portion of the Site, four palmate newts were



also seen in standing water during the survey along the access track. They are likely to be found throughout the Site in areas of suitable habitat and will use and commute through the adjacent terrestrial habitat.

105. There are several areas of standing water on the Site (including four within the turbine area), and these have the potential to support populations of amphibians and provide suitable habitat for breeding. Amphibians are considered to be of **Site** importance.

#### 8.6.5.8. Reptiles

106. Records of adder (*Vipera berus*), viviparous lizard (*Zootoca vivipara*) and slow worm (*Anguis fragilis*) were returned from within 2 km of the Site, with both common lizard and slow worm having been recorded within 100 m of the Site. Six common lizards were recorded during walkover surveys for Harestanes South Wind Farm Extension.
107. Common lizards were sighted on the north and middle portions of the turbine area and two shed skins from common lizard were found in the south of the turbine area. The lizard sightings were all found in clearings around and between the blocks of Sitka plantation where suitable rocks and tree stumps are present for basking. A slow worm (*Anguis fragilis*) was sighted in the north of the turbine area along the track running beside the Capel Water. In addition, three common lizards and a shed skin were seen during surveys along the access track, as well as a slow worm.
108. Several suitable refugia for reptiles were recorded onsite, including the old drystone walls that run across much of the Site, along with stone piles with both surface and sub-surface features suitable for reptiles, particularly slow worm. Reptiles are considered to be of **Site** importance, being common and widespread throughout the region.

#### 8.6.5.9. Freshwater Pearl Mussel

109. No records of freshwater pearl mussel (FWPM) (*Margaritifera margaritifera*) were obtained from within 2 km of the Site, and NatureScot do not hold any historic records of FWPM being present on the Water of Ae or its tributaries.
110. All watercourses within the Site, or immediately adjacent to the Site were assessed for their suitability to support populations of FWPMs. In total, eight watercourses were assessed, with the smallest burns and ditches disregarded for being unsuitable without a full assessment being required.
111. Of the watercourses assessed, only the Capel Water and Poldivan Lake Burn were deemed to provide some areas that would be suitable for FWPM, with the appropriate substrate, water flow and depth required to support the species. Spot checks were carried out on the Poldivan Lake Burn with no mussels identified.
112. The entire section of the Capel Water and a buffer of 250 m downstream was walked using waders and bathyscopes to identify suitable areas and survey for mussels. While some areas, especially along the edges of the banks, and in slow moving pools were suitable for FWPM, none were identified.
113. It is considered that this species is absent from the Site, and it is therefore not discussed further within this EIA Report Chapter.

#### 8.6.5.10. Fish and Aquatic Invertebrates

114. Two records of Atlantic salmon (*Salmo salar*) and three records of brown trout (*Salmo trutta*) were returned from within 2 km of the Site.



115. Fisheries surveys within the study area (as described **Table 8.2, Section 8.5.1**) revealed that the watercourses supported populations of salmonids. The locations of electro-fishing points are shown on **Figure 8.7**. Fish communities were dominated by brown trout fry and parr, with Atlantic salmon fry and parr and stone loach (*Barbatula barbatula*) also present. When present, brown trout fry densities at individual sites ranged from very low to high using the Solway Salmon Fishery Statistical Region classification system (the Annan and Nith catchments fall within the Solway region). Brown trout parr ranged from very low to very high, Atlantic salmon fry were present at two sites at very low and low densities, and Atlantic salmon parr present at low densities at one site. At connected watercourses outside the Application Boundary, when present, brown trout fry densities ranged from very low to low, brown trout parr ranged from low to high and a very low density of Atlantic salmon parr was recorded at one site.
116. Both Atlantic salmon and brown trout are considered to be of **Regional** importance. Stone loach are considered to be of **Site** importance.
117. Single season aquatic macroinvertebrate sampling revealed community's categories poor to high within the Application Boundary using the Walley Hawkes Paisley Trigg (WHPT) index. Macroinvertebrate communities outside the Application Boundary but within the catchment show an overall good level of water quality throughout the survey sites, as detailed within **Technical Appendix 8.3** and **Technical Appendix 8.4**. Aquatic macroinvertebrates are considered to be of **Site** importance.

#### **8.6.5.11. Other Species of Principal Importance**

118. Brown hare (*Lepus europaeus*) was noted on the Site and there are additional records within 2 km. Brown hare is a quarry species which is protected in the closed season (1 February – 30 September) under the Wildlife and Countryside Act 1981 (as amended). Brown hare is listed on the SBL as a priority species for biodiversity conservation in Scotland. Brown hare is considered to be of **Site** importance.

## **8.7. Predicted Future Baseline**

### **8.7.1. The 'Do Nothing' Scenario**

119. Ecological features are rarely static in their extent, distribution and condition. Habitats and species populations are dynamic and so the prediction of future baseline is complex. In the absence of the proposed Development it is likely that existing land uses will persist and habitat structure, function and protected species assemblages will broadly reflect their current condition.

#### **8.7.1.1. Implications of Climate Change**

120. The predicted effects of climate change are likely to influence the future ecological status of the study area. Drawing on the UK Climate Projections CPI8, which generally predict hotter, drier summers and milder, wetter winters, it is likely that ecological features will be subject to:
- an increase in invasive species diversity and range;
  - changes to vegetation assemblages; and
  - range contraction/expansion of faunal species.

121. These predicted changes to the climate are unlikely to significantly affect the findings of this assessment if they occur.

## 8.8. Embedded Mitigation

122. The Applicant initially investigated development scenarios up to 14 turbines, and with turbines up to 220 m to tip height prior to detailed EIA studies. These were subsequently modified to a 13-turbine layout of up to 220 m to tip during the scoping phase. The final design layout comprises a layout of 12 turbines, six with a maximum height of 220 m and six with a maximum height of 200 m (to vertical turbine blade tip), hardstandings, 26 km of access track (8.7 km of which is new), and associated infrastructure. A construction and maintenance compound would be required for the duration of the construction phase (approximately 24 months).
123. Artificial lighting may be required during the construction phase to ensure safe working conditions, during periods of limited natural light. It is intended that the type of lighting would be non-intrusive (e.g. directed towards works activity and away from the Application Boundary), to minimise impact on local properties and other sensitive receptors.
124. Watercourse and ditch crossings have been avoided in the design of the access track as far as possible; however, there would be eight new watercourse crossings within the Site, of which four are regulated crossings. Twenty watercourse crossings are to be upgraded, of which 15 are regulated crossings. Further details on the watercourse crossings including coordinates are contained in **Chapter 3: Proposed Development**.
125. The assessment has been carried out taking into account embedded mitigation for the proposed Development. Details of the embedded mitigation measures are provided in **Chapter 2: Site Description and Design Evolution** and **Technical Appendix 3.1: Outline Construction Environmental Management Plan (CEMP)**. However, a summary of the measures that are relevant to the ecological impact assessment is provided below:
- Track length and the number of watercourse crossings has been minimised as far as possible to minimise land take. The access track has utilised an existing track where practicable, with only a small new section being required along with some upgrading of the existing track, sections of floating access track will also be used to protect degraded blanket bog habitat;
  - Sensitive siting of the proposed infrastructure incorporating appropriate buffer distances from environmental receptors to avoid or reduce effects on the environment;
  - Minimising removal of plantation/tree cover to accommodate renewable energy infrastructure;
  - Sensitive ecological receptors, including habitats present within the Site and species which use the Site and appropriate buffers, have been avoided as far as possible. The proposed Development avoids ecological features of greatest sensitivity, such as Annex 1 peatlands. In addition, the recommended habitat standoff distances from blade swept path to key habitat features have been incorporated into the design to reduce collision risk to bats;
  - A minimum 50 m buffer has been included around all mapped watercourses on the Site for turbines. Watercourse crossings have been minimised as far as practicable; and where



possible, existing crossings would be used. Existing crossings may be upgraded or replaced as appropriate;

- A review of the peat depth data and habitat mapping, in conjunction with slope gradients, allowed areas of deep peat and those areas of less modified peat to be avoided where possible through the evolution of the design. Where possible, proposed wind turbines and site infrastructure would be located within areas with no peat or with peat less than 1.0 m deep. Where access tracks cannot avoid areas of deep peat, floating tracks have been incorporated into the design;
  - Turbines will be keyholed into existing forestry where feasible to reduce the number of trees to be felled. For the six turbines of up to 220 m in height, the radius of the area to be keyholed around each turbine would be 86 m. For the six turbines of up to 200 m in height, the radius of the area to be keyholed around each turbine would be 55 m;
  - A micro-siting buffer of 50 m has been placed around proposed wind farm infrastructure in order to address any localised environmental sensitivities;
  - The eight new watercourse crossings required will be of a design so as to maintain hydraulic connectivity and allow the free passage of fish and other wildlife beneath. Watercourse crossings will also be of sufficient size so as not to restrict or concentrate flows downstream and to convey flows during periods of heavy rainfall (e.g. 1 in 200-year event plus climate change allowance). The conceptual crossing designs are provided in **Technical Appendix 10.5: Drainage Impact and Watercourse Crossing Assessment**;
  - Fish rescue and translocation operations to be conducted prior to works on the watercourse crossing points to be undertaken. The isolation of the watercourse at the footprint of the crossing point working area using nets, subsequent removal of all fish from the area and their translocation to suitable habitat downstream will be undertaken during the construction phase. This standard mitigation measure further reduces the likelihood of direct loss / injury to Atlantic salmon and brown trout during the construction phase;
  - A minimum 86 m and 98 m buffer (for 220 m turbines and 200 m turbines respectively) between turbine locations and the edges of conifers (see **Technical Appendix 14.1**), and 55 m from watercourses has additionally been included to achieve a minimum 50 m 'standoff' from bat commuting (forest edge) and habitat features (watercourses) and turbine blade tips in accordance with current good practice mitigation outlined in NatureScot (2021) guidance; and
  - Operational lighting would be limited to aircraft warning thus minimising light-related impacts on nocturnal or crepuscular species such as bats, badgers and otters.
126. Excavated soil and peat would be used in site restoration and rehabilitation at the end of the construction period, in order to promote fast re-establishment of vegetation cover on worked areas and areas of bare soil or peat that are not required for the operational phase of the development. Some of the excavated peat would be reserved for peatland restoration in parts of the Application Boundary. Soils and peat would be stored for as short a time as practicable, in order to minimise degradation through erosion and desiccation. Storage would also meet best practice recommendations to reduce the risk of peat slides.





127. An outline habitat management plan detailing areas of the Site to be enhanced /restored has been developed and is provided in **Technical Appendix 8.9**. The outline HMP has been developed both to mitigate for adverse impacts on biodiversity but also to significantly enhance the biodiversity of the local area through habitat management measures. The HMP details measures to provide not only compensation, but larger scale enhancement to provide wider benefits for nature and biodiversity. The main focus of the HMP is on restoration of forested blanket bog habitat and native broadleaf planting. The habitat management measures will include restoration of 2.82 ha of degraded blanket bog as well as planting approximately 15 ha of native broadleaf woodland in Habitat Management Area A. Native broadleaf tree planting is also proposed across 13.33 ha of riparian habitat in a Area B.
128. Given the predicted fatality rates of common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, noctule and Leislars, additional mitigation measures will include the curtailment of wind turbine operations under specific weather conditions. This curtailment will start 30 minutes before sunset and finish 30 minutes after sunrise, between 1 April and 31 October each year, for the duration of the proposed Development. The curtailment strategy will be supported by a comprehensive monitoring programme to evaluate its effectiveness and to assess if adjustments to the curtailment parameters are warranted. Further details of these measures are provided in **Technical Appendix 8.10: Bat Monitoring and Mitigation Plan**. The post-construction bat monitoring programme will include -carcass searches to measure the success of the curtailment strategy. These casualty searches must be carried out by dogs. Dogs can have detection rates ranging from 70% to over 90%, while human searchers, in comparison, often have much lower detection rates, usually between 20% and 40% in similar conditions.

### 8.8.1. Good Practice Measures

129. Full details of construction phase mitigation measures for the proposed Development will be contained within a CEMP. The CEMP will include all good practice construction measures, pollution prevention controls and monitoring to be implemented during construction of the proposed Development in line with current industry and statutory guidance.
130. Good practice measures in relation to pollution risk, sediment management, watercourse crossings and sensitive techniques with regards construction in peatlands and near watercourses to be adopted during the construction and operation phases are detailed in **Chapter 10: Hydrology, Hydrogeology, Geology and Soils** and a draft CEMP is provided as **Technical Appendix 3.1**.
131. Good practice measures to protect flora and fauna during construction works, including the careful storage of potentially dangerous substances or materials within construction compounds, would also be implemented as outlined within **Technical Appendix 3.1**.

### 8.8.2. Pre-construction Surveys

132. There is some potential for a change in the distribution of protected terrestrial mammal species within the Site, between the completion of baseline surveys presented herein and the commencement of construction activities for the proposed Development. Pre-construction surveys for protected terrestrial mammals including bats, otter, water vole,



badger, pine marten, and red squirrel would therefore be undertaken, prior to the commencement of construction works as stated within **Technical Appendix 3.1**.

133. The results of the pre-construction surveys would inform the need for further mitigation (if required) in respect of sensitive working practices, species protection plans (SPPs) and/or the requirement to consult with NatureScot, in relation to protected species licencing. SPPs will be produced for all species which may be present on Site and in the surrounding area.
134. A licence from NatureScot will be applied for any bat roosts which cannot be avoided, and suitable mitigation and compensation will be put in place based on the type of roost located and species present.

#### **8.8.2.1. Reptiles and Amphibians**

135. To ensure compliance with the provisions of the Wildlife and Countryside Act 1981 (as amended in Scotland) measures to avoid and reduce the potential for inadvertently killing or injuring individual reptiles and amphibians during construction works would be implemented.
136. Given the low numbers of reptiles and amphibians likely to be present, the large areas of suitable habitat that would remain unaffected by the works, and given also the spatial scale of the works, fencing and translocation are not considered appropriate. Proposed mitigation would therefore involve vegetation management and the identification, and controlled removal of potential refugia and hibernacula, where necessary, under a watching brief by an project ecologist where present.
137. Where appropriate and safe to do so, potentially suitable habitats for reptiles located within construction working areas would be hand-cut, under the supervision of the project ecologist, prior to construction works commencing in that area, in order to encourage reptiles and amphibians to leave the area. Suitable habitat within working areas would also be searched by the project ecologist prior to construction commencing and any potentially suitable refuges would be removed. These works would take place during the active season for reptiles and amphibians (typically April to October, although this is dependent upon the weather conditions in any one year).

## **8.9. Identification and Evaluation of Effects**

### **8.9.1. Effects Scoped Out**

138. CIEEM guidelines (2018) stipulate that it is not necessary to carry out a detailed assessment of impacts upon ecological features that are sufficiently widespread, unthreatened and/or resilient to impacts of a development proposal. NatureScot guidance (2020a) similarly advises that there are some species which, with standard mitigation measures, are unlikely to experience a significant environmental effect as a result of the construction and/or operation of onshore renewable energy developments. These species do not require surveys to inform the EIA but may require appropriate mitigation to ensure legislative compliance.
139. As such, the assessment presented within this Chapter considers the effects upon designated sites for nature conservation and ecological features which are considered 'important' on the basis of relevant guidance and professional judgement.





140. Where ecological features are not considered so important as to warrant a detailed assessment or where they would not be significantly affected on the basis of baseline information, these are ‘scoped out’ of the assessment. Mitigation measures for such features may, however, still be outlined as appropriate, to reduce and/or avoid any potentially adverse effects, or to ensure legislative compliance.

141. The following ecological features are scoped out of assessment:

*8.9.1.1. Designated Sites for Nature Conservation*

142. The potential for indirect effects upon the ecological qualifying interests of any statutory designated site for nature conservation, located greater than 2 km from the Site is scoped out of the assessment, by virtue of the static nature of the sites’ qualifying habitats interests, spatial separation and/or absence of hydrological pathways of connectivity.

143. With the exception of the Galloway and Southern Ayrshire UNESCO Biosphere Reserve, there are no non-statutory designated sites for nature conservation with ecological qualifying interests located within 2 km of the Site. As the proposed Development is within the transition zone of the reserve and given that standard good practice measures would be applied (as detailed in the Outline CEMP provided as **Technical Appendix 3.1**), it is considered that this non-statutory site will not be significantly affected and can be scoped out of the assessment.

144. Due to the spatial separation of the Site from other non-statutory sites and the absence of any likely pathways for connectivity, potential effects upon non-statutory designated sites for nature conservation are scoped out of the assessment.

145. There will be no direct loss of ancient woodland as a result of the proposed Development, and in view of the good construction practice measures, effects on ancient woodland are scoped out of the assessment.

146. Sites with ornithological qualifying interests are considered separately in **Chapter 9** and sites with geological and hydrological qualifying interests considered in **Chapter 10**.

*8.9.1.2. Habitats and Vegetation*

147. Habitats that are of **Site** ecological value (see **Table 8.5**) and/or would not be impacted by the proposed Development have been scoped out of the assessment and are described in **Table 8.8**.

*Table 8.8 Summary of habitats scoped out of assessment.*

UK Hab	Description
Cereal crops (c1c)	Of less than Local importance and therefore scoped out of further assessment.
Blanket bog (fla)	Aligns with Annex 1 habitat: 7130 Blanket bogs, SBL and LBAP Priority Habitats Blanket bog. In view of the embedded mitigation measures ( <b>Section 8.8</b> ) of avoiding sensitive ecological features, and good construction practice measures ( <b>Section 8.8.1</b> ) in relation to mitigating pollution risk the blanket bog habitat onsite will not be impacted by the proposed Development and is scoped out of further assessment.
Degraded blanket bog (fla6)	SBL and LBAP Priority Habitats Blanket bog. The access track will cross an arm of one of the areas of this habitat onsite. In view of the embedded mitigation measure ( <b>Section 8.8</b> ) of using a floating track in this location and good construction practice measures ( <b>Section 8.8.1</b> ) in relation to mitigating pollution risk



UK Hab	Description
	the degraded blanket bog habitat onsite will not be impacted by the proposed Development and is scoped out of further assessment.
Purple moor grass and rush pastures (f2b)	The majority of the areas are considered of less than Local importance and have been scoped out of further assessment. The three small areas of this habitat valued as being of Local importance do not lie under the footprint of the proposed Development and, in view of the good construction practice measures in relation to mitigating pollution risk ( <b>Section 8.8.1</b> ) this habitat will not be impacted by the development and is scoped out of further assessment.
Other upland acid grassland (g1b6)	Of less than Local importance and therefore scoped out of further assessment.
Bracken (g1c)	Of less than Local importance and therefore scoped out of further assessment.
Other neutral grassland (g3c)	Of less than Local importance and therefore scoped out of further assessment.
Deschampsia neutral grassland (g3c7)	Of less than Local importance and therefore scoped out of further assessment.
Holcus – Juncus neutral grassland (g3c8)	Of less than Local importance and therefore scoped out of further assessment.
Modified grassland (g4)	Of less than Local importance and therefore scoped out of further assessment.
Wet heathland with cross-leaved heath (h1b6)	Aligns with Annex 1 habitat 4010 North Atlantic wet heaths with <i>Erica tetralix</i> and SBL and LBAP Priority Habitats Upland heaths. In view of the embedded mitigation measure ( <b>Section 6.7</b> ) of avoiding sensitive ecological features, and good construction practice measures ( <b>Section 8.8.1</b> ) in relation to mitigating pollution risk the wet heathland onsite will not be impacted by the proposed Development and is scoped out of further assessment.
Willow and mixed scrub (h3j and h3h)	Affiliated with LBAP Priority Habitat Scrub woods because of species composition, but only present onsite in small areas lining the tracks. Of less than Local value and scoped out of further assessment.
Eutrophic standing waters (r1a)	The small waterbody, considered to be of less than Local importance, is located 15 m from the existing access track, and is buffered from the track by an area of self-seeded Sitka spruce and other broadleaved tree species. In view of design layout considerations, embedded mitigation and good construction practice measures, this habitat will not be impacted by the proposed Development and is scoped out of further assessment. Further consideration of waterbody interests is provided in <b>Chapter 10: Hydrology, Hydrogeology, Geology and Soils.</b>
Acid peat-stained lakes and ponds (r1c7)	Three small waterbodies located over 200 m from infrastructure and forming part of two discrete wetland complexes onsite with blanket bog and marshy grass habitats and, as such, may be considered to be hydrologically connected to these habitats. In view of the embedded mitigation measures ( <b>Section 8.8</b> ) and good construction practice measures ( <b>Section 8.8.1</b> ), the wetland complexes will not be impacted by the proposed Development, and these waterbodies are scoped out of further assessment. Further consideration of waterbody interests is provided in <b>Chapter 10: Hydrology, Hydrogeology, Geology and Soils.</b>

UK Hab	Description
Other rivers and streams (r2b)	In view of the design layout considerations and embedded mitigation ( <b>Section 8.8</b> ) which include: a minimum 50 m buffer around all mapped watercourses, with the exception of crossing points, to safeguard the watercourses from indirect effects arising from the proposed Development; minimising watercourse crossings as far as practicable; using existing crossings where possible; and good construction practice measures ( <b>Section 8.8.1</b> ), this habitat will not be impacted by the proposed Development and has been scoped out of further assessment. Further consideration of watercourse interests is provided in <b>Chapter 10: Hydrology, Hydrogeology, Geology and Soils</b> .
Other inland rock and scree (sld)	Of less than Local importance and therefore scoped out of further assessment.
Other developed land (ulb6)	Of less than Local importance and therefore scoped out of further assessment.
Wet woodland (wld)	The area of willow carr onsite forms part of a discrete wetland complex with marshy grassland and wet heath. The wetland complex is adjacent to an existing windfarm track and surrounded by coniferous forestry and is considered to be moderately dependent on groundwater. It is affiliated with SBL Priority Habitat Wet woodland, and LBAP Priority Habitat Native wet woods. In view of embedded mitigation measures ( <b>Section 8.8</b> ) which includes the avoidance of potential GWDTE and good construction practice measures ( <b>Section 8.8.1</b> ), wet woodland will not be impacted by the proposed Development and is scoped out of further assessment. Further consideration of GWDTE interests is provided in <b>Chapter 10: Hydrology, Hydrogeology, Geology and Soils</b> .
Other broadleaved woodland (wlg)	This habitat is affiliated with SBL Priority Habitat Upland birchwoods, and LBAP Priority habitat Native birch woods and is considered to be of Local importance only, given its small extent onsite. The woodland does not lie under the footprint of the proposed Development and, in view of the good construction practice measures in relation to mitigating pollution risk ( <b>Section 8.8.1</b> ), this habitat will not be impacted by the proposed Development and is scoped out of further assessment.
Other woodland mixed (wlh)	Of less than Local importance and therefore scoped out of further assessment.
Other Scots pine woodland (w2b)	The woodland does not lie under the footprint of the proposed Development and in view of the good practice measures in relation to pollution risk, this habitat will not be impacted by the proposed Development and is scoped out of further assessment (further consideration of forestry interests is provided in <b>Chapter 14: Other Issues, and Technical Appendix 14.1: Forestry Assessment</b> ).
Other coniferous woodland (w2c)	Of less than Local importance and therefore scoped out of further assessment (further consideration of forestry interests is provided in <b>Chapter 14: Other Issues, and Technical Appendix 14.1: Forestry Assessment</b> ).

### 8.9.1.3. Species

148. NatureScot guidance (2024) advises that “there are some protected species (e.g. moths and other invertebrates, and amphibians) that, with standard mitigation, are unlikely to experience any significant environmental effects. Such species will not normally require surveys to inform the EIA, unless they are European Protected Species (EPS) or qualifying



*features of protected areas. Instead, we advise that developers should normally be able to apply mitigation during construction to minimise impacts and avoid committing an offence”.*

149. In consideration of the nature of the proposed Development and in accordance with NatureScot guidance (2024), the following species and/or species groups have been scoped out of the assessment:

- Invertebrates: no designated site for nature conservation, designated by virtue of its invertebrate qualifying interests, is located within 2 km of the Site and no existing records of any terrestrial invertebrate species listed as an EPS or afforded special protection under the provisions of the Wildlife and Countryside Act 1981 (as amended) were identified during the desk study within 2 km of the Site. On this basis and due to the relatively small footprint of the proposed Development within the wider context of the Site, and the availability of similar habitats remaining unaffected within the Site, immediate and wider surrounding area, significant negative effects upon other invertebrate populations are also considered unlikely. Invertebrates are therefore scoped out of the assessment.
- Reptiles and amphibians: in accordance with NatureScot guidance (2024) field surveys for reptiles and amphibians have not been undertaken. Existing records of adder and common lizard were however identified during the desk study and slow worm and palmate newt were recorded during surveys. No designated site for nature conservation, designated by virtue of its reptile or amphibian qualifying interests, is located within 2 km of the Site. No records of great crested newt were returned from within 5 km of the Site and this species was considered unlikely to be present due to the upland nature of the Site and the acidic quality of the aquatic habitats, which are considered unsuitable to support the species. This species was also scoped out during the Harestanes South Wind Farm surveys. Due to the relatively small footprint of the proposed Development and the availability of similar habitats remaining unaffected within the Site, immediate and wider surrounding area, significant negative effects upon amphibian and reptile populations are considered unlikely. The potential for impacts upon reptiles and amphibians is therefore scoped out of the assessment, but consideration is afforded to the provision of mitigation to ensure legislative compliance during the construction phase of the proposed Development, with regards to the protection afforded to common reptile and amphibian species under the Wildlife and Countryside Act 1981 (as amended).

150. Protected mammal species: baseline information collected through desk study and terrestrial mammal surveys have identified the Site as not being important for the following protected terrestrial mammal species:

- badger;
- otter;
- water vole; and
- red squirrel.

151. No badger setts were recorded within the Site, although mammal paths were recorded which could be attributed badger and there is suitable habitat for this species within the turbine area including areas of wind blow which could not be surveyed. Badger latrines, a footprint and snuffle holes were found along the access track. However, badgers are common and widespread throughout Scotland and are not considered endangered. Given



that pre-construction checks for badgers will be undertaken and used to inform a species protection plan (SPP), excavations will be provided with a means of escape and micro-siting has been allowed for, it is considered that there will be no significant effect on badgers, and they are scoped out of further assessment.

152. Evidence of otter was recorded in the form of spraints and several possible lie-up sites, including two along the access track with evidence of otter associated with them. No holts were recorded within the turbine area, although a feature with suitability for being used as a holt was found along the access track, albeit no evidence was found to indicate use. It is considered that otters use the turbine area for foraging and commuting and it is likely that they use the watercourses along the access track for resting. Otters are common and widespread in Scotland however they are an EPS under the Habitats Regulations as well as being listed on the SBL and the Dumfries and Galloway LBAP. As no confirmed holts were recorded, no significant effect on otter holts are predicted and given that there has been a sensitive design layout which includes watercourse buffers, best practice measures will be in place to avoid pollution of watercourses, excavations will be provided with a means of escape, micro-siting has been allowed for should any new features be discovered during pre-construction surveys and a SPP will be produced, no significant effect on otters is predicted. They are therefore scoped out of further assessment.
153. No definite evidence of water vole was found during the surveys and most watercourses around the Site are unsuitable for water vole. However, suitable habitat was noted on Poldivan Lake Burn. Water voles are listed on Schedule 5 of the Wildlife and Countryside Act 1981 (as amended), whereby their burrows are protected but individuals are not. They are also included on the SBL and Dumfries and Galloway LBAP as a priority species. However, it is considered that with sensitive design layout that includes watercourse buffers, burrows (if present) would be unlikely to be affected. Additionally, given that pre-construction checks for burrows will be undertaken and used to inform a SPP, excavations will be provided with a means of escape and micro-siting has been allowed for, it is considered that there will be no significant effect on water voles, and they are scoped out of further assessment.
154. The majority of the Site is Sitka spruce plantation which is considered sub-optimal for red squirrel and no definite evidence of red squirrel was found during the surveys. This species could however be present in low numbers across the Site, as they are known to be present in the geographical area. Red squirrels and their dreys are protected by Schedules 5 and 6 of the Wildlife and Countryside Act 1981 (as amended) as well as being listed on the SBL and Dumfries and Galloway LBAP. Given that habitat is sub-optimal, pre-construction surveys will be undertaken to inform an SPP and that 'key-holing' of the plantation will be undertaken, therefore reducing the amount of suitable habitat to be lost, it is considered that red squirrel will not be significantly affected, and they are scoped out of further assessment.
155. Brown hares were identified on Site during the surveys. This species is listed on the SBL and is also a Dumfries and Galloway LBAP species. However, given the small footprint of the proposed Development, the ability of brown hare to easily move away from construction activities, coupled with good practice measures and the production of a SPP, it is considered that this species would not be significantly affected, and they are scoped out of further assessment.



156. With good working practices protecting the freshwater environment from sedimentation and pollution, aquatic macroinvertebrates are scoped out of further assessment.
157. Although the species above have been scoped out of the assessment, consideration is nonetheless afforded to the provision of precautionary mitigation to ensure legislation compliance with regards the protection afforded to these species under the Conservation (Natural Habitats, &c.) Regulations 1994 (the Habitats Regulations) (as amended in Scotland) and the Wildlife and Countryside Act 1981 (as amended), as relevant. Pre-construction surveys would be undertaken to inform any such mitigation as well as any licences required from NatureScot.

### 8.9.2. Effects Scoped Into Assessment

158. In accordance with the guidance provided in CIEEM Guidelines for Ecological Impact Assessment in the UK and Ireland (CIEEM, 2018), ‘Key Ecological Features’ (KEFs) are important ecological features within the Zol of the proposed Development, which are “*both of sufficient value to be material in decision making and likely to be affected significantly*”. For this assessment, KEFs have been identified as ecological features with a value of **Local** importance or greater, which may be subject to significant effects from the potential impacts associated with the proposed Development. **Table 8.9**, below lists the KEFs identified that will be scoped into the detailed assessment of effects.
159. The embedded mitigation measures (outlined in **Section 8.8** above) have been taken into account when scoping potential impacts.

*Table 8.9 Features scoped into detailed assessment.*

Ecological Feature	Ecological Value	Key Ecological Features
Upland dry heaths (h1b5)	Regional	The access track crosses a 0.9 ha area of dry heath and truncates two further areas of dry heath by 32 m <sup>2</sup> and 68 m <sup>2</sup> . This habitat, present in small and discrete patches onsite, is affiliated with Annex 1 habitat: 4030 European dry, and SBL and LBAP Priority Habitats Upland heaths. It is scoped into the assessment because it is classified as being of <b>Regional</b> value because it is a small extent of an internationally important habitat.
Lowland mixed deciduous woodland (w1f)	Local	Lowland mixed deciduous woodland is represented onsite by three stands with mixed canopy of alder, birch, cherry, hazel, rowan and willow scattered throughout the site. The habitat is scoped into the assessment because 827 m <sup>2</sup> of the largest stand will be lost to a new track, causing habitat fragmentation.
Bats	Regional (Leisler’s, Noctule, Nathusius’ pipistrelle)  Local (common pipistrelle and soprano pipistrelle, <i>Myotis sp.</i> )	All bat species in the UK are afforded full statutory protection as EPS listed on Schedule 2 of the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended), which transpose the Habitats Directive (92/43/EEC) into Scottish Law.  With reference to those species identified within the Site; soprano and common pipistrelle bats, Noctule, brown long-eared bat, Daubenton’s and Natterer’s ICUN Red List Status in Scotland is considered to be of least concern (LC) (Natural England, 2018). While for Brandt’s and whiskered bats their status is data deficient (DD), for Leisler its status is near threatened (NT) and for Nathusius’ pipistrelle it is considered vulnerable (VU).





Ecological Feature	Ecological Value	Key Ecological Features
	And Brown Long-eared)	<p>Population trends in Scotland for soprano pipistrelle according to the National Bat Monitoring Programme (Bat Conservation Trust, 2022 is considered to have increased in the long-term and to have been stable in the short-term. While for common pipistrelle, brown-long-eared bats and <i>Myotis</i> species (Daubenton's, natterers and whiskered/Brandt's) in Scotland or Great Britain, these populations are considered to have been stable in the long term and in the short term. It should be noted, however, that the roost index for brown long-eared bats has declined in Great Britain. There is insufficient data available on Leisler's bat and Nathusius' pipistrelle at present to calculate population trends. Leisler' and Noctule are known to be at the end of their geographical range in Scotland, with these species more common in England, while Nathusius' pipistrelle is an uncommon migratory species in the UK, which is known to breed here with records of this species more common in England.</p> <p>The ecological value across the study area is assessed as being of '<b>Regional</b>' importance for Leisler, Noctule and Nathusius' pipistrelle based on their high collision risk, with cumulative bat deaths having the potential to be significant to the local and regional populations as well as likely low regional populations. This is because bats are long-lived, and their reproductive rate is low. The ecological value across the study area is assessed as being of '<b>Local</b>' importance for soprano and common pipistrelle given that their populations are considered to be stable.</p> <p>For <i>Myotis</i> sp. and brown long-eared bats, the ecological value across the study area is assessed to be '<b>Local</b>' due to their stable population trends, IUCN red list status in Scotland and their low collision risk with turbines. However, they could still be affected by displacement and habitat loss.</p>
Aquatics - Fish	Regional (Atlantic salmon; brown trout)	<p>Surveys revealed that Annex II species Atlantic salmon were present in watercourses within the Application Boundary, albeit in low numbers. Brown trout, UK BAP species, were present in the fish communities of all watercourses within the Application Boundary. The watercourses function as brown trout nursery grounds as evidenced by the densities of fry and parr. There is potential for mortality or injury to fish through being stranded during works on watercourse crossing points. Fish are therefore scoped in for further assessment.</p>
Pine marten	Regional	<p>Survey results indicate that pine martens are present within the Site and the mix of young and mature plantation, as well as large areas of windblown trees across the Site provides suitable habitat for pine marten for both foraging and shelter. This species receives full protection under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and certain methods of killing or taking this species is illegal under the Habitats Regulations. Pine Marten is also listed on the SBL, although it is not a Dumfries and Galloway LBAP priority species. The Forest of Ae is an important area in the conservation of this species as a whole in the UK. This species could be impacted through habitat loss and disturbance and is therefore scoped in for further assessment.</p>



160. The potential effects associated with each phase of the proposed Development which could lead to a significant effect on the KEFs are discussed below.
161. Impacts arising from the decommissioning phase of the proposed Development have not been presented in detail because they are considered to be of a similar nature to the construction issues identified but of a potentially smaller scale and shorter duration. Therefore, effects arising from decommissioning are anticipated to be broadly similar in nature to, but of a lower-level effect than those arising during the construction phase, and with all infrastructure removed and habitats reinstated to pre-development conditions.

#### *8.9.2.1. Potential Construction Effects*

162. Potential impacts scoped into the assessment:
163. Indirect impacts on GWDTE via the groundwater regime and via surface water drainage have been assessed in **Chapter 10: Hydrology, Hydrogeology, Geology and Soils**. Potential direct permanent impacts on GWDTE are considered in this Chapter.
- Permanent loss of habitats, including rare and ecologically sensitive habitats, and those used by protected species, due to permanent or temporary land take.
  - Fragmentation of habitat or severance of ecological corridors between habitats of ecological importance.
  - Creation of new areas of habitat and introduction of species as a result of reinstatement works, habitat enhancement proposals, and landscaping.
  - Habitat loss/fragmentation and disturbance - pine marten: there is potential for loss of suitable pine marten habitat during the construction works as well as the potential for direct injury or even death of individual pine martens due to construction traffic.
  - Loss/disturbance/displacement – bat roosts: potential bat roost features within trees could be removed by felling/lopping works which could result in the destruction of a bat roost. In addition, track widening, and upgrade works could take place adjacent to a roost, which could potentially result in disturbance to a bat roost, if it was in current use.
  - Disturbance/displacement – bats (foraging/commuting): there is the potential for displacement and/or disturbance to foraging and commuting bats during construction. Temporary effects arising during construction include disturbance through site clearance, pile driving, excavation works and widening/construction of new access tracks (including the removal of trees along existing access tracks). Onsite lighting and noise (from explosions used to excavate borrow pits) may also result in the disturbance of bat species forage in habitats surrounding the Site.
164. Habitat loss/fragmentation – bats (foraging/commuting): the proposed Development may lead to habitat fragmentation due to the temporary loss of functional habitat. This habitat loss will occur through the installation of turbines, crane pads, construction compounds, and the creation or widening of access tracks within the Site.
- Direct loss/injury – fish (Atlantic salmon and brown trout). There is potential for mortality, or injury to fish through being stranded during works on watercourse crossing points, both introducing new culverts/bridges or upgrades on existing crossing points.



### *8.9.2.2. Potential Operational Effects*

165. Potential impacts scoped out of the assessment for the operational phase:

- Disturbance/ displacement and loss of habitat – during the operational phase, the proposed Development will have regular site traffic which will be confined to the haulage roads and access tracks and will not be operating in areas of suitable habitat for protected species.
- With the design of crossing points over the watercourses within the Application Boundary allowing free passage of salmonids and other species, fish are scoped out of further assessment for the operational phase of the project.
- Uncontrolled spread of INNS as a result of operational maintenance activities, leading to reduced biodiversity. This impact will be managed through best working practices as specified in the CEMP.

166. Potential impacts scoped into the assessment for the operational phase:

- Disturbance/ displacement and loss of habitat – bats: during the operational phase, there will be 12 turbines, six with a maximum height of 220 m and six with a maximum height of 200 m (to vertical turbine blade tip) which have the potential to disturb and displace foraging and commuting bats.

167. Collision risk – the potential for incidental mortality resulting from collision risk on commuting and foraging bat species.

### *8.9.2.3. Potential Decommissioning Effects*

168. The proposed Development is anticipated to have an operational life of **40 years**, after which, the proposed Development would be decommissioned, and the turbines dismantled and removed (refer to **Chapter 3**).

169. A detailed methodology cannot be finalised until immediately prior to decommissioning. However, impacts would be similar to the construction phase and would be undertaken in line with relevant policy and legislation at that time.

170. Potential impacts on ecological features resulting from decommissioning activities would be expected to be similar to those during the construction phase and therefore have not been assessed separately in this chapter.

## **8.9.3. Potential Effects in the Absence of Mitigation**

171. The potential for significant effects on each KEF during the construction and operational phases of the proposed Development in the absence of mitigation are assessed below.

### *8.9.3.1. Habitats*

172. Habitats areas found within the Application Boundary are listed below, along with areas to be lost as part of the proposed Development.

Table 8.10 Terrestrial habitat lost to development footprint.

Habitat Uk Habitats	Turbine Area including internal access track (ha)	Access Track (ha)	Area Lost - Crane Pad and Turning Head (ha)	Area Lost – ALL Access Tracks (ha)	Total Lost (ha)
Cereal crops (c1c)	0.00	0.50	0.00	0.50	0.50
Blanket bog (f1a)	5.80	0.00	0.00	0.00	0.00
Degraded blanket bog (f1a6)	4.56	0.01	0.00	0.01	0.01
Purple moor-grass and rough pastures (f2b)	10.24	0.00	0.00	0.03	0.03
Other wetlands (f2f)	2.19	0.00	0.00	0.00	0.00
Upland acid grassland (g1b6)	6.87	0.05	0.00	0.05	0.05
Bracken (g1c)	16.55	0.02	0.00	0.02	0.02
Other neutral grassland (g3c)	4.73	0.35	0.00	0.37	0.37
Holcus – Juncus neutral grassland (g3c8)	0.00	0.04	0.00	0.04	0.04
Modified grassland (g4)	2.34	0.00	0.00	0.00	0.00
Dry heaths, upland (h4030) (h1b5)	3.68	0.03	0.00	0.03	0.03
Wet heathland with cross-leaved heath, upland (h4010) (h1b6)	6.03	0.00	0.00	0.00	0.00
Mixed scrub (h3h)	4.43	0.03	0.00	0.03	0.03
Acid peat-stained lakes and ponds (r1c7)	0.13	0.00	0.00	0.00	0.00
Other inland rock and scree habitats (s1d)	2.18	0.00	0.00	0.00	0.00
Other developed land (u1b6)	0.04	0.00	0.00	0.00	0.00
Artificial unvegetated unsealed surface (u1c)	10.54	8.05	0.00	11.70	11.70
Wet woodland (w1d)	1.57	0.00	0.00	0.00	0.00
Lowland mixed deciduous woodland (w1f)	9.61	0.05	0.00	0.15	0.15
Other woodland-broadleaved (w1g)	2.02	0.00	0.00	0.00	0.00
Other woodland mixed (w1h)	43.81	0.16	0.00	0.49	0.49
Other scots pine woodland (w2b)	4.51	0.00	0.00	0.00	0.00
Other coniferous woodland (w2c)	711.49	0.52	11.86	4.85	16.71

Table 8.11 Upland dry heath.

Parameter	Potential Effect
	Habitat Loss Through Direct and Indirect Impacts
Ecological value	Regional
Receptor sensitivity	Medium
Extent	Development footprint where the access track crosses this habitat
Magnitude (positive/negative)	Negative. Three areas will be lost: 257 m <sup>2</sup> where the access track crosses a 0.9 ha area of dry heath, and 32 m <sup>2</sup> and 68 m <sup>2</sup> lost where two further areas of dry heath are truncated by the access track. The total area of dry heath lost on Site is 357 m <sup>2</sup> , 0.50 % of the total area on Site.
Duration	Permanent
Timing/ Frequency	Habitat loss will be permanent with the construction works being infrequent/one-off
Reversibility	Reversible – it is possible for this habitat to be recreated, or to regenerate through species dispersal and colonisation from adjacent similar habitat
Likelihood	Certain
Significance (EclA)	<b>'Not Significant'</b> . Bisecting the dry heath with a track of 5.5 m width will not affect species dispersal or colonisation, and therefore should not affect the heathland's biodiversity. The loss of 0.5 % of the Site's dry heathland will not reduce the range nor affect the viability of the habitat on Site

Table 8.12 Lowland mixed deciduous woodland.

Parameter	Potential Effect
	Habitat Loss Through Direct and Indirect Impacts
Ecological value	Local.
Receptor sensitivity	Medium.
Extent	Development footprint where the access track crosses this habitat
Magnitude (positive/negative)	Negative. The access track crosses a 9.6 ha stand of this habitat, losing 827 m <sup>2</sup> (0.86 %) and bisecting the woodland. The total proportion of this habitat loss across the Site is 0.60 %.
Duration	Permanent.
Timing/ Frequency	Habitat loss will be permanent with the construction works being infrequent/one-off.
Reversibility	Reversible – it is possible for this habitat to be recreated, or to regenerate through species dispersal and colonisation from adjacent similar habitat.
Likelihood	Certain.
Significance (EclA)	<b>'Not Significant'</b> . Bisecting the woodland with a track of 5.5 m width will not affect species dispersal or colonisation, and therefore should not affect woodland biodiversity. The loss of 0.6 % of the Site's lowland mixed deciduous woodland will not reduce the range nor affect the viability of the habitat on Site.

8.9.3.2. Pine Marten

Table 8.13 Pine Marten.

Parameter	Potential Effect	
	Habitat Loss/Fragmentation – Indirect Impact	Direct Impact
Ecological value	Regional.	Regional.
Receptor sensitivity	Medium.	Medium.
Extent	Development footprint only where suitable habitat being lost for turbine infrastructure and access tracks.	Throughout the Site where vehicles moving etc and felling taking place.
Magnitude (positive/negative)	Negative if denning habitat lost during construction. May be some positive as key holed areas may lead to an increase in prey species as well as access track opening up transit routes allowing wider and faster dispersal.	Negative if individuals killed or injured during construction works.
Duration	Long-term negative – habitat will be permanently lost but only in small areas for infrastructure. Long-term positive.	Short-term – during construction (24 months approximately).
Timing/ Frequency	Habitat loss will be permanent with the construction works being in-frequent/one-off. Permanent positive.	During construction, infrequent.
Reversibility	Irreversible where habitat lost permanently for infrastructure.	Irreversible.
Likelihood	Probable.	Unlikely.
Significance (EclA)	<b>'Not Significant'</b> as not likely to affect Regional population due to small areas of habitat being lost.	<b>'Not Significant'</b> as not likely to affect Regional population.

8.9.3.3. Aquatics

Table 8.14 Atlantic salmon and brown trout.

Parameter	Potential Effect	
	Direct Impact (killing/injury)	
Ecological value	Regional.	
Receptor sensitivity	Medium.	
Extent	Water crossing points within Application Boundary.	
Magnitude (positive/negative)	Negative if individuals killed / injured during construction.	
Duration	Short term – during construction.	
Timing/ Frequency	During construction, infrequent.	
Reversibility	Irreversible.	
Likelihood	Unlikely.	
Significance (EclA)	<b>'Not Significant'</b> as not likely to affect Regional population.	

8.9.3.4. Bats

Table 8.15 Bat - excluding collision risk.

Parameter	Potential effect		
	Fragmentation/ Habitat Loss	Loss of Bat Roosts	Disturbance/ Displacement
Ecological value	Regional/local.	Regional/local.	Regional/local.
Receptor sensitivity	Medium.	Medium.	Medium.
Extent	<p>Permanent loss of coniferous plantation during construction across the proposed Development. Active plantation site with felling works in operation across the Site which are not connected to the proposed Development. The habitat loss within the proposed Development would be small-scale and mainly around turbine bases. This represents a small portion of the available habitat for bats within the wider area. Despite any felling that may be undertaken, displacement or disturbance to foraging and commuting bats during construction is considered negligible given the abundance of edge habitats available within the study area that will remain unaffected.</p> <p>Due to the 50 m watercourse buffer for turbine infrastructure or construction activity, linear watercourse features are also largely avoided, except where watercourse crossings are required.</p>	<p>Trees with PRF-I features within turbine area which are to be removed.</p> <p>Trees with PRF-M along access route may require removal for access track widening, however this is likely to be minimal.</p>	<p>Limited to turbine and infrastructure areas.</p> <p>Trees along access track with PRFs which may be disturbed during construction.</p>
Magnitude (positive/negative)	Negative.	Negative.	Negative.
Duration	Long term.	Short term.	Long term – construction and operation period.
Timing/Frequency	During construction and operation.	During construction and operation.	During construction and operation.
Reversibility	Reversible.	Irreversible.	Reversible.
Likelihood	Likely.	Probable.	Likely that displacement will occur through avoidance of foraging habitat and probable that potential roosting features may be disturbed within trees along access track.

Parameter	Potential effect		
	Fragmentation/ Habitat Loss	Loss of Bat Roosts	Disturbance/ Displacement
Significance (EclA)	<b>‘Not Significant’</b>	<b>‘Not Significant’</b>	<b>‘Not Significant’</b>

Table 8.16 Bats - operation (collision risk).

Parameter	Potential Effect
	Collision with Turbines
Ecological value	Regional/Local.
Receptor sensitivity	Medium.
Extent	<p>During the operational phase, there is the potential for collision risk on commuting and foraging common pipistrelle, soprano pipistrelle Nathusius’ pipistrelle, Leisler’s and Noctule species.</p> <p>As discussed in <b>Table 8.7</b> the ecological value across the study area is assessed as being of <b>Regional</b> Nature Conservation Importance for Nathusius’ pipistrelle, Leisler’s and Noctule species and <b>Local</b> for common pipistrelle and soprano pipistrelle.</p> <p>The activity levels for these species were high across the study area. The direct bat fatality rate at most locations therefore has the potential to be high.</p> <p>In the study by Kirkpatrick et al. (2017) on bat activity in coniferous plantations, it was observed that clear-fell areas resulted in increased activity for common pipistrelle, soprano pipistrelle, and Noctule bats. The study also found that <i>Pipistrellus</i> species exhibited 90% higher activity in smaller felled stands (less than 5 hectares) compared to larger felled stands (greater than 30 hectares). Based on these findings, it is suggested that key-holing (creating small, clear-felled openings within forests) may increase the risk of bat collisions with turbines due to heightened bat activity in these smaller, open areas.</p> <p>Exeter University found that most recorded bat fatalities at UK wind farms have been common pipistrelle, soprano pipistrelle and noctule bats with single carcass of brown long-eared bat, Nathusius’ pipistrelle and Natterer’s bat (Mathews et al. (2016). Richardson et al. (2021) research work on <i>Pipistrellus</i> species at wind farm sites found a potential attraction to wind turbines with common pipistrelle relative activity 37% greater at turbines compared to control locations. Roeleke et al., found that female noctule repeatedly came into close contact with wind turbines during foraging flights and flew at heights that suggested a high risk of colliding with turbine blades.</p> <p>The proposed turbines will require red aviation warning lights. A study by Spoelstra et al. (2017) concluded that foraging bats are not attracted to red lighting. The reason for this is that white and green spectrum lights attract foraging insects whilst red lights do not. Therefore, it is unlikely that red light will attract bat activity to the turbines.</p> <p><i>Myotis</i> and brown-long eared bats were also assessed to be of <b>Local</b> importance, however, these species are at low risk from collision,</p>

Parameter	Potential Effect
	Collision with Turbines
Magnitude (positive/negative)	Negative.
Duration	Long term.
Timing/Frequency	During operation.
Reversibility	Irreversible.
Likelihood	Likely.
Significance (EclA)	<p><b>'Significant'</b> at <b>Regional</b> level for Nathusius' pipistrelle, Leisler's and Noctule species.</p> <p><b>'Significant'</b> at <b>Local</b> level for soprano and common pipistrelle.</p> <p><b>'Not Significant'</b> for <i>Myotis</i> and brown long-eared bat due to their low collision risk.</p>

#### 8.9.4. Potential Cumulative Effects

173. The projects and proposed developments within 15 km which have been considered as part of this cumulative assessment are shown in **Table 8.5**. Of these, three (Dalswinton, Harestanes and Minnygap) are operational wind farms while three (Harestanes South, Daer and RivoX) are wind farms in planning.
174. It is not considered that the construction phase of the proposed Development will have any cumulative effects with any other projects or developments proposed for construction given the spatial separation and small footprint of these wind farm projects.
175. Only the potential for significant cumulative operational effects upon bat species are considered within this assessment, with the potential for significant cumulative effects to pine marten not predicted due to the very small area of suitable habitats affected by other windfarm developments considered in **Table 8.5** and the infrequency of operational activities associated with such developments.
176. Minnygap (10 turbines) and Dalswinton (15 turbines) wind farms both reported negligible residual effects on bats while Harestanes (68 turbines) Windfarm has curtailment in place. Harestanes South Windfarm Extension (8 turbines) also has proposed curtailment and monitoring.
177. The assessments upon bat species presented for Minnygap and Dalswinton windfarms were undertaken prior to the publication of current NatureScot guidance (2019 & updated in 2021). As such, it is not possible to undertake a meaningful cumulative assessment with these developments due to the differences in baseline survey and assessment methodologies used.
178. No significant impact was reported for bats for the Daer Wind Farm and no residual significant impact was reported for bats for RivoX Wind Farm. In review of the information available for these developments, significant cumulative effects are not considered likely.
179. The cumulative effects of several wind farms on bats could lead to more substantial impacts than from one development alone. Therefore, while a threshold of two bats per



turbine per year may be sustainable at an individual site, the combined number of bat fatalities across all nearby wind farms could exceed sustainable levels. The combined effects of multiple wind farms, therefore, warrant careful assessment.

180. The cumulative effects of Harestanes Windfarm and Harestanes South Windfarm Extension with the proposed Development are therefore considered to be potentially significant at the **Regional** level for Nathusius' pipistrelle, Leisler's and Noctule species and at the **Local** level for soprano and common pipistrelles.

## 8.10. Mitigation

181. There will be reduced rotation speed while blades are idle. Feathering the blades of wind turbines, which involves adjusting them to reduce their speed rather than allowing them to idle at full rotation, can significantly lower bat mortality rates—potentially by up to 50%. This method, known as feathering at low wind speeds, does not result in any loss of energy output. This approach is recommended as a best practice whenever it is feasible. Feathering can be easily implemented on turbines equipped with a blade pitch control system and can be automated through a Supervisory Control and Data Acquisition (SCADA) system. This allows for real-time adjustments based on environmental data, ensuring that turbines operate in a bat-friendly manner without sacrificing energy production.
182. In terms of indirect bat displacement and disturbance effects, these are considered to be mitigated through project assumptions detailed within **Section 8.8** such as sensitive placement of lighting and the application of good practice guidelines with regards to bats and lighting (ILP, 2023). The level of effect would be adverse, negligible and long-term.

## 8.11. Residual Effects

183. The residual effects are predicted to occur upon any KEF as a result of the construction or operation of the proposed Development at '**Not Significant**'.
184. Behr (2015) suggests that bat mortality from wind turbines is unlikely to significantly impact bat populations if fatalities are kept at or below a certain threshold. The study indicates that maintaining fatalities around two bats per turbine per year aligns with natural mortality and reproduction rates, preventing significant declines. Due to the limited data available on bat populations and bat ecology in Scotland it is not possible to predict exact impacts on bat populations, therefore applying a fatality value from within a European context is the best currently available method of establishing a threshold. This threshold serves as a guideline to determine if a wind farm's impact is sustainable. However, this does not apply universally; as migratory species like Nathusius' pipistrelle may face greater risks due to high collision potential across multiple wind farms along migration routes.
185. Wind farms in close proximity, such as Harestanes Windfarm and Harestanes South Windfarm Extension, should coordinate curtailment efforts based on real-time data on bat activity and environmental conditions. This could involve shared monitoring data and a synchronised curtailment strategy during peak bat activity periods. By doing so, the combined impact of multiple wind farms can be reduced.
186. To mitigate risks, ongoing monitoring and adaptive management will be implemented, including adjustments to curtailment parameters if fatalities exceed the established threshold, with cumulative bats across nearby wind farms also considered. However, no





thresholds will be set for species with limited population data or those at the edge of their geographical range, such as Nathusius' pipistrelle. The threshold will be reviewed annually based on the latest scientific data and guidance, incorporating an assessment of each species' population trends in Scotland and their IUCN Red List status. This ensures that mitigation measures remain effective and are adjusted as needed to reflect changing conditions or new insights.

187. However, as amendments to mitigation measures are iterative, a precautionary approach has been taken, and therefore, residual effects on bat populations are considered to be adverse but **'Not Significant'** as they will be at a low magnitude, short-term (i.e. the population would likely recover over a single breeding season) and reversible.

## 8.12. Summary of Effects

188. No significant residual effects are predicted to occur upon any important ecological feature as a result of the construction or operation of the proposed Development.

189. Residual effects on bats do remain but these are considered to be **'Not Significant'**.

*Table 8.17 Summary of Effects.*

Effect	Phase	Assessment Consequence	Effect Significance
<b>Bats – direct effect from collision risk</b>	Operation.	Low magnitude and short-term.	<b>'Not Significant'</b>

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