

6. Ecology

6.1 Introduction

- 6.1.1 This chapter considers the likely significant effects of the proposed Dalfad Wind Farm (the Proposed Development) on non-avian ecology. It details the likely significant effects arising from the Proposed Development during construction, operation and decommissioning (including cumulatively with other proposals within the Study Area).
- 6.1.2 The objectives of this chapter are to:
- describe the current baseline established from desk studies, non-avian ecological field surveys, and feedback obtained during engagement with stakeholders;
 - describe the assessment methodology and significance criteria used in completing the ecological impact assessment (EclA);
 - describe the likely significant effects, including direct, indirect and cumulative effects;
 - describe the mitigation measures proposed to address any likely significant effects and the resulting residual effects;
 - consider appropriate proposals for compensation; and
 - assess how the Proposed Development will contribute to the enhancement of biodiversity.
- 6.1.3 Effects on avian fauna (birds) are addressed separately in **Chapter 7: Ornithology**. The effects on hydrology and peat are addressed in **Chapter 8: Geology, Hydrology, Hydrogeology and Peat**. **Chapter 8** also considers the hydrological effects on Groundwater Dependent Terrestrial Ecosystems (GWDTEs) identified in the baseline section of this chapter.
- 6.1.4 The ecology assessment has been carried out by SLR Consulting Limited. All staff contributing to this chapter have professional experience in ecological impact assessment (EclA) and ecological survey, hold professional membership of and / or abide by the Chartered Institute of Ecology and Environmental Management (CIEEM) Code of Professional Conduct.
- 6.1.5 This chapter is supported by a number of figures (**Figures 6.1 – 6.13**) which are referenced throughout the text, and which can be found in **Volume 3a: Figures and Drawings**.
- 6.1.6 The following appendices are also referred to throughout the chapter and can be found in **Volume 4: Technical Appendices**:
- **Technical Appendix 6.1:** National Vegetation Classification and Habitats Survey Report;
 - **Technical Appendix 6.2:** Protected Species Survey Report;
 - **Technical Appendix 6.3:** Bat Survey Report;
 - **Technical Appendix 6.4:** Fish Population and Fish Habitat Assessment Report;
 - **Technical Appendix 6.5:** Species Protection Plan;



- **Technical Appendix 6.6:** Outline Biodiversity Enhancement and Management Plan; and
- **Technical Appendix 6.7:** Grid Connection and Abnormal Indivisible Load Route Appraisal.

6.1.7 An appraisal of likely significant effects of the likely grid connection route works and the proposed Abnormal Indivisible Load (AIL) route associated with the Proposed Development (as outlined in **Chapter 2: Project Description**) is provided within **Technical Appendix 6.7**, with a summary provided in **Section 6.13** of this chapter.

6.2 Consultation

6.2.1 Consultation undertaken prior to and during the EIA Scoping stage has been described in Appendix C of the Pre-Application Consultation (PAC) Report, submitted as part of the application for Section 36 consent. Appendix C of the PAC Report summarises relevant consultee responses to the Scoping Report and confirms how those responses would be addressed as part of the EIA process.

6.2.2 No further direct consultation has been necessary with respect to ecology.

6.3 Assessment Methodology and Significance Criteria

Study Area

6.3.1 The area in which desk based research and field surveys were undertaken varies dependent on the ecological feature and respective search area/survey requirements. Details of the extents are described in **Section 6.4** of this chapter and within **Technical Appendices 6.1 – 6.4**.

6.3.2 The area in which biodiversity enhancement is proposed is described in **Technical Appendix 6.6** and shown on **Figure 6.13**.

6.3.3 Hereafter in this chapter, the areas covered by field surveys for each respective ecological feature are termed the ‘survey area’, and areas which are considered as part of the assessment process are referred to as the ‘Study Area’ (N.B. the study area generally equates to the Site, except for designated sites and cumulative developments where the study area is a 5 km buffer around the Site).

Desk Study

6.3.4 A desk-based study was carried out to gather information relating to a range of ecological features with the Site and surrounding area, including: statutory and non-statutory designated sites; legally protected or notable species; and habitats and botanical species of principal importance for biodiversity conservation. The following desk based data sources have been used to aid baseline characterisation and inform the assessment of the Proposed Development.

- NatureScot Sitelink¹ to confirm the location and qualifying features of designated sites within 5 km of the Site;
- Ancient Woodland Inventory (AWI) Scotland² for ancient woodland within 5 km of the Site;

¹ NatureScot (2026). Sitelink. Available at: <https://sitelink.nature.scot/home> (Accessed: August 2026).

² Scottish Government (2026). Ancient Woodland Inventory. Available at: <https://map.environment.gov.scot/sewebmap/?layers=ancientWoodlandInventoryScotland> (Accessed: August 2026).



- Local Nature Conservation Site (LNCS)³ within 5 km of the Site;
- Scotland's Environment Map for the Carbon and Peatland Map 2016⁴;
- National Biodiversity Network (NBN) Atlas Scotland⁵ for protected, notable or invasive species records within 5 km (and 10 km for bats) of the Site within the last 15 years (i.e. since 2011);
- Saving Scotland's Red Squirrels (SSRS)⁶ for local species records and Priority Areas of Red Squirrel Conservation (PARCs);
- SEPA Water Environment Hub⁷ for watercourse classifications;
- SEPA Obstacles to Fish Passage⁸ for barriers to fish migration;
- Deer Distribution Survey (2023) by the British Deer Society⁹;
- any relevant Environmental Statement (ES), EIAR, or other technical reports from other developments or proposed developments within the local area (i.e., up to 5 km)¹⁰; and
- relevant scientific literature on protected species' distribution, habitats distribution, and conservation status etc.

Field Surveys

6.3.5 A suite of baseline ecological surveys was carried out during 2025 and 2026. The following field surveys were carried out in line with standard methodologies and best practice guidance to inform the assessment:

- NVC surveys, incorporating Phase 1 habitat characterisation and potential Groundwater Dependent Terrestrial Ecosystem (GWDTE) habitats (July 2025);
- Protected species surveys, including daytime bat walkover (DBW) and Preliminary Roost Assessment (PRA) (August 2025);
- Static bat activity surveys (April to September 2025, inclusive);
- Fisheries surveys, including electrofishing and fish habitat suitability assessment (July – August 2025); and
- Peatland Condition Assessment (PCA) (April 2026).

6.3.6 The respective survey areas are shown on **Figures 6.3 – 6.12** and **Figure 8.3.2**, and full details of survey methodologies, including species-specific legislation,

³ Scottish Government (2026). Local Nature Conservation Sites – Scotland. Available at: <https://www.data.gov.uk/dataset/c3460656-74ab-435a-8f77-9a528e24beb1/local-nature-conservation-sites-scotland> (Accessed: August 2026).

⁴ Scottish Government (2026). Carbon and Peatland Map 2016. Available at: <https://map.environment.gov.scot/sewebmap/> (Accessed: August 2026).

⁵ NBN Atlas Scotland (2026). Available at: <https://scotland.nbnatlas.org/> (Accessed: August 2026).

⁶ Saving Scotland's Red Squirrels (2026). Available at: <https://scottishsquirrels.org.uk/squirrel-sightings/> (Accessed: August 2026).

⁷ SEPA (2024). SEPA Water Environment Hub. Available at: <https://informatics.sepa.org.uk/WaterClassificationHub/> (Accessed: August 2026).

⁸ Scottish Government (2026). Obstacles to Fish Passage (SEPA WMS). Available at: <https://marine.gov.scot/?q=maps/1746> (Accessed: August 2026).

⁹ British Deer Society (2023). Deer Distribution Survey 2023. Available at: <https://bds.org.uk/science-research/deer-surveys/deer-distribution-survey/> (Accessed: August 2026).

¹⁰ Comprising: OnPath Energy (2026). Glen Water Wind Farm Environmental Impact Assessment Report, Chapter 5 Ecology; Wind Estate UK Ltd (2022). Drum Wind Farm Environmental Impact Assessment Report, Chapter 11 Ecology; and Banks Renewables (2019). Lethans Wind Farm Environmental Impact Assessment Report, Chapter 6 Ecology.



guidance and survey results are provided in **Technical Appendices 6.1 – 6.4** and **Technical Appendix 8.3**.

Assessment of Potential Effect Level and Significance

- 6.3.7 The significance of the potential effects of the Proposed Development has been assessed by professional consideration of the sensitivity of the ecological features and the spatial and temporal magnitude of the potential effects.
- 6.3.8 This assessment has been carried out following CIEEM guidance¹¹, which is in line with the EIA Regulations¹².
- 6.3.9 This assessment involves the following process:
- identification of the potential ecological effects of the Proposed Development on ecological features (beneficial and adverse);
 - considering the likelihood of occurrence of potential effects, where appropriate;
 - defining the nature conservation value and conservation status of the ecological features present to determine sensitivity;
 - establishing the magnitude of change associated with the potential effect (both spatial and temporal);
 - based on the above information, making a professional judgement as to whether or not the resultant effect is significant in terms of the EIA Regulations;
 - if a potential effect is determined to be significant, measures to avoid or reduce the effect are suggested, where required; and
 - confirming residual likely significant effects after mitigation measures are considered.

Sensitivity

- 6.3.10 The sensitivity of the baseline conditions, including the importance of environmental features on or near to the Proposed Development, or the sensitivity of potentially affected receptors, has been assessed in line with best practice guidance, legislation, statutory designations and/or professional judgement of the EIA team.
- 6.3.11 Determination of the level of sensitivity of an ecological feature is based on a combination of the feature's nature conservation value and conservation status. Nature conservation value is defined on the basis of the geographic context, as shown in **Table 6-1** which follows CIEEM guidance¹¹.
- 6.3.12 Attributing a value to an ecological feature is generally straightforward in the case of designated sites, as the designations themselves are normally indicative of an importance level. For example, a Special Area of Conservation (SAC) designated under the Habitats Directive is implicitly of European (International) importance. In the case of species, assigning value is less straightforward as contextual information about distribution and abundance is fundamental, including trends based on historical records. This means that even though a species may be protected through legislation at a national or international level, the relative value of the population onsite may be quite different (e.g. the Site population may consist of a single transitory animal, which within the context of a thriving local / regional /

¹¹ Chartered Institute of Ecology and Environmental Management (CIEEM) (2024). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. Version 1.3 updated September 2024.

¹² The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017.



- national population of a species, is therefore of local or regional value rather than national or international).
- 6.3.13 Determination of the level of importance of ecosystems, habitats and species is based on professional judgement and a combination of factors, such as level of protection, rarity, conservation status, population trends, and quality/extent of the feature onsite. Published evaluation criteria (e.g. the Scottish Biodiversity List (SBL)¹³, JNCC on selection of biological SSSIs¹⁴ are used where relevant).
- 6.3.14 Following CIEEM guidance¹¹, it is not necessary to carry out a detailed assessment on features that are sufficiently widespread, unthreatened, and resilient to effects of the Proposed Development. However, those ecological features affected by the Proposed Development and deemed to be of at least local importance are termed Important Ecological Features (IEFs) and are taken forward for assessment.

Table 6-1: Approach to Valuing Ecological Features

Importance of Feature in Geographical Context	Description
International/European	An internationally designated site (e.g. SAC), or undesignated areas that meet the criteria for international designations, or qualifying species whose presence contributes to the maintenance of such a site. Species present in internationally important numbers (>1 % of biogeographic populations).
National (UK)	A nationally designated site (e.g. SSSI, or a National Nature Reserve (NNR)), or sites meeting the criteria for national designation or qualifying species whose presence contributes to the maintenance of such a site. Species present in nationally important numbers (>1 % of UK population).
Regional (e.g. Natural Heritage Zone (NHZ) or Local Authority Area)	Regionally significant and viable areas of key habitat identified in a regional Biodiversity Action Plan (BAP). Species present in regionally important numbers (>1 % of NHZ population). Areas of key habitat falling below criteria for selection as a SSSI (e.g. areas of semi-natural ancient woodland larger than 0.25 hectares (ha)).
Local	A site within the local area designated for nature conservation (e.g. Local Nature Reserve (LNR), LNCS). Areas of semi-natural ancient woodland smaller than 0.25 ha. Areas of habitat or species considered to appreciably enrich the ecological resource within the local context, e.g. species-rich flushes or hedgerows.
Negligible/Less than Local	Usually widespread and common habitats and species that do not meet the above criteria. Features falling below Local value are not considered in detail in the assessment process.

¹³ NatureScot (2025). Scottish Biodiversity List. Available at: <https://www.nature.scot/scotlands-biodiversity/scottish-biodiversity-strategy/scottish-biodiversity-list> (Accessed: August 2026).

¹⁴ JNCC (2024). Guidelines for selection of biological Sites of Special Scientific Interest (SSSIs). Available at: <https://jncc.gov.uk/our-work/guidelines-for-selection-of-sssis/> (Accessed: August 2026).



Magnitude

- 6.3.15 The magnitude of potential effects refers to the level of change in the extent and integrity of an ecological feature. The following definition of ecological ‘integrity’ is found within Scottish Executive (2000)¹⁵, which states that, “*The integrity of a site is the coherence of its ecological structure and function, across its whole area, which enables it to sustain the habitat, complex of habitats and/or the levels of populations of the species for which it was classified*”¹⁶.
- 6.3.16 Although this definition is used specifically regarding European level designated sites (e.g. an SAC), it is applied to wider countryside habitats and species for the purposes of this assessment.
- 6.3.17 The magnitude of potential effects will be identified through consideration of the degree and spatial extent of change to baseline conditions predicted as a result of the Proposed Development; how the ecological features are likely to respond to the Proposed Development; the duration and reversibility of an effect; and the application of professional judgement, best practice guidance and policy/legislation. This change can occur during construction, operation or decommissioning of the Proposed Development, and effects can be beneficial, neutral or adverse.
- 6.3.18 Impacts are determined in terms of magnitude in space and time. There are five levels of spatial and temporal effect – these are described in **Table 6-2** and **Table 6-3** respectively.

Table 6-2: Definition of Spatial Effect Magnitude upon the IEFs

Magnitude of Effect	Definition
Very High	Would cause the loss, gain or improvement of the majority of a feature (>80 %) or would damage/enhance a feature sufficiently to immediately affect its integrity.
High	Would have a major effect on the feature or its integrity, for example more than 20 % habitat loss/damage or gain/improvement.
Medium	Would have a moderate effect on the feature or its integrity, for example between 10 % and 20 % habitat loss/damage or gain/improvement.
Low	Would have a minor effect upon the feature or its integrity, for example, less than 10 % habitat loss/damage or gain/improvement.
Negligible	Minimal change on a very small scale; effects not dissimilar to those expected within a ‘do nothing’ scenario.

Table 6-3: Definition of Temporal Effect Magnitude upon the IEFs

Magnitude of Effect	Definition
Permanent	Impacts continuing indefinitely beyond the span of one human generation (taken here as >30 years and beyond the operational life of the Proposed Development), except where there is likely to be substantial improvement after this period in which case the category Long Term may be more appropriate.

¹⁵ Scottish Executive (2000). Nature conservation: implementation in Scotland of EC Directives on the conservation of natural habitats and of wild flora and fauna and the conservation of wild birds (‘The Habitats and Birds Directives’). Revised guidance updating Scottish Executive Circular no. 6/1995.

¹⁶ At page 93, paragraph 2.



Magnitude of Effect	Definition
Long Term	Between 15 years up to (and including) 30 years.
Medium Term	Between five years up to (but not including) 15 years.
Short Term	Up to (but not including) five years.
Negligible	No effect.

Significance

- 6.3.19 The predicted significance of potential effects is determined through a standard method of assessment based on professional judgement and available evidence, considering both the sensitivity (nature conservation value and conservation status) of the IEF and the magnitude of change, in a reasoned manner.
- 6.3.20 A significant effect may either support or undermine biodiversity conservation objectives. Significant effects include those which result from impacts on the structure and function of defined sites, habitats or ecosystems (integrity) and the conservation status of habitats and species (including extent, abundance and distribution)¹⁷.
- 6.3.21 **Table 6-4** details the significance criteria that have been used in assessing the effects of the Proposed Development.

Table 6-4: Significance Criteria

Significance of Effect	Description
Major	The effect is likely to result in a long term adverse or beneficial effect on the structure and function (integrity) of defined sites, habitats or ecosystems or on the conservation status of habitat and species.
Moderate	The effect is likely to result in a medium term or partial adverse or beneficial effect on the structure and function (integrity) of defined sites, habitats or ecosystems or on the conservation status of habitats and species.
Minor	The effect is likely to adversely or beneficially affect the feature at a low level by virtue of its limited duration and/or extent, but there will probably be no effect on the structure and function (integrity) of defined sites, habitats or ecosystems or on the conservation status of habitats and species. The level of effect would be Minor and Not Significant.
Negligible	No material effect. The effect is assessed to be Not Significant.

- 6.3.22 Using the definitions in **Table 6-4**, it must be decided whether there would be any effects which would be sufficient to adversely or beneficially affect the IEF to the extent that its conservation status deteriorates or improves from that which would be expected should baseline conditions remain (i.e. the 'do nothing' scenario).
- 6.3.23 Major and Moderate effects are considered to be significant within the context of the EIA Regulations.
- 6.3.24 Where adverse effects are identified, mitigation and/or compensation is considered to reduce or offset effects where possible, including avoidance or reduction through

¹⁷ CIEEM (2024), at section 5.25 – 5.26.



implementation of, and compliance with, best practice guidance and protected species legislation.

- 6.3.25 Residual effects are characterised as either adverse, neutral or beneficial and either Significant or Not Significant, taking account of mitigation proposals and habitat management or biodiversity enhancement proposals.

Cumulative Assessment

- 6.3.26 NatureScot cumulative assessment guidance¹⁸ is used to inform the cumulative assessment in this chapter. Cumulative effects require the assessment of effects of the Proposed Development in combination with other developments, projects or activities. In the interests of focusing on the potential for significant effects, this assessment considers the potential for cumulative effects with other onshore wind farm EIA developments.
- 6.3.27 The context in which these effects are considered is heavily dependent on the ecology of the feature assessed. For example, for water voles it may be appropriate to consider effects specific to individual catchments, should the distance between neighbouring catchments be sufficient to assume no movement of animals between them, whereas for other species or habitats the region/NHZ may be the relevant spatial scale. Therefore, where it is considered necessary, an assessment of cumulative effects will be made for each feature taken forward to detailed assessment, appropriate to its ecology.

Assessment Assumptions

- 6.3.28 The following assumptions have been made when undertaking the assessment of otherwise unmitigated effects on IEFs:
- work on the Proposed Development, including vegetation clearance and construction of new tracks, wind turbine hardstandings and other ancillary infrastructure, erection of the wind turbines and Site restoration is predicted to last for approximately 18 to 24 months (as described in **Chapter 2**). For the purposes of this assessment, the construction period has been assumed to be 24 months.
 - Infrastructure dimensions, associated footprints and working areas, and the dimensions of the candidate turbine models are as described within **Chapter 2**.
 - All watercourse crossings will be of a bottomless arched culvert design to allow easier mammal passage and avoid watercourse bed disturbance (see also Section 2.2 of **Chapter 2** and **Technical Appendix 8.4: Watercourse Crossings Schedule**).
 - All electrical cabling between wind turbines and the associated infrastructure would be underground in shallow trenches (for this assessment, typical dimensions are assumed to be approximately 1 m x 1.2 m) which would be reinstated post-construction and, in all cases, follow the access tracks.
 - The construction compound and any temporary laydown/hardstanding areas will be temporary infrastructure. Any disturbance or earthworks around permanent infrastructure during construction will be temporary and these areas (along with the areas of temporary infrastructure) reinstated or restored before

¹⁸ NatureScot (2021). Assessing the cumulative landscape and visual impact of onshore wind energy developments. Available at: <https://www.nature.scot/doc/guidance-assessing-cumulative-landscape-and-visual-impact-onshore-wind-energy-developments> (Accessed: August 2026).



the construction phase ends. The only excavation in these areas around permanent infrastructure would be for cabling as noted above and otherwise may only be periodically used for side-casting of spoil until reinstatement.

- Where possible, the maintenance of a 50 m buffer from turbine blade tip to important habitat edges to mitigate bat collision/barotrauma risk, and turbine feathering whilst idling will be implemented during the operational lifetime.
- It is assumed that wetland habitat losses or modification due to indirect drainage effects may extend out to 10 m from infrastructure (in keeping with precautionary indirect drainage assumptions within SEPA carbon calculator guidance¹⁹).
- The good practice pre-construction and construction phase mitigation described in **Section 6.5** will be fully applied, e.g. the presence of an Ecological Clerk of Works (ECoW), adherence to the agreed Construction Environmental Management Plan (CEMP) and Species Protection Plan (SPP).
- Maintenance of the Proposed Development will involve occasional vehicular access along the access tracks only, with works undertaken being of small scale. This is unlikely to result in any operational effects on any species or habitats recorded at and around the Proposed Development.

Committed Mitigation and Enhancement

- 6.3.29 Where potentially significant effects are identified, taking account of embedded (primary) and standard (tertiary) mitigation, additional mitigation measures (secondary mitigation) are described. These measures are presented as commitments, with information provided on how the mitigation can be secured, for example through planning conditions.
- 6.3.30 Committed enhancement measures relevant to ecology are also described where applicable.

Assessment of Residual Effect Level and Significance

- 6.3.31 The assessment of residual effects follows the same process and criteria as the assessment of potential effects but takes account of the committed additional (secondary) mitigation and enhancement measures. Residual effects are characterised as either adverse, neutral or beneficial and either Significant or Not Significant.

Limitations, Difficulties and Uncertainties

- 6.3.32 Limitations exist regarding the knowledge base on how some species, and the populations to which they belong, react to impacts. A precautionary approach is taken in these circumstances, and as such it is considered that these limitations do not affect the robustness of this assessment.
- 6.3.33 Although the ecological surveys were undertaken during optimal survey seasons, the surveys are limited by factors which affect the presence of plants and animals, such as the time of year, migration patterns and behaviour and they therefore present a 'snapshot' of the conditions prevailing at the time of survey. The ecological surveys undertaken to inform the assessment of the Proposed Development have not therefore produced a complete list of plants and animals, and the absence of evidence of any particular species should not be taken as conclusive proof that the

¹⁹ Available at: https://informatics.sepa.org.uk/CarbonCalculator/assets/Carbon_calculator_User_Guidance.pdf (Accessed August 2026).



species is not present or that it will not be present in the future. Pre-construction surveys for protected species are proposed (**Section 6.5**); these are intended to address any issues resulting from future changes in the distribution of protected species and provide updated baseline data which can be used to inform the requirement for mitigation actions and support any future licence applications. The assessment is therefore undertaken using the best knowledge possible of the Site and the ecological features it supports.

- 6.3.34 Due to land access permissions, it was not possible to survey additional buffers outwith the Site boundary; however, in some locations the survey area does extend beyond the Site and this reflects earlier and larger areas of interest which have been refined down during the iterative design process (see **Chapter 3: Design Evolution and Alternatives**); see also **Figures 6.3 – 6.6**. Despite this minor limitation, baseline data gathered within the Site are considered sufficient to inform the assessment in this chapter.
- 6.3.35 One area within the centre of Site was inaccessible and could not be surveyed in detail due to access and health & safety restrictions around an unrestored area of old opencast mine – this area has been mapped and presented on relevant results figures as No Surveyor Access/Non-Surveyed Area (NSA). This area is unlikely to contain habitats of local or above importance, it is also unlikely to contain protected species. Despite this minor limitation, baseline data gathered within the Site are considered sufficient to inform the assessment in this chapter.
- 6.3.36 Static bat activity surveys experienced some minor limitations. Due to unforeseen malfunctions with the detectors, microphones or batteries, the ten consecutive nights of recordings recommended in the NatureScot *et al.* (2021) guidance²⁰ were not achieved at all detectors during deployments on a small number of occasions (see details within **Technical Appendix 6.3**). However, overall, the resulting static bat data collected for the Site was well in exceedance of guidance²⁰ requirements (i.e. 477 nights worth of bat data were collected compared to the requirement for 330 nights for a development of the size of the Proposed Development). Whilst unfortunate, malfunctions are relatively common when using static detectors at sites such as the Proposed Development's. However, given the volume of data collected around the Site, it is considered that data recorded provides a suitable and accurate representation of bat activity during the survey period and thus it is not considered to be a limitation to the assessment.
- 6.3.37 It was not possible to collect a full set of bat activity data for the active bat season at monitoring locations 4, 6 and 7 (spring data only) due to issues associated with land access after the initial deployment period. Each of these detector units was moved to monitoring locations 4a, 6a and 7a for summer and autumn deployment periods. Given the volume of data collected around the Site it is considered that data recorded provides a suitable and accurate representation of bat activity during the survey period and thus it is not considered to be a limitation to the assessment. Refer to **Technical Appendix 6.3** for further details on the bat survey limitations and amount of bat data collected.
- 6.3.38 Any further inherent and minor methodological limitations are described within relevant **Technical Appendices 6.1 – 6.4**.

²⁰ NatureScot, Natural England, Natural Resources Wales, RenewableUK, Scottish Power Renewables, Ecotricity Ltd, the University of Exeter & Bat Conservation Trust (BCT) (2019, with minor updates 2021). Bats and Onshore Wind Turbines – Survey, Assessment and Mitigation. Available at: <https://www.nature.scot/doc/bats-and-onshore-wind-turbines-survey-assessment-and-mitigation> (Accessed August 2026).



- 6.3.39 Whilst some limitations have been identified, it is considered that there is sufficient information to enable robust, informed decisions to be taken in relation to the identification and assessment of likely significant effects on ecological features.

6.4 Baseline Conditions

- 6.4.1 This section details the results of the desk based study and field surveys, providing the ecological baseline for the Site and Study Area, and includes:
- statutory nature conservation designated sites (not including those designated for ornithological features only, which are considered in **Chapter 7**);
 - non-statutory nature conservation sites with local importance (i.e. LNCS);
 - habitats and vegetation; and
 - protected or notable species (non-avian).

Desk Study

Statutory Designated Sites

- 6.4.2 There are no statutory designated sites with ecological (non-avian) qualifying interests within or overlapping with the Site.
- 6.4.3 There are two statutory designated sites with ecological (non-avian) qualifying interests within 5 km of the Site: Muirkirk Uplands SSSI abuts the Site boundary in the north-east of the Site; and Airds Moss SAC is north/north-west of the Site (**Figure 6.1** and **Table 6-5**).

Table 6-5: Statutory Designated Sites within 5 km of the Site

Designated Site	Distance from Site boundary (km) and nearest proposed infrastructure	Qualifying Features	Condition (and Date of Assessment)
Muirkirk Uplands SSSI	0 km – abuts Site and located 0.07 km from proposed new track associated with T1	Upland habitat assemblage	Favourable maintained (02 June 2009)
		Blanket bog	Unfavourable, no change (06 October 2009)
Airds Moss SAC	0.46 km from Site boundary and existing track to be upgraded at the Site entrance	Blanket bog	Unfavourable, no change (11 October 2018)

Ancient Woodland

- 6.4.4 There are six areas of ancient woodland (as present on the AWI²) within the Site; two stands in the far north, two in the west and two in the far south (see **Figure 6.1**). Five of these are classified as Long-Established (of plantation origin) and one as Ancient (of semi-natural origin). The one area classified as Ancient (of semi-natural origin) just overlaps marginally with the Site in the south. Of the stands in the west, one no longer exists and the other has been significantly reduced in size, having been removed as part of former mining operations.
- 6.4.5 There are several more areas of ancient woodland within 5 km of the Site (see **Figure 6.1**).



Non-Statutory Designated Sites/ Local Nature Conservation Sites (LNCS)

- 6.4.6 LNCS are identified by local authorities to safeguard biodiversity and geodiversity of at least local importance²¹.
- 6.4.7 There are two LNCS that overlap with the Site, i.e. Low Moss LNCS and Glenmuir Water - Lugar to Kyle Castle LNCS. Both of these LNCS are distant to Proposed Development infrastructure (see **Figure 6.1**).
- 6.4.8 There are an additional 16 LNCS within 5 km of the Site that are designated wholly or partially for habitat related, botanical or protected species interests; as shown on **Figure 6.1**. The full details of all these LNCS are provided within **Table 2-2 of Technical Appendix 6.1**.

Terrestrial Habitats

- 6.4.9 The Carbon and Peatland Map 2016⁴ was consulted to determine the likely classes of peatland present and associated distribution across the Site. The map is a *“predictive tool which provides an indication of the likely presence of peat on each individually mapped area, at a coarse scale”*, and its purpose is *“a high-level planning tool to promote consistency and clarity in the preparation of spatial frameworks by planning authorities”*.
- 6.4.10 The map identifies areas of *“nationally important carbon-rich soils, deep peat and priority peatland habitat”*, which are categorised as Class 1²² and Class 2²³ peatlands. Areas of Class 1 peatland are *“likely to be of high conservation value”*, and Class 2 are *“potentially high conservation value and restoration potential”*.
- 6.4.11 **Figure 6.2** indicates that, according to this predictive tool and map, there is only one area of Class 1 peatland that overlaps with the Site. This is in the west of the Site and covers the area of Low Moss, a raised bog and a LNCS, and which is distant and hydrologically separated from Proposed Development infrastructure. No Class 2 peatland as per the Carbon and Peatland Map is present within the Site. The majority of the Site is made up of Class 0 (mineral)²⁴ soils, with smaller areas of Class 5²⁵ found in the centre and north-east.
- 6.4.12 As the map is a high-level tool, detailed habitat (NVC) peat depth (phases 1 and 2) and peatland condition surveys have been carried out at the Site to provide high resolution data, and which supersedes the predictive high-level Carbon and Peatland Map data, to inform siting, design and mitigation and the detailed assessment on peatland and associated habitats. The results of the NVC surveys are discussed in **Technical Appendix 6.1** and shown in **Figure 6.3**, and the peat depth and condition results are presented in **Chapter 8** and associated technical appendices and figures.

²¹ NatureScot, Scottish Wildlife Trust and Scottish Geology Trust (2023). Guidance on Establishing and Managing Local Nature Conservation Site Systems in Scotland – 2023 update. Available online from: <https://www.nature.scot/sites/default/files/2024-04/lncs-guidance-march-2024-accessible.pdf> (Accessed: August 2026).

²² Class 1 - Nationally important carbon-rich soils, deep peat and priority peatland habitat. Areas likely to be of high conservation value. Indicative vegetation – Peatland.

²³ Class 2 - Nationally important carbon-rich soils, deep peat and priority peatland habitat. Areas of potentially high conservation value and restoration potential. Indicative vegetation – Peatland or areas with high potential to be restored to peatland.

²⁴ Mineral soil - Peatland habitats are not typically found on such soils (Class 0). Indicative vegetation - no peatland vegetation.

²⁵ Class 5 - Soil information takes precedence over vegetation data. No peatland habitat recorded.



Aquatic Habitats

- 6.4.13 There are few watercourses within the Site, with the largest watercourse locally (i.e. Glenmuir Water), located along the south-west boundary of the Site. Of the watercourses within the Site these tend to be small first order watercourses or minor tributaries of the Glenmuir Water (to the south-west) or Bellow Water (to the north-west), which in turn are part of the wider River Ayr catchment. A number of these minor watercourses are named (e.g. Small Burn, Duncanziemere Burn, Gass Water and Boghead Burn). Several of the watercourses in the northern half of the Site have been impacted through former mining operations, e.g. via historical pollution, siltation, enrichment and realignment (see **Technical Appendix 6.4**).
- 6.4.14 The Lugar/Glenmuir Water (River ID 10430) has been classified by SEPA as having ‘Good’ overall status and the Bellow Water/Gass Water (River ID 10433) has been classified by SEPA as having ‘High’ overall status⁷.
- 6.4.15 A review of SEPA Obstacles to Fish Passage map⁸ for barriers to fish migration indicates that there is an impassable natural barrier on the Bellow Water just north-east of Lugar and upstream of the confluence of the Bellow Water and Glenmuir Water. This barrier is located to the south-west of the Site and thus prevents migratory fish access into the Bellow Water and subsequently upstream into the Gass Water and associated tributaries within the Site. The same dataset indicates no impassable barriers associated with the Glenmuir Water.
- 6.4.16 Waterbodies within the Site generally comprise non-natural waterbodies resulting from the Site’s mining legacy and comprise a number of small settlement ponds and larger water filled mining voids.
- 6.4.17 Further information on watercourses, waterbodies and water quality within the Site is presented in **Chapter 8**.

Protected Species (Non-Avian)

National Biodiversity Network (NBN) Atlas

- 6.4.18 A search of the NBN Atlas⁵ returned records of the following protected or notable species within 5 km and 10 km (for bats species) of the Site in the past 15 years (i.e., from 2011 onwards):
- adder (*Vipera berus*);
 - bat species: common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle (*Pipistrellus pygmaeus*), Daubenton’s bat (*Myotis daubentonii*) and Leisler’s bat (*Nyctalus leisleri*);
 - brown hare (*Lepus europaeus*);
 - common lizard (*Zootoca vivipara*);
 - otter (*Lutra lutra*);
 - palmate newt (*Lissotriton helveticus*); and
 - red squirrel (*Sciurus vulgaris*).

Saving Scotland’s Red Squirrels (SSRS)

- 6.4.19 Sightings of red squirrels have been recorded by SSRS within 5 km of the Site in 2022, 2023, 2024 and 2025⁶. The sightings are predominately based in the nearby town of Cumnock, to the south-east of the Site, with the exception of one



observation recorded north of the Site. The south-west of the Site intersects with a PARC²⁶.

Fish

- 6.4.20 The Proposed Development falls within the River Ayr catchment, Ayrshire's largest river. The catchment covers 574 square km²⁷. Fish species known to be present within the River Ayr catchment include Atlantic salmon (*Salmo salar*), trout (*Salmo trutta*), European eel (*Anguilla anguilla*), grayling (*Thymallus thymallus*), minnow (*Phoxinus phoxinus*), stone loach (*Barbatula barbatula*) and stickleback (*Gasterosteus aculeatus*)²⁷.

Existing Ecological Information

- 6.4.21 Details of existing publicly available desk based records relating to protected and/or notable species, obtained through previous baseline studies within the local area / 5 km of the Site, gathered as part of surveys for Glen Water Wind Farm²⁸, Drum Wind Farm²⁹ and Lethans Wind Farm³⁰ are detailed in **Table 3-1 of Technical Appendix 6.2** and for bats within **Table 3-2 of Technical Appendix 6.3**. However, for the key species of conservation interest, in summary:

- badger (*Meles meles*) - evidence recorded at Lethans, none recorded at Glen Water or Drum);
- bat species – suitable habitats present and mix of typical local bat species recorded at all sites during static bat surveys;
- otter - evidence recorded at Lethans, Glen Water and Drum;
- water vole (*Arvicola amphibius*) - evidence recorded at Drum only;
- pine marten (*Martes martes*) - no evidence at any other site locally;
- red squirrel - evidence recorded at Lethans, none recorded at Glen Water or Drum); and
- reptiles - evidence of common lizard only at Lethans, no reptiles recorded at Glen Water or Drum).

Other Species (Non-Avian)

Deer

- 6.4.22 Deer are not included in this assessment from a nature conservation perspective; however, they are considered due to potential welfare issues and their potential impact on other ecological features through grazing.
- 6.4.23 The results of the Deer Distribution Survey⁹ suggest that red deer (*Cervus elaphus*), roe deer (*Capreolus capreolus*), sika deer (*Cervus nippon*) and fallow deer (*Dama dama*) are likely to be present within or have previously been recorded within the wider area of the Site.

²⁶ The Saving Scotland's Red Squirrel (SSRS) Priority Working Areas dataset is available online at: <https://www.arcgis.com/home/item.html?id=5ba6742d74014b79af77d87e3cc02a50#overview>

²⁷ Ayrshire Rivers Trust (2026). River Ayr. Available at: <https://www.ayrshirerivertrust.org/river-ayr/> (Accessed: August 2026).

²⁸ OnPath Energy (2026). Glen Water Wind Farm Environmental Impact Assessment Report, Chapter 5 Ecology.

²⁹ Wind Estate UK Ltd (2022). Drum Wind Farm Environmental Impact Assessment Report, Chapter 11 Ecology.

³⁰ Banks Renewables (2019). Lethans Wind Farm Environmental Impact Assessment Report, Chapter 6 Ecology.



Invasive Non-Native Species (INNS)

- 6.4.24 INNS are a threat to biodiversity and there is a legal obligation to control their spread³¹. The NBN Atlas⁵ and SSRS⁶ search returned records of grey squirrel (*Sciurus carolinensis*) within 5 km of the Site in the last 15 years (i.e. since 2011).

Field Surveys

- 6.4.25 Details of field survey methodologies, including survey timings, survey area extents, and survey results are presented in **Technical Appendices 6.1 – 6.4**. This section summarises the baseline conditions established during these surveys.

Habitats

National Vegetation Classification (NVC) and Phase 1

- 6.4.26 **Technical Appendix 6.1** presents information on the habitat surveys and detailed descriptions of habitat types and vegetation recorded during the surveys.
- 6.4.27 The habitats survey results are shown in **Figure 6.3** and display all data collected during the surveys³². The survey area for habitats covered an area greater than the Site, including areas to the west, reflecting earlier areas of development interest that were subsequently refined down during the iterative design process.
- 6.4.28 The habitat extents provided and discussed in this section relate only to those within the Site, as these habitats form the baseline conditions and the basis for the assessment of potential effects and habitat loss, discussed further below.
- 6.4.29 The NVC data collected was also cross-referenced to the Phase 1 Habitat Survey Classification³³ to allow a broader characterisation of habitats. The extent of Phase 1 habitat types within the survey area was calculated using the Site-specific correlation of NVC communities to their respective Phase 1 types (see **Technical Appendix 6.1** for full details), and their extents mapped within ArcGIS software, including within mosaic areas.
- 6.4.30 The 33 NVC communities and 23 non-NVC types, and the corresponding overarching 32 Phase 1 habitat types, recorded during surveys are provided in **Annex A** at the end of this chapter and include the proportions of particular habitat types found within the Site, including those within mosaic habitats. Full descriptions of the habitats, NVC communities and associated flora of the Site and wider survey area are provided in **Technical Appendix 6.1**.
- 6.4.31 **Chart 1** summarises the habitats which contribute over 2 % of the Site. This shows that much of the Site, i.e. Study Area, is comprised of improved grassland (24.3 %) and marsh/marshy grassland (21.3 %). The next most common habitat/feature type is unrestored mine (8.5 %). The remainder of the Site and Study Area is made up of a wide range of other habitat types, which are typically small, scattered and often fragmented in extent (see **Technical Appendix 6.1**, **Figure 6.3** and **Annex A**).

³¹ Section 14 to the Wildlife and Countryside Act 1981.

³² The Phase 1 symbology shading on **Figure 6.3** has been used to broadly characterise stands of vegetation based on the dominant NVC community within a particular area. The Phase 1 characterisation has been utilised to allow a broader visual representation of the habitats within the survey area. Polygons or areas where there are mosaic NVC communities have generally been assigned a single Phase 1 classification based on the dominant NVC type (despite some polygons containing multiple Phase 1 types, often in low percentages). Therefore, the Phase 1 characterisation is generally a broader overview, and the NVC data should be referred to for further detail in any specific area.

³³ JNCC (2010). Handbook for phase 1 habitat survey – a technique for environmental audit. JNCC, Peterborough.



- 6.4.32 The habitat types that have subsequently been scoped in to the assessment of effects due to their presence, extent, nature conservation value and conservation importance (sensitivity) are blanket bog and wet modified bog. Detailed descriptions of these habitat types are included in **Technical Appendix 6.1**.
- 6.4.33 The bog within the Site is a mix of NVC types, depending on location, although the communities do mosaic, overlap and transition with each other. The bog (raised and blanket) present within the Site is a mix of M17 *Trichophorum germanicum* – *Eriophorum vaginatum* mire, M18 *Erica tetralix* – *Sphagnum papillosum* mire and M19 *Calluna vulgaris* – *Eriophorum vaginatum* mire (see **Annex A**). Incidences of M2 *Sphagnum cuspidatum/fallax* and M3 *Eriophorum angustifolium* bog pool communities are rare. The only raised bog within the Site is located at Low Moss in the west of the Site (concurrent with the associated Low Moss LNCS) and is located distant and hydrologically separate to the Proposed Development. These habitats are likely associated with SBL bog habitat with some areas also corresponding to Annex I type bog habitats³⁴.
- 6.4.34 The blanket bog within the Site is generally in a relatively degraded and modified condition through primarily historical practices with ongoing legacy effects. The primary factors resulting in modified and degraded bog has been systematic moor grip drainage, livestock grazing, afforestation and associated works, with subsequent wider self-seeding of non-native conifers, and through opencast mining activities. Bog habitats were likely more extensive within the Site in the past, and prior to opencast mining activities, which during their period of operation removed much of the peatland in parts of the Site. There also appears to be evidence that some of the remaining patches of remnant peatland is secondary, having likely been previously excavated, side cast, mixed with other soils/substrates and placed in cells or bunds and which have subsequently restored due to locally perched water tables (see also **Chapter 8** and **Technical Appendix 8.3**).
- 6.4.35 The raised bog at Low Moss is in relatively good, albeit still modified condition, with abundant bog pools in places. The area has been historically drained but appears to have since been subject to peatland restoration works involving the use of peat dams.
- 6.4.36 Wet modified bog within the Site and Study Area is mainly composed of NVC type M25a³⁵ *Molinia caerulea* – *Potentilla erecta* mire *Erica tetralix* sub-community, with smaller extents of M20 *Eriophorum vaginatum* blanket mire (see **Annex A**). Wet modified bog was often present in mosaics with the other bog, flush and marshy grassland communities. It is likely to have been derived from the degradation of blanket/raised bog communities as described above.

³⁴ <https://sac.jncc.gov.uk/habitat/> (Accessed August 2026).

³⁵ The use of the carat symbol here '^' indicates the marshy grassland community appears likely to be on peat over 0.5 m in depth, contains mire associate species, or has been derived from degraded bog, and is therefore more appropriately considered wet modified bog rather than marshy grassland.



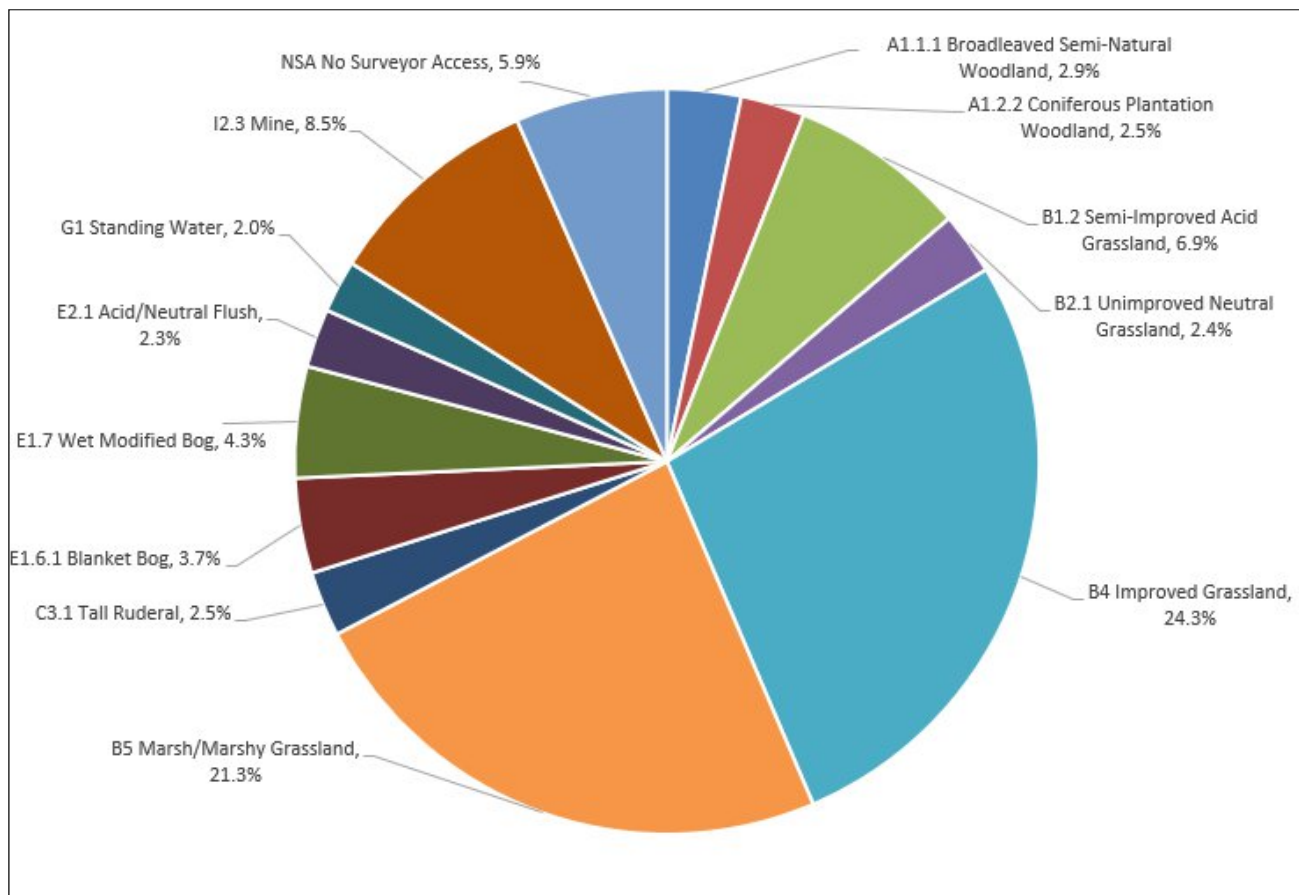


Chart 6-1: Predominant Phase 1 Habitat Types Recorded within the Site (habitat types making up <2 % of the Site are not included)

Peatland Condition Assessment (PCA)

- 6.4.37 Details relating to the PCA for the Proposed Development are presented in **Technical Appendix 8.3** and **Figure 8.3.2**. In summary, the results of these surveys indicate there is no 'Near-Natural' peatland within the Site and further highlights that the majority of the remaining peatland within the Site is either 'Drained: Artificial' or 'Modified'.

Groundwater Dependent Terrestrial Ecosystems (GWDTEs)

- 6.4.38 The NVC results were referenced against SEPA guidance³⁶ to identify those habitats which may be classified, depending on the hydrogeological setting, as being potentially groundwater dependent.
- 6.4.39 Potential GWDTE NVC communities recorded within the survey area are detailed in **Technical Appendix 6.1** and shown on **Figure 6.4a-i**.
- 6.4.40 Potential GWDTE sensitivity has been assigned solely on the SEPA listings³⁶. However, many of the NVC communities on the list are common habitat types across Scotland and generally of low nature conservation value. Furthermore, depending on several factors such as geology, superficial geology, presence of peat and topography, many of the potential GWDTE communities recorded may in fact be only partially groundwater fed or not dependent on groundwater (i.e.

³⁶ SEPA (2024). Guidance on Assessing the Impacts of Developments on Groundwater Dependent Terrestrial Ecosystems.



rainwater fed). Because designation as a potential GWDTE is related to groundwater dependency and not nature conservation value, GWDTE status has not been used as criteria to determine a habitat's nature conservation value with respect to ecology; and so, does not factor in the identification of IEFs within ecological impact assessments. There is, however, a requirement to consider GWDTEs, and the data gathered during the NVC surveys has been used to inform this assessment further in **Chapter 8**.

Annex I Habitats

- 6.4.41 Many NVC communities can also correlate with various Annex I habitat types listed under the Habitats Directive. The fact that a NVC community can be attributed to an Annex I type however does not necessarily mean all instances of that NVC community constitute Annex I habitat. Its Annex I status can depend on various factors such as quality, extent, species assemblages, geographical setting, and substrates.
- 6.4.42 NVC survey data and field observations have been compared to JNCC Annex I habitat listings and descriptions³⁴. Those habitats within the Site which could be considered Annex I habitats are discussed within **Technical Appendix 6.1**.

Scottish Biodiversity List (SBL) Habitats

- 6.4.43 The SBL¹³ is a list of species and habitats that Scottish Ministers consider to be of principal importance for biodiversity conservation in Scotland. The SBL was first published in 2005 with updates in 2007, 2012, and most latterly revised in December 2025. The most recent SBL revision started over and is shorter and more targeted.
- 6.4.44 The SBL identifies habitats which are important to furthering the conservation of biodiversity in Scotland; these are termed 'priority habitats'. The names of many priority habitat types have changed from the previous 2012 list, and it appears many of the underpinning habitat or community types that comprise these priority types are also likely to have been revised or changed. Whilst the previous iteration of the SBL provided associated priority habitat definition documents outlining the habitat type, where it occurs, its characteristics, and the associated correlations with Phase 1, NVC and UK BAP habitat types, the most recent revision has not provided such supporting information (at the time of preparation of this chapter). Therefore, at the current time and until such information is made available, it is not possible to definitively or accurately correlate the results of this survey, and the habitat types present within the Site or survey area to the revised SBL priority habitat types. However, for some important and higher conservation value habitat types it may be that the new SBL does still closely mirror the previous SBL, for example, and of relevance to the Site, with regards to the raised and blanket bogs priority habitat type.

Protected Species (Non-Avian)

- 6.4.45 This section outlines the results from the protected species surveys. Detailed methodologies, survey timings, survey results, species-specific habitat suitability and the legal status of each species are included within **Technical Appendices 6.2 – 6.4**. Survey results are shown on **Figures 6.5 – 6.12**.

Badger

- 6.4.46 No field evidence pertaining to badger was recorded within the respective survey area during baseline field surveys for the Proposed Development.



Bats

- 6.4.47 This section provides a summary of the field surveys and associated results for bats. Full details of the methods, field surveys and associated results for bats are presented in **Technical Appendix 6.3**; see also **Figures 6.6 – 6.10**.

Daytime Bat Walkover (DBW) and Habitat Suitability

- 6.4.48 The DBW identified that land within the Site is formed largely of open agricultural habitat (improved grassland, semi-improved acid grassland and marshy grassland, with pockets of heath and peatland) and areas of historic opencast mining. It also supports several habitat types with suitability for use by commuting and foraging bats. These include pockets of ancient and long-established woodland around the peripheries of the Site, coniferous woodland edge habitat, standing water (a series of ponds and water filled voids), and running water.
- 6.4.49 Overall, the Site was classified as having ‘moderate’ suitability to support foraging and commuting bats, with areas of localised ‘high’ suitability noted around woodland edge habitat positioned towards the edges of the Site.
- 6.4.50 With respect to potential roosting resource, a stand of long-established woodland and a single built structure near the western boundary of the Site were identified as having potential to support roosting bats. No detailed Ground Level Tree Assessment (GLTA) was conducted at the woodland given the distance from the Proposed Development infrastructure. A Preliminary Roost Assessment (PRA) of the built structure was carried out, for which the results indicated ‘moderate’ suitability for roosting bats; however, this structure is also distant from Proposed Development infrastructure and further surveys were not deemed to be required. For further details see **Technical Appendix 6.3** and **Figure 6.6**.

Automated Static Bat Activity Surveys

- 6.4.51 Static bat activity surveys were undertaken following standard guidance²⁰ and involved the deployment of 13 Anabat detectors across the Site between April and September 2025 inclusive over a period of 42 nights, covering three survey visits during spring, summer and autumn, and up to 14 consecutive nights per survey visit. This resulted in a total of 477 associated data recording nights, which is significantly more than the 330 nights recommended by NatureScot *et al.*²⁰ for a development of 14 turbines (**Technical Appendix 6.3**). The locations of Anabat detectors are shown on **Figure 6.6**.
- 6.4.52 The Anabats recorded a total of seven bat species and two genus classification during surveys. The total number of bat passes recorded for each species/genus across all Anabat locations is shown in **Table 6-6**.
- 6.4.53 Common pipistrelle and soprano pipistrelle accounted for the majority of registrations, at 37.2 % and 39.9 % respectively (**Table 6-6**).

Table 6-6: Total Number of Bat Passes for Each Species and Genus Across all Locations in 2025

Species/Species Group	No of Passes	Percentage of Total (%)
<i>Myotis</i> spp.	240	1.8
Daubenton's bat	432	3.2
Whiskered bat	5	<0.01



Species/Species Group	No of Passes	Percentage of Total (%)
Natterer's bat	230	1.7
<i>Nyctalus</i> spp.	2,127	15.6
Nathusius' pipistrelle	53	0.4
Common pipistrelle	5,081	37.2
Soprano pipistrelle	5,452	39.9
Brown long-eared bat	50	0.4
Total	13,670	100.2³⁷

Quantifying Bat Activity

- 6.4.54 In line with NatureScot guidance²⁰, the data from the 2025 static bat activity surveys was analysed using the Ecobat tool³⁸ to gain a measure of relative bat activity at the Proposed Development. The data was then evaluated to determine the overall Site risk level for each species. The guidance explains that *"The tool compares data entered by the user with bat survey information collected from similar areas at the same time of year... Ecobat generates a percentile rank for each night of activity and provides a numerical way of interpreting the levels of bat activity recorded at a site across regions in Britain."*
- 6.4.55 The Ecobat analysis provides a measure of average annual Site activity based on the median (most frequent activity category and representative of the 'typical' bat activity levels at the Site) and maximum (unusually high levels or important peaks of bat activity) percentiles³⁹. A reference range representing the number of nights for each species that the data was compared to was also generated. A reference range of more than 200+ nights is recommended for confidence in the activity level stated by the Ecobat output. Results are shown in **Table 6-7**.

Table 6-7: Average Annual Site Activity Levels

Species/Species Group	Site Activity		Reference Range
	Median (Typical Activity)	Maximum (Peak Activity)	
<i>Myotis</i> spp.	Low	Moderate	1,975
Daubenton's bat	Low	High	1,118
Whiskered bat	High	High	5
Natterer's bat	Low – Moderate	Moderate – High	424
<i>Nyctalus</i> spp.	Low	High	5,828
Nathusius' pipistrelle	Low – Moderate	High	53
Common pipistrelle	Low	Low – Moderate	42,651
Soprano pipistrelle	Low	Low – Moderate	45,911
Brown long-eared bat	Moderate – High	High	165

³⁷ The 'Total' percentage is not exactly 100% due to rounding of the percentages per species in the Ecobat outputs.

³⁸ Mammal Society (2026). Ecobat. Available at: <https://ecobat.mammal.org.uk/login> (Accessed: July 2026).

³⁹ The percentile rank is attributed to one of the following five bat activity categories as defined within relevant guidance: Low (0-20 %), Low-Moderate (21-40 %), Moderate (41-60 %), Moderate-High (61-80 %) and High (81-100 %).



- 6.4.56 The reference range for Whiskered bat, Nathusius' pipistrelle and brown long-eared bat fell well below the minimum threshold for confidence, especially with regards Whiskered bat and Nathusius' pipistrelle, and therefore the attributed activity levels for these records/species should be treated with caution. Further details are provided in **Technical Appendix 6.3**.

Categorising Site Risk Level

- 6.4.57 As detailed in **Technical Appendix 6.3**, the Site risk level was determined to be Medium (3), based on having a medium project size and moderate habitat risk level.

Categorising Collision Risk, Population Abundance, Potential Vulnerability & Assessing Potential Risk

- 6.4.58 The overall risk assessment of bat activity is undertaken for high collision risk species only. As per NatureScot guidance²⁰, the following species and genus recorded during surveys are deemed to have a high collision risk: common pipistrelle, soprano pipistrelle, *Nyctalus* spp. and Nathusius' pipistrelle.
- 6.4.59 As per NatureScot guidance²⁰, common and soprano pipistrelle are also considered of common abundance and of medium population vulnerability. *Nyctalus* spp. and Nathusius' pipistrelle are considered of rarest abundance and of high population vulnerability.
- 6.4.60 All other bat species and genus recorded are categorised as low collision risk and of low population vulnerability following the same guidance²⁰. These low-risk species have a low risk of collision with a turbine blade, so the impact of the Proposed Development on the local bat population would likely be negligible (particularly when considering the low activity levels for these species – see **Table 6-6** and **Table 6-7** and **Technical Appendix 7.3**).
- 6.4.61 The assessment of potential risk to high collision risk bat species is discussed in detail in **Section 6.7** of this chapter.

Otter

- 6.4.62 Three otter spraints were recorded during surveys, all located on the Gass Water in the north of the Site (**Figure 6.5**). No protected features for otter, i.e., holts, couches or resting sites were recorded during the survey.

Pine Marten

- 6.4.63 No field evidence pertaining to pine marten was recorded within the respective survey area during baseline field surveys for the Proposed Development.

Red Squirrel

- 6.4.64 No field evidence pertaining to red squirrel was recorded within the respective survey area during baseline field surveys for the Proposed Development.

Reptiles

- 6.4.65 No field evidence pertaining to reptiles was recorded within the respective survey area during baseline field surveys for the Proposed Development.

Water Vole

- 6.4.66 Two potential water vole burrows were recorded on the banks of Gass Water, within the north of the Site (**Figure 6.5**). The size and location of the burrow entrances



would suggest it could be evidence of water vole activity; however, it was not possible to confirm as there were no other distinguishable features or field signs recorded, and as Dean *et al.* (2016)⁴⁰ states, water vole droppings are the only field sign that can be used to determine water vole presence reliably on their own (no water vole droppings were recorded).

- 6.4.67 However, based on the precautionary principle, and that water vole field signs were found in the survey area for Drum Wind Farm²⁹, which abuts the Proposed Development to the east, it has been assumed these burrows may belong to water vole.

Fish

- 6.4.68 Baseline electrofishing and fish habitat surveys were undertaken by Ayrshire Rivers Trust (ART) in 2025. Eight electrofishing sampling sites were surveyed across six different watercourses considered representative of the Site and locale and were surveyed in order to characterise the fisheries baseline situation. The electrofishing sites were located within and outwith the Site boundary on the following watercourses: Glenmuir Water, Small Burn, Glenmuir Burn, Duncanzemere Burn, Boghead Burn and Gass Water (see **Figures 6.11 – 6.12**). Full results from the surveys are contained in **Technical Appendix 6.4**.
- 6.4.69 Trout fry and parr were recorded in variable densities in Glenmuir Water, Glenmuir Burn, Boghead Burn and Gass Water, with no trout recorded in the Small Burn or Duncanzemere Burn (see **Figure 6.11**).
- 6.4.70 Salmon fry and parr were recorded in variable densities in the Glenmuir Water and Glenmuir Burn to the south of the Site, only (see **Figure 6.12**). No salmon were recorded within the theoretically accessible Small Burn or Duncanzemere Burn. No salmon were recorded in the sampling sites on the Boghead Burn and Gass Water, as these are upstream of impassable barriers to migration.
- 6.4.71 An absence of both salmon and trout in the Duncanzemere Burn and the Small Burn are likely attributed to poor environmental conditions and unsuitable habitat for such species, rather than barriers to migration. Pollution and historic mining practices have impacted on the condition of the habitat within the Duncanzemere Burn in particular. Historic mining activities have also impacted the Gass Water, but this watercourse still contains a population of trout.
- 6.4.72 No lamprey species (*Lampetra* spp. or *Petromyzon marinus*) were recorded or witnessed during the surveys, and there are no historic records of lamprey species within the Site.
- 6.4.73 No European eels were recorded or witnessed during the surveys; however, historic records indicate that European eels are present in the River Ayr and Lugar Water further downstream of the Site.
- 6.4.74 The upper reaches of the six watercourses surveyed lack riparian tree cover.

Other Species and INNS

- 6.4.75 No other instances of other protected species, signs of notable species, or INNS were recorded within the Site during field surveys; however, it is assumed that deer will be present locally and use parts of the Site at least periodically.

⁴⁰ Dean, M., Strachan, R., Gow, D., Andrews, R. (2016). The Water Vole Mitigation Handbook (The Mammal Society Mitigation Guidance Series). Eds. Fiona Mathews and Paul Chanin. The Mammal Society, London.



Future Baseline in Absence of Proposed Development

- 6.4.76 In the absence of the Proposed Development, it is likely that the IEFs would generally remain as they are at present, although numbers and distribution of species may fluctuate naturally.
- 6.4.77 Vegetation and habitat composition, structure and extents within the agricultural land in the south of the Site may fluctuate marginally in the long-term in line with increasing or decreasing livestock grazing or any changes in ongoing farming practices. However, in the north and west-central parts of the Site where there continues to be areas of unrestored opencast mine these may be subject to future surface restoration proposals (e.g. soil/sludge spreading) and the associated revegetation/regeneration of these areas with secondary habitats, as these are EAC priority areas for restoration⁴¹.
- 6.4.78 The areas of commercial conifer plantation within the Site will continue to mature but would be subject to a future felling plan which may create temporary localised habitat changes until replanting and canopy closure. The future species composition of the second rotation plantation forestry may also fluctuate to a degree. The Site in the future may also be adversely affected by encroachment and invasion of non-native self-seeded conifer trees from adjoining and nearby forestry areas, and the continuing maturity of the existing self-seeded specimens.
- 6.4.79 With consideration of ongoing and predicted climate change, the summary of the relevant climate change projections for Ayrshire using the UK Climate Change Projections 2018⁴² are:
- temperatures are projected to increase, particularly in summer;
 - winter rainfall is projected to increase and summer rainfall is most likely to decrease;
 - heavy rain days (rainfall greater than 25 mm) are projected to increase, particularly in winter;
 - near surface wind speeds are expected to increase in the second half of the 21st century with winter months experiencing more significant effects of winds; however, the increase in wind speeds is projected to be modest; and
 - an increase in frequency of winter storms over the UK.
- 6.4.80 As a result of these projections noted above, fluctuations to habitat type/condition and species' behaviour and distribution may occur at a local level, over time. However, the overall baseline conditions in the local area are likely to remain relatively consistent over time, and so the data allows for a robust assessment of the effects of the Proposed Development, during its lifespan, on ecology.

6.5 Embedded and Standard Mitigation

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

⁴¹ East Ayrshire Council (2013). "Opencast Mining in East Ayrshire –Steps to Recovery, Council". <https://www.east-ayrshire.gov.uk/CouncilAndGovernment/About-the-Council/MinutesAgendasAndReports/OpencastCoalUpdate.aspx>

⁴² Met Office. UK Climate Projections (UKCP18). Available at: <https://www.metoffice.gov.uk/research/approach/collaboration/ukcp> (Accessed: August 2026).



Embedded Mitigation

- 6.5.2 Embedded mitigation measures are those measures that are inherent to the Proposed Development. This includes mitigation by design (also known as primary mitigation), implemented through design iteration works as described in **Chapter 3**.
- 6.5.3 As part of the iterative design process for the Proposed Development, the following ecological constraints identified through desk based study and baseline field survey results along with design principles were considered to avoid or reduce potential adverse effects on ecological features where possible:
- Avoidance of statutory designated sites, LNCS and areas of ancient woodland.
 - Avoidance of deeper peatland (>0.5 m), blanket bog, raised bog and wet modified bog, and potential GWDTEs for the location of turbines and other infrastructure as far as practicable.
 - Applying a minimum 50 m buffer for any infrastructure or construction activity around all watercourses, except where a minimum number of watercourse crossings are required, and where existing tracks are located within the 50 m avoidance buffer. This will minimise effects on associated habitats and species.
 - The track length and alignment have been designed to minimise the extent of new track and number of watercourse crossings required, where feasible re-using and upgrading existing tracks considering the topography of the Site and other environmental Site constraints.
 - Establishing a 50 m buffer from turbine blade tips to important edge habitats across the Site to reduce collision/barotrauma risk to commuting/foraging bats where possible considering other environmental Site constraints.

Standard Mitigation

- 6.5.4 Standard mitigation (also known as tertiary mitigation) includes all mitigation usually assumed to be in place during construction, operation and decommissioning, and is generally regarded as industry standard or best practice. As such, the assessment in this chapter has been carried out on the basis that all works would be carried out in line with good industry practice construction measures, guidance and legislation.

Pre-Construction and Construction

- 6.5.5 To ensure all reasonable precautions are taken to avoid adverse effects on habitats, protected species and aquatic interests, a suitably qualified ECoW will be appointed prior to the commencement of construction to advise the Applicant and the Principal Contractor (PC) on all ecological matters. The ECoW will be required to be present on-site during the construction phase and will carry out monitoring of works and briefings with regards to any ecological sensitivities on the Site to the relevant staff of the PC and any sub-contractors.
- 6.5.6 A Species Protection Plan (SPP) (outline SPP provided as **Technical Appendix 6.5**) will be implemented during the construction phase. The SPP details measures to safeguard protected species known or likely to be in the area. The SPP includes pre-construction surveys and good practice measures during construction. Pre-construction surveys will be undertaken to check for any new protected species or features in the vicinity of the construction works in order to establish the most up-to-date baseline. The results of the pre-construction surveys will be used to update the outline SPP ahead of construction starting. The SPP will remain a live document to be updated as required and in agreement with the ECoW



where changes to the distribution and status of protected species and features are recorded.

- 6.5.7 Once appointed, there will be a contractual management requirement for the successful PC to develop and/or implement a comprehensive, Site-specific and robust Construction Environmental Management Plan (CEMP) discharged in consultation with SEPA and EAC (as the planning authority). This document will detail how the successful PC will manage the works in accordance with all commitments and mitigation detailed in the EIAR, the SPP, statutory consents and authorisations, and good industry practice and guidance for environmental management, including implementation of appropriate pollution prevention (particularly in relation to watercourses). An outline CEMP is provided as **Technical Appendix 11.1**.
- 6.5.8 Any micro-siting of infrastructure will be based on a review of existing ecological data and the completion of pre-construction surveys, to take into consideration the potential for direct encroachment onto protected species features, sensitive habitats or GWDTEs, or indirect alteration of hydrological flows supporting sensitive habitats or GWDTEs. Any micro-siting will also take into consideration any buffer distances on protected features identified, as detailed within the SPP (**Technical Appendix 6.5**). While minimum buffer distances on protected features relevant to ecology are considered in this assessment, a 100 m micro-siting tolerance of all proposed infrastructure is assumed in any event (see **Chapter 2**).

Operation

- 6.5.9 In line with best practice guidance on bats²⁰, the Proposed Development will utilise the method of reduced rotation speed whilst idling by feathering, at all turbines, to reduce collision risks to bats during the bat active period (April to October, inclusive). The guidance notes that, “*The reduction in speed resulting from feathering compared with normal idling may reduce fatality rates by up to 50%*”. Given the known presence of high collision risk bat species on-site (see **Technical Appendix 6.3** for further details), this measure will be put in place from the start of the operational phase of the Proposed Development, and it does not result in any loss of output.
- 6.5.10 Operational phase environmental management plans following relevant best practice and guidance will be in place during operation of the Proposed Development. These will, for example, include provisions for, but not limited to, ongoing pollution prevention control measures.

Decommissioning

- 6.5.11 Based on the time between construction and decommissioning, the mitigation required at decommissioning cannot be accurately identified at this stage. However, it will include (as a minimum) decommissioning surveys, adherence to a Decommissioning Environmental Management Plan (DEMP), presence of an ECoW, and adherence to a SPP.

6.6 Scope of Assessment

Effects Assessed in Full

- 6.6.1 The EIA Scoping process, baseline conditions, professional judgement and experience from other relevant projects, policy and guidance or standards have identified the following effects for detailed assessment:



- direct and indirect effects during construction of the Proposed Development on blanket bog and wet modified bog, including direct habitat loss, indirect habitat loss/modification and temporary habitat loss/modification; and
- direct effects during operation of the Proposed Development on high-collision risk bat species (common pipistrelle, soprano pipistrelle, *Nyctalus* spp. and Nathusius' pipistrelle), including fatality through barotrauma or collision.

Effects Scoped Out

- 6.6.2 On the basis of the professional judgement of the EIA team, experience from other relevant projects, relevant guidance and feedback from consultees, the generally common and widely distributed habitats or species which do not fall within the following categories have been 'scoped out' of detailed assessment:
- Habitats listed in Annex I to the Habitats Directive, and species listed in Annex II to the Habitats Directive;
 - Habitats or species listed in the UKBAP⁴³ or SBL Priority Habitats¹³; and
 - Habitats or species protected by other legislation such as the Wildlife and Countryside Act 1981, the Nature Conservation (Scotland) Act 2004 and the Protection of Badgers Act 1992.
- 6.6.3 In addition to those ecological features and effects already scoped out above, based on survey findings and with consideration of the additional desk study and baseline data collected combined with the iterative design, embedded and standard mitigation measures and project assumptions described above, several potential effects on IEFs can be scoped out of further assessment based on the professional judgement of the EIA team, experience from other relevant projects and policy guidance or standards and due to a lack of potential significant effect at a relevant species population or habitat extent scale. This includes effects from the construction and operational phases of the Proposed Development, as well as cumulative effects. The following sections detail the ecological features and effects that have been scoped out following further desk-based assessment and Site surveys.

Statutory Designated Sites and Ancient Woodland

- 6.6.4 With respect to Airds Moss Special SAC, giving consideration to the distance between the SAC and the Site (**Table 6-5**), along with the absence of hydrological connectivity between the Site and the SAC, and in cognisance of the respective blanket bog qualifying feature, it is considered unlikely that the Proposed Development will have a significant effect on the qualifying interest, either directly or indirectly. An appropriate assessment is therefore not required, and Airds Moss SAC can be scoped out of further detailed assessment, as has been noted to be acceptable by NatureScot in their formal scoping consultation.
- 6.6.5 Muirkirk Uplands SSSI abuts the Site in the north-east and is approximately 67 m from the nearest infrastructure associated with the Proposed Development, i.e. a proposed track associated with T1; T2 and the associated hardstanding is also located approximately 102 m from the SSSI boundary (**Figure 6.1**). The relevant ecological qualifying features of the SSSI are blanket bog and the upland habitat assemblage (**Table 6-5**). Given the location and set-back distances, no direct

⁴³ JNCC (2020). Biodiversity – The UK Action Plan 1994. Available at: <https://hub.jncc.gov.uk/assets/cb0ef1c9-2325-4d17-9f87-a5c84fe400bd> (Accessed: August 2026).



permanent or temporary impacts are predicted to occur as a result of the Proposed Development. A small portion of the proposed infrastructure associated with T1 and T2 has potential hydrological connectivity with the SSSI based on topographical contours and probable surface water flow paths. The location of all other infrastructure is either hydrologically separate to the SSSI or the respective hydrological flow paths flow away from the SSSI. The existing habitat between the SSSI and the Proposed Development in these locations where there is potential hydrological connectivity comprises former mining areas that have revegetated with ephemeral or grassland vegetation in the case of T1, or a mosaic of wet heath, blanket bog and flush in the case of T2 (**Figure 6.3**). Given the set-back distances from the SSSI and the limited areas of potential connectivity, and in cognisance of the standard mitigation described above that will be in place, the likelihood of any indirect potential pollution events or effects on qualifying habitats of interest is low and it is considered the potential for significant effects is unlikely. Consequently, Muirkirk Uplands SSSI is scoped out of the detailed ecological assessment.

- 6.6.6 There is no overlap between Proposed Development infrastructure and areas of ancient woodland, the closest distance between ancient/long-established woodland and proposed infrastructure is 74 m (**Figure 6.1**). As no ancient woodland would be lost or impacted due to the Proposed Development, effects are therefore scoped out of the assessment.

LNCS

- 6.6.7 There are 18 LNCS within 5 km of the Site (as detailed in **Table 2-2 of Technical Appendix 6.1**; see also **Figure 6.1**). All of these LNCS are scoped out of detailed assessment due to distance from the Site or proposed infrastructure and a lack of relevant connectivity (whether it be physical, ecological and/or hydrological) with the interest features these LNCS are designated for.

Terrestrial Habitats

- 6.6.8 The following habitats within the Site and Study Area (using Phase 1 Habitat terminology and codes)³³ are considered of less than local ecological value in the context of the Proposed Development and they are scoped out of the assessment as they are features which are relatively common and/or widespread locally and/or regionally (i.e. of low conservation value), and which are, in some instances, present only in a very small area or would be unaffected by the Proposed Development (see also **Annex A**):

- Broadleaved Plantation Woodland (A1.1.2);
- Coniferous Plantation Woodland (A1.2.2);
- Mixed Plantation Woodland (A1.3.2);
- Dense/Continuous Scrub (A2.1);
- Scattered Coniferous Tree (A3.2);
- Recently Felled Coniferous Woodland (A4.2);
- Unimproved Acid Grassland and Semi-Improved Acid Grassland (B1.1 and B1.2 respectively);
- Unimproved Neutral Grassland (B2.1);
- Improved Grassland (B4);
- Continuous Bracken (C1.1);



- Tall Ruderal (C3.1);
 - Bare Peat (E4);
 - Mine (I2.3);
 - Amenity Grassland (J1.2);
 - Ephemeral/Short Perennial (J1.3);
 - Building (J3.6); and
 - Bare Ground (J4).
- 6.6.9 Several other habitats recorded within the Site and Study Area are of local importance, some due to their listing as Annex I habitats or likely SBL Priority Habitats (see **Technical Appendix 6.1**). However, as they occupy such small areas within the Study Area, they are species-poor examples, and/or any direct or indirect effects on the habitat would not occur or would be negligible in magnitude (see **Annex A**), all effects on them are scoped out of the detailed assessment. These habitats include:
- Broadleaved Semi-Natural Woodland (A1.1.1);
 - Scattered Broadleaved Tree (A3.1);
 - Acid Dry Dwarf Shrub Heath (D1.1);
 - Wet Dwarf Shrub Heath (D2);
 - Raised Bog (E1.6.2);
 - Acid/Neutral Flush (E2.1);
 - Basic Flush/Spring (E2.2); and
 - Swamp (F1).
- 6.6.10 Marsh/marshy grassland (B5) is also scoped out of the assessment. Marshy grassland covers 139.26 ha (21.3 %) of the Study Area (**Figure 6.3**) and comprises MG10, M23, M25 and M27 communities in variable extents in addition to non-NVC types *Juncus effusus* (Je) and *Juncus acutiflorus* (Ja) acid grassland communities and an *Equisetum palustre* (Epal) dominant community. MG10, a poor-quality and very common and widespread rush pasture habitat type, is the most abundant community present (**Annex A**). The overall range of marshy grassland communities within the Study Area are common habitat types locally, regionally and nationally, and the relatively small direct and indirect losses predicted, as per **Annex A** (included at the end of this chapter), are of minor significance, and marshy grassland is therefore scoped out of the assessment.
- 6.6.11 Many of the NVC communities underpinning these marshy grassland communities are considered potential GWDTEs in line with SEPA guidance³⁶. However, designation as a GWDTE does not infer an intrinsic biodiversity value, and GWDTE status has not been used as criteria to determine conservation value in the ecology assessment. There is however a statutory requirement to consider GWDTEs, and the data gathered during the NVC surveys has been used to inform this assessment (see **Chapter 8**).

Aquatic Habitats and Species

- 6.6.12 Effects on aquatic habitats and species including standing and running water and fisheries interests are scoped out of the detailed assessment on the basis of



- sensitive scheme design and implementation of standard good practice mitigation (e.g. the through the measures detailed in the CEMP).
- 6.6.13 The watercourses in the northern and central parts of the Site are inaccessible to migratory fish due to barriers to migration identified much further downstream of the Site. The fish communities in and around this part of the Site are typical of the area and are characterised by variable densities of resident brown trout only (**Technical Appendix 6.4**).
- 6.6.14 Watercourses around the south of the Site are accessible to migratory fish; however, the size of and environmental conditions in some of the smaller watercourses here are unsuitable for fish and no fish were recorded during baseline electrofishing surveys (e.g. Small Burn and Duncanziemere Burn). Salmon were recorded in the larger and more suitable watercourses to the south (e.g. Glenmuir Burn and Glenmuir Water). No fish species other than trout and salmon were recorded during surveys (**Technical Appendix 6.4**).
- 6.6.15 The Proposed Development has the potential to impact adversely on water quality and hydrogeomorphology in the absence of mitigation. However, to avoid direct or indirect impacts on these features, a minimum 50 m buffer distance between infrastructure and watercourses has been maintained where possible, except where an access track watercourse crossing and/or other design constraints cannot be avoided to maintain this buffer. The design of permanent and temporary access track watercourse crossings would comply with relevant guidance⁴⁴ to minimise impacts on fish and their habitat.
- 6.6.16 As detailed in **Section 6.5** the standard/best practice mitigation includes that construction work would comply with a CEMP developed by the PC, which would be monitored by a suitably experienced ECoW. The CEMP would include good practice mitigation for effective silt and pollution prevention and undertaking works in accordance with best practice guidance⁴⁴. With this standard mitigation in place, potential significant water pollution impacts, and associated effects associated with the Proposed Development on watercourses, aquatic ecology and fish are considered unlikely, and therefore these pollution impacts are scoped out of further assessment. Further assessment of watercourses is provided in **Chapter 8**. Implementation and monitoring of measures within the CEMP for aquatic interests would be undertaken via an integrated Water Quality and Fish Monitoring Plan (WQFMP) in line with Marine Scotland Science (MSS) monitoring guidelines⁴⁵.

Protected Species

- 6.6.17 Effects on badger, beaver (*Castor fiber*), great crested newt (*Triturus cristatus*), hares (*Lepus* spp.), pine marten, red squirrel, reptiles and wildcat (*Felis silvestris*) are scoped out of the detailed assessment due to the absence of protected features, lack of suitable habitat, the Proposed Development being outwith the known species range (e.g. beaver and wildcat), limited or absence of desk-based evidence or absence of field evidence within the Site and survey area, and/or lack of potential effects from the Proposed Development.
- 6.6.18 Effects on otter and water vole are scoped out of the assessment. Three otter spraints were recorded within the Site during surveys, but no protected features for otter were recorded. This indicates there may be low foraging/commuting usage of

⁴⁴ NatureScot (2024). Good practice during wind farm construction.

⁴⁵ Scottish Government (2021). Monitoring watercourses in relation to onshore wind farm developments: generic monitoring programme. <https://www.gov.scot/publications/monitoring-watercourses-in-relation-to-onshore-wind-farm-developments-generic-monitoring-programme/> (Accessed August 2026).



parts of the Site by otter, periodically. A single location with two burrows that were of a bank location and size that could potentially be attributed to water vole were recorded, however definite signs (i.e. droppings) were not recorded, but these burrows have been attributed to water vole on the precautionary principle. These burrows are over 150 m from the nearest infrastructure associated with the Proposed Development which therefore greatly exceeds the 10 m exclusion zone required by NatureScot standing advice⁴⁶. All of these signs/potential signs of otter and water vole are on the Gass Water (**Figure 6.5**). Implementation of the SPP (**Technical Appendix 6.5**) would include a requirement for pre-construction surveys to be carried out in any area where construction activities are planned near or across a watercourse to ensure that the relevant species has not created new protected features, with ongoing monitoring during the construction phase by the ECoW. As such, with standard mitigation in place, there is no likelihood for significant impacts on otter and water vole populations, and these species are therefore scoped out of the assessment.

- 6.6.19 Effects on roosting bats are scoped out of the assessment. Habitat suitable for supporting roosting bats (long established woodland and built structures) have been identified within the Site. However, given the distance between proposed infrastructure and suitable long-established woodland (495 m at closest point) and built structures (580 m at closest point), the Proposed Development would not result in the loss of any features suitable for roosting bats, or active bat roosts. As such, roosting bats have been scoped out of further assessment.
- 6.6.20 Surveys suggest the Site may support seven bat species and two genera for commuting and foraging (common, soprano, and Nathusius' pipistrelles, Daubenton's, Natterer's, brown long-eared, whiskered, *Myotis* spp. and *Nyctalus* spp.). Following CIEEM (2025)⁴⁷ guidance this equates to a Nationally important assemblage. Construction disturbance effects on foraging/commuting bats are scoped out of the assessment. Construction would mainly take place during daylight hours during the season when bats are active (April to October, inclusive); therefore, any disturbance to foraging and commuting bats of any species is unlikely to occur, or would likely be negligible in magnitude, and is therefore scoped out.
- 6.6.21 Operational and cumulative effects arising from collision mortality for low collision risk bat species are scoped out of the assessment (as per NatureScot *et al.* 2021²⁰ guidance).
- 6.6.22 Overall, the SPP (outline provided in **Technical Appendix 6.5**) to be implemented will provide for suitable mitigation measures and ensure that all reasonably practicable measures are taken during construction so that provisions of the relevant wildlife legislation are complied with in relation to all protected species present or potentially present, should any evidence be found during pre-construction surveys or during construction.
- 6.6.23 Adverse effects on all IEFs during operation of the Proposed Development have been scoped out of the assessment, with the exception of collision risk to high risk bat species. Maintenance of the Proposed Development will involve vehicular access along the access tracks only, and any maintenance of turbines will be occasional, typically carried out by a small number of maintenance staff inside the turbines/on-site during normal working hours. This is unlikely to result in any

⁴⁶ NatureScot (2024). Standing advice for planning consultations – Water Voles. Available at: <https://www.nature.scot/doc/standing-advice-planning-consultations-water-voles>. [Accessed August 2026]

⁴⁷ Reason, P.F. and Wray, S. (2025). UK Bat Mitigation Guidelines: a guide to impact assessment, mitigation and compensation for developments affecting bats. Version 1.2. Chartered Institute of Ecology and Environmental Management, Ampfield.



operational effects on any species or habitats recorded at and around the Proposed Development.

Other Species

Deer

- 6.6.24 Effects on deer are scoped out of the assessment. From the desk study red, roe, sika and fallow deer may be present in the local area. The majority of the Site is open and contains little plantation or woodland cover to support deer, and many of the habitats within the former opencast mine sections also provide poor grazing due to a lack of/sparse vegetation cover. Larger areas of plantation/woodland are also scarce surrounding the Site, with the exception of the conifer plantation at The Drum to the east of the Site. No deer were incidentally noted during ecology surveys on-site, but they are presumed to be present, albeit likely in relatively low number given the prevailing habitat conditions.
- 6.6.25 Operational effects on deer are not anticipated as there is no deer fencing around the Site and therefore deer may use and pass through uninhibited. The Proposed Development is relatively small, and habitat loss has been minimised. Due to the extensive amount of similar suitable habitat in the surrounding land and its availability and accessibility, this loss of grazing and sheltering habitat is expected to be negligible to the wide-ranging species. The size of the Proposed Development is not considered to pose a significant barrier to any local movements or migrations of deer. Construction effects, due to disturbance, are expected to be minimal due to the timing of works (primarily during the day when deer are least active) and short-term construction period (approximately 24 months).
- 6.6.26 If individuals are displaced during construction, there are suitable areas and alternative commuting routes around the Site. As a result of the size and location of the Proposed Development, temporary construction period, minimal habitat loss and the extensive suitable habitat and commuting corridors locally within the Site and beyond, no negative effects on deer are predicted. Due to minimal displacement expected outwith the Site during construction and operation, no negative effects through increased browsing/trampling on surrounding habitats are expected.

Decommissioning

- 6.6.27 As described in **Chapter 2**, effects associated with the construction phase can be considered to be representative of reasonable worst-case decommissioning effects, therefore no separate assessment of the decommissioning phase is presented in this chapter.

6.7 Assessment of Potentially Significant Effects

- 6.7.1 The assessment of effects identified above is based on the Proposed Development as outlined in **Chapter 2**. Unless otherwise stated, potential effects identified are considered to be adverse.

Important Ecological Features (IEFs)

- 6.7.2 A summary of the nature conservation value of the remaining IEFs identified within the Site and surrounding area (as confirmed through survey results and consultation, outlined above) which have been scoped into the assessment is provided in **Table 6-8**, together with the justification for inclusion. These comprise blanket bog/wet modified bog and bats (operational, high collision risk species



comprising common pipistrelle, soprano pipistrelle, *Nyctalus* spp. and Nathusius' pipistrelle).

Table 6-8: Nature Conservation Value of Scoped in IEFs

IEF	Nature Conservation Value	Relevant Legislation/Guidance & Justification
Blanket Bog and Wet Modified Bog	Local	The Proposed Development would result in direct habitat loss and potentially indirect habitat loss/modification for blanket bog and wet modified bog habitats. Blanket bog covers 24.17 ha (3.7 %) of the Study Area, and wet modified bog covers a further 28.31 ha (4.3 %) (Annex A). Blanket bog and wet modified bog within the Study Area is generally localised within the centre of the Site, where it is present in small, fragmented, scattered, remnant patches which have for the most part been avoided by Proposed Development infrastructure (see Figure 6.3). The priority peatland⁴⁸ blanket bog communities present within the Study Area comprise M17, M18 and M19 in variable amounts. Infrequent records of M2 and M3 bog pool communities were also made. Wet modified bog communities present within the Study Area comprise M20 and M25a³⁵, with the latter community being by far the most extensive (Annex A). These wet modified bog communities have a lower relative quality compared to the blanket bog communities and in line with relevant guidance⁴⁸ are communities that are unlikely to raise issues of national interest. As described in Section 6.4 the peatland within the Site is a degraded, drained and modified resource, having been subject to artificial drainage, grazing, afforestation effects, and removal/disturbance from mining operations. There is no near-natural peatland within the Site. Despite some of these communities being associated with Annex I or SBL blanket bog classifications, the habitat within the Study Area is a fragmented, degraded and modified resource that has been impacted over time in several ways. As a result of its condition in addition to size, distribution and relatively fragmented nature, the habitat within the Study Area is not considered to be Nationally or Regionally important. Therefore, assigning a Nature Conservation Value higher than Local is not deemed appropriate.
Bats (commuting/foraging of high collision risk species: common pipistrelle,	Local	All UK bat species are listed on Annex II of the Habitats Directive and fully protected through the Habitats Regulations. Five species (including common pipistrelle, soprano pipistrelle and Nathusius' pipistrelle) are listed on the SBL. Common pipistrelle and soprano pipistrelle are considered to have a 'Favourable' and 'Stable' overall conservation status in Scotland⁴⁹ under the Habitats Regulations and are listed as

⁴⁸ NatureScot (2026). Advising on peatland habitats and carbon-rich soils in development management. <https://www.nature.scot/doc/advising-peatland-habitats-and-carbon-rich-soils-development-management> (Accessed August 2026).

⁴⁹ Scottish Government (2026). Habitats Regulations – Scotland – Art 3ZA – Species 2025. Available at: <https://statistics.gov.scot/resource?uri=http%3A%2F%2Fstatistics.gov.scot%2Fdata%2Fhabitats-regulations-species-2025> (Accessed: August 2026).



IEF	Nature Conservation Value	Relevant Legislation/Guidance & Justification
soprano pipistrelle, <i>Nyctalus</i> spp. and <i>Nathusius</i> pipistrelle)		Least Concern (LC) in Scotland on the IUCN Red List⁵⁰. Both species are common throughout the majority of Scotland⁵⁰. <i>Nathusius</i> pipistrelle have an 'Unknown' overall conservation status in Scotland⁴⁹, and are listed as Vulnerable (VU) under the IUCN Red List criteria⁵⁰. The Proposed Development is outwith the main areas of predicted occurrence and predicted activity for <i>Nathusius</i> pipistrelle⁵⁰. <i>Nyctalus</i> spp. comprise Leisler's bat (<i>Nyctalus leisleri</i>) and noctule bat (<i>Nyctalus noctula</i>). There is no specific conservation status categorisation for <i>Nyctalus</i> spp. in Scotland. Both Leisler's and noctule bats have an overall conservation status of 'Favourable' and 'Stable' in Scotland⁴⁹. Noctule are also listed as LC, and Leisler's as Near Threatened (NT) on the IUCN Red List⁵⁰. The Proposed Development is in the general vicinity of the areas of predicted occurrence and predicted activity for Leisler's and potentially also noctule bats⁵⁰. Reliable population estimates for <i>Nyctalus</i> spp. in Scotland are currently not available with some currently used population estimates of only a few hundred bats⁵¹ outdated and based on expert opinion. Actual populations in Scotland, and their distribution range, are now thought to be much larger than previously reported with populations suggested to be in the region of many thousands⁵². The majority of bat activity (77.1 %) (Table 6-6) was attributed to common or soprano pipistrelle, which are considered to have a 'common' population relative abundance and are considered of 'medium' potential vulnerability²⁰. <i>Nathusius</i> pipistrelle and <i>Nyctalus</i> spp. are considered to have the 'rarest' population relative abundance and are considered of 'high' potential vulnerability²⁰; 53 <i>Nathusius</i> pipistrelle and 2,127 <i>Nyctalus</i> spp. registrations were recorded during surveys, i.e., 0.4 % and 15.6 % respectively of bat activity recorded (Table 6-6). In cognisance of the reference range and confidence levels of survey results for <i>Nathusius</i> pipistrelle (see paragraph 6.4.56), the overall median/typical risk assessment for high collision species recorded for the Proposed Development was generally low (see Table 6-7 as well as full details within Technical Appendix 6.3 and Figures 6.7 – 6.10). While the Site supports a Nationally important bat assemblage for foraging and commuting bats overall (paragraph 6.6.20), given the lack of effects predicted on low collision risk species²⁰, and therefore focusing only on the high collision risk bat assemblage, the Site scores an importance level of 'County'⁴⁷. Considering the above information, lack of potential roosts within

⁵⁰ Mathews, F., Kubasiewicz, L.M., Gurnell, J., Harrower, C.A., McDonald, R.A., Shore, R.F. (2018). A Review of the Population and Conservation Status of British Mammals: Technical Summary. A report by the Mammal Society under contract to Natural England, Natural Resources Wales and Scottish Natural Heritage. Natural England, Peterborough.

⁵¹ Harris S., Morris, P., Wray, S. & Yalden, D. (1995). A review of British mammals: population estimates and conservation status of British mammals other than cetaceans. JNCC, Peterborough.

⁵² Newson, S.E., Evans, H.E., Gillings, S., Jarrett, D., Wilson, M.W. (2017). A survey of high risk bat species across southern Scotland. Scottish Natural Heritage Commissioned Report No. 1008.



IEF	Nature Conservation Value	Relevant Legislation/Guidance & Justification
		the Site, the majority of species recorded being common pipistrelle and soprano pipistrelle, and the County importance level determined through guidance, a Nature Conservation Value of Local is considered suitable for high collision risk bat species.

Construction

- 6.7.3 This section provides an assessment of the likely effects of the construction of the Proposed Development upon the scoped in IEFs.

Habitats

- 6.7.4 The most tangible impact during construction of the Proposed Development would be direct habitat loss due to the construction of infrastructure such as new tracks, wind turbine foundations, hardstandings, laydown areas, construction compound and substation. Much of this infrastructure will be permanent, however the construction compound and any other temporary laydown or hardstanding areas will be restored at the end of construction.
- 6.7.5 There may also be some indirect habitat losses/modifications of wetland habitats due to drainage effects. As noted in **paragraph 6.3.28**, for the purposes of this assessment, it is assumed that wetland habitat losses due to indirect drainage effects may extend out to 10 m from infrastructure (in keeping with precautionary indirect drainage assumptions within SEPA carbon calculator guidance¹⁹). It is expected that any indirect drainage effects would only impact wetland habitat such as blanket bog, flushes etc. No indirect drainage effects are expected to impact or alter the quality or composition of non-wetland habitats, such as acid grassland, as such only direct habitat loss applies to these habitats.
- 6.7.6 Temporary habitat losses due to the creation of temporary infrastructure and earthworks areas of cut and fill have been calculated separately. These have been considered separately to permanent infrastructure as although these areas would be restored at the end of the construction period and therefore would not show a loss in habitat extent, the habitat type resulting after restoration may not be the same as the original due to changes in topographical or hydrological conditions. In particular, areas of land take for this temporary infrastructure may represent permanent losses for certain wetland habitat types, such as blanket bog, due to the effects on the structure and function of the habitat type, and the complexities and long timescales involved in restoring or re-creating these particular habitat types.
- 6.7.7 **Table 6-9** details the estimated relative losses expected to occur to scoped in habitats (i.e. blanket bog and wet modified bog) for all new permanent and temporary infrastructure (with habitat loss estimated for all habitat types presented in **Annex A**).



Table 6-9: Estimated Loss of IEF Habitats in Study Area for Permanent and Temporary Infrastructure

Habitat Type	Extent in Site (ha)	NVC Community ⁵³	Direct Habitat Loss (ha)	Direct Habitat Loss as a % of Habitat Type	Indirect Habitat Loss / Modification (ha) in Study Area	Indirect Habitat Loss / Modification as a % of Habitat Type in Study Area
Permanent						
Blanket Bog	24.17	M19	0.00	0.00	0.01	0.04
Wet Modified Bog	28.31	M20	0.09	2.70	0.13	2.83
		M25a^	0.67		0.67	
Temporary						
Blanket Bog	24.17	M19	0.05	0.22	N/A	N/A
Wet Modified Bog	28.31	M20	0.09	2.79	N/A	N/A
		M25a^	0.70		N/A	
Totals	52.48		1.61	3.07	0.81	1.54

Blanket Bog and Wet Modified Bog

- 6.7.8 **Effect:** Impacts upon blanket bog and wet modified habitats will be direct (through permanent and temporary habitat loss) and potentially indirect (through potential drying effects upon neighbouring bog habitats) occurring from the construction phase into the operational phase. Direct loss will occur in areas where permanent infrastructure such as tracks, wind turbine foundations and permanent hardstandings are sited on these habitat types. The excavation of these habitat types for temporary infrastructure will also likely lead to the losses of blanket bog and wet modified bog due to the long-term effect on the ecological and hydrological structure and function of these habitat types. In addition, there may be indirect losses or habitat modification as a result of drainage effects around infrastructure (precautionarily around 10 m from infrastructure is assumed¹⁹).
- 6.7.9 Fragmentation could involve the creation of smaller areas of habitat which in turn could impair the functioning and reduce the resilience of essential hydrological processes. This could make the impacted habitat more vulnerable to future decline in condition and potentially lead to a transition to a different habitat type such as blanket bog to wet modified bog/wet heath or wet modified bog to dry modified bog/wet heath, or more subtle sub-community shifts.
- 6.7.10 For blanket bog and wet modified bog, fragmentation effects are a function of the extent of the hydrological unit, location of impact within the unit and magnitude of direct and indirect impact in the context of the hydrological unit.
- 6.7.11 For blanket bog and wet modified bog, fragmentation effects are a function of the extent of the hydrological unit, location of impact within the unit and magnitude of direct and indirect impact in the context of the hydrological unit. **Figure 6.3** shows that blanket bog and wet modified bog habitats exist together in mosaics, and with

⁵³ Only specific IEF habitats, communities or features subject to habitat losses are presented within this table. Any IEF communities not listed here are not subject to any predicted direct or indirect habitat losses. Full details of habitat losses for all habitat types are presented in **Annex A**.



several other wetland habitats (e.g., mires, flushes, swamps and marshy grasslands) in relatively large expansive and hydrologically connected mosaics across the Study Area and in the wider local area. The scale of these wetland habitat mosaics reduces the likelihood that small, fragmented habitat patches would be created. Given the general avoidance of blanket bog and wet modified bog by proposed infrastructure, no small-scale habitat fragments appear to be created by the location of tracks and other infrastructure, and where some wetland habitats are subject to infrastructure there are good practice construction methods that would allow the maintenance of sub-surface hydrological connectivity between areas. It should also be recognised the Site's mining legacy has imparted historical and ongoing legacy physical and hydrological fragmentation effects on what was likely more extensive peatland and wetland habitat mosaics prior to mining operations. It is therefore unlikely that the potential effects of fragmentation would lead to further loss of blanket bog and wet modified bog in addition to that predicted to occur as a result of direct loss and precautionary indirect loss figures detailed above.

- 6.7.12 **Nature Conservation Value:** Local (as detailed in **Table 6-8**).
- 6.7.13 **Conservation Status:** Since leaving the EU, the UK no longer needs to provide Article 17 reports on Annex I habitats and Annex II species to the European Commission. However, understanding the condition of these habitats and species is still important for UK biodiversity. The reporting requirements are detailed in the amended legislation; for Scotland, this is The Conservation (Natural Habitats, &c.) Regulations 1994 (as amended), Regulation 3ZA.
- 6.7.14 Under the amended Habitats Regulations, NatureScot must produce a public report every six years which includes conservation status assessments, including the current condition of habitats and species (excluding birds) of national interest, how condition has changed and future prospects⁵⁴. The current reports cover the period 2019–2024 with publication in January 2026⁵⁵.
- 6.7.15 The current overall assessment of conservation status for blanket bog in Scotland is 'Unfavourable-Bad' and 'Improving'⁵⁶. The 'Improving' positive trend is due to the widespread and ongoing restoration and conservation efforts for blanket bog habitats across Scotland.
- 6.7.16 **Magnitude of Effect:** Scotland has a single best estimate of around 1,759,000 ha of blanket bog⁵⁶.
- 6.7.17 Blanket bog covers approximately 24.17 ha (3.7 %) of the Study Area and is primarily made up of a mix of M17, M18 and M19 blanket mire (see **Annex A**). As per **Table 6-9**, the direct habitat loss for blanket bog is predicted to be zero for permanent infrastructure (as it has been completely avoided by permanent infrastructure during iterative design) and up to 0.05 ha of predicted loss due to temporary works areas (these losses all correspond to M19 mire). This results in a potential total direct loss of 0.05 ha, equivalent to 0.22 % of the blanket bog within the Study Area (i.e. within the Site).

⁵⁴ NatureScot (2026). Habitats Regulations Reporting. Available at: <https://www.nature.scot/professional-advice/protected-areas-and-species/protected-species/legal-framework/habitats-directive-and-habitats-regulations/habitats-regulations-0> (Accessed: August 2026).

⁵⁵ JNCC (2026). Habitats Regulations Reporting. Available at: <https://jncc.gov.uk/our-work/habitats-regulations-reporting/> (Accessed: August 2026).

⁵⁶ Scottish Government (2026). Habitats Regulations – Scotland – Art 3ZA – Habitats 2025. Available at: <https://statistics.gov.scot/resource?uri=http%3A%2F%2Fstatistics.gov.scot%2Fdata%2Fhabitats-regulations---habitats-2025> (Accessed: August 2026).



- 6.7.18 Wet modified bog covers approximately 28.31 ha (4.3 %) of the Study Area and is comprised of much lower quality M20 and M25a[^] (predominately M25a[^]). As per **Table 6-9**, the direct habitat loss for wet modified bog is predicted to be 0.77 ha due to permanent infrastructure with up to an additional 0.79 ha due to temporary works areas. This results in a potential total direct loss of 1.56 ha, equivalent to 5.51 % of the wet modified bog within the Study Area (i.e. within the Site).
- 6.7.19 For this blanket mire resource as a whole, i.e., combining blanket bog and wet modified bog, direct losses amount to 0.77 ha for permanent infrastructure and 0.84 ha for temporary works areas; a total of 1.61 ha or 3.07 % of the combined resource within the Study Area (i.e. the Site).
- 6.7.20 In addition, there may be some indirect losses or modifications to habitat type/composition because of the potential zone of drainage around infrastructure. The actual distance of the effects of drainage on a peatland is highly variable and depends on various factors such as the type of peatland and its characteristics and properties of the peat; the type, size distribution and frequency of drainage feature; and whether the drainage affects the acrotelm, penetrates the catotelm, or both. The intactness of the existing peatland hydrological unit and current condition and quality of the peatland, along with any historical or ongoing effects the peatland has been subject to, such as effects of conifer plantation, historical moor grip drainage, mining, burning, erosion and/or haggling/gullying will also influence the likelihood of potential indirect drainage effects and the distance they may be realised (if occurring). Consequently, drainage effects can be restricted to just a few decimetres or metres around the feature or extend out to tens of metres, or occasionally further (for example, see review within Landry & Rochefort (2012)⁵⁷). The hydraulic conductivity of the peatland is one of the key variables which affect the extent of drainage. In general, less decomposed more fibric peatlands (which tend to be found commonly in fen type habitats) generally have a higher hydraulic conductivity and drainage effects can extend further and to around 50 m, whilst in more decomposed (less fibrous) peat drainage effects may only extend to around 2 m. Blanket bog habitats like those present within the Study Area are commonly associated with more highly decomposed peats (see Nayak *et al.* (2008)⁵⁸). For this assessment, indirect effects are precautionarily assumed to extend out to 10 m from infrastructure in line with carbon calculator guidance¹⁹.
- 6.7.21 As per **Table 6-9**, if indirect drainage effects were fully realised out to 10 m around permanent infrastructure in all blanket bog and wet modified bog areas, then the total predicted potential habitat modification or losses increase for blanket bog by 0.01 ha and 0.80 ha for wet modified bog. This worst-case scenario of all direct and indirect habitat loss or modification for permanent and temporary works areas is an overall total of 0.06 ha or 0.26 % of the Study Area's blanket bog, and 2.36 ha or 8.33 % of the Study Area's wet modified bog. For this blanket mire resource as a whole, i.e. combining blanket bog and wet modified bog, direct and potential indirect losses for permanent and temporary works areas overall amount to 2.42 ha, or 4.61 % of the combined resource within the Study Area (i.e. within the Site).
- 6.7.22 It is considered highly unlikely, for this Site in particular, that indirect drainage effects of this scale (i.e. out to 10 m either side of all permanent infrastructure) would occur or would have such an effect on the habitat as to result in any notable effect on the type of bog present or shifts to a lower conservation value habitat type (such as acid

⁵⁷ Landry, J. & Rochefort, L. (2012). The Drainage of Peatlands: Impacts and Rewetting Techniques. Peatland Ecology Research Group, Université Laval, Quebec.

⁵⁸ Nayak, R.A., Miller, D., Nolan, A., Smith, P., Smith, J. (2008). Calculating carbon savings from wind farms on Scottish peat lands - A New Approach.



grassland, for example). For instance, Stewart & Lance (1991)⁵⁹ in their study found that a lowering of the water table next to drains was slight and confined to just a few metres either side of the drain, on sloping ground the uphill zone of drawdown was even narrower. Subtle variations in plant species abundance were noted, with species dependent on high water-tables having a lower cover-abundance near to drains, and species with drier heathland affinities having higher cover than at places farther away. However, there were no wholesale changes in vegetation or the species assemblage; for instance, declines in *Sphagna* cover were highly localised and took nearly 20 years to achieve statistical significance. Anecdotal observations from wind farms around Scotland also suggest that bog habitats readily persist around infrastructure and within this 10 m zone of possible influence.

- 6.7.23 It should also be noted that all of the peatland within the Site and where proposed infrastructure is to be sited has been classified as modified or drained and has suffered from historical and ongoing drainage, disturbance and drying out effects, through artificial drains and the Sites mining legacy, as was confirmed through the PCA and NVC surveys undertaken for the Proposed Development (see **Section 6.4**). With the peatland in this already drained and generally modified condition, the potential for additional indirect drying effects is therefore also limited and reduced by the current nature and state of the peatland present.
- 6.7.24 Furthermore, the predicted indirect losses due to drainage are calculated in GIS and based on the habitat survey mapping, there may be small-scale local specific factors such as those relating to natural breaks in habitat type, hydrology, geology or topography, or the presence of non-wetland habitats that act as a barrier or buffer, that would prevent the full predicted indirect drainage effects from materialising.
- 6.7.25 Overall, evidence suggests that if some indirect drainage effects materialise locally around infrastructure due to the Proposed Development the most likely effect would not be a major change in overall bog habitat type, but rather a potential small scale near-zone change in vegetation micro-topography, certain species cover, or abundance that may result in a subtle NVC community or sub-community shift, and which may only be apparent in the long term.
- 6.7.26 When considering the scale of the above worst-case habitat losses for the Proposed Development, which includes the unlikely scenario of indirect drainage effects being realised out to 10 m in all peatland areas (i.e. direct and precautionary indirect effects on up to 4.61 % of the combined blanket bog and wet modified bog within the Study Area) and accounting for the relative abundance, distribution and quality of the blanket bog and wet modified bog within the Study Area and locally to the Site, an impact magnitude of **low spatial** and **long-term temporal** is appropriate (in keeping with the assessment methodology parameters as set out within **Section 6.3**).
- 6.7.27 **Significance of Effect:** Given the above consideration of Nature Conservation Value, Conservation Status and Magnitude of Effect, the effect significance is considered to be **minor adverse** and **not significant** under the EIA Regulations.

Operation

- 6.7.28 This section provides an assessment of the likely impacts of the operation of the Proposed Development upon the scoped in IEFs.

⁵⁹ Stewart, A. J. A. and Lance, A. N. 1991: Effects of moor-draining on the hydrology and vegetation of northern Pennine blanket bog. *Journal of Applied Ecology* 28, 1105-1117.



Habitats

- 6.7.29 All likely direct and indirect adverse effects on scoped in habitats have been considered in the Construction section above. Although the majority of habitat loss is associated with infrastructure required for the operation of the Proposed Development (rather than temporary construction infrastructure), the physical loss of habitat would occur during the construction stage and is therefore considered above.
- 6.7.30 Potential indirect effects on wetland habitats, if realised, would largely occur during the operational phase as potential drying effects become established. However, for ease and clarity of assessing effects on habitats these are considered together in the Construction section above.
- 6.7.31 However, additional compensation and biodiversity enhancement measures, such as habitat creation/enhancement for a range of habitat types, are proposed for the operational phase as part of the Proposed Development's OBEMP, see **Technical Appendix 6.6** and **Section 6.8** for further details.

Protected Species

Bats

- 6.7.32 **Effect:** During the operational phase, there is potential collision risk for commuting and foraging bat species in addition to the risk that bats may be affected by barotrauma⁶⁰ when flying in close proximity to moving turbine blades. For the purposes of this assessment, the potential effects from barotrauma are assumed to be the same as for collision risk. This is due to the lack of published empirical evidence in causes of bat fatalities around wind farms and the difficulties in determining whether bat fatalities are due to strikes (collisions) with the turbine blades or barotrauma.
- 6.7.33 Research undertaken by Exeter University on behalf DEFRA⁶¹ found that most bat fatalities at UK wind farms have been common pipistrelle, soprano pipistrelle and noctule bats. Further work⁶² found that common pipistrelle activity was higher at turbine locations than at control locations in similar habitat, suggesting that this species may be at particular risk. In the same study soprano pipistrelle activity was comparable between sites with no attraction or repulsion by turbines. It is suggested the observed higher levels of activity could be because there are more individual bats around turbines, or because bats spend more time in these locations relative to controls, even if the number of individual bats remains the same; however, it is not possible to distinguish between these possibilities using acoustic bat data⁶².
- 6.7.34 As discussed in **Chapter 2**, some of the turbines will require red aviation warning lights. A five-year study by Spoelstra *et al.* (2017)⁶³ concluded that foraging bats are not attracted to red lighting. This is attributable to the fact that white and green

⁶⁰ Barotrauma describes injuries that occur when a bat (or other animal) encounters sudden and extreme changes in atmospheric pressure. The rapid pressure fluctuations can rupture air-containing structures in the bodies of mammals which causes internal bleeding and, potentially, death.

⁶¹ Mathews, F., Richardson, S., Lintott, P. & Hosken, D. (2016) Understanding the Risk to European Protected Species (bats) at Onshore Wind Turbine Sites to inform Risk Management. University of Exeter/DEFRA.

⁶² Richardson, S.M., Lintott, P.R., Hosken, D.J. (2021). Peaks in bat activity at turbines and the implications for mitigating the impact of wind energy developments on bats. *Sci Rep* 11, 3636 (2021).

⁶³ Spoelstra, Kamiel & van Grunsven, Roy & Ramakers, Jip & Ferguson, Kim & Raap, Thomas & Donners, Maurice & Veenendaal, Elmar & Visser, Marcel. (2017). Response of bats to light with different spectra: Light-shy and agile bat presence is affected by white and green, but not red light. *Proceedings of the Royal Society B: Biological Sciences*. 284. 20170075. 10.1098/rspb.2017.0075.



spectrum lights attract insects whereas red lights do not. Based on this, Spoelstra *et al.* (2017) advised, “Hence, in order to limit the negative impact of light at night on bats, white and green light should be avoided in or close to natural habitat, but red lights may be used if illumination is needed”⁶³.

- 6.7.35 A study by Voight *et al.* (2018)⁶⁴ found evidence of attraction of migratory soprano pipistrelle and Nathusius’ pipistrelle to red lighting. However, these species do not migrate in the UK as they do in continental Europe, so this finding is not relevant to the Proposed Development. With regard to *Nyctalus* spp., the results were inconclusive due to the difficulty in distinguishing between species, although there was some suggestion of attraction to red light. The explanation for the contrasting findings between these studies is given by Spoelstra *et al.* (2017) as, “migratory bats may be more susceptible to light sources of specific wavelength spectra because vision may play a more dominant role than echolocation during migration. Non-migratory bats might use orientation cues that are more involved during general hunting behaviour, for example, echoes reflected from local landmarks, instead of cues from natural or artificial light sources”⁶³.
- 6.7.36 Bats may also be displaced from their foraging grounds through avoidance of operational wind turbines⁶⁵. Barré *et al.* (2018)⁶⁶ recorded a marked reduction in bat activity around operational wind turbines.
- 6.7.37 **Nature Conservation Value:** Local (as detailed in **Table 6-8**).
- 6.7.38 **Conservation Status:** Common pipistrelle and soprano pipistrelle are assessed to have a ‘Favourable’ and ‘Stable’ overall conservation status in Scotland⁵⁶ under the Habitats Regulations. There is insufficient data for the conservation status of Nathusius’ pipistrelle to be assessed under the Habitats Regulations. There is no specific conservation status categorisation for *Nyctalus* spp. in Scotland, however, both Leisler’s and noctule bats are assessed to have a ‘Favourable’ and ‘Stable’ conservation status of in Scotland⁵⁶ under the Habitats Regulations. Mathews *et al.* (2018)⁵⁰ also consider common pipistrelle, soprano pipistrelle and *Nyctalus* spp. to have a ‘Favourable’ conservation status.
- 6.7.39 Further details on the Conservation Status of high collision risk bat species recorded within the Site are provided below. Information on Leisler’s and noctule bats is also presented, as while registrations for the genera only was recorded (i.e. *Nyctalus* spp.; see **Technical Appendix 6.3**), these species may be present on the Site and as such consideration is given to both species individually.
- 6.7.40 Both common and soprano pipistrelle are widespread in Scotland, however there is insufficient data to estimate the population range for Nathusius’ pipistrelle. The low population estimates for *Nyctalus* spp. in Scotland are outdated and likely underestimated due to under-recording⁵⁰. The survey data indicates that *Nyctalus* spp. are present on-site, and both Leisler’s and noctule bats could therefore be present at the Site. Studies by Newson *et al.* (2017)⁵² have shown a general east-west geographical divide between the species distribution in southern Scotland; with the Proposed Development located in the west of their research area and largely within the region of Leisler distribution mapping, however there may be

⁶⁴ Voigt, CC., Rehnig, K., Lindecke, O., Pétersons, G. Migratory bats are attracted by red light but not by warm-white light: Implications for the protection of nocturnal migrants. *Ecol Evol.* 2018; 8:9353–9361.

⁶⁵ Christian C. Voigt, Klara Kaiser, Samantha Look, Kristin Scharnweber, Carolin Scholz. Wind turbines without curtailment produce large numbers of bat fatalities throughout their lifetime: A call against ignorance and neglect, *Global Ecology and Conservation*, Volume 37, 2022, e02149, ISSN 2351-9894.

⁶⁶ Barré, K., Le Viol, I., Bas, Y., Romain J. & Kerbiriou, C. (2018). Estimating habitat loss due to wind turbine avoidance by bats: Implications for European siting guidance. *Biological Conservation*. 226. 205-214. 10.1016/j.biocon.2018.07.011.



- some marginal overlap with noctule distribution mapping. The Proposed Development is also within the northern area of *Nyctalus* spp. distribution range⁵⁰.
- 6.7.41 In 2016-2017 the estimated population of common pipistrelle in Scotland was between 285,000 and 2,160,000⁴⁹ (with a 95 % confidence interval). Mathews *et al.* (2018)⁵⁰ provided a UK estimate of 3,040,000 (with a plausible range of 991,000 – 7,510,000); population estimates for Scotland were not provided in that review.
- 6.7.42 For soprano pipistrelle, the estimated population in Scotland was between 512,000 and 2,180,000⁴⁹ (with a 95 % confidence interval). Mathews *et al.* (2018)⁵⁰ provided a UK estimate of 4,670,000 (with a plausible range of 970,000 – 8,400,000); population estimates for Scotland were not provided in that review.
- 6.7.43 There is insufficient data to estimate the population range for Nathusius' pipistrelle, Leisler's and noctule bats in Scotland, with the best single value of these species' population assumed to be 47, 238 and 186 respectively⁴⁹. However, Newson *et al.* (2017)⁵² in their study stated that the previously used population estimates in Scotland of only a few hundred bats are outdated, with their research indicating actual populations of *Nyctalus* spp. in Scotland, and their distribution range, are much larger than previously reported, with populations suggested to be in the region of many thousands.
- 6.7.44 **Magnitude of Effect:** Evaluating the vulnerability of a bat population to wind farms is based on the following three factors: i) activity level recorded, ii) population vulnerability (determined by collision risk of species and population size), and iii) Site risk level. These factors are used in Ecobat to generate an overall risk assessment score per species of either Low (0-4), Moderate (5-12) or High (15-25) in line with NatureScot guidance²⁰. **Figures 6.7 – 6.10** also present overall risk levels for high risk species based on the results of the monitoring undertaken at locations across the Site in 2025. A summary is provided further below to inform the assessment.
- 6.7.45 The evidence in the UK shows that most bat activity is close to habitat features e.g. woodland or wetlands. Foraging habitat quality and connectivity within the Site is moderate, with some watercourses throughout/close to the Site and a number of woodland boundaries/edges present. As set out in **Technical Appendix 6.3**, the Proposed Development has been categorised as a 'Medium' risk to bats due to its 'Medium' project size and 'Moderate' habitat risk.
- 6.7.46 The following risk assessment score for 'Median' and 'Maximum' percentiles was returned in 2025 for the undernoted species:
- common pipistrelle: Low (3) to Medium (6);
 - soprano pipistrelle: Low (3) to Medium (6);
 - Nathusius' pipistrelle: Medium (6) to High (15); and
 - *Nyctalus* spp.: Low (3) to High (15).
- 6.7.47 **Figures 6.7 – 6.10** show the bat Site activity risk assessment categories per month and per Anabat location based on the median (typical activity) and maximum (peak activity) percentile for the Site in 2025. As can be seen on these figures, the risk level varied temporally and spatially between April and September, but with most locations generally showing 'Low' or 'No Activity'. The figures also show there were no median activity 'High' risk locations for common pipistrelle, soprano pipistrelle or Nathusius' pipistrelle. A single location, in summer and autumn, recorded 'High' median activity for *Nyctalus* spp. Further context on each high collision risk species is provided further below.



- 6.7.48 Various embedded mitigation is in place (**Section 6.5**), and as per **paragraph 6.5.3** this has included, where possible when factoring in all Site and environmental constraints, applying a minimum 50 m buffer from turbine blade tips to important edge habitats (i.e. woodland edges and watercourses) to reduce collision/barotrauma risk to commuting/foraging bats. Turbine-specific stand-off distances were estimated using the formula detailed within NatureScot *et al.* guidance²⁰. Watercourses have a 0 m height for the calculation. Woodland is sparse within the Site and resultantly there are relatively few woodland edge features, the exception being in the east where the Site abuts the neighbouring conifer plantation at The Drum (**Figure 6.3**). The Sitka spruce height at the woodland edge with The Drum has been measured as 22 m. Woodlands within the Site are younger and are not as tall. However, to represent a worst-case scenario for this assessment woodland edge habitat has been assigned a height of 22 m in the calculation. However, it should also be noted that the plantation at The Drum, given its size and maturity, would potentially already be felled before the anticipated construction start date for the Proposed Development (i.e. indicatively 2030), or will be felled early into the operational period. As a result, the woodland edge feature at The Drum will likely be removed or subsequently of much lower height (on the assumption the area is restocked) during the operational phase of the Proposed Development, and accordingly the stand-off distances required from turbines would be much smaller.
- 6.7.49 For turbines 1, 3, 6, 13 and 14 based on the associated turbine parameters in **Chapter 2**, the currently required stand-off distance from turbine base to habitat features is 101.5 m for woodland and 84.7 m for watercourses. For turbines 2, 4, 5, 7, 8, 9, 10, 11 and 12 based on the associated turbine parameters in **Chapter 2**, the currently required stand-off distance from turbine base to habitat features is 88.0 m for woodland and 54.8 m for watercourses.
- 6.7.50 Based on the above stand-off distances, there is minor encroachment within these buffers in a small number of instances. For woodland edge habitats T5 is set-back by 83.9 m, T8 by 87.0 m and T9 by 84.0 m, the recommended stand-off distance is 88 m. This equates to minor buffer encroachment in the order of 1.0 m – 4.1 m. T5, T8 and T9 border The Drum plantation, and as noted above the stand-off distances would be much reduced in the likely scenario that this woodland is felled prior to construction of the Proposed Development or early during the operational phase. The stand-off distance for woodland is greatly exceeded at all other turbines.
- 6.7.51 For watercourses, T14 is set-back by 67.6 m from the nearest watercourse and the recommended turbine stand-off distance is 84.7 m. This equates to buffer encroachment of 17.1 m. The watercourse by T14 is the Small Burn, where there will also be a new watercourse crossing (i.e. WX06 – see **Technical Appendix 8.4**). This is a very small watercourse of approximately 0.4 m in width and 0.2 m in depth (**Technical Appendix 8.4**), and which is set within a predominately open agriculturally improved grassland setting, with few foraging/commuting features/habitats in the proximity. The small nature of the watercourse, its character and setting mean it is unlikely to be a key foraging resource or commuting route for bats (as also indicated by the bat activity data collected in this general area (see **Figures 6.7 – 6.10**). The stand-off distance for watercourses is greatly exceeded at all other turbine locations. Where relevant, any stand-off distance encroachment is considered in the assessment below.
- 6.7.52 The standard operational phase mitigation described in **Section 6.5**, with respect to bats, namely reduced rotor speed when idling through feathering of the blades, will be implemented throughout operation during the bat active period (April to October, inclusive), reducing the risk of bat fatalities. The presence of this mitigation measure has been taken into account when assigning the significance of effect.



- 6.7.53 **Common Pipistrelle:** As shown on **Figure 6.7**, analysis of the risk assessment scores for common pipistrelle, when based on the median percentile and typical activity, indicate consistent levels of activity across the survey locations throughout 2025, with all locations having a Low risk assessment score or No Activity⁶⁷, in each survey visit.
- 6.7.54 Data relating to the maximum percentile and peak activity levels indicates that the risk of collision remains low at most monitoring locations. The only peaks in activity were recorded at Locations 4a, 7a and 10 in summer and Location 4a in autumn where Medium risk assessment scores were returned from Ecobat.
- 6.7.55 Monitoring Location 4a was positioned approximately 8 m from Glenmuir Burn, 23 m from woodland edge habitat, and approximately 193 m from the nearest turbine (T9) (**Figure 6.6**). Bats are known to use linear features such as woodland edge habitat and watercourses for navigation and foraging purposes and therefore higher activity would be expected in a location such as Location 4a. The woodland edge habitat and watercourse themselves are located approximately 84 m east and 93 m south-west of T9 respectively. As noted above, there is minor encroachment here within the recommended stand-off distance between T9 and the woodland edge, however as also noted above, the woodland edge/height feature is also likely to change here from the current situation.
- 6.7.56 Location 7a was also positioned along woodland edge habitat within the east of the Site, located approximately 147 m south-east of the nearest turbine (T7).
- 6.7.57 Monitoring location 10 was situated within open marshy grassland habitat set within a surrounding mixed mosaic of other open habitat types and minor watercourses and waterbodies towards the north of the Site, approximately 357 m north-west of the nearest proposed turbine (T3). While open landscape generally provides limited suitability for foraging bats, it may serve as a commuting pathway to and from areas of more suitable foraging and roosting habitat nearby. This is evidenced by the presence of several early pass times attributed to common pipistrelle during spring, summer and autumn 2025 at this open habitat monitoring location (**Technical Appendix 6.3**).
- 6.7.58 Considering the above discussion, an effect magnitude of **low spatial** and **long-term temporal** is considered appropriate for common pipistrelle.
- 6.7.59 **Soprano Pipistrelle:** As shown on **Figure 6.8**, analysis of the risk assessment scores for soprano pipistrelle, when based on the median percentile and typical activity, follow generally similar results as common pipistrelle, with relatively consistent levels of activity across the survey locations throughout 2025, with all locations having a Low risk assessment or No Activity; the only exceptions to this being the Medium risk assessment scores at Locations 4a and 7a in summer.
- 6.7.60 Data relating to the maximum percentile and peak activity levels indicates that the risk of collision remains low at most monitoring locations. The only peaks in activity were recorded at Locations 9 in spring, Locations 4a, 7a in summer and Location 4a in autumn where Medium risk assessment scores were returned. The locational characteristics of Locations 4a and 7a have been described above. Location 9 was situated within open marshy grassland habitat set within a surrounding mixed mosaic of other open habitat types and former mine workings and located approximately 175 m west of the nearest proposed turbine (T6).

⁶⁷ i.e. no bat calls were recorded during the associated survey period.



- 6.7.61 Considering the above discussion, an effect magnitude of **low spatial** and **long-term temporal** is considered appropriate for soprano pipistrelle.
- 6.7.62 **Nathusius' Pipistrelle:** As shown on **Figure 6.9**, several of the survey locations recorded no Nathusius' pipistrelle activity throughout the entire survey period, and when Nathusius' pipistrelle was recorded this was at just a few scattered locations in summer and autumn. Based on the median percentile and typical activity there were Medium risk assessment scores at Locations 5, 6a, 9, 10 and 11 in summer and Locations 2, 7a and 10 in autumn, with little correlation in activity areas between summer and autumn.
- 6.7.63 Data relating to the maximum percentile and peak activity levels also indicates Medium risk assessment scores at Locations 5, 6a, 9 and 11 in summer and Locations 2, 7a and 10 in autumn. The only High risk assessment score was at Location 10 in summer (**Figure 6.9**).
- 6.7.64 Although several locations recorded a Medium risk assessment based on the median and maximum percentile, with one High risk assessment location based on the maximum percentile, the reference range for Nathusius' pipistrelle was just 53 (see **Table 6-7** and **Technical Appendix 6.3**). For a reliable result a reference range of 200 and above is recommended, therefore the result is treated with caution as the relative levels of activity indicated will be elevated as result of the small dataset for comparison, particularly in light of the low number of Nathusius' pipistrelle registrations recorded on-site (i.e. only 53 registrations (over 477 data nights) and 0.4 % of total bat passes).
- 6.7.65 Considering the above discussion, an effect magnitude of **low spatial** and **long-term temporal** is considered appropriate for Nathusius' pipistrelle.
- 6.7.66 **Nyctalus spp.:** As shown on **Figure 6.10**, analysis of the risk assessment scores for *Nyctalus* spp., when based on the median percentile and typical activity, indicate relatively consistent levels of activity across the survey locations throughout 2025, with most locations having a Low risk assessment score or No Activity in each survey visit. The exception to this is Location 4a in summer and autumn with a Medium risk assessment and Location 10 in summer and autumn with a High risk assessment.
- 6.7.67 Data relating to the maximum percentile and peak activity levels indicates that the risk of collision remains low at most monitoring locations. Peaks in activity with Medium risk assessment scores were recorded at Locations 4 in spring, Location 4a in summer and Locations 4a, 7a, 11 and 12 in autumn. The only High risk assessment results for peak activity levels were at Location 10 in summer and autumn.
- 6.7.68 Overall, for *Nyctalus* spp., the incidences of moderate to higher activity levels and associated risk are primarily related to peaks in activity related to the maximum percentile ranking and which are very localised within the Site and tend to be weighted towards the autumn (**Figure 6.10**).
- 6.7.69 Overall, considering the above discussion, an effect magnitude of **low spatial** and **long-term temporal** is considered appropriate for *Nyctalus* spp.
- 6.7.70 **Significance of Effect:** Given the above consideration of Nature Conservation Value, Conservation Status and Magnitude of Impact, the effect significance of collision risk on all high collision risk bat species recorded at the Site is considered **minor adverse** and **not significant** in the context of the EIA Regulations.



6.8 Additional Mitigation and Enhancement

Additional Mitigation

Construction

- 6.8.1 For habitats, no significant construction effects were identified on related IEFs which require additional or bespoke mitigation measures beyond embedded design mitigation and good practice in the context of the EIA Regulations. However, habitat compensation and biodiversity enhancement measures are proposed as part of the OBEMP (see below and **Technical Appendix 6.6**).

Operation

- 6.8.2 No significant adverse operational effects are predicted on scoped in IEFs, i.e. high collision risk bat species, and therefore no additional or bespoke mitigation beyond embedded design mitigation and good practice is necessary. However, it is recognised above there are some infrequent and localised Medium to High risk assessment scores (mostly related to the maximum percentile and peak activity data) and in a small number of locations there is some minor encroachment within recommended blade-tip to habitat feature stand-off distances.
- 6.8.3 It is also recognised that there may be a considerable time lag between the above assessment of risk, receipt of planning consent, and the actual construction and operation of the Proposed Development. This is considered in combination with the fact that bat activity can temporally vary markedly across different years and can also vary spatially over time due to changes in land use, character or prevailing conditions in both the absence of, and separate to, the Proposed Development, and also due to the Proposed Development (for instance the planting, felling or restructuring of woodland creating, removing or varying the location and type of key woodland edge features and associated commuting/foraging routes).
- 6.8.4 In cognisance of the above, to reduce the potential risks to bats further, it is proposed that a Bat Mitigation and Monitoring Plan (BMMP) will be developed and agreed with NatureScot and EAC prior to construction of the Proposed Development. The BMMP will include a post-construction monitoring programme in line with NatureScot *et al.* guidance²⁰ and which will involve a bat activity monitoring programme combined with high resolution weather data, and bat carcass searches. This monitoring would begin in operational Year 1 and initially continue for three years; the need for further monitoring will be reviewed at the end of Year 3. After the first year, the information will be used to inform the development of a detailed curtailment plan if this is deemed to be required. If implemented, the curtailment plan would be monitored to establish its effectiveness. Effective and efficient curtailment plans require high resolution information on bat activity combined with detailed weather data on rainfall and wind speed plus information from carcass searches. This information allows curtailment to focus on specific times and dates corresponding with periods of high bat activity.

Enhancement

- 6.8.5 Enhancement, restoration and creation of habitats of conservation value and interest through the delivery of a BEMP would reduce effects on habitats further and provide additional suitable and key habitat for a range of flora and fauna. Overall, the BEMP would deliver significant biodiversity enhancement at the Proposed Development, in line with objectives outlined in NPF4 Policy 3⁶⁸ the

⁶⁸ Scottish Government (2023). National Planning Framework 4. Available at:



- Onshore Wind Policy Statement⁶⁹ and the Scottish Biodiversity Strategy to 2045⁷⁰. The OBEMP is presented in **Technical Appendix 6.6**, see also **Figure 6.13**.
- 6.8.6 The OBEMP includes provisions for the protection, maintenance and enhancement of areas of ancient woodland within the Site. The OBEMP also aims to deliver native broadleaved and riparian woodland creation, expansion and connectivity (through new woodland creation); species-rich mixed scrub creation; species-rich grassland creation; and mixed grassland mosaic habitat. The mixed grassland mosaic habitat would comprise the combined management of existing areas of grassland and the restoration of currently unrestored areas of former mine workings to create a mosaic of species-rich grassland, areas of wetter grassland, and with patches of thinner soils and more stony/ephemeral grassland, with the incorporation of wader scrapes where the hydrology allows. The key driver for the mixed grassland mosaic habitat is to support the local breeding wader assemblage (see **Chapter 7**), but there would be multiple secondary biodiversity benefits, for example to local floral diversity, pollinators and passerines.
- 6.8.7 The OBEMP is based on a number of identified land parcels or search areas for each respective habitat management and biodiversity enhancement proposal (**Figure 6.13**). These areas may be refined following further specialist surveys, feedback from relevant consultees and in cognisance of any changes in the baseline environmental conditions or legislative and policy context at the time of pre-construction BEMP finalisation. All identified OBEMP areas may not be taken forward for the final BEMP, and other areas and/or proposals may also be considered (if deemed necessary), for example the future inclusion of peatland restoration proposals if these are considered feasible on-site. However, the Applicant is committed to delivering significant biodiversity enhancement at the Proposed Development.
- 6.8.8 The native and riparian woodland creation and enhancement proposals within the OBEMP would create and enhance bat foraging and commuting habitat within the Site and locally, and in the long term potentially provide future roost features.
- 6.8.9 The detailed and final BEMP would be agreed with NatureScot and EAC in advance of construction as part of associated planning condition discharge and would ensure the Proposed Development secures significant biodiversity enhancements through creating new habitats, restoring degraded habitats and strengthening nature networks.
- 6.8.10 **Table 6-10** summarises the additional mitigation measures (also known as secondary mitigation, comprising measures beyond embedded/standard mitigation) and enhancement measures to which the Applicant has committed. These measures are designed to reduce identified adverse effects and/or to enhance beneficial effects.

<https://www.gov.scot/binaries/content/documents/govscot/publications/strategy-plan/2023/02/national-planning-framework-4/documents/national-planning-framework-4-revised-draft/national-planning-framework-4-revised-draft/govscot%3Adocument/national-planning-framework-4.pdf> (Accessed: August 2026).

⁶⁹ Scottish Government (2022). Onshore Wind Policy Statement 2022. Available at: <https://www.gov.scot/publications/onshore-wind-policy-statement-2022/> (Accessed: August 2026).

⁷⁰ Scottish Government (2022). Scottish Biodiversity Strategy to 2045 - Tackling the Nature Emergency in Scotland. Available at: <https://www.gov.scot/publications/scottish-biodiversity-strategy-2045-tackling-nature-emergency-scotland/documents> (Accessed: August 2026).



Table 6-10: Additional (Secondary) Mitigation and Enhancement

Reference	Mitigation / Enhancement Measure	Description
ECO001	BMMP	Post-construction and operational phase bat mitigation and monitoring delivered via a BMMP to determine the requirement for, and if required, the details of, any curtailment plan required to reduce collision/barotrauma risk to high collision risk bat species present on the Site. Agreement and implementation of the BMMP can be secured via an appropriately worded planning condition.
ECO002	BEMP	Creation, restoration and enhancement of a suite of habitats of conservation value from construction through the operational period. Agreement and implementation of the BEMP can be secured via an appropriately worded planning condition.

6.9 Residual Effects

Construction

- 6.9.1 No significant residual effects are identified. Effects on blanket bog and wet modified bog have been assessed as being **minor adverse (not significant)**.

Operation

- 6.9.2 No significant residual effects are identified. Effects on high collision risk bat species have been assessed as being **minor adverse (not significant)**.

6.10 Cumulative Assessment

- 6.10.1 The primary concern regarding the assessment of cumulative effects is to identify situations where effects on habitats or species populations that may be non-significant from individual developments, are judged to be significant when combined with nearby existing or proposed projects. The cumulative situation for the Proposed Development is presented on **Figure 4.17**.
- 6.10.2 In the interests of focusing on the potential for similar significant effects, this assessment considers the potential for cumulative effects of the Proposed Development with other wind farm developments that are consented or at application stage (as those sites that are operational or under construction are considered part of the baseline) within 5 km of the Site (for habitats) and within 8 km of the Site (for bats). The 8 km cumulative Study Area for bats ensures the core sustenance zones (CSZ) for all high collision risk species at the Site are considered in the scenario a bat roost was present by the Site boundary.
- 6.10.3 Wind farm projects at scoping stage have been scoped out of the cumulative assessment because they generally do not have sufficient information on potential effects to be included, as the baseline survey period is ongoing, or results have not been published. Projects that have been refused or withdrawn have also been scoped out.
- 6.10.4 Small projects with three or fewer turbines have also been excluded from the cumulative assessment as often these projects are not subject to the same level of detail of assessment, and so there are no directly comparable data. Because of the small scale of such projects, effects are likely to be negligible on the IEFs assessed.



- 6.10.5 In consideration of the above, the relevant Sites that fulfil the above criteria within 5 km and 8 km of the Proposed Development are:
- The Drum Wind Farm, located immediately to the east of the Site, consisting of eight proposed turbines, planning refused – at appeal;
 - Glen Water Wind Farm, nearest proposed turbine to the Site boundary is 1.02 km, consisting of six turbines, in planning;
 - Lethans Wind Farm, nearest proposed turbine to the Site boundary is 4.75 km, consisting of 22 turbines, consented with construction imminent;
 - Glenmuckloch Wind Farm, nearest proposed turbine to the Site boundary is 6.94 km, consisting of six turbines, in planning;
 - Lethans Wind Farm Extension, nearest proposed turbine to the Site boundary is 7.40 km, consisting of ten turbines, consented; and
 - Greenburn Wind Farm, nearest proposed turbine to the Site boundary is 7.64 km, consisting of 16 turbines, consented.
- 6.10.6 Similarly to the Proposed Development, no likely significant residual effects were identified at any of the above noted wind farm sites on the relevant IEFs considered here.
- 6.10.7 With respect to habitats, in general, for most wind farm developments that are operational or consented, mitigation and/or additional management / restoration / enhancement / creation of habitats is usually proposed to compensate and offset any effects on IEFs. These management areas tend to be much larger than the area of predicted loss to provide additional enhancement over and above compensation. As noted above, the requirement for each new development submitted into planning to provide significant biodiversity enhancement is now imperative through NPF4 Policy 3⁶⁸ which states that major/EIA developments should demonstrate significant biodiversity enhancement in addition to mitigation; therefore, all projects at application stage will also require compensation (if peatlands are affected) and biodiversity enhancement at a significantly larger scale than predicted losses. In addition, NatureScot guidance⁴⁸ specifically relating to developments on peatland advises significant compensation and enhancement for impacts on priority peatland habitats.
- 6.10.8 With respect to bats, a review of ecology assessments for each of the above developments identified that through implementation of appropriate embedded and standard mitigation, likely residual effects to populations of all bat species listed above were considered not significant. Due to high levels of common pipistrelle, soprano pipistrelle and *Nyctalus* spp. bat activity recorded at Greenburn Wind Farm additional mitigation in the form of turbine curtailment and post-construction monitoring has been proposed⁷¹. In addition, a programme of post-construction monitoring is also proposed for Glen Water Wind Farm with the aim of monitoring the effectiveness of the implementation of stand-off distances between key bat commuting and foraging features and turbine infrastructure⁷².
- 6.10.9 Therefore, it is considered unlikely that any significant cumulative effects at a local level would arise on the IEFs scoped in for the Proposed Development. This is due to embedded and standard mitigation and the relatively minor scale and 'not significant' effects associated with the Proposed Development along with the

⁷¹ MBEC (2020). Greenburn Wind Park EIAR, Chapter 10: Ecology.

⁷² OnPath Energy (2026). Glen Water Wind Farm Environmental Impact Assessment Report, Chapter 5 Ecology.



Applicant's commitment to the delivery of a BEMP and the additional mitigation BMMP proposal (**Section 6.8**), in combination with the lack of significant effects and mitigation in place at other relevant sites. This ensures that the Proposed Development would not contribute to long-term adverse effects on the scoped in IEFs locally.

6.11 Summary and Statement of Significance

- 6.11.1 **Table 6-11** summarises the predicted significant effects of the Proposed Development on ecology; there are no identified significant residual effects.



Table 6-11: Summary of Significance of Effects

Description of Effect	Mitigation/Enhancement Measure(s)	Significance of Residual Effect	
		Level and Significance	Beneficial/ Adverse
During Construction & Decommissioning			
Direct and indirect habitat loss/modification to blanket bog and wet modified bog.	Embedded and standard mitigation, along with the implementation of an OBEMP	Minor (Not Significant)	Adverse
During Operation			
Fatality of high collision risk bat species (common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle and <i>Nyctalus</i> spp.) through barotrauma or collision.	Embedded and standard mitigation, along with the implementation of an OBEMP and a BMMP.	Minor (Not Significant)	Adverse



6.12 Annex A: Habitat Baseline Composition and Habitat Loss Calculations

Table 6-12: Habitat Baseline Composition (Study Area) and Habitat Loss Calculations

		Site and Study Area (Baseline)				Permanent Direct Loss	Permanent Infrastructure Indirect Loss (only applies to Wetland Habitats) ⁷³	Temporary Direct Loss
Phase 1 Description (Code)	NVC	Phase 1 Area (ha)	Phase 1 % of Study Area	NVC Area (ha)	% of NVC Type within Study Area	NVC Area (ha)	NVC Area (ha)	NVC Area (ha)
Totals		655.09	100	655.09	100	14.36	5.18	20.37
Broadleaved Semi-Natural Woodland (A1.1.1)	W4	18.82	2.87%	3.44	0.52%	<0.01	0.00	0.02
	W7			11.67	1.78%	<0.01	0.00	0.02
	W10			3.71	0.57%	0.00	0.00	<0.01
Broadleaved Plantation Woodland (A1.1.2)	W10(p) ⁷⁴	5.31	0.81%	3.12	0.48%	0.05	0.00	0.04
	YBP			2.19	0.33%	0.08	0.00	0.20
Coniferous Plantation Woodland (A1.2.2)	CP / YCP	16.31	2.49%	16.31	2.49%	1.12	0.00	1.39
Mixed Plantation Woodland (A1.3.2)	YMP	5.45	0.83%	5.45	0.83%	0.40	0.00	0.57
Dense/Continuous Scrub (A2.1)	W21	0.88	0.13%	0.88	0.13%	<0.01	0.00	0.01
Scattered Broad-Leaved	SBT	7.64	1.17%	7.64	1.17%	0.18	0.00	0.33

⁷³ Based upon the precautionary 10 m indirect drainage assumption.

⁷⁴ The suffix (p) indicates that although the area has been attributed an NVC code and the vegetation is broadly referable to that community, the area is clearly, or very likely, of plantation origin and therefore not semi-natural.



		Site and Study Area (Baseline)				Permanent Direct Loss	Permanent Infrastructure Indirect Loss (only applies to Wetland Habitats) ⁷³	Temporary Direct Loss
Tree (A3.1)								
Scattered Coniferous Tree (A3.2)	SCT	1.72	0.26%	1.72	0.26%	0.03	0.00	0.04
Recently Felled Coniferous Woodland (A4.2)	CF>MG10a CF>OV27	6.18	0.94%	6.18	0.94%	0.09	0.00	0.16
Unimproved Acid Grassland (B1.1)	U4	7.51	1.15%	7.47	1.14%	0.00	0.00	0.00
	U6			0.03	<0.01%	0.10	0.00	0.28
Semi-Improved Acid Grassland (B1.2)	U4b	45.14	6.89%	45.14	6.89%	0.29	0.00	0.79
Unimproved Neutral Grassland (B2.1)	MG1	15.86	2.42%	0.40	0.06	<0.01	0.00	0.00
	MG9			15.46	2.36%	0.16	0.11	0.29
Improved Grassland (B4)	MG6	159.23	24.31%	159.23	24.31%	3.71	0.00	4.06
Marsh/Marshy Grassland (B5)	MG10 / MG10(Ja)	139.26	21.26%	77.35	11.81%	1.81	2.08	3.74
	M23a			7.15	1.09%	0.05	0.10	0.05
	M23b			6.99	1.07%	0.09	0.11	0.13
	M25a			16.97	2.59%	0.62	0.41	0.64
	M25b			16.97	2.59%	0.62	0.41	0.64
	M27			0.49	0.08%	<0.01	0.01	<0.01
	Je			19.08	2.91%	0.57	0.45	0.87
	Ja			7.06	1.08%	0.27	0.24	0.40



		Site and Study Area (Baseline)				Permanent Direct Loss	Permanent Infrastructure Indirect Loss (only applies to Wetland Habitats) ⁷³	Temporary Direct Loss
	Epal			0.40	0.06%	0.00	0.00	0.00
Continuous Bracken (C1.1)	U20	1.61	0.25%	1.61	0.25%	0.00	0.00	0.00
Tall Ruderal (C3.1)	OV24 OV25 OV27	16.57	2.53%	16.57	2.53%	0.00	0.00	0.00
Acid Dry Dwarf Shrub Heath (D1.1)	H9	0.50	0.08%	0.12	0.02%	0.00	0.00	0.00
	H10			0.10	0.01%	0.00	0.00	0.00
	H12			0.28	0.04%	0.03	0.00	0.11
Wet Dwarf Shrub Heath (D2)	M15b	12.20	1.86%	12.20	1.86%	0.69	0.31	0.97
Blanket Bog (E1.6.1) & Raised Bog (E1.6.2) ⁷⁵	M2	24.17	3.69%	0.12	0.02%	0.00	0.00	0.00
	M3			0.07	0.01%	0.00	0.00	0.00
	M17			5.65	0.86%	0.00	0.00	0.00
	M18			9.23	1.41%	0.00	0.00	0.00
	M19			9.11	1.39%	0.00	0.01	0.05
Wet Modified Bog (E1.7)	M20	28.31	4.32%	4.90	0.75%	0.09	0.13	0.09
	M25a^			23.41	3.57%	0.67	0.67	0.70

⁷⁵ Due to the way the NVC communities are grouped in the GIS analysis E1.6.1 and E1.6.2 have been grouped together here; however, there is no loss or impacts associated with Raised Bog (E1.6.2) as the only area of raised bog is at the Low Moss LNCS in the west of the Site which has been avoided and is distant to any proposed infrastructure (**Figure 6.3**).



		Site and Study Area (Baseline)				Permanent Direct Loss	Permanent Infrastructure Indirect Loss (only applies to Wetland Habitats) ⁷³	Temporary Direct Loss
Acid / Neutral Flush (A2.1)	M4	14.89	2.27%	0.05	0.01%	0.00	0.00	0.00
	M6c			12.87	1.96%	0.45	0.43	0.60
	M6d			1.97	0.30%	0.06	0.05	0.06
Bare Peat (E4)	ExP	0.14	0.02%	0.14	0.02%	0.00	0.00	0.00
Swamp (F1)	S9	1.01	0.15%	0.42	0.06%	0.00	0.00	0.00
	S10			0.15	0.02%	0.00	<0.01	<0.01
	S12			0.44	0.07%	<0.01	<0.01	<0.01
Standing Water (G1)	SW	13.33	2.03%	13.33	2.03%	<0.01	0.00	0.03
Mine (I2.3)	UM	55.57	8.48%	55.57	8.48%	0.70	0.00	0.84
Amenity Grassland (J1.2)	PG	0.65	0.10%	0.65	0.10%	<0.01	0.00	0.05
Ephemeral/short perennial (J1.3)	UM>M15b UM>U4 Tf	10.21	1.56%	10.21	1.56%	0.30	0.00	0.57
Building (J3.6)	BD	0.22	0.03%	0.22	0.03%	0.00	0.00	0.01
Bare Ground (J4)	BG	5.41	0.83%	5.41	0.83%	0.83	0.00	0.30
No Surveyor Access (NSA)	NSA	38.62	5.90%	38.62	5.90%	0.67	0.00	1.43



6.13 Grid Connection and AIL Route

- 6.13.1 An appraisal of likely significant effects of the likely grid connection route and associated works (assuming the construction of an overhead line (OHL) to a point of connection at the consented Glenmuckloch substation) and the proposed AIL route associated with the Proposed Development (as outlined in **Chapter 2**) is detailed and fully provided within **Technical Appendix 6.7**, a summary is presented below.
- 6.13.2 The OHL corridor identified for the grid connection, as presented in **Figure 2.13**, has been identified considering the balance of technical feasibility and economic viability with the least disturbance to the environment and to people as far as practicable.
- 6.13.3 The OHL corridor identified has been guided by the principles established by the Holford Rules⁷⁶ along with Scottish Power Energy Networks (SPEN) routeing guidance, other relevant guidance, and professional judgement relating to the local environmental conditions, relevant designations, and their sensitivities. Included within this has been the consideration of ecological sensitivities and potential constraints, such as the presence and locations of statutory and non-statutory designated sites, ancient woodland, peatland etc.; for full details see **Technical Appendix 6.7**.
- 6.13.4 An extensive desk based study has been undertaken of the OHL corridor to characterise the baseline ecological conditions. No ecological surveys were undertaken specifically for the OHL corridor and likely grid connection route.
- 6.13.5 The desk study, which is fully presented in **Technical Appendix 6.7**, has generally indicated the following with regards to the OHL route corridor:
- there is no overlap with statutory designated sites;
 - there is overlap with one non-statutory designated site (i.e. Glenmuir Water: Lugar to Kyle Castle LNCS);
 - there is no ancient woodland within the OHL route corridor;
 - there is no Class 1 or Class 2 peatland within the OHL route corridor, and it is almost entirely comprised of Class 0 (mineral soils);
 - there is likely a mix of habitats within the OHL route corridor, but the predominant habitat type appears to be low conservation value mesotrophic agriculturally improved and semi-improved grassland;
 - several protected species may be present locally and may utilise sections of the OHL route corridor where suitable habitats for them exist. The most likely species to be present locally when considering habitats present would appear to be badger, bats, otter and red squirrel; and
 - fish are likely to be present in many of the watercourses capable of supporting them.
- 6.13.6 The appraisal of the likely significant effects of the OHL and grid connection route, when considering embedded design and standard mitigation in place, concludes no significant effects to designated sites, habitats, or protected species are expected during construction of the OHL within the corridor identified. Furthermore,

⁷⁶ A set of guidelines on overhead line routeing, first formulated in 1959 and subsequently adopted by the National Grid as a basis of the company's approach to overhead line routeing.



the combined effects of the OHL grid connection construction with the effects reported in this chapter in respect of the Proposed Development's construction are not likely to be significant.

- 6.13.7 A similar desk based study was undertaken for the AIL route to characterise the baseline conditions. The related appraisal, when considering embedded design and standard mitigation in place, concludes that the construction and use of the AIL route for the Proposed Development would not result in likely significant effects on any IEF, either standalone or in-combination with the Proposed Development (see **Technical Appendix 6.7**).



6.14 References

- Ayrshire Rivers Trust (2026). River Ayr. Available at: <https://www.ayrshirerivertrust.org/river-ayr/> (Accessed: August 2026).
- Barré, K., Le Viol, I., Bas, Y., Romain J. & Kerbiriou, C. (2018). Estimating habitat loss due to wind turbine avoidance by bats: Implications for European siting guidance. *Biological Conservation*. 226. 205-214. 10.1016/j.biocon.2018.07.011.
- British Deer Society (2023). Deer Distribution Survey 2023. Available at: <https://bds.org.uk/science-research/deer-surveys/deer-distribution-survey/> (Accessed: August 2026).
- Chartered Institute of Ecology and Environmental Management (CIEEM) (2024). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. Version 1.3 updated September 2024.
- Dean, M., Strachan, R., Gow, D., Andrews., R (2016). The Water Vole Mitigation Handbook (The Mammal Society Mitigation Guidance Series). Eds. Fiona Mathews and Paul Chanin. The Mammal Society, London.
- East Ayrshire Council (2013). "Opencast Mining in East Ayrshire –Steps to Recovery, Council". <https://www.east-ayrshire.gov.uk/CouncilAndGovernment/About-the-Council/MinutesAgendasAndReports/OpencastCoalUpdate.aspx> (Accessed August 2026).
- Harris S., Morris, P., Wray, S. & Yalden, D. (1995). A review of British mammals: population estimates and conservation status of British mammals other than cetaceans. JNCC, Peterborough.
- JNCC (2010). Handbook for phase 1 habitat survey – a technique for environmental audit. JNCC, Peterborough.
- JNCC (2020). Biodiversity – The UK Action Plan 1994. Available at: <https://hub.jncc.gov.uk/assets/cb0ef1c9-2325-4d17-9f87-a5c84fe400bd> (Accessed: August 2026).
- JNCC (2024). Guidelines for selection of biological Sites of Special Scientific Interest (SSSIs). Available at: <https://jncc.gov.uk/our-work/guidelines-for-selection-of-sssis/> (Accessed: August 2026).
- JNCC (2026). Annex I Habitats List. Available at <https://sac.jncc.gov.uk/habitat/> (Accessed August 2026).
- JNCC (2026). Habitats Regulations Reporting. Available at: <https://jncc.gov.uk/our-work/habitats-regulations-reporting/> (Accessed: August 2026).
- Landry, J. & Rochefort, L. (2012). The Drainage of Peatlands: Impacts and Rewetting Techniques. Peatland Ecology Research Group, Université Laval, Quebec.
- Lethans Wind Farm Environmental Impact Assessment Report, Chapter 6 Ecology.
- Mammal Society (2026). Ecobat. Available at: <https://ecobat.mammal.org.uk/login> (Accessed: July 2026).
- Mathews, F., Richardson, S., Lintott, P. & Hosken, D. (2016) Understanding the Risk to European Protected Species (bats) at Onshore Wind Turbine Sites to inform Risk Management. University of Exeter/DEFRA.
- Mathews, F., Kubasiewicz, L.M., Gurnell, J., Harrower, C.A., McDonald, R.A., Shore, R.F. (2018). A Review of the Population and Conservation Status of British Mammals: Technical Summary. A report by the Mammal Society under contract to Natural England, Natural Resources Wales and Scottish Natural Heritage. Natural England, Peterborough.
- Met Office (2026). UK Climate Projections (UKCP18). Available at: <https://www.metoffice.gov.uk/research/approach/collaboration/ukcp> (Accessed: August 2026).
- MBEC (2020). Greenburn Wind Park EIAR, Chapter 10: Ecology.



NatureScot (2021). Assessing the cumulative landscape and visual impact of onshore wind energy developments. Available at: <https://www.nature.scot/doc/guidance-assessing-cumulative-landscape-and-visual-impact-onshore-wind-energy-developments> (Accessed: August 2026).

NatureScot, Natural England, Natural Resources Wales, RenewableUK, Scottish Power Renewables, Ecotricity Ltd, the University of Exeter & Bat Conservation Trust (BCT) (2019, with minor updates 2021). Bats and Onshore Wind Turbines – Survey, Assessment and Mitigation. Available at: <https://www.nature.scot/doc/bats-and-onshore-wind-turbines-survey-assessment-and-mitigation> (Accessed August 2026).

NatureScot, Scottish Wildlife Trust and Scottish Geology Trust (2023). Guidance on Establishing and Managing Local Nature Conservation Site Systems in Scotland – 2023 update. Available online from: <https://www.nature.scot/sites/default/files/2024-04/lncs-guidance-march-2024-accessible.pdf> (Accessed: August 2026).

NatureScot (2024). Good practice during wind farm construction.

NatureScot (2024). Standing advice for planning consultations – Water Voles. Available at: <https://www.nature.scot/doc/standing-advice-planning-consultations-water-voles> (Accessed August 2026).

NatureScot (2025). Scottish Biodiversity List. Available at: <https://www.nature.scot/scotlands-biodiversity/scottish-biodiversity-strategy/scottish-biodiversity-list> (Accessed: August 2026).

NatureScot (2026). Advising on peatland habitats and carbon-rich soils in development management. <https://www.nature.scot/doc/advising-peatland-habitats-and-carbon-rich-soils-development-management> (Accessed August 2026).

NatureScot (2026). Habitats Regulations Reporting. Available at: <https://www.nature.scot/professional-advice/protected-areas-and-species/protected-species/legal-framework/habitats-directive-and-habitats-regulations/habitats-regulations-0> (Accessed: August 2026).

NatureScot (2026). Sitelink. Available at: <https://sitelink.nature.scot/home> (Accessed: August 2026).

Nayak, R.A., Miller, D., Nolan, A., Smith, P., Smith, J. (2008). Calculating carbon savings from wind farms on Scottish peat lands - A New Approach.

NBN Atlas Scotland (2026). Available at: <https://scotland.nbnatlas.org/> (Accessed: August 2026).

Newson, S.E., Evans, H.E., Gillings, S., Jarrett, D., Wilson, M.W. (2017). A survey of high risk bat species across southern Scotland. Scottish Natural Heritage Commissioned Report No. 1008.

OnPath Energy (2026). Glen Water Wind Farm Environmental Impact Assessment Report, Chapter 5 Ecology.

Reason, P.F. and Wray, S. (2025). UK Bat Mitigation Guidelines: a guide to impact assessment, mitigation and compensation for developments affecting bats. Version 1.2. Chartered Institute of Ecology and Environmental Management, Ampfield.

Richardson, S.M., Lintott, P.R., Hosken, D.J. (2021). Peaks in bat activity at turbines and the implications for mitigating the impact of wind energy developments on bats. Sci Rep 11, 3636 (2021).

Saving Scotland's Red Squirrels (2026). Available at: <https://scottishsquirrels.org.uk/squirrel-sightings/> (Accessed: August 2026).

Saving Scotland's Red Squirrels (2026). Priority Working Areas dataset is available online at: <https://www.arcgis.com/home/item.html?id=5ba6742d74014b79af77d87e3cc02a50#overview>

SEPA (2024). SEPA Water Environment Hub. Available at: <https://informatics.sepa.org.uk/WaterClassificationHub/> (Accessed: August 2026).

SEPA (2024). Guidance on Assessing the Impacts of Developments on Groundwater Dependent Terrestrial Ecosystems.



SEPA (undated). Carbon Calculator User Guidance Available at: https://informatics.sepa.org.uk/CarbonCalculator/assets/Carbon_calculator_User_Guidance.pdf (Accessed August 2026).

Scottish Executive (2000). Nature conservation: implementation in Scotland of EC Directives on the conservation of natural habitats and of wild flora and fauna and the conservation of wild birds ('The Habitats and Birds Directives'). Revised guidance updating Scottish Executive Circular no. 6/1995.

Scottish Government (2021). Monitoring watercourses in relation to onshore wind farm developments: generic monitoring programme. <https://www.gov.scot/publications/monitoring-watercourses-in-relation-to-onshore-wind-farm-developments-generic-monitoring-programme/> (Accessed August 2026).

Scottish Government (2022). Onshore Wind Policy Statement 2022. Available at: <https://www.gov.scot/publications/onshore-wind-policy-statement-2022/> (Accessed: August 2026).

Scottish Government (2022). Scottish Biodiversity Strategy to 2045 - Tackling the Nature Emergency in Scotland. Available at: <https://www.gov.scot/publications/scottish-biodiversity-strategy-2045-tackling-nature-emergency-scotland/documents> (Accessed: August 2026).

Scottish Government (2023). National Planning Framework 4. Available at: <https://www.gov.scot/binaries/content/documents/govscot/publications/strategy-plan/2023/02/national-planning-framework-4/documents/national-planning-framework-4-revised-draft/national-planning-framework-4-revised-draft/govscot%3Adocument/national-planning-framework-4.pdf> (Accessed: August 2026).

Scottish Government (2026). Ancient Woodland Inventory. Available at: <https://map.environment.gov.scot/sewebmap/?layers=ancientWoodlandInventoryScotland> (Accessed: August 2026).

Scottish Government (2026). Carbon and Peatland Map 2016. Available at: <https://map.environment.gov.scot/sewebmap/> (Accessed: August 2026).

Scottish Government (2026). Habitats Regulations – Scotland – Art 3ZA – Habitats 2025. Available at: <https://statistics.gov.scot/resource?uri=http%3A%2F%2Fstatistics.gov.scot%2Fdata%2Fhabitats-regulations---habitats-2025> (Accessed: August 2026).

Scottish Government (2026). Habitats Regulations – Scotland – Art 3ZA – Species 2025. Available at: <https://statistics.gov.scot/resource?uri=http%3A%2F%2Fstatistics.gov.scot%2Fdata%2Fhabitats-regulations-species-2025> (Accessed: August 2026).

Scottish Government (2026). Local Nature Conservation Sites – Scotland. Available at: <https://www.data.gov.uk/dataset/c3460656-74ab-435a-8f77-9a528e24beb1/local-nature-conservation-sites-scotland> (Accessed: August 2026).

Scottish Government (2026). Obstacles to Fish Passage (SEPA WMS). Available at: <https://marine.gov.scot/?q=maps/1746> (Accessed: August 2026).

Spoelstra, Kamiel & van Grunsven, Roy & Ramakers, Jip & Ferguson, Kim & Raap, Thomas & Donners, Maurice & Veenendaal, Elmar & Visser, Marcel. (2017). Response of bats to light with different spectra: Light-shy and agile bat presence is affected by white and green, but not red light. *Proceedings of the Royal Society B: Biological Sciences*. 284. 20170075. 10.1098/rspb.2017.0075.

Stewart, A. J. A. and Lance, A. N. 1991: Effects of moor-draining on the hydrology and vegetation of northern Pennine blanket bog. *Journal of Applied Ecology* 28, 1105-1117.

Wind Estate UK Ltd (2022). Drum Wind Farm Environmental Impact Assessment Report, Chapter 11 Ecology.



Voigt, CC., Rehnig, K., Lindecke, O., Pētersons, G. Migratory bats are attracted by red light but not by warm-white light: Implications for the protection of nocturnal migrants. *Ecol Evol.* 2018; 8:9353–9361.

Voigt, CC., Kaiser, K., Look, S., Scharnweber, K., Scholz, C (2022). Wind turbines without curtailment produce large numbers of bat fatalities throughout their lifetime: A call against ignorance and neglect, *Global Ecology and Conservation*, Volume 37, 2022, e02149, ISSN 2351-9894.

