7 Ecology

Executive Summary

This chapter considers the potential for significant effects upon important ecological features (IEFs) associated with the construction, operation and decommissioning of the Proposed Development.

Baseline conditions to inform the design and assessment of the Proposed Development have been established through desk study, ecological field surveys in accordance with industry standard guidance, and consultation with nature conservation bodies.

The Site does not form part of any statutory designated site for nature conservation with ecological qualifying interests; based on a lack of connectivity to designated sites within 5 km of the Site, NatureScot (NS) agreed that these sites can be scoped out of the assessment. NS advised that there is potential for connectivity between the Proposed Development and the River Tay Special Area of Conservation (SAC). However, from a review of aerial maps, and as discussed in **Chapter 8: Geology, Peat, Hydrology and Hydrogeology** (**EIAR Volume 1**), it is confirmed that no infrastructure is located within the River Tay catchment, therefore the Proposed Development has no hydraulic connection to the SAC. As such, risk of any effects is negligible and the River Tay SAC is scoped out of the assessment. There is a small area of Ancient Woodland Inventory (AWI) within the Site, present along Glen Beich to the south along the new access track, however the AWI has been avoided and no mature/semi-mature trees are expected to be lost here as a result of the Proposed Development.

Baseline studies have established the Site is used by badger, bats, brown hare, mountain hare, otter, reptiles and trout. The risk to all species, including high collision risk bat species and roosting bats, is considered to be low based on the levels and distribution of species activity recorded. The main and most extensive habitats present within the Site are blanket bog (25.46 % of Site), acid dry dwarf shrub heath (18.91 % of Site) and unimproved acid grassland (12.60 % of the Site). Acid/neutral flush, wet modified bog, marshy grassland and recently planted coniferous plantation woodland are also present each covering between 5 % and 10 % of the Site. The remainder of the Site is made up of a range of woodland, grassland, heath, flush, mire, swamp and exposed ground.

The Proposed Development has been designed to minimise impacts on important habitats or protected species as far as practicable. Embedded mitigation, good practice measures, and pre-construction checks (as directed by an appointed suitably qualified Ecological Clerk of Works (ECoW) will enable the protection of protected species during construction works associated with the Proposed Development.

The direct and indirect impacts associated with the construction phase of the Proposed Development are assessed in this chapter. **No significant effects are predicted**.

No significant effects are predicted with respect to protected species.

In addition to habitat reinstatement and restoration following completion of construction works, the Proposed Development also provides an opportunity to deliver long-term beneficial habitat enhancement measures for habitats and species, including specific management for blanket bog enhancement, bracken control, and wetland enhancement. These proposals form the basis of the Outline Biodiversity Enhancement Management Plan (OBEMP) (**TA 7.7, EIAR Volume 4**) which will deliver significant biodiversity enhancement at the Site. A Biodiversity Net Gain (BNG) assessment and metric indicates measures proposed in the OBEMP would deliver +20% net gain for biodiversity.

Based on the Proposed Development alone, or cumulatively, with any other wind farm development (Glen Lednock windfarm), residual effects upon IEF are predicted to be **not significant.**

7.1 Introduction

7.1.1 This chapter of the Environmental Impact Assessment Report (EIAR) considers the potential effects associated with the construction, operation and decommissioning of the Glentarken Wind Farm (the 'Proposed Development') on IEFs, including designated sites, terrestrial and aquatic habitats, and protected (non-avian) species.

7.1.2 The specific objectives of the chapter are to:

- describe the non-avian ecology baseline;
- describe the assessment methodology and significance criteria used in completing the impact assessment;
- describe the potential effects, including direct, indirect, and cumulative effects;
- describe the mitigation measures proposed to address likely significant effects; and
- assess the residual effects remaining following the implementation of mitigation.

7.1.3 The assessment has been carried out by MacArthur Green in accordance with NatureScot[1] and Chartered Institute of Ecology and Environmental Management (CIEEM) guidance (2018)[2]. All staff contributing to this chapter have undergraduate and/or postgraduate degrees in relevant subjects, have extensive professional ecological impact assessment experience, hold professional membership of CIEEM and abide by CIEEM Code of Conduct.

7.1.4 This chapter is supported by the Figures (**EIAR Volume 2**) and Technical Appendices (TAs) (**EIAR Volume 4)** listed in **Table 7-1,** which are referenced throughout the chapter.

Table 7-1: Supporting Figures and Technical Appendices

Document Location
Figures
Figure 1.1: Site Location
Figure 7.1: Ecological Designated Sites and Ancient Woodland within 5 km
Figure 7.2: Carbon and Peatland Map 2016 within 1 km
Figure 7.3: National Vegetation Classification Survey Area and Survey Results
Figure 7.4: Potential Groundwater Dependent Terrestrial Ecosystems Survey Area and Survey Results
Figure 7.5: Peatland Condition Classification
Figure 7.6: Bare Peat Presence
Figure 7.7: Grazing Impact on Peatland Sub-Shrubs
Figure 7.8: Sphagna Abundance and Distribution
Figures 7.9: Protected Species Survey Area and Survey Results
Figures 7.9C: Protected Species Survey Area and Survey Results - Confidential
Figure 7.10: Bat Survey Area, Anabat Locations and Preliminary Bat Roost Assessment Results
Figure 7.11: Seasonal Bat Site Activity 2023 - Common Pipistrelle
Figure 7.12 Seasonal Bat Site Activity 2023 - Soprano Pipistrelle
Figure 7.13: Seasonal Bat Site Activity 2023 – *Nyctalus* spp.
Figure 7.14: Electrofishing Locations and Survey Results
Figure 7.15: Outline Biodiversity Enhancement and Management Plan Area
Technical Appendices

[1] NatureScot (formerly SNH) (2018) Environmental Impact Assessment Handbook – Version 5: Guidance for competent authorities, consultation bodies, and others involved in the Environmental Impact Assessment process in Scotland.

[2] Chartered Institute of Ecology and Environmental Management (CIEEM) (2018). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine (version 1.2; updated April 2022). Chartered Institute of Ecology and Environmental Management, Winchester.

Document Location
Technical Appendix 7.1 – National Vegetation Classification (NVC) and Habitats Survey Report[3]
Technical Appendix7.2 – Protected Species Survey Report
Technical Appendix 7.2C (Annex D) – Protected Species Reports Confidential Annex
Technical Appendix7.3 – Bat Survey Report
Technical Appendix 7.4 – Fish Survey Report
Technical Appendix 7.5 – Outline Species Protection Plan (SPP)
Technical Appendix 7.6 – Ecological Impact Assessment Methodology
Technical Appendix7.7 - Outline Biodiversity Enhancement Management Plan (OBEMP)

7.2 Assessment Methodology and Significance criteria

Scope of Assessment

7.2.1 The assessment presented within this chapter considers the potential for effects upon IEFs associated with the construction, operation and decommissioning (including cumulatively) of the Proposed Development.

7.2.2 This includes:

- **Designated nature conservation sites** - effects include direct (i.e., derived from land-take or disturbance to habitats or protected species) and indirect (i.e., habitat fragmentation and modification, including through changes caused by effects to supporting systems such as groundwater or overland flow);
- **Terrestrial habitats** - effects include direct (i.e., derived from land-take) and indirect (i.e., habitat fragmentation and modification, including through changes caused by effects to supporting systems such as groundwater or overland flow);
- **Aquatic habitats** - effects are limited to the ecological impacts of changes in water conditions through potential pollution effects (hydrological effects are considered in **Chapter 8: Geology, Peat, Hydrology and Hydrogeology (EIAR Volume 1**); and,
- **Protected and other notable species** - effects include direct (i.e., loss of life; loss of key habitat; displacement from key habitat; barrier effects preventing movement to/from key habitats; and general disturbance) and indirect (i.e., loss/changes of/to food resources; population fragmentation; degradation of key habitat e.g., as a result of pollution).

7.2.3 The potential for significant effects is considered as a result of the construction, operation and decommissioning of the Proposed Development alone and, where appropriate and sufficient information is available, cumulatively with other relevant developments subject to a valid planning application.

7.2.4 The scope of the assessment has been informed by consultation responses summarised in **Table 7-2**, and the following key industry standard guidelines, national and local policies of relevance to ecology.

Legislation

7.2.5 The following key pieces of legislation have been considered in carrying out the assessment:

- The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017[4];
- European Union Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora ('Habitats Directive');
- Environmental Impact Assessment Directive 85/337/EEC, as amended ('EIA Directive') (as subsequently codified by Directive 2011/92/EU, as amended by Directive 2014/52/EU);

[4] Scottish Government (2017d). The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017. Available at: https://www.legislation.gov.uk/ssi/2017/101/contents

- European Union Council Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy ('Water Framework Directive');
- The Electricity Act 1989;
- The Conservation (Natural Habitats &c.) Regulations 1994 (as amended) ('the Habitats Regulations');
- The Water Environment and Water Services (Scotland) Act 2003 (WEWS);
- Wildlife and Countryside Act 1981 (as amended); and,
- Wildlife and Natural Environment (Scotland) Act 2011 (WANE);
- Nature Conservation (Scotland) Act 2004 (as amended);
- The Water Environment (Controlled Activities) (Scotland) Regulations 2011;
- Salmon and Freshwater Fisheries (Consolidation) (Scotland) Act 2003;
- Protection of Badgers Act 1992.

Planning Policy

7.2.6 The following key pieces of planning policy of relevance to ecology have been considered in carrying out this assessment:

- National Planning Framework 4 (NPF4[5]) (February 2023);
- Draft Planning Guidance: Biodiversity (November 2023);
- Joint Nature Conservation Committee (JNCC) and Department for Environment, Food and Rural Affairs (DEFRA) (2012). UK Post-2010 Biodiversity Framework.
- Scottish Executive (2004). Scottish Biodiversity Strategy: It's in Your Hands.
- Scottish Government (2000). Planning Advice Note (PAN)60: Planning for Natural Heritage;
- Draft Planning Guidance: Biodiversity[6];
- Planning Advice Note 1/2013-Environmental Impact Assessment[7];
- Scottish Government (2022a[8]). Onshore Wind Policy Statement 2022.
- Scottish Biodiversity Strategy to 2045[9]. Tackling the Nature Emergency in Scotland.
- Scottish Government (2023[10]). National Planning Framework (NPF)4; and
- Perth and Kinross Local Development Plan (LDP2)[11].
- Perth and Kinross Local Biodiversity Action Plan 2016-2026[12]

Guidance

7.2.7 The following key pieces of guidance have also been considered in carrying out this assessment:

- Chartered Institute for Ecology and Environmental Management (CIEEM) (2018) (updated 2022[13]) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine;
- Collins, J. (2016[14]). Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edition);
- Collins, J. (2023[15]). Bat Surveys for Professional Ecologists: Good Practice Guidelines (4th edition);
- European Commission (2020) Guidance document on wind energy developments and EU nature legislation[16].

[5] Scottish Government (2023) National Planning Framework 4. Available at:https://www.gov.scot/publications/national-planning-framework-4/. Accessed on: August 2024

[6] Scottish Government (2000). Planning Advice Note (PAN) 60: Planning for Natural Heritage.

[7] https://www.gov.scot/publications/planning-advice-note-1-2013-environmental-impact-assessment/ [Accessed August 2024]

[8] Scottish Government (2022a). Onshore Wind Policy statement – available at Onshore wind: policy statement 2022 - gov.scot (www.gov.scot)

[9] Scottish Government (2022b). Scottish Biodiversity Strategy to 2045. Tackling the Nature Emergency in Scotland. Scottish Government, Edinburgh.

[10] Scottish Government (2023). National Planning Framework 4. https://www.gov.scot/publications/national-planning-framework-4/

[11] https://www.pkc.gov.uk/article/15042/Adopted-Local-Development-Plan-LDP2 [Accessed May 2024]

[12] https://www.pkc.gov.uk/article/18069/Enhancing-biodiversity [Accessed May 2024]

[13] CIEEM (2018*). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine version 1.1*. Chartered Institute of Ecology and Environmental Management, Winchester.

- JNCC and Defra (on behalf of the Four Countries' Biodiversity Group) (2012[17]) UK Post-2010 Biodiversity Framework.
- Joint Nature Conservation Committee (JNCC) (2013[18]) Guidelines for selection of biological Sites of Special Scientific Interest (SSSI).
- 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[19]). Bats and Onshore Wind Turbines - Survey, Assessment and Mitigation.
- NatureScot (2024[20]) General Pre-application and Scoping Advice to Developers of Onshore Wind Farms.
- Scottish Badgers (2018[21]) Surveying for Badgers: Good Practice Guidelines. Version 1.
- Scottish Executive (2000[22]) Nature conservation: implementation in Scotland of EC Directives on the conservation of natural habitats and of wild flora and fauna and the conservation of wild birds ('The Habitats and Birds Directives'). Revised guidance updating Scottish Office Circular no. 6/1995.
- Scottish Environment Protection Agency (SEPA) (2017[23]) Land Use Planning System Guidance Note 4 - Planning guidance on on-shore windfarm developments.
- SEPA (2017[24]) Land Use Planning System Guidance Note 31 - Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems.
- Scottish Government (2001[25]). European Protected Species, Development Sites and the Planning Systems: Interim guidance for local authorities on licensing arrangements.
- Scottish Government (2006[26]). European Protected Species - terms of guidance: Chief Planner letter.
- Scottish Government (2016[27]) Draft Peatland and Energy Policy Statement.
- Scottish Government (2017a[28]) Planning Advice Note 1/2013 - Environmental Impact Assessment, Revision 1.0.
- Scottish Government (2017b[29]) Planning Circular 1/2017: Guidance on The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017.
- Scottish Government (2020[30]) Scottish biodiversity strategy post-2020: statement of intent.
- SNH (2015[31]) Scotland's National Peatland Plan.
- SNH (2016a[32]) Planning for Development: What to consider and include in deer assessments and management at development sites (Version 2).

[18] Joint Nature Conservation Committee (2013). Guidelines for selection of biological Sites of Special Scientific Interest (SSSI). Available at: https://jncc.gov.uk/our-work/guidelines-for-selection-of-sssis/. Accessed on: August 2024

[19] NatureScot, Natural England, Natural Resources Wales, RenewableUK, Scottish Power Renewables, Ecotricity Ltd, the University of Exeter & Bat Conservation Trust (BCT) (2019, updated 2021). Bats and Onshore Wind Turbines – Survey, Assessment and Mitigation;

[20] NatureScot (2024). General Pre-application and Scoping Advice to Developers of Onshore Wind Farms. NatureScot pre-application guidance for onshore wind farms | NatureScot [Accessed August 024]

[21] Scottish Badgers (2018). Surveying for Badgers: Good Practice Guidelines. Version 1. Available at: https://www.scottishbadgers.org.uk/wp-content/uploads/2020/12/Surveying-for-Badgers-Good-Practice-Guidelines_V1-2020-2455979.pdf. Accessed on: August 2024

[23] Scottish Environment Protection Agency (2017). Land Use Planning System Guidance Note 4 – Planning guidance on on-shore windfarm developments. Available at: https://www.sepa.org.uk/media/136117/planning-guidance-on-on-shore-windfarms-developments.pdf. Accessed on: 6 July 2024

[24] Scottish Environment Protection Agency (2017). Land Use Planning System Guidance Note 4 – Planning guidance on on-shore windfarm developments. Available at: https://www.sepa.org.uk/media/136117/planning-guidance-on-on-shore-windfarms-developments.pdf. Accessed on: August 2024

[25] Scottish Government (2001). European Protected Species, Development Sites and the Planning Systems: Interim guidance for local authorities on licensing arrangements. Available at: https://www.webarchive.org.uk/wayback/archive/20150220012946/http://www.gov.scot/Publications/2001/10/10122/File-1. Accessed on: August 2024

[26] Scottish Government (2006). European Protected Species – terms of guidance: Chief Planner letter. Available at: https://www.gov.scot/binaries/content/documents/govscot/publications/correspondence/2006/05/european-protected-species-chief-planner-letter/documents/ec-directive-92_43_eec-conservation-natural-habitats-wild-flora-fauna-pdf/ec-directive-92_43_eec-conservation-natural-habitats-wild-flora-fauna-pdf/govscot%3Adocument/EC%2BDirective%2B92_43_EEC%2BOn%2Bthe%2BConservation%2Bof%2BNatural%2BHabitats%2Band%2Bof%2BWild%2BFlora%2Band%2BFauna.pdf. Accessed on: August 2024

[27] Scottish Government (2016). Draft Peatland and Energy Policy Statement. Available at: https://www.gov.scot/publications/peatland-and-energy-draft-policy-statement/. Accessed on: August 2024

[28] Scottish Government (2017a). Planning Advice Note 1/2013 – Environmental Impact Assessment, Revision 1.0. Available at: https://www.gov.scot/publications/planning-advice-note-1-2013-environmental-impact-assessment/. Accessed on: August 2024

[29] Scottish Government (2017b). Planning Circular 1/2017: Guidance on The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017. Available at: https://www.gov.scot/publications/planning-circular-1-2017-environmental-impact-assessment-regulations-2017/. Accessed on: August 2024

[30] Scottish Government (2020). Scottish biodiversity strategy post-2020: statement of intent. Available at: https://www.gov.scot/publications/scottish-biodiversity-strategy-post-2020-statement-intent/. Accessed on: August 2024

[31] SNH (2015). Scotland's National Peatland Plan. Available at: https://www.nature.scot/doc/scotlands-national-peatland-plan-working-our-future. Accessed on: August 2024

[32] SNH (2016a). Planning for Development: What to consider and including in deer assessments and management at development sites (Version 2). Available at: https://www.nature.scot/doc/guidance-planning-development-what-consider-and-include-habitat-management-plans. Accessed on: August 2024

- SNH (2016b[33]) Planning for Development: What to consider and include in Habitat Management Plans. Version 2.
- SNH (2018[34]) Environmental Impact Assessment Handbook - Version 5: Guidance for competent authorities, consultation bodies, and others involved in the Environmental Impact Assessment process in Scotland.
- NatureScot (2023)[35] Advising on peatland, carbon-rich soils and priority peatland habitats in development management.
- Scottish Renewables, SNH, SEPA, Forestry Commission (Scotland), HES, AEECoW (2019[36]) Good Practice During Windfarm Construction (4th Edition).

Consultation

7.2.8 **Table 7-2** below summarises the consultation undertaken throughout the EIAR process, including Scoping and further pre-application consultation, relevant to ecology.

Table 7-2: Consultation responses relevant to this chapter.

Organisation and Type of Consultation	Response	How Response has been Considered
Perth and Kinross Council (PKC) (02/02/2023)	PKC agrees that subject to further information arising from field surveys and desk study, the scope and assessment of the IEF is acceptable. PKC also agrees that the desk study to complement the proposed field work will be sufficient to inform a robust impact assessment. Biodiversity enhancement opportunities and intentions should be considered and discussed under this wider heading.	Full details of baseline studies are presented in **TAs 7.1, 7.2, 7.3 and 7.4 (EIAR Volume 4)**. Habitat management proposals are contained within the OBEMP **(TA 7.7** (**EIAR Volume 4**) and **Figure 7.15** (**EIAR Volume 2**)).
	PKC agrees with the topics, potential impacts (as noted in **Table 7.1** of the Scoping Report) and assessment methodology. PKC acknowledges an assumption that there is little or no impacts from the operation of the windfarm on the River Tay SAC. These assumptions will need to be confirmed through field studies and via the proposed CEMP mitigation.	Noted. It has been confirmed that no development is proposed within the River Tay catchment and therefore the River Tay SAC is not considered at risk from the Proposed Development.
NatureScot (30/01/2023)	New tracks required to accommodate the Proposed Development should be subject to appropriate ecological surveys and assessment. This includes additional survey if track widening works are required.	Noted. All new tracks and those to be upgraded have been surveyed as part of the baseline and are included in the background data search areas. Full details of baseline studies are presented in **TAs 7.1, 7.2, 7.3 and 7.4** (**EIAR Volume 4**).

[33] SNH (2016b). Planning for Development: What to considered and including in Habitat Management Plans. (Version 2). Available at: https://www.nature.scot/doc/guidance-planning-development-what-consider-and-include-habitat-management-plans. Accessed on: August 2024

[34] SNH (2018). Environmental Impact Assessment Handbook – Version 5: Guidance for competent authorities, consultation bodies, and others involved in the Environmental Impact Assessment process in Scotland. Scottish Natural Heritage. Available at: https://www.nature.scot/doc/handbook-environmental-impact-assessment-guidance-competent-authorities-consultees-and-others. Accessed on: August 2024

[35] NatureScot (2023). Advising on peatland, carbon-rich soils and priority peatland habitats in development management. https://www.nature.scot/doc/advising-peatland-carbon-rich-soils-and-priority-peatland-habitats-development-management. Accessed on: August 2024

[36] Scottish Renewables, SNH, SEPA, Forestry Commission (Scotland), HES, AEECoW (2019). Good Practice During Windfarm Construction (4th Edition). Available at: https://www.nature.scot/doc/guidance-good-practice-during-wind-farm-construction. Accessed on: August 2024

Organisation and Type of Consultation	Response	How Response has been Considered
	NatureScot agree there is potential for connectivity between the Proposed Development and the River Tay SAC and should be scoped into the assessment. The assessment should include direct/indirect effects on Atlantic salmon, river lamprey, otter and potential pollution (from excess sediment released into the burns and streams). NatureScot agree that consultation is carried out with Tay District Salmon Fisheries Board (TDSFB).	TDSFB were contacted to obtain baseline fisheries data for the watercourses with potential to be impacted by the proposed development; these are discussed where relevant in this chapter. From a review of aerial mapping, it is considered that watercourses within the Site drain south toward Loch Earn, and away from the River Tay SAC. From subsequent consultation with the Tay District Salmon Fisheries Board (26/09/2024), if the site boundary happens to cross onto any burn which flows to Loch Tay, then in theory, the SAC could be impacted, but such impacts would be negligible. As such, it is considered there will be no significant effect on the River Tay SAC, as a result of the Proposed Development As stated above, It has been confirmed that no development is proposed within the River Tay catchment and therefore the River Tay SAC is not considered at risk from the Proposed Development.
	NatureScot note that Dalveich Meadow SSSI, Coille Criche SSSI, Edinample Meadow SSSI, Edinchip Wood SSSI, Cambusurich Wood SSSI and Ben Chonzie SSSI; are unlikely to have connectivity to the proposal and should be scoped out of the EIAR.	Scoped out of assessment based on lack of connectivity to the Site.
	NatureScot recommend the inclusion of measures to avoid direct/indirect impacts to the most sensitive and high quality peatland and should be considered as part of site design. It also recommends mitigation such as the revision of site design to exclude/protect areas of deep peatland and priority peatland habitats is considered. Where impacts to peatland is unavoidable, detailed mitigation should be provided. NatureScot recommend, as part of the Habitat Management Plan, degraded peatland areas should be considered.	Development designed to limit impacts upon deep peat , as well as peatland habitats in better condition. This is detailed in **Chapter 3 Evolution of Design and Alternatives**(**EIAR Volume 1**). Baseline studies have been used to identify areas of degraded peatland that could be restored as part of the Proposed Development. Such opportunities are set out within the OBEMP (**TA 7.7** (**EIAR Volume 4**) and **Figure 7.15 (EIAR Volume 2**)).
SEPA (12/12/2022)	SEPA request copies of the survey information to be sent including proposed layout overlain with National Vegetation Classification (NVC) plus any related target notes shown (this was sent on 18/10/24). It is noted that there is a demonstration of the proposal avoiding impacts on highly groundwater	Baseline NVC data is presented in in **TA 7.1** (**EIAR Volume 4**) and **Figure 7.3** (**EIAR Volume 2**)), with potential groundwater dependency illustrated on **Figure 7.3** (**EIAR Volume 2**)). An assessment of the potential for effects upon groundwater dependent terrestrial ecosystems is presented in

Organisation and Type of Consultation	Response	How Response has been Considered
	dependent habitats and minimises impact on groundwater dependent habitats.	(**Chapter 8: Geology, Peat, Hydrology and Hydrogeology)**
Fisheries Management Scotland (21/12/2022)	It is noted that the Proposed Development falls within the jurisdiction of the Tay District Salmon Fishery Board and Tay Rivers Trust who are recommended to be consulted with throughout the project. Fisheries Management Scotland recommend the guidelines developed and linked in the scoping response are considered.	TDSFB have been consulted over the course of the EIA and due to limited resource availability, the TDSFB were scheduled to complete the surveys but due to lack of resource, Clyde Rivers Foundation (CRF) were contacted to complete baseline electrofishing surveys in August 2022.
Stirling Council (13/01/2023)	Stirling Council are satisfied with the Scoping Report and proposed actions.	Noted.
	It is recommended that The Wildlife Information Centre (TWIC) are approached.	A data request was submitted to TWIC for records of species incidences and Local Nature Conservation Sites within the study area. This information has been included in the Desk Study section of this chapter and considered as part of the assessment.
	It is recommended that a proposed Local Nature Conservation Site (pLNCS) (Ancient Woodland Inventory) along Glen Beich is considered in subsequent surveys and mitigation.	The pLNCS was considered in the surveys (**TA 7.1** (**EIAR Volume 4**)) and is discussed where relevant in this chapter.

7.2.10 Full details of all consultation undertaken is provided in **TA 1.2: Consultation Register (EIAR Volume 4).**

Potential Effects Scoped Out

7.2.11 On the basis of the professional judgement of the EIA team, experience from other relevant projects and policy guidance, and feedback from consultees (e.g., **Table 7-2** above), the generally common and widely distributed habitats or species which *do not* fall within the following categories, were scoped out of detailed assessment:

- Habitats listed in Annex I to the Habitats Directive, and species listed in Annex II to the Habitats Directive (i.e. European Union Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora);
- Wild deer population;
- Migratory salmonids and resident fish;
- UK Biodiversity Action Plan (UKBAP)[37] or Scottish Biodiversity List (SBL) Priority Habitats[38] ; and
- Habitats or species protected by other legislation such as the Wildlife and Countryside Act 1981 (as amended) the Nature Conservation (Scotland) Act 2004 (as amended), or The Protection of Badgers Act 1992.

7.2.12 Wildcat (*Felix sylvestris*) and great crested newt (GCN) (*Triturus cristatus*) were scoped out of the assessment due to the absence of suitable habitat within the Site.

7.2.13 Further ecological features and potential effects have been scoped out of the detailed assessment based on the results of the desk-based study and survey work undertaken for the Proposed Development. This

[37] Available at: https://hub.jncc.gov.uk/assets/cb0ef1c9-2325-4d17-9f87-a5c84fe400bd

[38] Available at: https://www.nature.scot/doc/scottish-biodiversity-list

is due to a lack of likely significant effects at a relevant species population or habitat extent scale. Details of ecological features and effects scoped out after further data searches and post-survey are provided in **paragraphs 7.4.1 - 7.4.21**.

Method of Baseline Characterisation

Extent of the Study and Survey Area

7.2.14 The area within which baseline information relating to the presence and distribution of ecological features has been collected through desk study and field survey, has included the footprint of the Proposed Development, together with appropriate buffers. Desk study and field survey areas varied depending on the ecological feature, its potential sensitivity to development and its respective search/survey requirements in accordance with industry standard guidance.

7.2.15 Details of the extents of the Survey Areas are described in the relevant sections in the 'Baseline' **Section 7.3 o**f this chapter and **TAs 7.1 – 7.4** (**EIAR Volume 4**) and their respective Figures (**EIAR Volume 2**).

7.2.16 In this chapter the areas covered by field surveys are termed the 'Survey Area'. The Survey Areas are referred to as the 'Study Area' (N.B. the Study Area generally equates to the Site, except for designated sites where the Study Area is a 5 km distance band around the Site (**Figure 7.1, EIAR Volume 2**).

Desk Study

7.2.17 The following key sources were consulted for existing ecological information within proximity to the Proposed Development:

- National Biodiversity Network (NBN) Atlas Scotland for protected or notable species records within 5 km of the Site boundary from the last 15 years (i.e., 2009 and onwards)[39] ;
- NatureScot Sitelink for designated sites information within 5 km (10 km for bats) of the Site boundary[40] ;
- Ancient Woodland Inventory (AWI) (Scotland) for Ancient Woodland sites within 5 km of the Site boundary[41];
- Scotland's Environment Map for the Carbon Peatland Map 2016[42] ;
- Saving Scotland's Red Squirrels website for local species records (since 2010) and Priority Areas of Red Squirrel Conservation[43] ;
- Deer Distribution Survey Results by the British Deer Society[44] ;
- The Wildlife Information Centre (TWIC)[45] ; and
- SEPA Water Environment Hub[46] for watercourse classifications.

7.2.18 Any relevant Environmental Statement (ES), EIARs or technical reports from other developments or Proposed Developments in the local area were also reviewed.

Field Survey

7.2.19 The following ecological field surveys were undertaken, from May 2023 to June 2024, to further establish the baseline ecological conditions at the Proposed Development (plus appropriate buffers) to inform the

[39] Available at: https://scotland.nbnatlas.org. Accessed June 2024.
[40] Available at: https://sitelink.nature.scot/home. Accessed June 2024.
[41] Available at: https://map.environment.gov.scot/sewebmap/?layers=ancientWoodlandInventoryScotland. Accessed June 2024.
[42] Available at: https://map.environment.gov.scot/sewebmap/. Accessed June 2024.
[43] Available at: https://scottishsquirrels.org.uk/squirrel-sightings/. Accessed June 2024.
[44] Available at: https://bds.org.uk/science-research/deer-surveys/deer-distribution-survey/. Accessed June 2024.
[45] https://wildlifeinformation.co.uk/. Accessed June 2024.
[46] https://www.sepa.org.uk/data-visualisation/water-environment-hub/. Accessed June 2024.

assessment and were undertaken in line with industry standard methodologies and good practice guidance:

- NVC surveys, incorporating Phase 1 habitat characterisation and potential Groundwater Dependent Terrestrial Ecosystem (GWDTE) habitats (July, August and September 2023, and peatland condition surveys (June 2024);
- Protected species surveys (June 2023 and June 2024), focusing on otter (*Lutra lutra*), water vole (*Arvicola amphibius*), badger (*Meles meles*), red squirrel (*Sciurus vulgaris*) and pine marten (*Martes martes*);
- Preliminary bat roost assessments (June 2023 and June 2024);
- Bat activity surveys (May 2023 to September 2023); and
- Fisheries surveys, including electrofishing and habitat surveys (August 2023).

7.2.20 Incidental records of other protected species (such as signs or features of particular importance i.e., potential signs of adder (*Vipera berus*), common or viviparous lizard (*Zootoca vivipara*), slow worm (*Anguis fragilis*), and potential hibernacula for reptiles), notable species, or invasive non-native species (INNS), were also recorded during field surveys.

7.2.21 The full details of the survey methods, species-specific legislation and guidance and results for surveys undertaken in 2023 and 2024 are provided within **TAs 7.1 - 7.4** (**EIAR Volume 4).** Respective survey areas are shown in **Figures 7.3 – 7.14** (**EIAR Volume 2**) inclusive.

Method of Assessment

7.2.22 The assessment methodology, including criteria for identifying and assessing sensitivity of IEFs, magnitude of change and cumulative effects, as well as overall significance criteria, is detailed in **TA 7.6 (EIAR Volume 4)** and summarised below:

7.2.23 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.

7.2.24 The assessment method follows the process set out in The Electricity Works (Environmental Impact Assessment)(Scotland) Regulations 2017[4], Chartered Institute of Ecology and Environmental Management (CIEEM) (2022)[13] and guidance on the implementation of the EU Birds and Habitats Directive (SERAD, 2001)[47].

7.2.25 The assessment for wider countryside interests (i.e., unrelated to any Natura 2000 sites) involves the following process:

- identification of the potential ecological effects of the Proposed Development on ecological features, including both positive and negative;
- considering the likelihood of occurrence of potential effects;
- 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;

47 SERAD (2001). European Protected Species, Development Sites and the Planning Systems: Interim guidance for local authorities on licensing arrangements.

- if a potential effect is determined to be significant, measures to avoid, reduce, mitigate, or compensate for the effect are suggested where required;
- considering opportunities for enhancement where appropriate; and
- confirming residual effects after mitigation, compensation or enhancement are considered.

Limitations and Assumptions

7.2.26 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.

7.2.27 Although the surveys were undertaken during the optimal survey seasons, ecological surveys are limited by factors which affect the presence of plants and animals, such as migration patterns and behaviour. 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 species is not present or that it will not be present in the future.

7.2.28 No notable limitations were experienced with regards to habitats, fish, or protected species field surveys. The bat field surveys experienced some limitation due to one failed Anabat detector at one location during one survey (recording zero nights of data instead of the required ten) and two detectors had fallen (Location 6 in May and Location 1 in July) but had still recorded for the full 14 nights , however all bat detectors are susceptible to limitations and the amount of static bat data collected overall greatly exceeded relevant guidance (NatureScot *et al*. 2021)[19] requirements (see **Technical Appendices 7.1 - 7.4 (EIAR Volume 4)** for details**)**.

7.2.29 At the time of preparing **TA 7.3** (**EIAR Volume 4**) and undertaking the assessment presented within this chapter, the Ecobat tool [48], which can be used to obtain objective measures of bat activity, was unavailable. In the absence of Ecobat, and on the advice of NatureScot, alternative quantitative methods may therefore be used to quantify levels of bat activity for the purposes of assessment of onshore wind farm developments. This is not considered to be a significant limitation.

7.2.30 Whilst some general limitations have been identified, it is considered that there is sufficient information to enable a robust assessment to be taken in relation to the identification and assessment of potential effects on ecological features.

7.3 Baseline Conditions

7.3.1 This section details the results of the desk-based assessment 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 only ornithological or geological features);
- habitats and vegetation; and
- protected or notable species (non- avian).

[48] Mammal Society (2017).

Desk Study

Designated Sites

7.3.2 The Site does not form part of any statutory designated sites with qualifying ecological interests. Within 5 km of the Site, there is one SAC and five SSSIs; their qualifying interests are summarised in **Table 7-3** and shown on **Figure 7.1 (EIAR Volume 2**).

7.3.3 There is a potential Local Nature Conservation Site; pLNCS (Ancient Woodland) located in Glen Beich within the Site; this is classified as Ancient Woodland Inventory (AWI)[49] (see Ancient Woodland **Section 7.4; paragraph 7.4.4**.

Table 7-3: Designated sites with ecological qualifying interests within 5 km of the Site.

Site Name	Distance to Site Boundary	Qualifying Interest(s)[40]	Condition and Last Assessed Date[40]
Glen Beich pLNCS	Within Site	Ancient Woodland	n/a
Dalveich Meadow SSSI	0.3 km	Lowland calcareous grassland	Unfavourable Declining 30 July 2019
		Lowland neutral grassland	Unfavourable Declining 25 July 2019
Coille Chriche SSSI	1.1 km	Wet woodland	Unfavourable Declining[50] 25 September 2001
Edinample Meadow SSSI	2.1 km	Lowland neutral grassland	Unfavourable No change 1 August 2013
Edinchip Wood SSSI	3.3 km	Upland oak woodland	Unfavourable Declining 2 September 2014
		Wet Woodland	Favourable Maintained 23 July 2008
Cambusurich Wood SSSI	3.7 km	Fly assemblage	Unfavourable No change 12 August 2015
		Upland mixed ash woodland	Unfavourable Declining 27 September 2017
		Upland oak woodland	Unfavourable No change 14 April 2014
		Wet woodland	Unfavourable No change 8 May 2008
River Tay SAC	4.3 km	Atlantic salmon (*Salmo salar*)	Favourable Maintained 19 September 2011
		Brook lamprey (*Lampetra planeri*)	Favourable Maintained 30 November 2007
		Clear-water lakes or lochs with aquatic vegetation and poor to moderate nutrient levels	Favourable Maintained 12 August 2009
		Otter	Favourable Maintained 3 September 2007
		River lamprey (Lampetra fluviatilis)	Favourable Maintained 30 November 2007
		Sea lamprey (Petromyzon marinus)	Favourable Maintained 30 November 2007

[49] NatureScot (2024). Ancient Woodland Inventory. Online. Available: https://opendata.nature.scot/datasets/ancient-woodland-inventory/explore.

[50] Management measures are in place that should, in time, improve the feature to Favourable condition (Unfavourable Recovering Due to Management)

Ancient Woodland

7.3.4 In review of the AWI, there is Ancient Woodland within the Site boundary (**Figure 7.1** (**EIAR Volume 2**)).The AWI site is classified as being 2a Ancient (of semi-natural origin), interpreted as semi-natural woodland from maps of 1750 (class 1a) or 1860 (class 2a) and continuously wooded to the present day. Several additional AWI sites are also located within 5 km of the Site boundary (**Figure 7.1**, **EIAR Volume 2**).

Habitats

Peatland Habitats

7.3.5 The Carbon and Peatland Map 2016[51] was consulted to determine likely peatland classes present. It identifies areas of "*nationally important carbon-rich soils, deep peat and priority peatland habitat*"[52] as Class 1 and Class 2 peatlands. Class 1 peatlands are "*likely to be of high conservation value*" and Class 2 "*of potentially high conservation value and restoration potential*".

7.3.6 **Figure 7.2 (EIAR Volume 2**) indicates, according to this predictive tool and map, that there are areas of Class 1 peatland within the Site in the area around Loch Eas Domhain to the north and towards Creag Dhubh to the south-west; there is other Class 1 peatland adjacent to the Site to the north and east, and to the south-west within 1 km of the Site. There are no areas of Class 2 peatland within the Site however there is Class 2 peatland within 1 km of the Site. There is a small area of Class 3[53] peatland to the west of the Site and within 1km of the Site, as well as Class 5[54] soil also to the west. Much of the Site and surrounding area is underlain by Class 0[55] (mineral) soils (**Figure 7.2** (**EIAR Volume 2**)).

7.3.7 As the Carbon and Peatland Map is a high-level tool, detailed habitat and peat depth surveys have been carried out across the Site to inform siting, design and mitigation, and the detailed assessment of peatland and associated habitats. The results of the habitat surveys are summarised in **paragraphs 7.3.13 - 7.3.29** and discussed in more detail within **TA 7.1** (**EIAR Volume 4**), and the results of the peat depth surveys are presented and discussed in **Chapter 8: Geology, Peat, Hydrology and Hydrogeology (EIAR Volume 1)**, and associated TAs (**EIAR Volume 4**).

Protected Species

7.3.8 A search of the NBN Atlas Scotland[39] within 5 km of the Site in the past 15 years (from 2009) returned records of the following protected or notable species (excluding bats, discussed in **TA 7.3 (EIAR Volume 4)):**

- Beaver (*Castor fiber)*;
- Common lizard;
- Mountain hare (*Lepus timidus*);
- Pine marten;
- Red deer (*Cervus elaphus*);
- Red squirrel; and
- Slow worm.

7.3.9 No INNS were recorded under these search parameters.

[51] SNH. (2016) Carbon and Peatland 2016 map. Online. Available: https://www.nature.scot/professional-advice/planning-and-development/planning-and-development-advice/soils/carbon-and-peatland-2016-map.

[52] Priority peatland habitat is land covered by peat-forming vegetation or vegetation associated with peat formation.

[53] Class 3 - Dominant vegetation cover is not priority peatland habitat but is associated with wet and acidic type. Occasional peatland habitats can be found. Most soils are carbon-rich soils, with some areas of deep peat. Indicative soil = Predominantly peaty soil with some peat soil. Indicative vegetation = Peatland with some heath.

[54] Class 5 - Soil information takes precedence over vegetation data. No peatland habitat recorded. May also include areas of bare soil. Soils are carbon-rich and deep peat. Indicative soil = Peat soil. Indicative vegetation = No peatland vegetation.

[55] Class 0 - Mineral soil - Peatland habitats are not typically found on such soils. No peatland vegetation.

7.3.10 Sightings of red squirrels have been recorded by Saving Scotland's Red Squirrel (SSRS) within 5 km of the Site each year since 2010[43]. Sightings of grey squirrels, and INNS, have also been recorded by SSRS over the majority of years since 2010. There is no Priority Area for Red Squirrel Conservation (PARC) within 5 km of the Site.

7.3.11 Results of the Deer Distribution Survey[44] suggest that the following deer species are likely to be present or have been previously recorded in the wider area of the Site:

- Roe deer (*Capreolus capreolus*);
- Red deer;
- Sika deer (*Cervus nippon*); and
- Fallow deer (*Dama dama*).

7.3.12 Drummond Estates Deer Management Plan[56] [57] states that deer species present are principally red deer, with occasional roe deer. It states that no sika deer are present. The Deer Management Plan is discussed in greater detail in **paragraph 7.4.20**.

Field Surveys

Terrestrial Habitats

National Vegetation Classification (NVC) and Phase 1

7.3.13 **TA 7.1** (**EIAR Volume 4**) sets out detailed descriptions of habitats identified, and vegetation recorded during the respective surveys. The NVC data collected were also cross-referenced to the Phase 1 Habitat Survey Classification (JNCC, 2010)[17] to allow a broader characterisation of habitats.

7.3.14 The extent of Phase 1 habitat types within the Site was calculated using the correlation of NVC communities to their respective Phase 1 types specific to the Site and their extents mapped within ArcGIS software, including within mosaic areas.

7.3.15 35 NVC communities and 11 non-NVC communities were recorded within the Site and wider survey area, which corresponded to 28 Phase 1 habitat types. These communities and habitat types, and their respective Site-specific correlations are detailed in **TA 7.1 (EIAR Volume 4**), and their distributions illustrated in **Figure 7.3** (**EIAR Volume 2**).

7.3.16 The extents of NVC communities and non-NVC types recorded within the Site are provided in **TA 7.1 (EIAR Volume 4**) and include proportions of particular habitat types that are found within the Site, including those within mosaic habitats.

7.3.17 In summary, the main habitats on Site are blanket bog (25.46% of Site), acid dry dwarf shrub heath (18.91% of Site) and unimproved acid grassland (12.60% of the Site). Acid/neutral flush, wet modified bog, marshy grassland and recently planted coniferous plantation woodland are also present each covering between 5% and 10% of the Site. This is summarised in **Diagram 7-1 (Annex A of this chapter,** provides the detailed breakdown of all habitat types and communities recorded, and their extents, within the Site).

[56] Scottish Forestry (2023) General Deer Management Plan; Ardveich Plantation.

[57] Drummond Estates (2023) Deer Management Plan Background Information & Analysis for Proposed Culls and Monitoring.

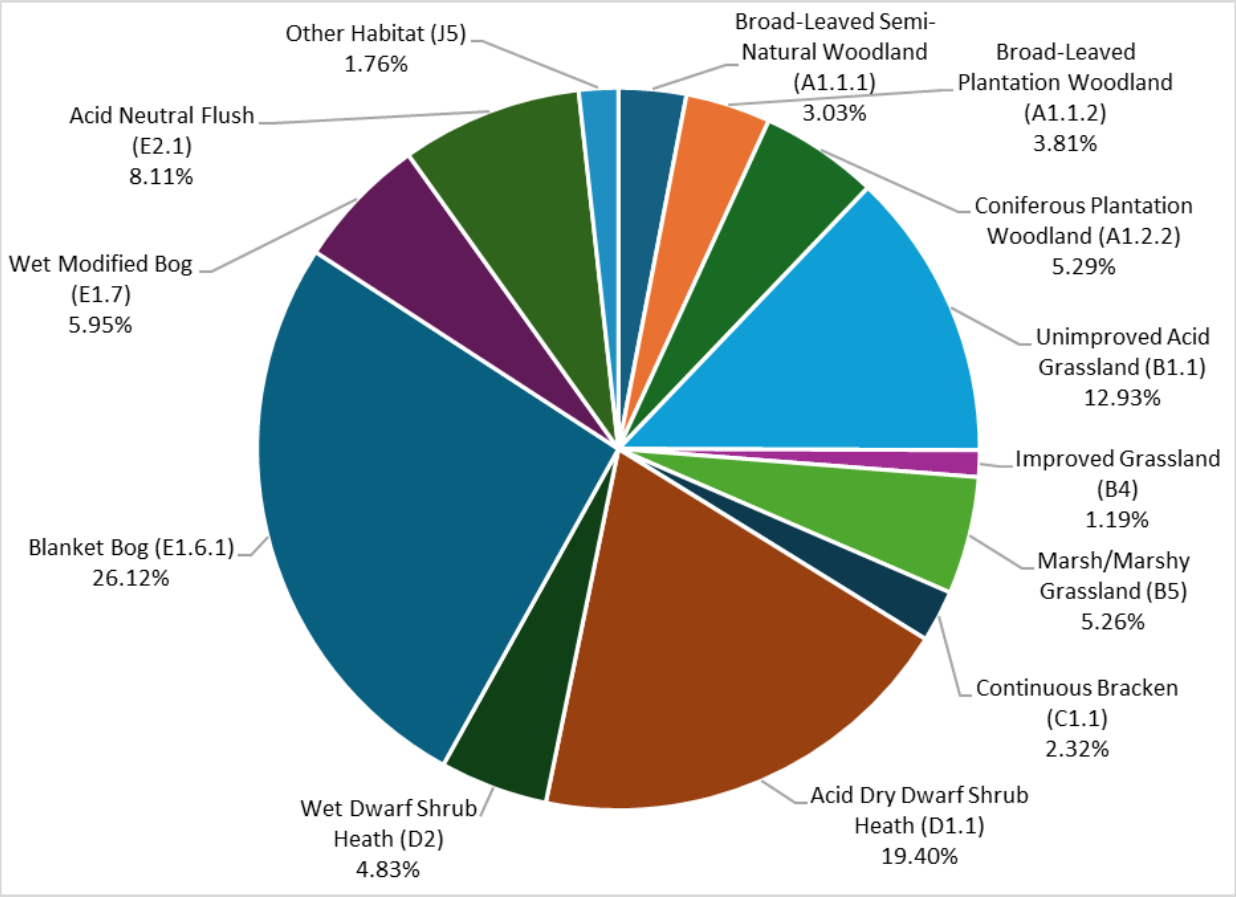

Figure 7-1: Predominant Phase 1 Habitat Types Recorded within the Site

(habitat types making up <1% of the Site are not included).

7.3.18 The remainder of the Site is made up of broadleaved semi-natural woodland, broadleaved plantation woodland, semi-improved acid grassland, improved grassland, continuous bracken, heath, flush standing water, running water and exposed ground (see **Annex A**).

7.3.19 The only habitat types that have subsequently been scoped into the assessment of effects due to their extent and nature conservation value are blanket bog and wet modified bog. Blanket bog here is mainly represented by the M17 and M19 NVC communities. The M2 and M3 communities were also infrequently recorded. In some areas M19 and M17 form mosaics and transitional areas with overlap between each other, and with wet modified bog. These habitats are associated with Scottish Biodiversity List (SBL) blanket bog habitat with some areas also corresponding to Annex 1 type 7130 blanket bog habitat. Wet modified bog communities recorded are dominated by the M20 community, with a small area of the M25a^ sub-community. M25a being classified as wet modified bog and not marshy grassland here due to generally appearing on peat of greater than 0.5 m in depth. These communities referenced above are also considered priority peatland habitats within NatureScot guidance[35].

7.3.20 The blanket bog within the Site is a degraded resource that has been impacted over time in several ways. Historical and ongoing impacts on blanket bog (and wet modified bog) at the Site include livestock grazing and extensive moor grip drainage. Some of the relatively larger patches of bog also exhibit some erosion features, such as haggs, gullies, and peat pans. The overall result is a highly fragmented, impacted, modified, and degraded peatland that would be classified, using NatureScot Peatland Action Condition

Criteria[58], as predominantly 'Modified', 'Drained: Hagg/Gully' and 'Drained: Artificial' with any remaining areas falling within the' 'Actively Eroding: Hagg/Gully' and 'Actively Eroding: Flat Bare' categories (see **Figures 7.5.1 – 7.5.3** (**EIAR Volume 2**) and **TA 7.1 (EIAR Volume 4**)).

Groundwater Dependent Terrestrial Ecosystems (GWDTEs)

7.3.21 NVC communities recorded within the survey area were referenced against SEPA guidance[28] to identify those habitats which may be classified, depending on the hydrogeological setting, as being potentially groundwater dependent.

7.3.22 Potential GWDTE NVC communities recorded within the survey area are detailed in **TA 7.1 (EIAR Volume 4**) and their distribution shown on **Figure 7.4** (**EIAR Volume 2**).

7.3.23 Potential GWDTE sensitivity has been assigned solely on the SEPA listings. 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. 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 and similarly 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 in **Chapter 8: Geology, Peat, Hydrology and Hydrogeology (EIAR Volume 1).**

Annex I Habitats

7.3.24 A number of NVC communities can also correlate to various Annex I habitat types. However, the fact that an NVC community can be attributed to an Annex I type 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.

7.3.25 Using Joint Nature Conservation Committee (JNCC) Annex I habitat listings and descriptions[59], which have then been compared with survey results and field observations, the following NVC communities within the Survey Area which constitute Annex I habitat are detailed in **TA 7.1 (EIAR Volume 4).**

Scottish Biodiversity List (SBL) Habitats

7.3.26 The SBL[60] is a list of animals, plants and habitats that Scottish Ministers consider to be of principal importance for biodiversity conservation in Scotland.

7.3.27 The SBL identifies habitats which are the highest priority for biodiversity conservation in Scotland; these are termed 'priority habitats'. Some of the priority habitats are quite broad and can be correlated to many NVC types.

7.3.28 Relevant SBL priority habitat types and corresponding associated NVC types recorded within the Site are detailed in **TA 7.1 (EIAR Volume 4).**

7.3.29 These SBL priority habitats correspond with the UKBAP Priority Habitats.

58 https://www.nature.scot/doc/peatland-action-peat-depth-and-peat-condition-survey-guidance-and-recording-form-guidance

59 https://sac.jncc.gov.uk/habitat/

60 https://www.nature.scot/doc/scottish-biodiversity-list [Accessed May 2024]

Protected Species (Non-avian)

7.3.30 This section outlines the results from the protected species surveys. Detailed methodologies, survey timings, and results, including the legal status of each species, are included within **Technical Appendices 7.2 - 7.4 inclusive (EIAR Volume 4**), and their associated annexes. Results are presented in **Figures 7.9 - 7.14 inclusive** (**EIAR Volume 2**), with confidential information presented in **TA 7.2c** (**EIAR Volume 5**), and **Figure 7.9C** (**EIAR Volume 5**).

Badger

7.3.31 Evidence of badger recorded during baseline surveys comprised one disused outlier sett which was recorded at a distance of over 150 m from the nearest infrastructure (access tracks). Footprints were also recorded approximately 2.5 km to the north of the disused sett. Two D-shaped holes considered suitable for badger were recorded during the protected species surveys across the Site and Survey Area. However, there was not enough evidence to indicate that they are being used by badger. Further information is detailed in **TA 7.2C** (**EIAR Volume 4**) and **Figure 7.9c (EIAR Volume 2)).**

Bats

7.3.32 Full details of baseline studies pertaining to bats are contained within **TA 7.3** (**EIAR Volume 4)** and **Figures 7.10 – 7.13** inclusive (**EIAR Volume 2**).

Preliminary Roost Assessment (PRA)

7.3.33 A total of ten trees were recorded within the Site and assessed from ground-level as providing potential suitability for roosting bats, in accordance with the classifications provided in Collins[14] (**Figure 7.10**, **EIAR Volume 2**). All of these features were located along the main spine track entrance to the Site (six moderate and four low potential), the moderate potential features are located beyond 30 m of planned infrastructure or access track, except one moderate feature that is an alder (*Alnus glutinosa*) tree within 20 m of the access track (**Figure 7.10**, **EIAR Volume 2**).

7.3.34 No features with moderate suitability for roosting bats were recorded within 200 m plus blade length (81 m) of a proposed wind turbine location and as such, no further surveys were required.

Bat Activity Surveys
Automated Ground Level Activity Surveys

7.3.35 Static bat activity surveys involved the deployment of 12 detectors as shown on **Figure 7.10** (**EIAR Volume 2)** detectors between May and September 2023, over a total period of 42 days, covering spring, summer and autumn. This resulted in 490 recording nights of data (significantly more than the 390 as required by NatureScot *et al*.[19] guidance for a development of this size); see **TA 7.3** (**EIAR Volume 4**).

7.3.36 Surveys recorded a total of seven bat species and 976 bat call registrations as summarised **Table 7-4,** with soprano and common pipistrelle accounting for 87.4% (n = 853) of total registrations (n = 976) across all surveyed locations.

Table 7-4: Total Number of Bat Passes for Each Species Across all Locations 2023

Species/Species Group	No. of Registrations	Percentage of total (%)
Soprano pipistrelle (*Pipistrellus pygmaeus*)	515	52.77
Common pipistrelle (*P. pipistrellus*)	338	34.63
Daubenton's (*Myotis daubentonnii*)	64	6.56

Species/Species Group	No. of Registrations	Percentage of total (%)
Noctule (*Nyctalus noctula*)	22	2.25
Brown long-eared (*Plecotus auritus*)	21	2.15
Natterer's (*M. naterreri*)	10	1.02
Leisler's (*N. leisleri*)	6	0.61
Total	**976**	**99.99**[61]

Quantifying Bat Activity Levels

7.3.37 NatureScot *et al.* (2021) recommends the use of Ecobat tool (Mammal Society, 2017[62]) as a measure of bat activity levels. Ecobat analyses activity levels during nights where bat activity was recorded and assigns a value to the activity levels (low, low/moderate, moderate, moderate/high or high) for each location on each night. These values are based on a comparison with other surveys within the local area. While this provides an objective assessment of activity levels in a given area, the reliability of the results can be impacted by how many previous surveys within the comparison radius have been submitted to Ecobat. The Ecobat tool was offline and unavailable at the time of preparing this report.

7.3.38 In the absence of Ecobat, and on the advice of NatureScot, alternative quantitative methods are to be used to assess bat activity levels. As such, the data obtained from the 2023 static bat surveys was considered in accordance with NatureScot *et al.* (2021) as far as practicable to determine the overall Site risk level for each species of bat.

7.3.39 To generate a bat activity index value and allow a comparison of bat activity between locations, species and seasons, the number of bat passes per hour (bpph) was calculated. This method refers to the number of bat passes as opposed to the number of individual bats recorded, as it is not possible to definitively identify individual bats and the total number of individual bats present. The bpph is used to provide a quantitative measure of bat activity across the Site. Data on the activity levels for all species recorded across the Site and through the three deployments visits is provided in **TA 7.3** (**EIAR Volume 4**). **Figures 7.11 – 7.13** also display the activity of high collision risk species.

Assessing Potential Risk

7.3.40 As detailed in **TA 7.3 (EIAR Volume 4)**, the Site risk level was determined to be 'Low/Lowest', based on having a Medium project size and a Low habitat risk.

7.3.41 As per NatureScot *et al.* (2021) guidance, common pipistrelle, soprano pipistrelle and *Nyctalus* spp. were the only bat species recorded which are deemed to have a high collision risk. All other bat species recorded are categorised as low collision risk and of low population vulnerability in line with the same guidance.

7.3.42 In analysing bat activity levels, professional judgement has been used previously in the absence of any recognised standard measure to define levels as being high, medium or low. This took into consideration the geographical and site location and habitats present as well as professional experience. NatureScot *et al.* (2021) recommends the use of Ecobat as a measure of activity levels; however, as noted above, at the time of preparation the Ecobat tool was offline and unavailable.

[61] Due to rounding of the percentages per species, the 'Total' percentage may not be exactly 100%.

[62] Available at: http://www.ecobat.org.uk/home.

7.3.43 Therefore, Site specific details, knowledge of bat species behaviour, professional judgement and experience from other and similar projects has been used to assess the bat activity levels at the Proposed Development as high, medium or low. While the appraisal of activity levels was ascertained using professional judgement, the risk assessment has taken due consideration of the NatureScot *et al.* (2021) guidance to provide an assessment of risk.

7.3.44 **Figures 7.11 – 7.13** illustrate the results of the seasonal risk assessment for high collision risk bat species recorded at the Site at each survey location, to provide an overview of how bat activity and risk levels vary across the Site though the year and by species. As seen in these figures many locations in many of the survey months recorded no activity by high collision risk bat species (in particular *Nyctalus* spp.). However, in locations and months where bat activity was recorded, the Site risk level for common pipistrelle, soprano pipistrelle and *Nyctalus* spp. per month at each location was 'Low'. As shown in **Figure 7.11** (**EIAR Volume 2**), analysis of the risk to common pipistrelle, only Locations 4 and 10 recorded any bat activity (less than 1 bpph) during spring, with the rest of the Locations recording no activity. In summer, Locations 5, 6 and 10 recorded no activity, with the remaining Locations recording less than 0.5 bpph. All locations in the autumn survey visit recorded less than 0.5 bpph, and the overall risk at these locations is considered Low.

7.3.45 **Figure 7.12 (EIAR Volume 2)** provides an analysis of the risk to soprano pipistrelle. In spring, Locations 1, 4 and 7 recorded less than 1.5 bpph, with the rest of the Locations recording no activity. Locations 1, 3-6 and 11 recorded less than 0.05 bpph in summer, and the other Locations recorded no activity. All Locations in autumn recorded bat activity but the bpph were below 0.55.

7.3.46 As shown in **Figure 7.13** (**EIAR Volume 2**), for Nyctalus spp., location 4 had less than 0.2 bpph in spring and summer, with autumn recording no activity. Locations 5, 7 and 8 recorded 0.01 bpph in autumn. No Nyctalus spp. were recorded at Location 1-3, 5-12 in spring and summer or Locations 1-4, 6 and 9-12 during autumn.

7.3.47 Overall, for common and soprano pipistrelle, the risk is considered to be Low across all Locations and seasons.

Beaver

7.3.48 No signs of beaver were recorded during the protected species surveys.

7.3.49 It is noted that beaver are present in Loch Earn. However, for the following reasons, the risk of the Proposed Development to beaver is negligible, and as such, beaver have been scoped out of the assessment:

- the small and open watercourses on Site;
- the steep gradient (in places) of these watercourses, between the Site and Loch Earn;
- the A85 being a significant barrier between Loch Earn and the Site; and
- the habitats in the Site are of limited value to beaver; much of the north and central areas of the Site are covered by drained peaty soils and open moorland, which is generally not utilised by beaver.

Otter

7.3.50 Two otter sightings were incidentally recorded during ornithology surveys (one adjacent to the Site boundary, west of Creag Dhubh in May 2021, and the other east of the Site boundary on Lochan Mhaoil na Meidhe in May 2021).

7.3.51 Sixty-five records of otter spraints were recorded at watercourses and waterbodies across the Site and wider Survey Area during protected species surveys. The ages of spraints varied from very old to fresh, indicating that the Site and Survey Area is frequently used by otters. No otter sightings, holts or couches were recorded during the protected species surveys.

7.3.52 Many of the watercourses within the Site and Survey Area provide suitable foraging and commuting habitat for otter and provide connectivity between the Site, Loch Earn and Loch Lednock Reservoir.

7.3.53 The watercourses within the north and central area of the Site provide limited opportunities for resting places, with limited riparian tree presence. Further information is detailed in **TA 7.2** (**EIAR Volume 4**).

Pine Marten

7.3.54 One potential pine marten scat (TN PS085 in **Figure 7.9 (EIAR Volume 2)** was recorded during the protected species surveys. Although not confirmed to be of pine marten, it was considered to be so in accordance with the precautionary principle. The scat was recorded within the Site to the south west in a gorge by Beich Burn. The age of the scat was relatively old, suggesting the Site is not frequently used by pine marten.

7.3.55 The Site offers very limited suitability for pine marten, with no extensive areas of woodland or forestry present. The sloped and partially wooded areas by Glen Beich may provide some limited, suitable habitat for foraging and hunting.

Red Squirrel

7.3.56 Three red squirrel sightings were incidentally recorded during ornithology surveys for the Proposed Development (two south of Glentarken Wood; TN PS108 and TN PS110 in **Figure 7.9 (EIAR Volume 2)** and one east TN PS109 in **Figure 7.9 (EIAR Volume 2)** of the Site by Invergeldie). All sightings were at least 1.8 km from the Site.

7.3.57 Two potential squirrel feeding signs (both stripped pine cones) were recorded during the protected species surveys by Scots pine trees within the Site to the south. This sign alone cannot distinguish between red and grey squirrels, and both species are known to be present within 5 km of the Site[43].

7.3.58 The Site and Survey Area offer limited suitability for red squirrel, with no extensive areas of woodland or forestry present. The sloped and partially wooded areas by Glen Beich and areas of broadleaf woodland south west of the Site boundary may offer suitability for feeding and drey building.

Reptiles

7.3.59 Fifteen common lizards were sighted across the Site and wider Survey Area during protected species surveys; and several (at least ten) were sighted incidentally during ornithology surveys.

7.3.60 Five features with the potential to act as reptile hibernacula were recorded across the south west of the Site. Collapsed drystone sections of wall, dilapidated stone structures and stone piles accounted for the majority of features, offering hibernation opportunities. Much of the Site is open ground with upland vegetation, providing suitable foraging habitat for reptiles. Further information is detailed in **TA 7.2** (**EIAR Volume 4**) and **Figure 7.9 (EIAR Volume 2)).**

Water Vole

7.3.61 No signs of water vole were recorded during the protected species surveys.

7.3.62 The watercourses within the Site are varied, with some having suitability for water vole burrowing and foraging. Rush vegetation was noted along many stream banks, with areas of steep, peaty banks. Two mammal holes located in watercourse banks and considered suitable for water vole were recorded during the protected species surveys across the Site and Survey Area. However, no further evidence of water vole was recorded so it is considered unlikely that they are being used by water vole. Further information is detailed in **TA 7.2** (**EIAR Volume 4**) and **Figure 7.9 (EIAR Volume 2)).**

Brown and Mountain Hare

7.3.63 Two mountain hares and one brown hare were incidentally recorded during ornithology and other ecology surveys. There is suitable habitat for the species' across the Site and wider Survey Area, with extensive upland moorland habitat.

Fish

7.3.64 Electrofishing surveys were undertaken by Clyde River Foundation (CRF) in August 2023, with full results detailed in **TA 7.4** (**EIAR Volume 4**).

7.3.65 A total of eight survey points were sampled during the survey; fish were caught at five[63] of these (**TA 7.4** (EIAR Volume 4)). A total of three species of fish were present within the Site; brown trout (*Salmo trutta*), stone loach (*Barbatula barbatula*) and minnow (*Phoxinus phoxinus*); overall fish numbers were low.

7.3.66 Only 17 brown trout were caught in total (an additional two were seen not caught), across five of the eight sampling sites. A total of 11 young-of-the-year (0+) fish were encountered, whilst numbers of older (1++) brown trout caught ranged between zero and three fish per sampling point (**TA 7.4** (**EIAR Volume 4)).**

7.3.67 It should be noted that no migratory species; Atlantic salmon (*Salmo salar*), European eel (*Anguilla anguilla*) or marine lamprey (*Petromyzon marinus*) were caught. Furthermore, no river lamprey (*Lampetra fluviatilis*) or brook lamprey (*L. planeri*) were caught either.

7.3.68 Abstraction prevents trout being present in the lower Allt Eas Domhain and the Allt an Fhionn; the former being dry and the latter a series of pools below their respective abstractions. The rivers trust who completed the electrofishing survey were asked about the reason behind the abstraction; it was stated that it could be for hydro power generation, but they could not confirm. It is also possible that a steep gradient in Allt Eas Domhain contributes to the absence of fish here.

7.3.69 No fish were caught in the middle reach of the Beich Burn but two 1++ (at least one year old) trout were seen there (and a 0+ (young of the year i.e. hatched in 2023) fish were recorded there in 2017). Despite the presence of impassable barriers downstream, it appears that a small population of brown trout persists there.

Future Baseline

7.3.70 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. Vegetation and habitat composition and extents across the Site may fluctuate marginally in the long-term in line with increasing or decreasing livestock grazing and fluctuations in deer browsing.

[63] Of the three points that no fish were recorded, one watercourse was considered to be unsuitable for fish and was not subject to fishing.

7.4 Summary of Sensitive Features

Scoped Out Receptors

7.4.1 Based on surveys findings combined with the iterative design and standard mitigation measures described in **Section 7.7**, the potential for significant effects upon several IEFs can be scoped out of further assessment based on the professional judgement of the EIA Team and experience from other relevant projects and policy guidance or standards. This includes effects from the construction, operational and decommissioning phases of the Proposed Development, as well as cumulative effects.

Designated Sites

7.4.2 In accordance and agreement with NatureScot consultation (**Table 7-2**), Dalveich Meadow SSSI, Coille Criche SSSI, Edinample Meadow SSSI, Edinchip Wood SSSI, Cambusurich Wood SSSI are unlikely to have connectivity to the Site and are scoped out of the assessment. Although out with the 5 km buffer (**Table 7-3**), NatureScot have stated that Ben Chonzie SSSI can be scoped out of the assessment based on the above reasons.

7.4.3 PKC acknowledged in scoping that there will be little or no impact from the operation of the windfarm on the River Tay SAC. It has been confirmed through a review of aerial maps, and as discussed with the authors of **Chapter 8: Geology, Peat, Hydrology and Hydrogeology (EIAR Volume 1),** no part of the Proposed Development is located within the River Tay catchment so the Proposed Development is not hydrologically connected to the SAC. As such, the River Tay SAC is not at risk from the Proposed Development, and the risk of any likely significant effect upon the SAC is excluded, neither an appropriate assessment[64] nor EIA assessment is required..

Ancient Woodland

7.4.4 No woodland removal is proposed nor will any fragmentation occur to any AWI site as a result of the Proposed Development. With standard mitigation in place (see **Section 7.7**.), no pollution effects are anticipated. Effects on AWI are therefore considered to be negligible and as such have been scoped out of further assessment. Work in the vicinity of AWI will be subject to the use of non-working buffers and root protection zones that will be set out in the Construction and Environmental Management Plan (CEMP). An Outline CEMP is provided in **TA 2.1 (EIAR Volume 4).**

Terrestrial Habitats

7.4.5 The following habitats (using Phase 1 Habitat terminology and codes[56]) are considered of less than 'Local' ecological value in the context of the Proposed Development as they are features which are relatively common and/or widespread locally and/or regionally (i.e. of low conservation value), which are, in some instances, present only in very small areas:

- Broadleaved Plantation Woodland (A1.1.2);
- Coniferous Plantation Woodland (A1.2.2);
- Unimproved Acid Grassland (B1.1);
- Semi-Improved Acid Grassland (B1.2);
- Improved Grassland (B4);
- Continuous Bracken (C1.1);
- Tall Ruderal (C3.1);
- Bare Peat (E4);
- Acid/Neutral Exposure (I1.4.1);
- Bare Ground (J4); and
- Other Habitat (J5).

[64] In accordance with the Conservation (Natural Habitats &c.) Regulations 1994 .

7.4.6 A number of other habitats recorded within the Study Area are of local importance, some due to their listing as Annex I habitats or SBL Priority Habitats (**TA 7.1** (**EIAR Volume 4**)). 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 will not occur or will be negligible in magnitude (see **Annex A, Table 7-8**), the potential for significant effects on them are scoped out of the assessment. These habitats include:

- Broadleaved Semi-Natural Woodland (A1.1.1);
- Scattered Broadleaved Trees (A3.1);
- Marsh/Marshy Grassland (B5);
- Acid Dry Dwarf Shrub Heath (D1.1);
- Wet Dwarf Shrub Heath (D2);
- Lichen/Bryophyte Heath (D3);
- Acid/Neutral Flush (E2.1);
- Basic Flush (E2.2);
- Swamp (F1);
- Standing Water (G1); and
- Running Water (G2).

Aquatic Habitats and Species

7.4.7 Effects on aquatic habitats including standing water, running water and fisheries interests are scoped out of the assessment, on the basis of limited suitable habitat (as reflected in low numbers of fish caught during the baseline surveys), sensitive scheme design and standard mitigation (**Section 7.7**).

7.4.8 A minimum 50 m buffer distance between infrastructure and watercourses has been maintained in so far as has been possible, and requirement for new watercourse crossings has minimised as much as possible. The design of any permanent water crossings (23 new water crossings and the upgrade and one existing water crossing) would comply with SEPA good practice guidance to minimise impacts on fish and their habitat (**Section 7.7**).

The majority of these crossing are on tributaries of the Beich Burn which is known to support fish populations ((**TA 7.4** (**EIAR Volume 4**)).

7.4.9 With the standard mitigation and sensitive scheme design water pollution impacts and associated likely significant effects associated with the Proposed Development on watercourses and aquatic ecology are considered unlikely and therefore these pollution impacts are scoped out of further assessment.

7.4.10 Further assessments of watercourses are provided in **Chapter 8: Geology, Peat, Hydrology and Hydrogeology (EIAR Volume 1)**.

Protected Species

7.4.11 NatureScot guidance (NatureScot, 2023[36]) stipulates that there are some species, which with standard mitigation measures, are unlikely to experience a significant environmental effect to their populations as a result of the construction and/or operation of onshore wind farms. These species do not require surveys to inform the design and assessment of an onshore wind farm development but may require appropriate mitigation to ensure legislative compliance.

7.4.12 The potential for significant effects on water vole, pine marten, red squirrel, GCN, brown/mountain hare, wildcat, and beaver are scoped out of the assessment due to the absence of protected features, lack of suitable habitat, limited desk-based assessment or field evidence within the Site, and/or lack of potential effects from the Proposed Development based on scheme design and the implementation of standard mitigation measures.

7.4.13 Fifteen common lizard were sighted across the Site and wider Survey Area during protected species surveys; and several (at least ten) were sighted incidentally during ornithology surveys. Reptiles are

mobile species capable of avoiding disturbance except during hibernation. The identified hibernacula lies out with the turbine infrastructure. Reptiles are included in the Species Protection Plan (**TA 7.5 EIAR Volume 4**). However, the risk is considered to be low and reptile are scoped out of the assessment.

7.4.14 The potential for significant effects on otter is scoped out of the assessment. Although the Site is established to be frequently used by otter, no protected features were recorded. The number of water crossings will be minimised and sensitive design will allow free passage of otter. It is considered that with the application of standard mitigation during construction and operation (**Section 7.7**), including pre-commencement surveys as set out in the Species Protection Plan (**TA 7.5 EIAR Volume 4**), there is no likelihood for significant impacts to otter populations arising from disturbance, displacement or accidental mortality during the construction or operation of the Proposed Development. Otter is therefore scoped out of further assessment.

7.4.15 The potential for significant effects on badger is scoped out of the assessment. Whilst the presence of badger has been established within the Site, the species is widespread across Scotland and is protected for welfare reasons rather than conservation concerns. There will be no mature or semi-mature woodland removal or fragmentation resulting from construction of the Proposed Development and suitable foraging habitats and sett creation opportunities will remain available and extensive within the Site and wider surrounding area. Mitigation through scheme design has also ensured a 150 buffer around the outlier sett recorded, in accordance with NatureScot guidance[65]. It is considered that with the application of standard mitigation during construction and operation (**Section 7.7**), including pre-commencement surveys, there is no likelihood for significant impacts to badger populations as a result of the Proposed Development. Badger is therefore scoped out of further assessment.

7.4.16 The potential for significant effects upon roosting bats is scoped out of assessment. No potential maternity roosts and/or hibernation/swarming sites have been identified within at least 200 m plus blade tip (i.e., 281 m) of proposed turbine locations and there is no likelihood of impacts to such features. A total of ten tree features were recorded along the access track route, with low to moderate potential suitability for roosting bats. There will be no loss, direct or indirect impacts to any of these trees/structures. There is a single alder tree within 20 m of the proposed access track, that offers moderate roosting potential to bat. However, based on the very low levels of bat activity recorded across the Site, combined with the superficial nature of one feature recorded and the other being open to the sky, and therefore open to water ingress and therefore unsuitable to roosting bats, the risk is considered to be low.

7.4.17 Low levels of bat activity were recorded during automated surveys (**TA 7.3** (**EIAR Volume 4**)). Disturbance to and displacement of roosting bats, and damage to roosts, removal of roosts is therefore scoped out of further assessment.

7.4.18 Construction works would mainly take place during daylight hours, therefore any disturbance for foraging and commuting bats of any species during construction of the Proposed Development is unlikely to occur or would likely be negligible in magnitude and is therefore scoped-out.

7.4.19 Effects on all IEFs during operation of the Proposed Development have been scoped out. Maintenance of the Proposed Development will involve vehicular access along the access tracks only, and any ongoing

[65] https://www.nature.scot/doc/standing-advice-planning-consultations-badgers [Accessed May 2024]

maintenance of turbines is typically carried out by a small number of maintenance staff during normal working hours. This is unlikely to result in any operational effects on any species or habitats recorded at and around the Proposed Development.

OTHER SPECIES

Deer

7.4.20 Effects on deer are scoped out of the assessment. Drummond Estates Deer Management Plan [56] [57] states that deer species present are principally red deer, with occasional roe deer. A helicopter survey discussed in the above Management Plan recorded densities of 9 deer per km^2 (Invergeldie), to 12 deer per km^2 (Ardeonaig and Lochearnside) and 23 deer per km^2 (Glenbeich) giving an average of 12 deer per km^2 for Drummond Estate. The Deer Management Plan discusses culling rates to maintain a steady population of deer. There are only a relatively small number of small, isolated and fragmented woodland blocks within (mainly along the access track) and in close proximity (along the northern shores of Loch Earn, to the north of the A85) to the Site (**Figure 7.3** (**EIAR Volume 2**)), which would only potentially support low numbers of deer. Operational effects are not anticipated as there is currently no deer fencing around the Site, apart from deer fencing surrounding the Ardveich Planting Scheme. Therefore, deer may use and pass through uninhibited. Due to the extensive amount of similar suitable habitat in the surrounding land, and its accessibility, the small loss of grazing habitat associated with the Proposed Development 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.

7.4.21 Construction effects are expected to be minimal due to the timing of works (i.e., primarily during the day, with deer more active during evening/nights), and a short-term construction period (approximately 24 months). If individuals are displaced during construction, there are suitable routes around the Site which will not force deer into areas of risk, including A85. As a result of the size and location of the Proposed Development, temporary construction period, the retention of woodland, 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 out with the Site during construction and operation, no negative effects, through increased browsing/trampling on surrounding habitats are expected.

Scoped In Receptors

Important Ecological Features

7.4.22 A summary of the nature conservation value (as detailed in **TA 7.1, EIAR Volume 4**) of the remaining IEFs; Blanket Bog and Wet Modified Bog (treated as a combined receptor), identified within the Site and surrounding area (as confirmed through survey results and consultation outlined above) which have been scoped-in to the assessment is provided in **Table 7-5** below, together with the justification for inclusion.

Table 7-5: Summary of Identified Sensitive/ Important Ecological Receptors

IEF	Nature Conservation Value	Relevant Legislation / Guidance & Justification
Blanket Bog and Wet Modified Bog	Local	Blanket bog covers 280.72 ha (25.46 %) of the Study Area whilst wet modified bog covers a further 63.90 ha (5.80 %) (**Annex A**, **Table 7-8**). Both habitats are also present out with the Application Boundary (**Figure 7.3** (**EIAR Volume 2**)). The habitats are present across the more elevated northern and eastern parts of the Site; through a combination of larger areas and smaller isolated fragments. Blanket bog is mainly represented by the M17 and M19 NVC communities. The M2 community and M3 community were also infrequently recorded. Wet modified bog communities recorded are dominated by M20 community, with a small area of the M25a^ sub-community. M25a being classified as wet modified bog and not marshy grassland here due to generally appearing on peat of greater than 0.5 m in depth. These habitats are associated with Scottish Biodiversity List (SBL) blanket bog habitat with some areas also corresponding to Annex 1 type 7130 blanket bog habitat. The NatureScot Carbon and Peatland Map (**Figure 7.2** (**EIAR Volume 2)**) shows that the Site contains some areas of Class 1 peatland. It is recognised that this definition is not solely for nature conservation and so not directly applicable to evaluating the value of a peatland. Despite some of these communities being associated with Annex I and SBL blanket bog classifications, the habitat within the survey area is a degraded resource in relatively poor condition that has been impacted over time in several ways (as discussed in **paragraph 7.3.20**). Therefore, assigning a nature conservation value higher than Local is not deemed appropriate.

7.5 Assessment of Likely Effects

Embedded Mitigation

Mitigation By Design

7.5.1 As part of the iterative design process for the Proposed Development, ecological constraints identified through baseline survey results were considered to avoid or reduce negative effects on ecological features where possible (see **Chapter 2: Development Description** (**EIAR Volume 1**) and **Chapter 3: Evolution of Design and Alternatives** (**EIAR Volume 1**)). This involves:

- A 50 m buffer for any infrastructure or construction activity around all watercourses where possible, except where a minimum number of watercourse crossings are required. This will minimise effects on associated habitats and species;
- Designing track length and alignment to reduce the extent of new track and number of watercourse crossings required, where feasible considering the topography of the Site;
- Designing track length and alignment to reduce the extent of new track crossing blanket bog and wet heath, where feasible considering the topography of the Site;
- Avoiding peat over 1m in depth, blanket bog and wet modified bog, and potential high GWDTEs for the location of wind turbines and other infrastructure as far as practicable;
- A minimum 30 m buffer for any infrastructure or construction activity (100 m for pile driving and blasting works) around the entrance to any badger sett;
- Positioning of turbines to ensure potential bat roosts (moderate or high potential) lie out with the 281 m protection buffer; and
- Establishing a 50 m buffer from turbine blade tips to edge habitats (where present), across the Site to safeguard bats.

Pre-Construction & Construction

7.5.2 General and standard mitigation measures for habitats and species, such as complying with best practice, micrositing provisions, presence of an ECoW and adherence to an Outline CEMP (**TA 2.1** (**EIAR Volume 4**)) and SPP (**TA 7.5**, **EIAR Volume 4**).

7.5.3 The SPP (outline SPP provided in **TA 7.5**, **EIAR Volume 4**) 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. 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.

7.5.4 Any micrositing of infrastructure will be based on a review of existing ecological data and the findings of completed 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 micrositing will also take into consideration any buffer distances on protected features identified, as detailed within the SPP (**TA 7.5**, **EIAR Volume 4**).

7.5.5 There will be a contractual management requirement for the Principal Contractor (PC) to implement a comprehensive, site-specific and robust CEMP in consultation with the SEPA and the planning authority. This document will detail how the PC will manage the works in accordance with all commitments and mitigation detailed in the EIA Report, 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).

7.5.6 The embedded mitigation includes that construction work would comply with a CEMP developed by the PC, which would be monitored by a suitably experienced ECoW. The ECoW will be appointed prior to the commencement of construction to advise the Applicant and the 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 employed by the Principal Contractor and sub-contractors.

7.5.7 No significant construction effects were identified on IEFs and therefore requiring additional mitigation measures; however, a number of additional mitigation, compensation and significant enhancement measures are proposed as part of the Proposed Developments OBEMP, as detailed in **TA 7.7** and outlined below.

7.5.8 Enhancement, restoration and creation of habitats through the delivery of a BEMP would reduce effects on habitats further. Overall, the BEMP would deliver significant biodiversity enhancement at the Proposed Development, in line with objectives outlined in NPF4 Policy 3 the Onshore Wind Policy Statement, and the Scottish Biodiversity Strategy to 2045. The BEMP would include provisions for the protection, maintenance, restoration and enhancement of moorland and bog habitats locally. Furthermore, the BEMP would deliver wetland enhancement to benefit waders (curlew) and other upland breeding birds, and bracken control for grassland restoration.

7.5.9 The OBEMP is provided in **TA 7.7**, also see **Figure 7.15**. The OBEMP is based on a number of identified land parcels or areas for each respective habitat management and biodiversity enhancement proposal. These areas may be refined following further specialist surveys and feedback from relevant consultees, and all areas may not be taken forward for the final BEMP, and other areas and/or proposals may also be considered (if deemed necessary); however, the Applicant remains committed to delivering significant biodiversity enhancement at the Proposed Development.

7.5.10 In summary the OBEMP includes the following proposals:

- Aim 1: Restore & enhance peatland habitat and improve bog condition;
- Aim 2: Restore acid grassland habitats; and
- Aim 3: Enhance the mosaic of curlew breeding and foraging habitat.

7.5.11 Full details of the proposals and associated monitoring and reporting schedules are provided in **TA 7.7 (EIAR Volume 4)**.

7.5.12 As part of the OBEMP a Biodiversity Net Gain (BNG) assessment was undertaken using a BNG metric. This demonstrates the measures proposed for the creation and enhancement of habitats would result in a significant increase in the biodiversity value of the Site post construction. The BNG metric was applied to the Proposed Developments baseline habitats, considered predicted habitat losses, and the habitat creation and enhancement measures as proposed in the OBEMP. The BNG metric indicates that following construction, Site restoration, BEMP implementation and subsequent habitat management, the Proposed Development would compensate for predicted habitat and biodiversity losses and on top of this provide further enhancement that would result in an increase and net gain for biodiversity of +20 % over and above the baseline and no irreplaceable habitats are predicted to be lost as a result of the Proposed Development (see **TA 7.7, EIAR Volume 4**).

7.5.13 The detailed and final BEMP would be agreed with PKC and NatureScot in advance of construction and would ensure the Proposed Development secures significant biodiversity enhancements through restoring degraded habitats and strengthening nature networks.

Operation

7.5.14 Operational impacts to bat species caused by the wind turbines has been assessed as being low (as previously discussed in Section 7.3) and therefore 'Not Significant'. However, it is recommended that carcass searches are undertaken in the operational phase to ensure consistency with the predicted effects. The monitoring should be manual searches of turbine hardstandings and a 50 m radius of the ground surrounding the turbines to identify bat collisions as a result of the operation of the turbines. A dedicated search for bat carcasses shall be carried out on a monthly basis as per the Operational phase environmental management plan, at each turbine location:

- Searches shall be centred on each turbine and shall cover a minimum radius of 50 m from the base of the turbine. This encompasses the area where carcasses are most likely to be found.
- The area of hardstand and surrounding vegetation within the defined radius shall be walked and a visual inspection of the area shall be carried out for carcasses.
- Areas around ancillary infrastructure (stairs, fans, package subs. etc.) shall also be searched as part of the check.

7.5.15 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

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

7.5.17 Standard and embedded mitigation implemented during the construction, operational and decommissioning phases are discussed in **Section 7.1**.

Potential Construction Effects

7.5.18 This section provides an assessment of the potential for significant effects of the construction of the Proposed Development upon the scoped in IEFs.

Habitats

Blanket Bog & Wet Modified Bog

7.5.19 The most tangible effect during construction of the Proposed Development would be direct habitat loss due to the construction of infrastructure such as new tracks, wind turbines, hardstands, laydown areas, compounds, borrow pits, batching plant, substation and BESS. Much of this infrastructure would be permanent, however the temporary construction compound, temporary crane pad sections, and borrow pits would be restored at the end of construction.

7.5.20 There may also be some indirect habitat losses to wetland habitats due to drainage effects. For the purposes of this assessment, it is assumed that habitat losses to wetland habitats due to indirect drainage effects may extend out to 10 m from infrastructure (i.e., in keeping with precautionary indirect drainage assumptions within the carbon calculator guidance (SEPA, 2018)). It is expected that any indirect drainage effects would only impact wetland habitat such as blanket bog, wet modified bog, wet heath, flushes etc. No indirect drainage effects are expected to impact or alter the quality or composition of non-wetland habitats, such as dry heath, bracken, acid grassland etc., as such only direct habitat loss applies to these habitats.

7.5.21 Temporary habitat losses due to the creation of temporary infrastructure and up to five borrow pit search areas (all of which, or the full search area extents, may not be used or required) 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 habitat types such as blanket bog/wet modified 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.

7.5.22 **Table 7-6** details the estimated relative losses expected to occur for scoped-in habitats, for all new permanent and temporary infrastructure (with habitat loss estimated for all habitat types presented in **Annex A, Table 7.8**).

Table 7-6: Summary of Receptor Sensitivity

Phase 1 Habitat Type	Phase 1 Extent in Study Area (ha)	NVC Community Code or Habitat Type[66]	Direct Habitat Loss (ha)	Direct Habitat Loss as a % of Phase 1 Type	Indirect Habitat Loss (ha) in Study Area	Indirect Habitat Loss as a % of Phase 1 Type in Study Area
Permanent						
Blanket Bog	280.72	M17, M17a, M17b, M19a, M19b, M19c	7.89	2.81	9.31	3.32
Wet Modified Bog	63.90	M20a	1.76	2.75	1.56	2.45
Temporary						
Blanket Bog	280.72	M17, M17a, M17b, M19a, M19b, M19c	6.50	2.32	N/A	N/A
Wet Modified Bog	63.90	M20a	2.77	4.33	N/A	N/A

7.5.23 **Effect:** Effects upon blanket bog and wet modified bog habitats during construction would be direct (through permanent and temporary habitat loss) and indirect (through potential drying effects upon neighbouring bog habitats) occurring from the construction phase into the operational phase. Direct loss would occur in areas where permanent infrastructure such as access tracks, wind turbine foundations, hardstandings and substation are sited on these habitat types. The excavation of these habitat types for temporary infrastructure would also likely lead to 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 type. In addition, there may be indirect losses or habitat modification as a result of drainage around infrastructure (precautionarily around 10 m from infrastructure is assumed) and disruption to hydrological flows.

7.5.24 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.

7.5.25 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. **Figures 7.3.1 – 7.3.16 (EIAR Volume 2)** shows that blanket bog and wet modified bog habitats exist together and with other wetland habitats (e.g., mires, flushes and marshy grasslands) in large expansive hydrologically connected mosaics across the Study Area and in the wider local area. However, it should also be noted that peatland erosion within the Site naturally creates fragmentation effects within the peatland hydrological units present. Overall, the large scale of these

[66] Only specific IEF 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, Table 7-8**.

wetland habitat mosaics reduces the likelihood that small, fragmented habitat patches would be created as a result of the Proposed Development. 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 will allow the maintenance of sub-surface hydrological connectivity between areas. It is therefore unlikely that the potential effects of fragmentation as a result of the Proposed Development 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.

7.5.26 Nature conservation value: Local (as detailed in **Table 7-5**).

7.5.27 **Conservation Status:** Conservation Status of this habitat as assessed in the JNCC report on blanket bog is 'Unfavourable Bad' and 'Stable' at the UK level[67].

7.5.28 **Magnitude of Effect:** The UK has an estimated 2,182,200 ha of blanket bog (JNCC, 2019[67]) of which around 1,759,000 to 1,800,000 ha is in Scotland (JNCC, 2019[68]) (approximately 23% of the land area)

7.5.29 Blanket bog covers 280.72 ha (25.46%) of the Study Area and is indicated by NVC communities M17, M17a, M17b, M19, M19a, M19b, M19c, M2 and M3 (**Annex A, Table 7-8**). The direct habitat loss for blanket bog is predicted to be 7.89 ha (2.81%) due to permanent infrastructure, with up to an additional 6.50 ha (2.32 %) due to temporary works areas (see **Table 7-6** and also **Annex A, Table 7-8**). This results in a potential total direct loss of 14.39 ha, equivalent to 5.13 % of the blanket bog within the Site.

7.5.30 Wet modified bog covers 63.90 ha (5.80 %) of the Study Area and is indicated by NVC communities M20, M20a, M20b and M25a^ (**Annex A, Table 7-8**). The direct habitat loss for wet modified bog is predicted to be 1.76 ha (2.75 %) due to permanent infrastructure, with up to an additional 2.77 ha (4.33 %) due to temporary works areas (see **Table 7-6** and **Annex A, Table 7-8**). This results in a potential total direct loss of 4.52 ha, equivalent to 7.08 % of the wet modified bog within the Site.

7.5.31 For this blanket mire resource as a whole, i.e., combining blanket bog and wet modified bog, direct losses amount to 9.64 ha for permanent infrastructure and 9.27 ha for temporary works areas and borrow pits: a total of 18.91 ha, or 5.49 %, of the combined resource within the Study Area.

7.5.32 In addition, there may be some indirect losses because of the 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. Consequently, drainage effects can be restricted to just a few metres around the feature or extend out to tens of metres, or further (e.g., see review within Landry & Rochefort (2012)[69]). 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 to around 50 m, whilst in more decomposed (less fibrous) peat drainage effects may only extend to around 2 m. Blanket bog habitats commonly are associated with more highly decomposed peats (Nayak et al. 2008[70]). For this assessment, indirect effects are assumed to extend out to 10 m from infrastructure.

[67] https://jncc.gov.uk/jncc-assets/Art17/H7130-UK-Habitats-Directive-Art17-2019.pdf [Accessed June 2024]

[68] https://www.nature.scot/landscapes-habitats-and-ecosystems/habitat-types/mountains-heaths-and-bogs/blanket-bog

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

[70] 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.

7.5.33 As per **Table 7-6**, if indirect drainage effects are fully realised out to 10 m around permanent infrastructure in all blanket bog and wet modified bog areas, then the total predicted indirect habitat modification or losses for blanket bog are 9.31 ha and 1.56 ha for wet modified bog.

7.5.34 The worst-case scenario of direct and indirect habitat loss for permanent and temporary works areas is an overall total of 23.70 ha or 8.44 % of the Study Area for blanket bog and 6.09 ha or 9.53 % of the Study Areas wet modified bog. For this blanket mire resource as a whole, i.e., combining blanket bog and wet modified bog, direct and indirect losses for permanent and temporary works areas overall amount to 29.79 ha, or 8.64 % of the combined resource within the Study Area.

7.5.35 However, it is considered unlikely that indirect drainage effects (i.e., out to 10 m either side of infrastructure) would have a significant effect on the degraded blanket bog / wet modified bog present in the Site or result in large-scale vegetation shifts to a lower conservation value habitat type (e.g., acid grassland). For instance, Stewart & Lance (1991)[71] 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 wholescale 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. In addition, as described in **TA 7.1 (EIAR Volume 4**) given the eroding and degraded condition of peatland known to be present onsite, with historical moor grips, extensive hagging, gullies acting like drains, and naturally drained peatland, it is assumed due to the long history of these already present drying effects it is unlikely these potential indirect effects as a result of the Proposed Development would materialise to such a degree as predicted (as much of the habitat and supporting peatland is already effectively drained or hydrologically impaired to a degree).

7.5.36 It should also be noted that 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 hydrology, geology or topography, or the presence of non-wetland habitats that act as a break, barrier or buffer, that would prevent the full predicted indirect drainage effects from materialising.

7.5.37 Overall, evidence suggests that if some drainage effects materialise locally around infrastructure due to the Proposed Development, the most likely effect will not be a major change in overall bog habitat type, but rather a potential 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. If severe indirect drying effects are observed long-term then blanket bog communities may transition towards modified bog, or modified bog may transition towards wet heath vegetation on deeper peat. These are still habitats of conservation interest, being Annex I and SBL Priority Habitats.

7.5.38 When considering the scale of the above habitat losses (i.e., direct and precautionary indirect effects on up to 8.64 % of the combined blanket bog and wet modified bog) within the Study Area and accounting

[71] Stewart, A.J.A. & 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.

for the relative abundance, distribution and quality of the blanket bog and wet modified bog within the Study Area and connected immediately adjacent to the Proposed Development, an effect magnitude of low spatial and long-term temporal is appropriate.

7.5.39 **Significance of Effect:** Given the above consideration of nature conservation value, Conservation Status and Magnitude of Effect, the effect significance with embedded mitigation is considered to be minor adverse and **not significant** under the EIA Regulations.

7.5.40 The Proposed Development proposes significant biodiversity enhancement via the OBEMP (which incorporates peatland restoration); this would deliver +20 % net gain for biodiversity. This is discussed in **TA 7.7 (EIAR Volume 4**).

7.5.41 Although the 1:10 peatland restoration ration has not been achieved at this stage, it should be noted that every effort to maximise the potential for peatland restoration within the red line boundary has been made. However, it is hoped that there will be further benefits realised in the future, but there are too many uncertainties at this stage for such benefits to be quantified.

Potential Operational Effects

7.5.42 This section provides an assessment of the likely effects of the operation of the Proposed Development upon scoped in IEFs.

7.5.43 Based on the embedded and specific mitigation discussed in **paragraphs 7.5.1 – 7.5.13** there are no likely significant effects upon scoped in IEFs during the operational phase of the Proposed Development that are not already reported upon and assessed in discussion of the Construction Effects, above.

Habitats

7.5.44 All likely direct and indirect effects on habitats have been considered in the Predicted Construction Effects **Section 7.5**.

7.5.45 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 in **paragraphs 7.5.18 - 7.5.39**.

7.5.46 Indirect effects on wetland habitats would largely occur during the operational phase as potential drying effects become established. However, for ease and clarity assessing effects on habitats, these are considered together within Predicted Construction Effects.

7.5.47 **Significance of Effect:** Given the above consideration of nature conservation value, Conservation Status and Magnitude of Effect, the effect significance with embedded mitigation combined with the implication of the BEMP is considered to be minor beneficial and not **significant** under the EIA Regulations. However, it is hoped that there will be further benefits realised in the future, but there are too many uncertainties at this stage for such benefits to be quantified.

Potential Decommissioning Effects

7.5.48 Due to the distant timeframe until their occurrence (50 years), decommissioning effects are difficult to predict with confidence. In general, decommissioning effects are usually considered for the purposes of assessment to be similar to (or likely less than) those of construction effects in nature and are likely to be

of shorter duration. Prior to decommissioning, a DEMP would be prepared and agreed with the relevant statutory consultees, which would include the need for pre-works surveys.

7.5.49 The decommissioning of the Proposed Development would involve the removal of most of the above ground elements and restoration of the associated ground (details provided in **Chapter 2 Development Description** (**EIAR Volume 1**)). Restoration would seek to return areas to their pre-construction habitat type, or as similar as feasible depending on local substrates, topography, hydrology etc. Provided there is an approved decommissioning plan, the effects associated with decommissioning are not likely to be any greater than the construction phase. Furthermore, due to potential restoration of habitats in these areas, there could be a net positive effect.

Potential Cumulative Effects

7.5.50 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. In the interests of focusing on the potential for similar significant effects, this assessment considers the potential for cumulative effects with other wind farm developments at application stage (as those sites that are operational or under construction are considered part of the baseline) within 5 km of the Site. 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.

7.5.51 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.

7.5.52 The Glen Lednock Wind Farm (proposed to the immediate east of the Proposed Development) is currently at EIA scoping stage; whilst the scoping response is publicly available, sufficient quantitative ecological/ornithological information has not yet been published to allow a meaningful cumulative assessment to be made upon ecological/ornithological features. A cumulative assessment will be undertaken, but this would be a consideration for the Glen Lednock Wind Farm, undertaken at the appropriate stage, using the baseline data collected for the Proposed Development and presented within this Chapter.

7.5.53 It would, however, be expected that the design and assessment of the Glen Lednock Wind Farm would be informed by site-specific baseline information, with the development designed in accordance with the Mitigation Hierarchy to firstly avoid the potential for significant effects upon ecological/ornithological features in so far as is possible. In accordance with NPF4 Policy 3c which states Development proposals for national or major development, or for development that requires an Environmental Impact Assessment will only be supported where it can be demonstrated that the proposal will conserve, restore and enhance biodiversity, it would also be assumed that the Glen Lednock Wind Farm would not proceed without such a commitment to conserve, restore and enhance biodiversity within the Site, beyond that required to offset any significant adverse effects upon ecological/ornithological features.

7.5.54 On the basis of these assumptions and considering the commitment to the enhancement of biodiversity within the Site made by the Proposed Development, the potential for significant cumulative adverse effects upon ecological/ornithological features is unlikely.

Construction

7.5.55 Based on the conclusion above, blanket bog and wet modified bog, i.e., the habitat IEF considered in relation to the Proposed Development (as per above), no significant adverse effects are predicted.

7.5.56 In general, for wind farm developments, mitigation and/or additional management/ restoration/ enhancement/ creation of habitats is usually proposed to compensate and offset any effects on IEFs. These mitigation and enhancement areas also tend to be larger or many orders of magnitude greater than the area of predicted loss. As discussed above, the requirement for each development project to provide 'significant biodiversity enhancement' is a requirement of NPF4, Policy 3.

7.5.57 As such, no adverse cumulative effects are predicted. Based on the above commitments in regard to implementation of the OBEMP **TA 7.7** (**EIAR Volume 4**), the effect significance is considered to be minor adverse and **not significant** under the EIA Regulations.

Operation

7.5.58 No potential cumulative operational phase effects are considered likely. Based on the commitment of the Applicant to implement the OBEMP **TA 7.7** (**EIAR Volume 4**) over the operational phase of the Proposed Development, the effect significance is considered to be moderate beneficial and **significant** under the EIA Regulations.

7.6 Assessment of Residual Effects

7.6.1 No significant effects (either standalone, or cumulative) identified with all scoped in IEFs remaining as minor adverse and n**ot significant** for the construction phase. Moderate beneficial**Error! Bookmark not defined.** and **significant** effects have been identified within the operational phase.

7.7 Monitoring

Construction Phase Monitoring

7.7.1 Construction Phase Monitoring would comply with a CEMP (**TA 2.1, EIAR Volume 4).** and would be monitored by a suitably experienced ECoW. General environmental monitoring of the Site to be undertaken by an ECoW. Such monitoring would also consider the SPP (**TA 7.5, EIAR Volume 4**).

Operational Phase Monitoring

7.7.2 Operational Phase Monitoring would comply with the BEMP, once finalised (OBEMP provided in **TA 7.7** (**EIAR Volume 4**).

Decommissioning Phase Monitoring

7.7.3 None identified at this stage.

7.8 Summary

7.8.1 For all IEFs assessed, the predicted residual levels of significance of effects during the construction, operational and decommissioning phases of the Proposed Development, alone or cumulatively with

other projects, are considered to be no more than minor adverse and therefore **not significant**. The summary of potential significant effects of the Proposed Development is discussed in **Table 7-7** below.

Table 7-7: Summary of Potential Significant Effects of the Proposed Development

IEF	Potential Effect	Significance	Mitigation Proposed	Outcome/Residual Effect
Construction				
Blanket Bog & Wet Modified Bog	Direct and indirect habitat loss	Minor adverse	In addition to all mitigation, the implementation of a BEMP (OBEMP provided in **TA 7.6** (**EIAR Volume 4**) which includes bog and upland habitat restoration.	Not significant
Operation				
Blanket Bog & Wet Modified Bog	Habitat improvement	Minor beneficial	Implementation of a BEMP (OBEMP provided in **TA 7.6** (**EIAR Volume 4)** which includes bog and upland habitat restoration.	Significant
Decommissioning				
None identified. Generally, as for Construction (or less). No further direct or indirect losses; potential net positive effect on habitats after Site restoration.				
Cumulative Construction				
None identified.				
Cumulative Operation				
None identified.				

Annex A

Table 7-8: Habitat Baseline Composition and Habitat Loss Calculations for Study Area

		Study Area (Baseline)				Permanent Direct Loss		Permanent Indirect Loss (only applies to Wetland Habitats)		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)**	**% Loss of Phase 1 Type within Study Area**	**NVC Area (ha)**	**% Loss of Phase 1 Type within Study Area**	**NVC Area (ha)**	**% Loss of Phase 1 Type within Study Area**
Totals		**1102.46**	**100%**	**1102.46**	**100%**	**16.99**	**1.54%**	**17.56**	**1.59%**	**32.72**	**2.97%**
Broad-Leaved Semi-Natural Woodland (A1.1.1)	W10a	32.55	2.95%	1.03	0.09%	0.00	0.20%	0.00	0.00%	0.00	0.11%
	W11			25.03	2.27%	0.04		0.00		0.03	
	W4			0.02	0.00%	0.01		0.00		0.00	
	W10			0.34	0.03%	0.01		0.00		0.01	
	W7			0.28	0.03%	0.00		0.00		0.00	
	W7a			1.46	0.13%	0.00		0.00		0.00	
	W7c			4.21	0.38%	0.00		0.00		0.00	
	W4c			0.18	0.02%	0.00		0.00		0.00	
	W8			0.00	0.00%	0.00		0.00		0.00	
Broad-Leaved Plantation Woodland (A1.1.2)	YBP	40.93	3.71%	87.60	4.54%	0.33	0.81%	0.00	0.00%	1.34	3.28%
Coniferous Plantation Woodland (A1.2.2)	CP	56.86	5.16%	1.07	0.06%	0.03	1.16%	0.00	0.00%	0.02	3.72%
	YCP			188.16	9.76%	0.63		0.00		2.10	
Dense/Continuous Scrub (A2.1)	W23	0.01	<0.01%	0.01	<0.01%	0.00	1.54%	0.00	0.00%	0.00	0.46%
Scattered Broad-Leaved Tree (A3.1)	SBT	0.12	0.01%	0.12	0.01%	0.01	4.43%	0.00	0.00%	0.00	1.75%
Unimproved Acid Grassland (B1.1)	U4a	138.95	12.60%	3.85	0.35%	0.01	0.59%	0.00	0.67%	0.01	3.10%
	U4			37.53	3.40%	0.14		0.00		0.11	
	U5			45.28	4.11%	0.34		0.00		1.00	
	U6			27.89	2.53%	0.14		0.47		1.56	
	U6c			2.48	0.22%	0.03		0.11		0.02	
	U6a			12.50	1.13%	0.16		0.35		0.61	

		Study Area (Baseline)				Permanent Direct Loss		Permanent Indirect Loss (only applies to Wetland Habitats)		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)**	**% Loss of Phase 1 Type within Study Area**	**NVC Area (ha)**	**% Loss of Phase 1 Type within Study Area**	**NVC Area (ha)**	**% Loss of Phase 1 Type within Study Area**
	U6b			2.48	0.22%	0.00		0.00		0.00	
	U5a			2.85	0.26%	0.00		0.00		0.00	
	U5b			1.68	0.15%	0.00		0.00		1.00	
	U5d			2.40	0.22%	0.00		0.00		0.00	
Semi-Improved Acid Grassland (B1.2)	U4b	6.75	0.61%	6.75	0.61%	0.18	2.60%	0.00	0.00%	0.19	2.78%
Improved Grassland (B3.1)	MG6a	12.74	1.16%	9.25	0.84%	0.04	0.71%	0.00	0.00%	0.03	0.44%
	MG6			3.50	0.32%	0.05		0.00		0.03	
Marsh/Marshy Grassland (B5)	M23a	56.61	5.13%	50.74	4.60%	0.40	0.95%	1.50	3.61%	0.65	2.30%
	MG10a			0.77	0.07%	0.01		0.03		0.01	
	M25b			1.13	0.10%	0.02		0.11		0.08	
	M25a			1.92	0.17%	0.08		0.23		0.08	
	Je			1.12	0.10%	0.01		0.07		0.48	
	M23b			0.92	0.08%	0.02		0.11		0.02	
Continuous Bracken (C1.1)	U20a	24.87	2.26%	9.96	0.90%	0.12	1.39%	0.00	0.00%	0.08	0.87%
	U20			14.78	1.34%	0.22		0.00		0.14	
	U20b			0.13	0.01%	0.00		0.00		0.00	
Tall Ruderal (C3.1)	OV25	0.08	0.01%	0.04	<0.01%	0.00	3.08%	0.00	0.00%	0.00	1.37%
	W24			0.04	<0.01%	0.00		0.00		0.00	
Acid Dry Dwarf Shrub Heath (D1.1)	H18a	208.49	18.91%	0.65	0.06%	0.00	0.94%	0.00	0.00%	0.00	4.95%
	H12a			71.99	6.53%	0.57		0.00		0.53	
	H12c			7.06	0.64%	0.07		0.00		0.02	
	H12b			93.80	8.51%	1.05		0.00		9.50	
	H10c			10.37	0.94%	0.00		0.00		0.00	
	H9c			2.82	0.26%	0.04		0.00		0.02	

		Study Area (Baseline)				Permanent Direct Loss		Permanent Indirect Loss (only applies to Wetland Habitats)		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)**	**% Loss of Phase 1 Type within Study Area**	**NVC Area (ha)**	**% Loss of Phase 1 Type within Study Area**	**NVC Area (ha)**	**% Loss of Phase 1 Type within Study Area**
	H10a			15.14	1.37%	0.17		0.00		0.06	
	H10			0.27	0.02%	0.00		0.00		0.00	
	H21			0.33	0.03%	0.00		0.00		0.00	
	H9a			0.99	0.09%	0.00		0.00		0.00	
	H9d			0.18	0.02%	0.00		0.00		0.00	
	H10b			1.49	0.14%	0.05		0.00		0.13	
	H18			0.60	0.05%	0.02		0.00		0.05	
	H21a			0.06	0.01%	0.00		0.00		0.00	
	H12			2.60	0.24%	0.00		0.00		0.00	
	H9			0.15	0.01%	0.00		0.00		0.00	
	M15a			17.65	1.60%	0.18		0.42		0.55	
Wet Dwarf Shrub Heath (D2)	M15b	51.87	4.71%	29.80	2.70%	0.48	1.42%	1.40	3.98%	0.38	1.89%
	M15d			4.43	0.40%	0.08		0.25		0.05	
Lichen/Bryophyte Heath (D3)	H14b	2.48	0.23%	2.48	0.23%	0.07	2.63%	0.00	0.00%	0.50	19.98%
Acid/Neutral Exposure (E1.4.1)	RK	4.17	0.38%	4.17	0.38%	0.01	0.21%	0.00	0.00%	0.38	9.08%
	M19a			154.26	13.99%	4.07		4.15		2.35	
	M17b			35.19	3.19%	0.94		1.58		1.30	
	M2			0.06	0.01%	0.00		0.00		0.01	
	M19c			17.54	1.59%	0.63		0.78		0.51	
Blanket Bog (E1.6.1)	M17a	280.72	25.46%	32.54	2.95%	1.51	2.81%	1.81	3.32%	0.61	2.32%
	M17			3.11	0.28%	0.14		0.07		0.00	
	M19b			30.31	2.75%	0.54		0.82		1.67	
	M3			2.47	0.22%	0.06		0.08		0.04	
	M19			5.24	0.47%	0.00		0.00		0.00	

		Study Area (Baseline)				Permanent Direct Loss		Permanent Indirect Loss (only applies to Wetland Habitats)		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)**	**% Loss of Phase 1 Type within Study Area**	**NVC Area (ha)**	**% Loss of Phase 1 Type within Study Area**	**NVC Area (ha)**	**% Loss of Phase 1 Type within Study Area**
Wet Modified Bog (E1.7)	M20a	63.90	5.80%	63.66	5.77%	1.76	2.75%	1.56	2.45%	2.77	4.33%
	M25a^			0.24	0.02%	0.00		0.00		0.00	
Acid Neutral Flush (E2.1)	M6d	87.08	7.90%	42.00	3.81%	0.24	0.83%	0.69	1.89%	0.13	1.41%
	M6c			30.67	2.78%	0.34		0.64		0.87	
	M6a			11.08	1.01%	0.12		0.28		0.22	
	M4			0.53	0.05%	0.01		0.00		0.00	
	M32a			0.06	0.01%	0.00		0.00		0.00	
	M6b			2.73	0.25%	0.01		0.02		0.00	
Basic Flush (E2.2)	M10a	0.04	0.00%	0.04	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%
	M10			<0.01	<0.01%	0.00		0.00		0.00	
Bare Peat (E4)	ExP	7.92	0.72%	7.92	0.72%	0.22	2.83%	0.00	0.00%	0.15	1.90%
Swamp (F1)	S9a	0.04	0.00%	0.03	<0.01%	0.00	0.00%	0.00	0.00%	0.00	0.00%
	S10			0.01	<0.01%	0.00		0.00		0.00	
Standing Water (G1)	SW	4.27	0.39%	4.27	0.39%	0.00	0.00%	0.00	0.00%	0.00	0.00%
Running Water (G2)	RW	0.05	0.00%	0.05	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%
Bare Ground (J4)	BG	1.97	0.18%	1.97	0.18%	0.44	22.40%	0.00	0.00%	0.13	0.00%
Other Habitat (J5)	MB	18.98	1.72%	18.98	1.72%	0.16	0.84%	0.00	0.00%	0.20	0.00%